Lab SCIENTIFIC DO8500 Portable Optical Dissolved Oxygen Meter

Lab SCIENTIFIC DO8500 Portable Optical Dissolved Oxygen Meter User Manual

Contents

Lab SCIENTIFIC DO8500 Portable Optical Dissolved Oxygen Meter

Product Information

Technical Specifications

- **Dynamic Range:** (0-20.00) mg/L (ppm), (0-200.0)%
- **Resolution:** 0.01/0.1mg/L (ppm), 0.1/1%
- **Accuracy:** RoHS, CE & ISO9001:2015
- **Temperature Compensation:** Yes

Frequently Asked Questions

- **Q:** How often should I calibrate the DO8500 Portable Optical Dissolved Oxygen Meter?
  - **A:** It is recommended to calibrate the meter regularly, ideally before each use or as per the specific application requirements.
- **Q:** Can I replace the optical sensor in the DO8500 meter?
  - **A:** The optical sensor is a critical component, and replacement should be done by authorized service personnel to maintain accuracy and functionality.
- **Q:** What should I do if the readings appear unstable?
  - **A:** Check the probe connection, calibration status, and environmental conditions to ensure stable and accurate readings.

OVERVIEW

Thank you for purchasing Apera Instruments DO8500 Portable Optical Dissolved Oxygen Meter. The DO8500 measures dissolved oxygen in water using luminescence technology through an optical sensor and displays data with intelligent instrumentation. Compared to conventional electrochemical dissolved oxygen meter, the DO8500 is more accurate, stable and easier to use.

Before you use the instrument, please carefully read the instruction manual to help you properly perform tests and maintenance.

Luminescent optical sensor

- **Stability and Accuracy:** Oxygen is not consumed during measurements. It is not affected by sample flow rate and thus provides a stable measurement.
- **Easy to Use:** No electrolytes or membranes are required; frequent calibration is not necessary.
- **Interference-Free:** Sensor cap is coated with a light-shielding layer and minimizes the impact from external light sources. The use of non-chemical sensors helps reduce a variety of heavy metal ions interference in the aqueous environment with H2S and NH4 and other chemical substances.
- **Long service life:** except for mechanical deterioration (such as scratches to the light shielding layer), the sensor cap has up to 8000 hours of service life.
- Easy to calibrate and maintain. Probe is equipped with a calibration/storage sleeve, which makes calibration and maintenance more convenient and reliable.

Intelligent Instrumentation

- Built-in microprocessor chip, featured with Auto. Temperature Compensation, Auto. Air Pressure Compensation, Auto. Salinity Compensation and parameter setting, auto. power off, and low power indication.
- Meter meets with the requirement of international GLP standards, clock display, manual storage and automatic timing storage. USB data output.
- Stable reading and automatic locking modes available.
- Clear large-size LCD display with white backlight.
- Meets IP57 waterproof rating; In addition, a rugged instrument suitcase is provided.

Special Notes

- Sensor cap surface coating can not withstand high temperature, so the optical dissolved oxygen electrode can not test water with temperature over 50 °C.
- When the electrode is not in use, it should be kept in the storage sleeve and the sponge in the cap should be kept moist, so that the fluorescent cap will not dry out. If the sponge is dried out or the probe is exposed in dry air for more than 8 hours, soak the electrode in tap water for 24~48 hours (see section 4.2), otherwise it may cause unstable measurements or slow response.
- Before getting readings or performing other operations, wait about 30 seconds after meter is powered on.

TECHNICAL SPECIFICATIONS

DISSOLVED OXYGEN	**DYNAMIC RANGE**	(0-20.00) mg/L (ppm), (0-200.0)%
	RESOLUTION	0.01/0.1mg/L (ppm), 0.1/1%
	ACCURACY	±2% reading or ±2% mg/L, whichever is greater ±2% reading or ±0.2 saturation, whichever is greater
	RESPONSE TIME	≤30 s (2˚C, 90% response)
	CALIBRATION POINTS	Saturation Point & Zero Oxygen
	TEMPERATURE COMPENSATION	Automatic, (0 to 50)˚C
	PRESSURE COMPENSATION	Automatic, (60 to 120) kPa
	SALINITY COMPENSATION	Manual, (0 to 45) ppt
TEMPERATURE	**RANGE**	(0 to 50.0)˚C
	RESOLUTION	0.1 ℃
	ACCURACY	±0.5 ℃
OTHER	**BATTERIES**	AA x 3 (1.5V×3)
	IP RATING	IP57
	DIMENSIONS AND WEIGHT	Meter: 88×170×33 mm/313g With case: 360×270×76 mm/1.3kg
	PRODUCT CERTIFICATE	RoHS, CE & ISO9001:2015

INSTRUCTIONS

LCD Screen

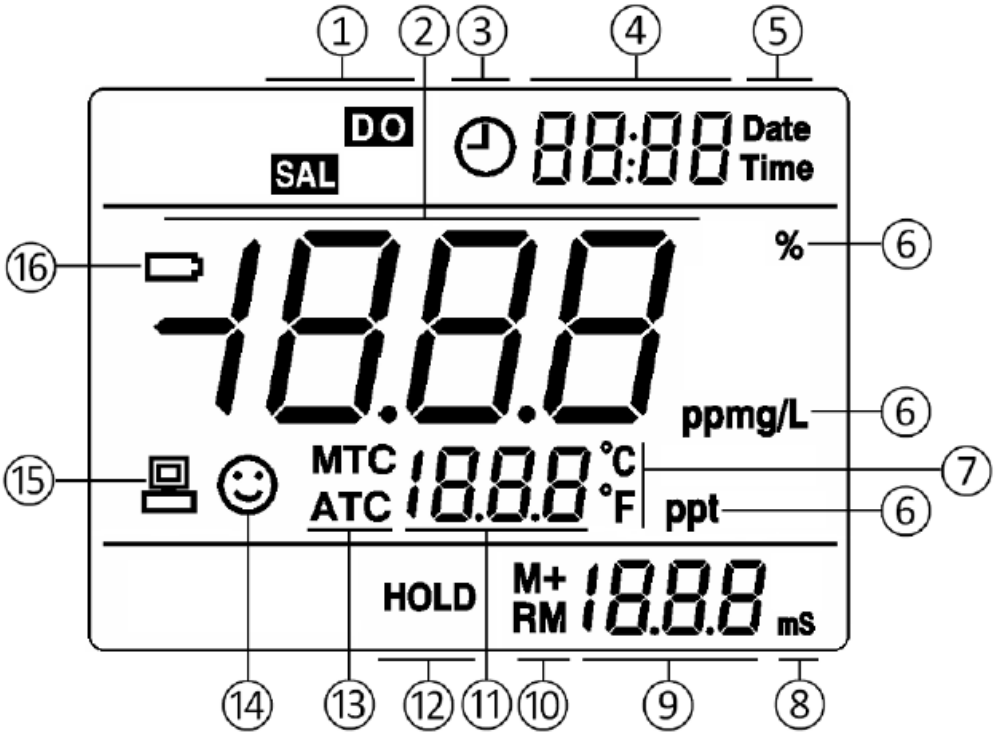


Figure - 1

1	Measurement Mode Icon	9	Serial number of storage and prompts of special display mode
2	Reading/Measured Value	10	M+ — Measurement to be stored RM — Reading to be recalled
3	Timing Storage	11	Temperature value and prompts of speci al display mode
4	Date/time and prompts of special displa y mode	12	Automatic reading lock-up
5	Units of date and time	13	ATC—Auto temperature compensation MTC—Manual temperature compensation
6	Units of measurement	14	Stability icon of readings
7	Units of temperature	15	USB communication
8	Units during calibration	16	Low power indication

Key Operation

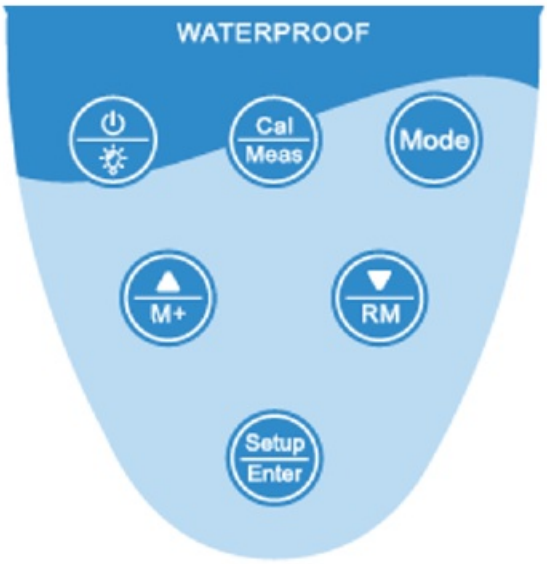


Figure - 2

- **Short press:** key press time < 2 seconds; Long press: key press time> 2 seconds.
- **Power on:** Press to turn on. Power off: long press 2 seconds off.
- **Special notes:** After meter power on, wait about 30 seconds to read value or operation.
- **First time use:** see parameter setting P4.7 & P4.8 to set correct date and time (as Clause 8.3)

Special notes: Before getting readings or performing other operations, wait about 30 seconds after meter is powered on.

KEY	OPERATION	FUNCTIONS
	Short Press	When powered off, press the key to power on In measurement mode: press to turn backlight on or off
	Long Press	Press and hold for 2 seconds to turn off
	Short Press	In measurement mode: press the key to switch unit: %→mg/L or %→ppm
	Long Press	In the measurement mode: press the key for 2 seconds to enter the calibration mode
	Short Press	To cancel any operation, press to return to measurement mode
	Short Press	In measurement mode: press to enter menu mode; In calibration mode: pr ess key to calibrate; In the menu mode: press key to confirm the parameter.
	Short Press or Long P ress	In measurement mode: press  to change the serial number or press  to recall the measurement value. In recall mode (RM), short press to change serial number of stored measurement value, or long press to conduct rapidly change; In the menu mode: press the key to change the serial number or select the parameter

Batteries

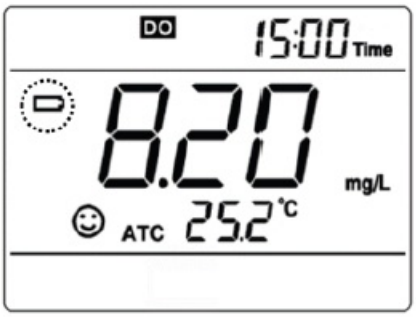


Figure 3

- The instrument uses three AA alkaline batteries. Battery life > 200 hours (without backlight). When the display shows symbol as shown  in Figure-3, replace the battery.

Instrument Socket

The instrument sockets are protected by grey rubber sealing cap, as shown in Figure-4.

Figure 4

- Eight-pin socket (right) – connect DO electrode. When inserting the probe connector, align the notch on the connector to the socket, and twist the nut to tighten. There is a sealing ring between the end face of the socket and the connector, which can effectively maintain the waterproof rating of the socket.
- BNC socket (left) – connect salinity electrode
- RCA socket (middle) – connect temperature probe

Display mode

Main Display Screen

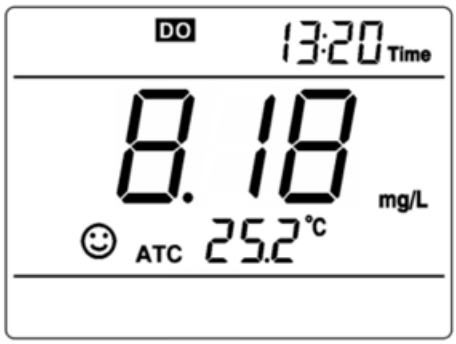


Figure 5

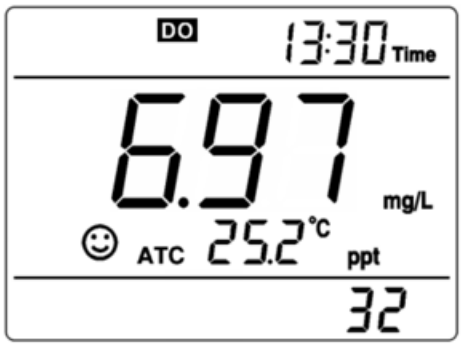


Figure 6

If the salinity probe is not connected or salinity is lower than 1ppt, only the DO value and temp. value will be displayed on the screen as shown in Figure-5, DO value: 8.18mg/L; temp. value: 25.2°C. When salinity probe is connected and salinity is greater than 1ppt, salinity will be displayed on the bottom right of the screen, as shown in Figure-6, DO value: 6.97mg/L, Temp value: 25.2°C;

Salinity

- 32ppt, Press Mode to switch between unit of mg/L→%. Or select unit of mg/L or ppm. Time displays on upper right of the screen.

Reading Stability Mode

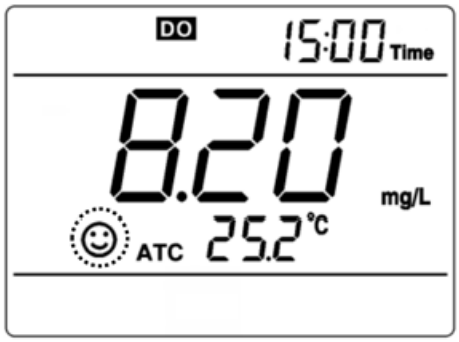


Figure 7

- When the measured value is stable, the LCD screen displays the icon ☺ as shown in Figure-7.
- If there is no ☺ icon or it's flashing it means that the reading is not stable yet, and it should not be read, saved or calibrated.

Auto Lock Mode

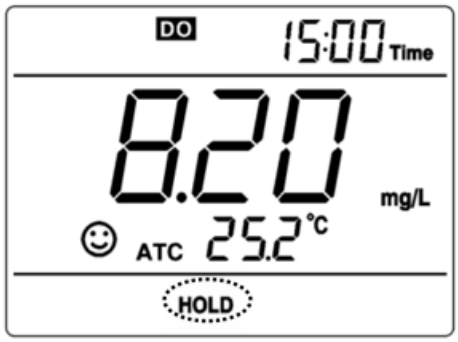


Figure 8

In parameter setting P4.3 you can select the auto-lock mode (Off-On) , Select On to turn on automatic locking. When the reading is stable for more than 10 seconds, the meter automatically locks the measured value and displays the HOLD icon, as shown in Figure – 8. When auto. locked, press Cal Meas to unlock. Select Off to turn off automatic lock.

Data storage, recall, and clear

Manual storage

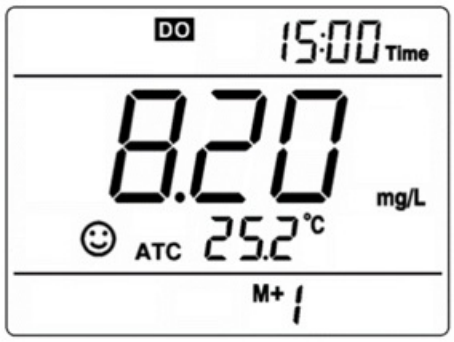


Figure 9

When the measurement is stable, press M+, the meter will store the measurement at the moment, M+ icon and storage serial number will be displayed on the bottom right of screen, as shown in Figure-9, First group of data was stored. If salinity probe is connected and salinity is greater than 1 ppt, press M+, M+ icon and storage serial number will be displayed for 2 seconds, then salinity value displays on bottom right continuously. As shown in Figure-6

Automatic timing storage

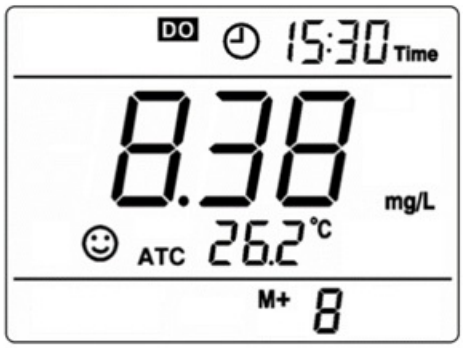


Figure 10

Set the automatic timing storage mode (e.g. 3 minutes a.k.a 00:03) in parameter P4.1, if displays on screen, the meter enters the auto. timing storage mode. If you press M+ , starts flashing and the first measurement is stored. After 3 minutes, the 2nd measurement will be stored automatically. See Figure-10 the meter stores eight measurements automatically. Press M+ again, stops flashing and the meter stops the auto. timing storage. In auto. timing mode, manual storage does not work. Set time to 00:00 in parameter P4.1 to exit from the auto. timing storage mode.

Recall stored value

In the measurement mode, press RM to recall the last stored measurement. See Figure 11:

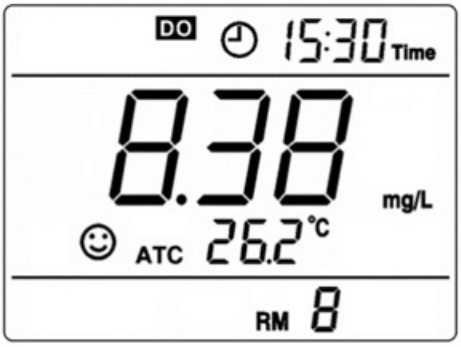


Figure 11

- Pressing M+ or RM to change the recalled measurement. Press and hold M+ or RM to change the recalled measurement quickly.
- Press Cal Meas to go back to measurement mode.

Clear stored value

- Select YES in parameter P4.4 to clear all stored values.

Backlighting

The Instrument's LCD screen has a white backlight suitable for use in dark environments. Turning on the backlight will consume more power. There are two backlighting modes, On and Off, which you can select in the parameter setting P4.5. If On is selected, short press , the backlight will stay on for one minute then automatically shuts off. If Off is selected, press , the backlight will stay on and won't turn off unless is pressed again.

Automatic Power-Off

In the parameter setting P4.6, you can set the auto. power off function (On-Off), select On to turn on auto power off function, the instrument will shut down automatically if no operation within 20 minutes, select Off to disable this function, meaning the meter won't power off until the user manually turn it off.

OPTICAL DISSOLVED OXYGEN PROBE

Probe Structure

The instruments DO803 optical dissolved oxygen probe has a cable length of 3m and built-in temperature sensor for automatic temperature compensation. The electrode structure is shown in Fig.-6

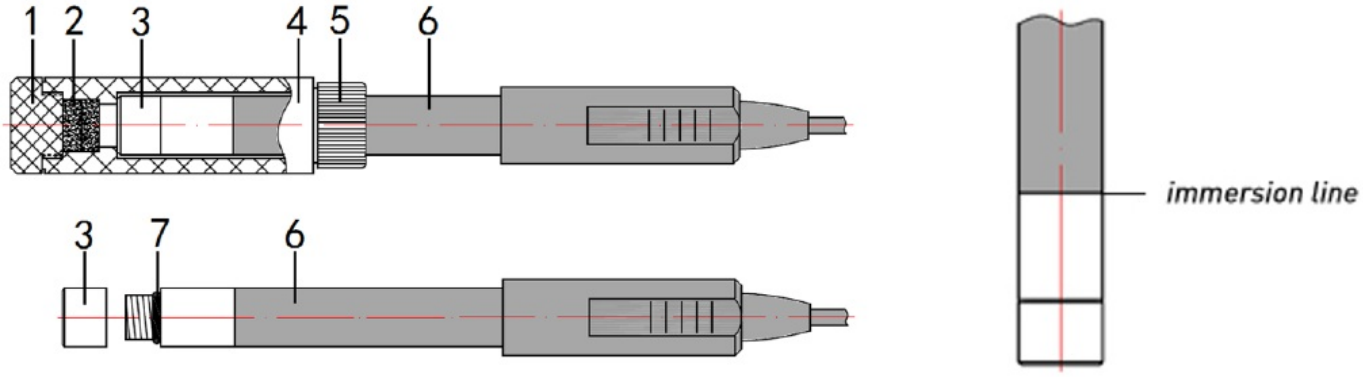


Figure - 12

1. Bottom Cover of the Calibration Sleeve	5. Locking Cap
2. Sponge for Water Storage	6. Optical DO Electrode
3. Sensor Cap	7. O Ring
4. Calibration Sleeve	Immersion Line: The tested solution should be above this line

Probe Maintenance

The sensor cap of the optical DO electrode must be kept in a moist environment. If the surface coating of the sensor cap dries out, the measured value will be unstable or the response will be slow. The electrode calibration sleeve is used to store the probe.

- Short-term storage (less than 30 days): The probe head is kept in the calibration sleeve. Always keep the sponge inside the calibration sleeve wet. Several drops of clean water should be added to a dry sponge (let the sponge be saturated, but not dripping), and tighten the lock cap, so that the sensor cap is kept in the moist saturated air.
- Long-term storage (greater than 30 days): The probe head is kept in the calibration sleeve. Check whether the water storage sponge is moist every 30 days or user can store the electrode in a beaker containing water.
- Before the first use, unscrew the calibration sleeve to check if the sponge is wet. If the sponge is dry or if the electrode is exposed to dry air for more than 8 hours, the surface coating of the sensor cap may be completely dry. So the electrode should be immersed in tap water at room temperature 25℃ for 24 hours. If the water temperature is low, soaking time is 48-72 hours.
- The sponge cannot be allowed to get stained or mouldy, otherwise it will consume or produce oxygen. If stained or mouldy, please clean immediately.

Sensor Cap

- The sensor cap is an important part of the optical DO probe. The surface coating of the cap cannot be scratched or mechanically worn. Otherwise, the life of the sensor cap will be reduced or the probe will be damaged. Please pay special attention to it when using the probe.
- The surface coating of the sensor cap cannot withstand high temperatures, so the optical DO probe cannot be tested in water above 50°C/122°F.
- If the surface of the sensor cap is contaminated, please do not use alcohol and organic solvents to clean,

otherwise, it may damage the probe. It can be gently wiped with a soft cloth or paper towels. To disinfect the probe, immerse it in 3% hydrogen peroxide for 15 to 30 minutes and then rinse off with water.

- The sensor cap has a service life of more than 8,000 hours. When the probe is not being used, it does not “bleach” the luminescence layer; in addition, the storage time will not reduce the life of the probe, so the actual use time of the sensor cap is far more than a year. The major factor affecting the service life of the sensor cap is the surface coating being damaged under external force. So the key is to protect the sensor cap from external damage.
- If the sensor cap is damaged or deteriorated, users need to purchase a new one. Every new cap has a set of calibration codes which need to be input into the instrument. The specific input method will be described in the instruction manual of sensor cap.
- Users should not take off the sensor cap when it is not in use. Nor should one swap the caps from different instruments. When being installed, the sensor cap must be tightened, and the interior can not be contaminated or wet.

PREPARATION FOR CALIBRATION

Dissolved Oxygen Units Selection

Dissolved oxygen units displays in two forms: mg / L and %, and ppm and %. Press 

to switch between mg / L → %, or ppm → %. Users can choose mg / L or ppm in parameter setting P3.1, but only a percentage (DO %) is displayed in calibration.

Resolution Selection

- The resolution unit can be selected in parameter setting P3.2: 0.01 or 0.1mg/L (ppm). After setting, the meter will display resolution of 0.1 or 1 in according to %.

Temperature Unit Selection

- The temperature unit can be selected in parameter setting P4.2: °C or °F

Air Pressure Compensation

The instrument has automatic air pressure compensation function. The air pressure has been calibrated before the product left the factory. So in general users do not have to calibrate air pressure any more. If necessary, calibrate it according to standard value measured by aneroid barometer. Refer to parameter setting P3.5 for the procedure of aneroid barometer calibration.

Salinity Compensation

Figure 13

Generally, salinity of freshwater is 0 to 0.5 ppt, salinity of seawater is around 35 ppt. As the salinity of the solution increases, the level of DO decreases. Refer to parameter setting P3.3, for selection of auto salinity compensation or manual salinity compensation. If manual salinity compensation selected in P3.3, please enter the parameter setting P3.4 to input salinity value (see section 5.5.1); if auto. salinity compensation is selected, users should connect the salinity probe, then perform calibration in parameter setting P3.4 (see section 5.5.2).

Manual salinity compensation (Hnd)

- In parameter setting P3.3, select manual salinity compensation (Hnd). Operation refers to P3.3.
- In parameter setting P3.4, input salinity value (0~45ppt), Operation refers to P3.4.
- Connect DO probe to take DO measurement.

Automatic salinity compensation (Auto)

- Connect salinity probe to meter;
- Switch parameter setting to P3.3, select auto. Salinity compensation (Aut), Operation refers to P3.3.
- Switch parameter setting to P3.4, press Setup Enter to enter salinity calibration mode. Submerge the salinity probe in 12.88mS/cm conductivity calibration solution, stir gently and allow it to stay in the calibration solution for a while. When the reading is stable and ☺ displays on the LCD, press Setup Enter to calibrate, LCD displays correct

salinity value (the calibration procedure refer to Figure –13). Press Cal Meas to return to measurement mode.

Special notes:

Figure 14

- Use 12.88mS/cm conductivity calibration solution to calibrate salinity. If the standard solution is wrong, Err icon will be flashing at the bottom right of LCD if is pressed, indicating invalid calibration.
- Since salinity calibration is done by the factory before shipment. It is not necessary to perform salinity calibration during initial use. Only perform salinity calibration when replacing a new electrode, or when the electrode is unused for a long time.
- For auto. salinity compensation, salinity probe must be connected, As shown in figure-14. Users can fit DO probe and salinity probe together into the clip to measure them simultaneously.

CALIBRATION

Saturated Oxygen Calibration

- This procedure requires the use of a calibration sleeve to allow the probe to be calibrated in a humidity-saturated atmosphere.
- Check if the sponge in the calibration sleeve is damp. Attach the calibration sleeve to the probe. Tighten the locking cap. Be careful not to have water droplets on the head of the sensor cap. Wait for the 5 to 10 minutes after turning on the instrument in order to saturate the air in the calibration sleeve with water vapor. In addition, wait for the temperature to completely stabilise.
- Long press Cal Meas to enter the calibration mode, and CAL is flashing in the upper right corner. Wait for the stable ☺ to appear and stay on, press Setup Enter to finish calibration, once 100% starts flashing, the saturated oxygen calibration is completed.

Zero-Oxygen Calibration

Zero-Oxygen calibration is only performed when a probe or sensor cap is replaced, the probe has not been used for a long time, or users have a requirement for high accuracy in low DO range (0 to 2.0 ppm). Zero-Oxygen calibration is done at the factory before shipment, so it is not necessary to perform it during initial use. Zero-oxygen calibration should follow these steps:

- Preparation of 100ml of oxygen-free water: in the 100ml beaker, weigh 2g of anhydrous sodium sulfite (Na2SO3) and add 100ml of distilled or deionized water to dissolve. Oxygen-free water is only effective within 1 hour.
- Put the electrode into the oxygen-free water, wait for 3 to 5 minutes after the instrument is turned on, and wait for the temperature and DO reading to completely stabilize. The DO reading should be very close to 0, 0.1mg/L (ppm) or so.
- Long press 

to enter the calibration mode. CAL will be flashing at the upper right corner. Wait for a stable ☺. Press 

and the zero-oxygen calibration is completed.

Special Notes for Calibration

- To ensure the optimal measuring accuracy, please perform the calibration at the same temperature as your samples. It is recommended that the oxygen saturation calibration be performed according to section 6.1 before use every day.
- A dried out surface coating of the sensor cap can adversely affect the stability of measurement. Please pay special attention to this situation. See Section 4.2 (Probe Maintenance) for details.
- The instrument has factory default setting function, select YES in parameter setting P3.6, the meter will be calibrated to the theoretical value.

MEASUREMENT

1. When measuring, place the probe in your sample solution, stir quickly for a few seconds in the solution to remove bubbles from the measuring surface of the sensor cap. Then hold the probe still and wait for a stable measurement. The solution must be above the immersion line of the probe.
    - **Note:** the brief stirring of the probe in solution is only to eliminate bubbles. Unlike conventional galvanic/polarographic electrodes, the measuring via optical dissolved oxygen probes does not require constant stirring of the solution or flowing fluid.
2. Users can read the measurements when ☺ appears and stays on. Note that the measurement time is related to temperature. When the solution temperature and the probe temperature is close, it takes about one minute to get the readings stabilised. When the solution temperature and the electrode temperature differ a lot, it takes about 3 minutes to reach a stable reading. This is because the reading of dissolved oxygen is heavily influenced by temperature, and the probe senses temperature slower than dissolved oxygen.

PARAMETER SETTINGS

Press 

in the measurement mode to enter the parameter setting mode P3.0, press 

to switch the menu P3.0 →P4.0;

In P3.0 mode, press 

to enter P3.1, press 

to switch submenu P3.1→P3.6; In P4.0 mode, press 

to enter P4.1, press 

to switch submenu P4.1→P4.8. See Table 2 for details.

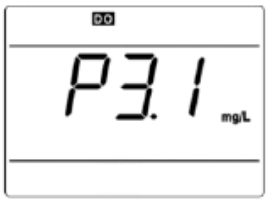
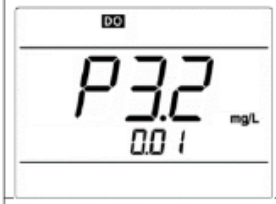
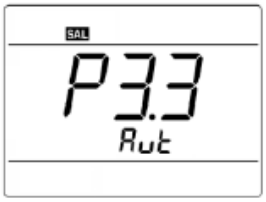
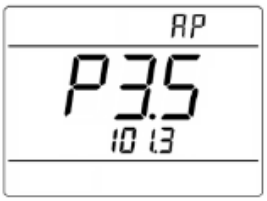
Table 2 – Parameter Setting List

MENU	SUBMENU	PARAMETER	CODE	CONTENT
P3.0 DO PARAMETER	P3.1	DO Units Selection	/	mg/L—ppm
	P3.2	Resolution Selection	/	0.01/0.1 mg/L(ppm)
	P3.3	Salinity Compensation Mode	/	Aut – Hnd
	P3.4	Salinity Compensation	(0 to 45) ppt	
	P3.5	Air Pressure Calibration	**AP** /	(60 to 120) kPa
	P3.6	Back to Factory Default	**F5** /	No – Yes
P4.0 BASIC PARAMETER	P4.1	Timing Storage	/	0:00
	P4.2	Temp. Unit Selection	/	˚C – ˚F
	P4.3	Auto Lock	**HOLD**	Off – On
	P4.4	Clear Storage	**CLr**	No – Yes
	P4.5	Auto Backlight	**bL** /	On—Off
	P4.6	Auto Power Off	**AC** /	On—Off
	P4.7	Adjust Date	/	/
	P4.8	Adjust Time	/	/

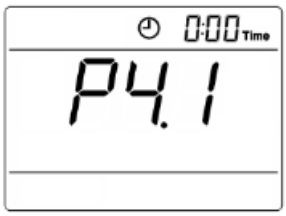
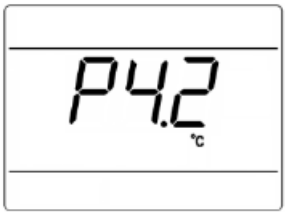
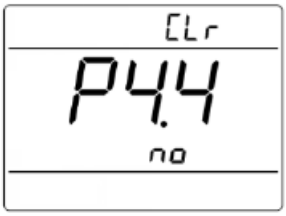
**DO Parameter setting (press 

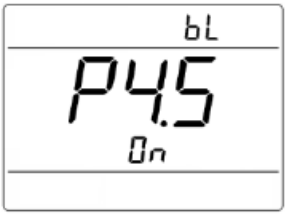
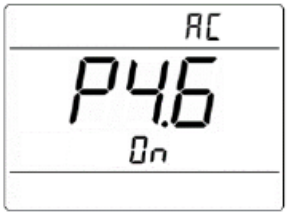
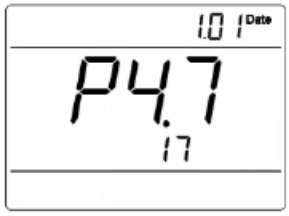
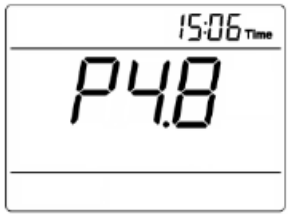
or 

to switch)**

	**P3.1—Dissolved Oxygen Unit** (mg/L—ppm) 1. In P3.0 mode, press Setup/Enter to enter P3.1 mode. 2. Press Setup/Enter, **mg / L** flashes, press M+ to select mg/L → ppm, press Setup/Enter to confirm. 3. Press M+ to enter P3.2 mode, or press Cal/Meas to return to measurement mode.
	**P3.2—Resolution** (0.01-0.1mg/L) 1.Press Setup/Enter , **0.01** flashes, press M+ to select resolution (0.01-0.1mg/L), press Setup/Enter to confirm. 2. Press M+ to enter P3.3 mode, or press Cal/Meas to return to measurement mode.
	**P3.3—Salinity Compensation Mode** (Aut-Hnd) 1. Press Setup/Enter, **Aut** flashes. Press M+ to select auto. salinity compensation (**Aut**) or manual salinity compensation (**Hnd**); Press Setup/Enter to confirm. 2. Press M+ to enter P3.4 mode, or press Cal/Meas to return to measurement mode.
	**P3.4—Salinity Compensation** (0~45 ppt) 1. Press Setup/Enter to input salinity value, when manual salinity compensation selected in P3.3, operation refers to section 5.5.1. 2. Press Setup/Enter to enter salinity calibration mode, when auto. salinity compensation was selected in P3.3, operation refers to clause 5.5.2
	**P3.5—Air Pressure Calibration** (60 to 120 kPa) 1. Press Setup/Enter, **101.3** flashes, according to standard pressure value of aneroid barometer. Press M+ or RM to adjust, Press Setup/Enter to confirm. 2. Press M+ to enter P3.6 mode, or press Cal/Meas to return to measurement mode.
	**P3.6—Back to Factory Default** (No—Yes) Press Setup/Enter **No** flashes, Press M+ to select **No** →**Yes**, Press Setup/Enter to confirm. Meter returns to measurement mode. No—cancel restore. Yes—restore

Basic Parameter setting (press M+ or RM to switch)

	**P4.1—Adjust timing storage time** 1. In P4.0 mode, Press Setup/Enter to enter P4.1 mode. 2. Press Setup/Enter "00" flashes, Press M+ or RM to adjust minute (0~59); Press Setup/Enter, "0" flashes; Press M+ or RM to adjust hour (0~99); Press Setup/Enter to confirm; 3. Press Setup/Enter to enter P4.2 mode, or Cal/Meas to return to measurement mode.
	**P4.2— temperature unit** (℃—℉) 1. Press Setup/Enter, ℃ flashes, Press M+ to select ℃→℉, Press Setup/Enter to confirm. 2.Press M+ to enter P4.3 mode, or Cal/Meas to return to measurement.
	**P4.3—Auto Lock** (Off—On) 1. Press Setup/Enter, **Off** flashes, Press M+ to select Off→On, Press Setup/Enter to confirm. Off—turn off lock function; On—turn on lock function (If reading stays stable for more than 10 seconds, it auto locks). 2. Press M+ to enter P4.4 mode, or Cal/Meas to return to measurement.
	**P4.4. – Clear all the stored value** （No—Yes） 1. Press Setup/Enter, " No " flashes, then press M+ to select between No—Yes, press Setup/Enter to confirm No: not delete, Yes: delete. 2. After confirming the parameter, press M+ to enter P4.5 mode or press Cal/Meas to return to measurement.

	**P4.5—Auto Backlight** (On—Off) 1. Press Setup Enter, **On** flashes, Press M+ to select On→Off, Press Setup Enter to confirm. On – turn on auto backlight off function, Off – turn off auto backlight off function. 2. Press M+ to enter P4.6 mode, or press Cal Meas to return to measurement.
	**P4.6—Auto Power Off** (On—Off) 1. Press Setup Enter, **On** flashes，Press M+ to select On→Off，press Setup Enter to confirm. On—turn on auto power off function Off—turn off auto power off function. 2. Press M+ to enter P4.7 mode, or press Cal Meas to return to measurement.
	**P4.7. – Adjust date** 1. Press Setup Enter, “Month” flashes, then press M+, “Date” flashes, then press Setup Enter “Year” flashes. When the number flashes, press M+ or RM to adjust value, then press Setup Enter to confirm. 2. Press M+ to enter in P4.8 mode or press Cal Meas to return to measurement.
	**P4.8. – Adjust time** 1. Press Setup Enter, “HH” flashes, then press Setup Enter, “MM” flashes. When the number flashes, press M+ and RM to adjust time, then press Setup Enter to confirm. 2. After confirming the parameter, press Cal Meas to return to measurement.

USB COMMUNICATION

The meter uses “PC-Link” software with USB communication function. The port is USB.
Software interface (as shown in Figure – 15.)

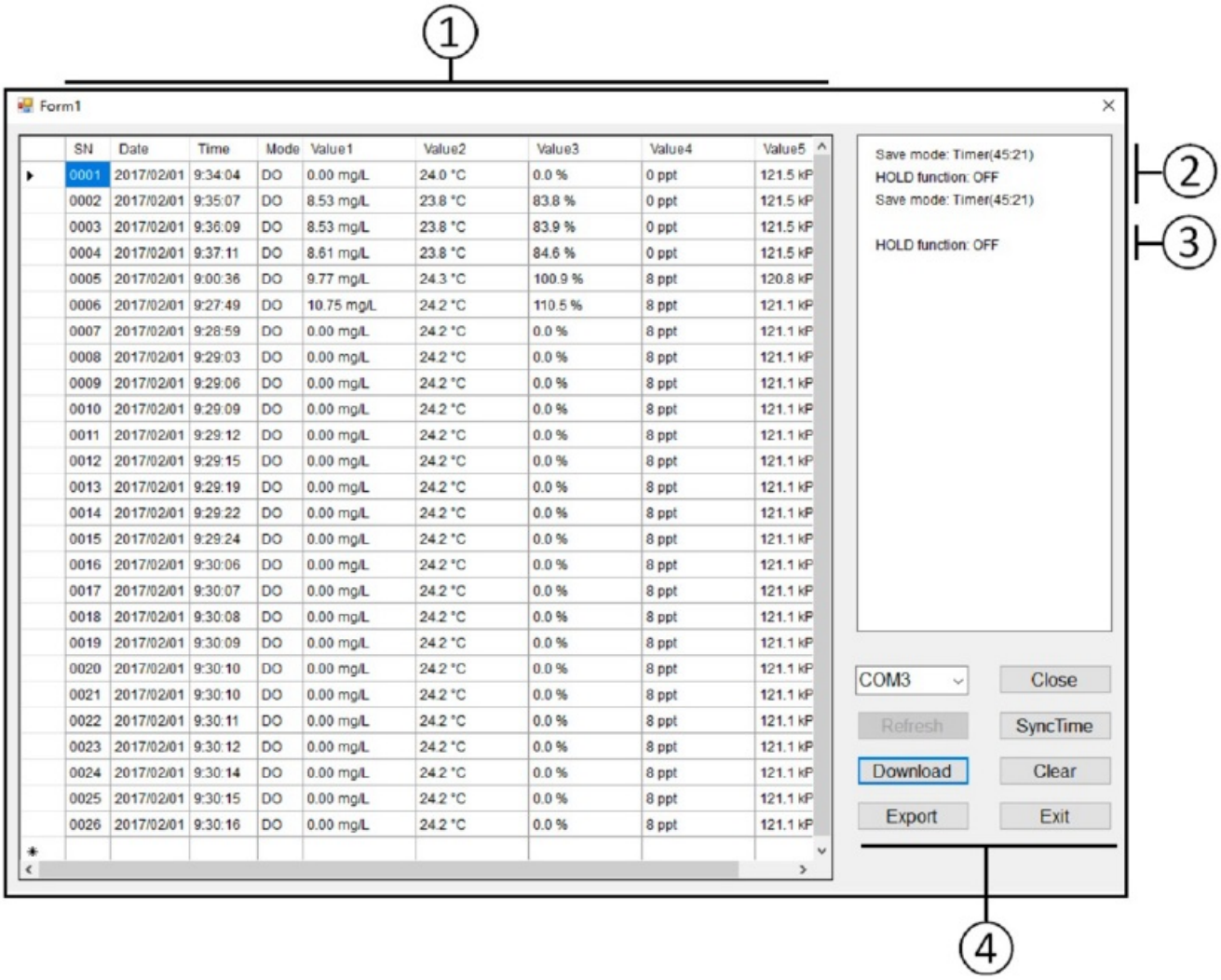


Figure -15

1. Stored value display area
    - Press “Download” to download the data from the meter to the computer, measuring date, time, value and temperature and so on.
    - Connect meter to computer, then press 

, or set the auto. timing storage mode. The measuring information will be displayed on the computer through USB and will not be- 18 – stored in the meter as shown in Figure – 15.
2. Mode and Serial Number
3. Parameter setting information
4. Port type and press key

The port number shows where the software is connected to the computer, each computer recognizes a different port number, as shown in Figure – 15, the port number is COM3.

- **Open/Close —** press this key to turn on or off software, Icon  indicates that software is activated.
- **Refresh —** press this key to reset COM port
- **SyncTime —** press this key to sync time with computer.
- **Download —** press this key to download the data from the meter to the computer,

- **Clear —** press this key to clear all the stored values.
- **Export —** press this key to export the stored value to a Microsoft Excel file.
- **Exit —** press this key, PC-Link program exits from the computer interface.

Run Software

Load PC-Link to the computer, open “PC-Link” file, which includes PCLink software file and driver Compressor file. Generally, users can open PCLlink file directly. If the meter can`t be connected to software, please install the USB driver program.

Note

- for 32bit OS please install “McphCdcDriverInstallationTool” file in /x86;
- for 64bit OS please install “McphCdcDriverInstallationTool” file in /x64.

Connection Port Selection

Connect USB cable to the meter and the computer, open PC-Link program, program interface shows in computer, press the arrow icon next to COM1, then press Open key, LCD will display  , or please confirm the port number in “device manager” of the computer.

Software Operation

Upload the stored value

- Press “Download” key, all the data stored in the meter will be downloaded to the computer. The data will be listed by category.

Storage during operation

- During operation, press 

to store or set auto. timing storage. The measuring information is downloaded to the computer through USB and will not be stored in the meter.
- The stored mode and unit during operation is the same as the data shown on the meter. Press 

to change.

Data processing

- Press “Export” key to export the stored value to Microsoft Excel file for further analysis or printing.

COMPLETE KIT

What’s In The Box

	CONTENT	QUANTITY
1	DO8500 Portable Optical Dissolved Oxygen Meter	1
2	DO803 Optical Dissolved Oxygen Probe	1
3	Probe Calibration/Storage Sleeve	1
4	Conductivity Electrode 2301-3M	1
5	PC-Link Communication Software Flash drive	1
6	USB Communication Cable	1
7	Combined electrode clip	1
8	Small Screwdriver	1
9	Carrying Case	1
10	Sponge for Water Storage (spare)	4
11	Instruction Manual	1

Accessories for Separate Purchase

MODEL	NAME
DO803	Optical DO probe (3m cable. with sensor cap and calibration sleeve)
DO810	Optical DO probe (10m cable, with sensor cap and calibration sleeve)
DO8032	Sensor cap
DO8031	Calibration/Storage sleeve

WARRANTY

The warranty period of the DO8500 instrument (only the instrument) is 3 years from the date of purchase. That of DO803 optical DO probe (excluding sensor cap) is 2 years from the date of purchase. That of DO8032 sensor cap is 1 year from the date of delivery. If the above products or parts within the warranty period is not functional due to raw material defects or poor manufacturing, they are free for repair or replace.

Damage and malfunction of the product caused by the following reasons are not covered by the warranty:

- Fails to install, operate, or use the product in accordance with the instruction manual, or if the product is damaged by abuse or incorrect use;
- The sensor cap is damaged by external force and can not work; or the electrode cable is damaged or twisted

due to external force;

- Fails to maintain the product in accordance with the requirements of this manual and the industry standard process;
- Any unauthorized repairs, and the use of defective or incorrect components to repair the product;
- Any modification of the product unauthorized by the Company.

TROUBLESHOOTING

ERROR	SOLUTIONS
THE INSTRUMENT DOES NOT TURN ON	1. The battery is not installed correctly. Check the direction. 2. Battery low voltage, replace the battery. 3. Instrument freezes. Take out the batteries and re-install.
THE INSTRUMENT CAN NOT CALIBRATE	1. Check calibration procedure: correct atmospheric pressure, salinity input and temperature. 2. The measured value is not stable, prolong the stabilization time, until  is fully stabilised, then press  to finish. 3. Check the sensor cap. If it is contaminated, it can be cleaned; if dried out, it can be hydrated; if damaged, it can be replaced.
DO READINGS ARE NOT ACCURATE	1. Check whether the temperature is stable, the salinity input and barometric pressure are accurate. 2. If the probe calibration is not good, recalibrate. 3. Check the sensor cap. If it is contaminated, it can be cleaned; if dried out, it can be hydrated; if damaged it can be replaced. 4. Unscrew the sensor cap, check whether there is moisture inside, if so, wipe off, dry, and tighten it.
THE DISPLAY VALUE STAYS 200% OR 20.0 MG/L. NO CHANGE	1. Check whether the concentration of the sample is higher than 200% or 20.0 mg / L (ppm). 2. Check if the temperature reading is accurate. 3. If the probe calibration is not good, recalibrate. 4. Check the sensor cap. If it is contaminated, it can be cleaned; if dried out, it can be hydrated; if damaged, it can be replaced.

Appendix A

Appendix A: Oxygen Solubility Table (760mm Hg)

TEMP ˚C	CHLORITY: 0 SALINITY: 0	5.0 PPT 9.0 PPT	10.0 PPT 18.1 PPT	15.0 PPT 27.1 PPT	20.0 PPT 36.1 PPT	25.0 PPT 45.2 PPT
0.0	14.62	13.73	12.89	12.10	11.36	10.66
1.0	14.22	13.36	12.55	11.78	11.07	10.39
2.0	13.83	13.00	12.22	11.48	10.79	10.14
3.0	13.46	12.66	11.91	11.20	10.53	9.90
4.0	13.11	12.34	11.61	10.92	10.27	9.66
5.0	12.77	12.02	11.32	10.66	10.03	9.44
6.0	12.45	11.73	11.05	10.40	9.80	9.23
7.0	12.14	11.44	10.78	10.16	9.58	9.02
8.0	11.84	11.17	10.53	9.93	9.36	8.83
9.0	11.56	10.91	10.29	9.71	9.16	8.64
10.0	11.29	10.66	10.06	9.49	8.96	8.45
11.0	11.03	10.42	9.84	9.29	8.77	8.28
12.0	10.78	10.18	9.62	9.09	8.59	8.11
13.0	10.54	9.96	9.42	8.90	8.41	7.95
14.0	10.031	9.75	9.22	8.72	8.24	7.79
15.0	10.08	9.54	9.03	8.54	8.08	7.64
16.0	9.87	9.34	8.84	8.37	7.92	7.50
17.0	9.67	9.15	8.67	8.21	7.77	7.36
18.0	9.47	8.97	8.5	8.05	7.62	7.22
19.0	9.28	8.79	8.33	7.90	7.48	7.09

20.0	9.09	8.62	8.17	7.75	7.35	6.96
21.0	8.92	8.46	8.01	7.61	7.21	6.84
22.0	8.74	8.30	7.87	7.47	7.09	6.72
23.0	8.58	8.14	7.73	7.34	6.96	6.61
24.0	8.42	7.99	7.59	7.21	6.84	6.50
25.0	8.26	7.85	7.46	7.08	6.72	6.39
26.0	8.11	7.71	7.33	6.96	6.62	6.28
27.0	7.97	7.58	7.20	6.85	6.51	6.18
28.0	7.83	7.44	7.08	6.73	6.40	6.09

29.0	7.69	7.32	6.93	6.62	6.30	5.99
30.0	7.56	7.19	6.85	6.51	6.20	5.90
31.0	7.43	7.07	6.73	6.41	6.10	5.81
32.0	7.31	6.96	6.62	6.31	6.01	5.72
33.0	7.18	6.84	6.52	6.21	5.91	5.63
34.0	7.07	6.73	6.42	6.11	5.82	5.55
35.0	6.95	6.62	6.31	6.02	5.73	5.46
36.0	6.84	6.52	6.22	5.93	5.65	5.38
37.0	6.73	6.42	6.12	5.84	5.56	5.31
38.0	6.62	6.32	6.03	5.75	5.48	5.23
39.0	6.52	6.22	5.98	5.66	5.40	5.15
40.0	6.41	6.12	5.84	5.58	5.32	5.08
41.0	6.31	6.03	5.75	5.49	5.24	5.01
42.0	6.21	5.93	5.67	5.41	5.17	4.93
43.0	6.12	5.84	5.58	5.33	5.09	4.86
44.0	6.02	5.75	5.50	5.25	5.02	4.79
45.0	5.93	5.67	5.41	5.17	4.94	4.72

- Salinity = Dissolved salts in water
- Chlorinity = Measure of chloride content, by mass, of water
- S (‰) = 1.80655 x Chlorinity (‰)

Appendix B

Appendix B: DO % Calibration Values

CAL. VALUE	PRESSURE				CAL. VALUE	PRESSURE			
D.O. %	In Hg	mmHg	kPa	mbar	D.O %	In Hg	mmHg	kPa	mbar
101%	30.22	767.6	102.34	1023.38	86%	25.73	653.6	87.14	871.40
100%	29.92	760.0	101.33	1013.25	85%	25.43	646.0	86.13	861.26
99%	29.62	752.4	100.31	1003.12	84%	25.13	638.4	85.11	851.13
98%	29.32	744.8	99.30	992.99	83%	14.83	630.8	84.10	841.00
97%	29.02	737.2	98.29	982.85	82%	24.54	623.2	83.09	830.87
96%	28.72	729.6	97.27	972.72	81%	24.24	615.6	82.07	820.73
95%	28.43	722.0	96.26	962.59	80%	23.94	608.0	81.06	810.60
94%	28.13	714.4	95.25	952.46	79%	23.64	600.4	80.05	800.47
93%	27.83	706.8	94.23	942.32	78%	23.34	592.8	79.03	790.34
92%	27.53	699.2	93.22	932.19	77%	23.04	585.2	78.02	780.20
91%	27.23	691.6	92.21	922.06	76%	22.74	577.6	77.01	770.07
90%	26.93	684.0	91.19	911.93	75%	22.44	570.0	75.99	759.94
89%	26.63	676.4	90.18	901.79	74%	22.14	562.4	74.98	749.81
88%	26.33	668.8	89.17	891.66	73%	21.84	554.8	73.97	739.67
87%	26.03	661.2	88.15	881.53	72%	21.54	547.2	72.95	729.54

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Documents / Resources

	Lab SCIENTIFIC DO8500 Portable Optical Dissolved Oxygen Meter [pdf] User Manual DO8500 Portable Optical Dissolved Oxygen Meter, DO8500, Portable Optical Dissolved Oxygen Meter, Optical Dissolved Oxygen Meter, Dissolved Oxygen Meter, Oxygen Meter

References

- Home Page
- User Manual