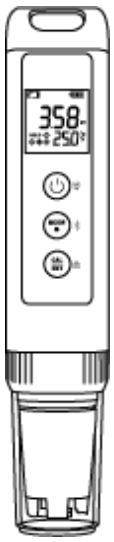
Pocket Testers

Operation Manual

- ☐ DPH1 Pocket pH/mV Tester
- ☐ DORP1 Pocket ORP Tester
- ☐ DEC1 Pocket Conductivity Tester
- ☐ DPC1 Pocket pH/Conductivity Tester



DLAB SCIENTIFIC CO., LTD.

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NOTES

- There is a small amount of deionized water in the electrode storage cap to keep the electrode sensitiveness, which is normal.
- The probe is designed with a polycarbonate plastic (PC) shell. PC plastic will dissolve in certain organic solvents, such as carbon tetrachloride, trichlorethylene, tetrahydrofuran, toluene, xylene and methylethyl ketone, etc. Should avoid test samples solution containing such solvents.

1. Overview

Thank you for purchasing microprocessor-based waterproof pH/ EC / TDS / SALT tester with multi-color backlight display.
Be sure to read this manual before using the product to ensure proper and safe operation of the product. Also, safely store the manual so it is readily available whenever necessary. Product specifications and appearance as well as the contents of this manual are subject to change without notice.

1.1 Package Content

Model No.			DPH1	DORP1	DEC1	DPC1
Test kit	1	Meter with pre-installed electrode	✓	✓	✓	✓
	2	pH Buffer solution: 30mL pH4.00/7.00/10.01, one for each	✓	-	-	-
	3	3mol KCl pH/ORP electrode soaking solution： 10mL 1btl	✓	✓	-	✓
	4	Sample vials: 30mL	3pcs	1pc	2pcs	4pcs
	5	ORP Standard solution： 30mL 222mV, 1btl		✓	-	-
	6	Standard Cond solution: 30mL 1413μS/12.88mS/cm, one for each	-	-	✓	✓
	7	pH buffer solution: 30mL pH4.00/7.00, one for each	-	-	-	✓
	8	AAA alkaline battery: 4pcs (pre-installed)	✓	✓	✓	✓
	9	Lanyard	✓	✓	✓	✓
	10	Carrying case （spec： 28.0×23.0×8.2cm）	✓	✓	✓	✓

1.2 Key Features

- Multi-color backlit LCD display (blue with measurement, green with calibration), built-in microprocessor chip and automatic calibration. The instrument circuit board adopts SMT patch technology to improve the reliability.
- Adopts digital filtering and slip technology to intelligently improve the response speed of the instrument and the accuracy of measurement data. When the measurement is stable, the smile icon ☺ appears, and you can lock the reading manually or automatically.
- The electrode has a built-in temperature element, automatic temperature compensation, and automatic recognize the standard solutions among USA/NIST/CN. Calibration points: 1 to 3 pts automatic.
- Waterproof and dustproof rating: IP67

2. Technical Specifications

pH

Measurement Range	(-2.00-16.00) pH
Resolution	0.1/0.01 pH
Accuracy	±0.01pH ± one digit
ATC range	(0-50) ℃/ (32-122) ℉ automatically
Calibration	1-3 points automatically

mV (ORP)

Measurement Range	-1000 mV - +1000 mV
Resolution	0.1/1mV
Accuracy	±0.1% F.S ± one digit

Temperature

Measurement Range	(0.0-50.0) ℃/ (32.0-122.0) °F
Resolution	±0.2℃
Accuracy	0.1

3. Descriptions

3.1 Display screen （Blue color: measurement mode; Green color: calibration mode）

① ------parameter test

② ------battery power indication

③ ------Measurements

④ ------Temperature units

⑤ ------ HOLD Data freezing icon

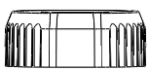
⑥ ------reading stability icon

⑦ ------calibration points reminder

3.2 Keypad Functions

	1. Short press to power on. Long press to power off. 2. When powered off, long press to enter parameter setting mode. 3. In the measurement mode, short press to turn backlight on/off. 4. In the parameter setting mode, short press to exit and enter to measurement mode.
MODE ▼	**1.** In the measurement, short press to toggle between available measurement types : **pH → mV → mV (ORP)** 2. In the parameter setting up mode, short press to move among the parameter
CAL ENT	1. When powered on, long press to enter calibration mode 2. In the setting up mode, short press to confirm selection. 3. In the measurement mode, short press to hold or release the measured reading.

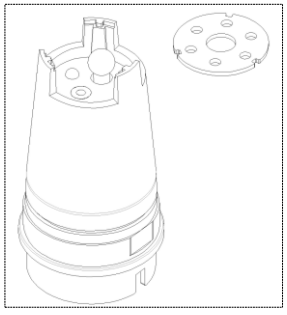
3.3 Electrode locking ring



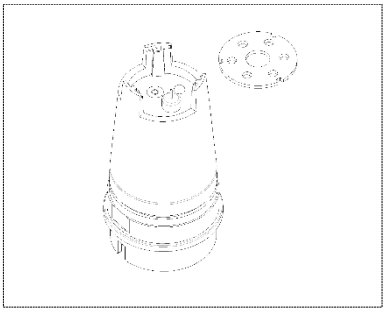
	Twist the electrode ring counter clockwise, pull out the old probe from the tester.
	Align the groove of the new electrode module to the tongue on the tester, gently push the electrode into the slots to twist it in position. Wear the new electrode ring and twist on tightly.

3.4 Sensor types to different modes

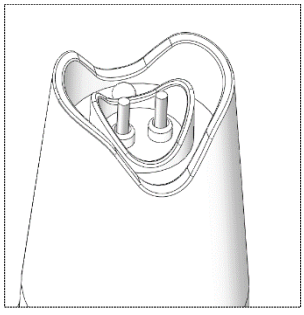
DPH1



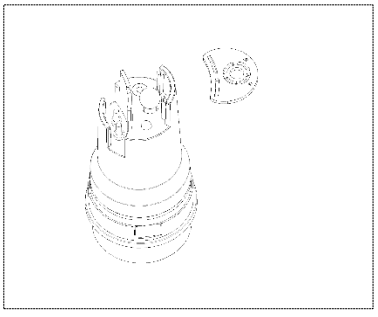
DORP1



DEC1



DPC1

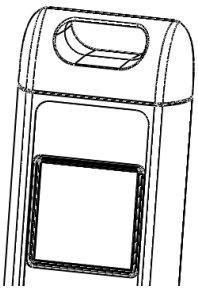


4. Before use

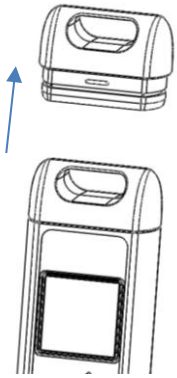
- Check out the Items in package, including the electrode, shelf time of standard solution.
- Before measurement, it is necessary to confirm the meters had been set rightly as required, as: the data locking/backlight display/resolution/standard of calibration.

5. Installing the Batteries

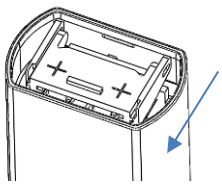
Step: 01



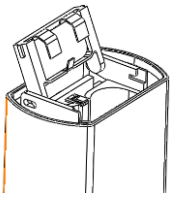
Step: 02



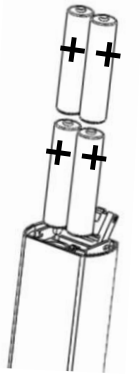
Step: 03



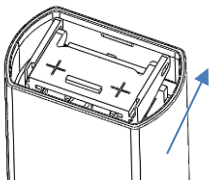
Step: 04



Step: 05



Step: 06



01. The front view
02. Pull the lid upwards
03. Push the plastic cover forwards and release
04. Remove the old batteries
05. Install new batteries (**all the positive polarity + must face up**)
06. Push the plastic cover forwards.
07. Close the lid tightly

Note:

- Never mixing use old and new batteries.
- Wrong installation direction of the batteries would lead to the battery electrolyte leakage and destroy the tester.

6. Setup Programs

Icons	Setup	Des.	Factory default setting
P01	Temperature unit	℃/℉	℃
P02	Auto lock	5-20 seconds - OFF	OFF
P03	Auto backlight	1-8 minutes - OFF	1
P04	Auto shutoff	10~20 minutes - OFF	10
P05	pH buffer solution series	CH - USA - NIST(PH)	USA
P06	pH resolution	1-0.1-0.01	0.01
P07	pH calibration reminder	H hours - D days - OFF (set up in smart APP)	-
P08	Reset pH to factory default	No - Yes	No
P09	Conductivity Reference Temperature	15 ~ 30℃	25℃
P10	Temp. Compensation Coefficient	0 ~ 9.99%	2.00%
P11	Auto Temperature compensation	0~99℃	25℃
P12	Cond solution series	CH - USA(COND)	USA
P13	Cond cell constant	0.80~1.20	1.00
P14	Cond calibration reminder	H hours - D days - OFF (set up in smart APP)	-
P15	Reset Cond to factory default	No - Yes	No
P16	TDS factor	0.40 ~ 1.00	0.71
P17	Salinity unit	ppt - mg/L	ppt
P18	Display screen diagnostic	No/YES (LCD 全亮 5 秒)	No

Ways to set parameters:

- When turned off, long press ⏻ key to enter parameter setting
- Short press MODE ▼ to toggle among P01/P02/P03…
- Short press CAL ENT key, the parameter to select flickering
- Short press MODE ▼ key, move to the parameter
- Short press CAL ENT key to confirm
- Short press MODE ▼ key to set the other parameter
- Short press ⏻ key to return to measurement mode

Main parameter description:

- Temp. unit (P01): ℃/℉
- Data hold (P02): set the reading hold from 5 to 20 seconds when the measurement stabilized between 5-20 seconds. For example, if set to 10 seconds, the meter will hold automatically after 10 seconds, and the HOLD icon will appear. To stop the HOLD, you can press the key to release/hold the reading manually.

a) Backlight color (P03): Light the backlit color from 1 to 8 minutes; Off: turn off the backlight; In the measurement mode, short press ⏻ key to turn on/off backlight manually.

b) Auto power off (P04): turn off the meter in 10 to 20 minutes if no operation. “OFF”turn off this function. In the measurement mode, long press to turn off the meter manually.

c) pH buffer standard (P05): USA/NIST/CH.

d) Calibration reminder (P07): available with the Bluetooth pocket testers.

e) Reset pH settings to factory default (P08): Yes: restore the meter to theoretical value (pH7.00 at 0mV with 100% slope).

f) Conductivity reference temperature (P09): set the reference temperature manually.

g) Temp. Compensation Coefficient (P10): the default setting 2.00%.

h) Auto Temperature compensation (P11): set the temperature compensation manually.

i) Factory default (P08&P15): This function can be used when instrument does not work well in calibration or measurement. Calibrate and measure again after setting the instrument back to factory default.

7. pH Module

7.1 pH Calibration

1. Short press to turn on the tester, gently rinse the electrode in pure water, shaking dry, (For the first-time use or long time not in use, soak the electrode in pH/ORP electrode for 10-15 minutes).
2. Pour certain pH7.00 buffer solution in the sample vial, (around the Level of MAX line, 10ml).
3. Long press to enter calibration mode, backlight turns green, the pH7.00 appears on the bottom right, (short press to exit, if there`s no calibration needs).
4. Submerge the electrode in pH7.00, shake the electrode for a few seconds, then let it stand still, get the readings when the smile icon stands on the screen, short press to confirm the 1st point calibration, the tester returns to measurement mode, and (M) shows up on the screen, indicating the first point is calibrated successfully.
5. Conduct the 2nd and 3rd pts calibration with pH4.00/10.01 buffer solution immediately if multi-pts calibration needed, and all the calibrated points icon (L)(M)(H) will show up on the bottom left of the screen. (Do not turn off the tester during multi-pts calibration. Every calibration starts with the middle point pH7.00)

7.2 pH Measurement

➢ Short press to power on, rinse the electrode in pure water and shake dry.

➢ Submerge the electrode in sample solution, stir gently, let it still, get the readings when the smile icon ☺ stays on screen. If the auto-hold function was preset, the readings will be hold automatically, you can short press to release the readings.

7.3 pH Measurement Notes

7.3.1 For the most accurate pH measurements, the temperature of the sample solution and the calibration solution should be as the close.

7.3.2 The tester is calibrated at the factory (calibrated (L)(M)(H) icon stays on the screen). It can automatically recognize the buffer solutions as shown below. You can conduct 1 to 3pts calibration. The 1st point calibration must be pH7.00. To improve the accuracy, the 2nd pH buffer solution should cover the sample solution pH value. For example, if the pH value of the sample solution is around pH5.16, using a pH4.00 buffer solution would be best.

DO NOT turn off the tester during multi-pts calibration. If there`s a sudden shut off, please start the calibration with pH7.00 first (otherwise, the Er1 will appears).

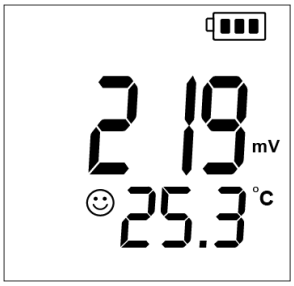
Cal points	USA	NIST	CH	Calibration Icon	Recommended
1 point	7.00pH	6.86pH	6.86 pH	(M)	≤ ±0.1pH
2 points	7.00pH/4.00pH	6.86pH/4.01pH	6.86pH/4.00pH	(L)(M)	<7.00 pH
	7.00pH/10.01pH	6.86pH/9.18pH	6.86pH/9.18pH	(M)(H)	>7.00 pH
3 points	7.00pH/4.00pH/ 10.01pH	6.86pH/4.01pH/9. 18pH	6.86pH/4.00pH/9. 18pH	(L)(M)(H)	0~14.00pH

7.3.3 Do not pour the solution back after use to avoid contamination.

7.3.4 Strong acid, strong alkali, and organic solutions will accelerate the aging of the electrode bulb and the plastic shell solvent. Please avoid testing such substances.

8. ORP Module

8.1 ORP Measurement



- Short press (⏻) key to turn the meter on. Press (MODE) key to enter the mV (ORP) mode, as the right figure.
- Connect the ORP probe to the tester (the ORP probe DORP1-S is optional), rinse the front tip in the purified water, and shake-dry, gently stir it in the sample solution and let it still, get the readings when the smile icon ☺ stabilized.

Note: The Temp is on the screen, but this does not mean the temperature compensation is on the process.

8.2 ORP Measurement notes

⚠ In mV (ORP) measurement, there is no need of temperature compensation. (the (CAL ENT) key will not activated in the mV (ORP) mode.), If there`s doubt about the quality of the ORP electrode or

the test results, you can use the ORP standard solution to test its mV value to determine whether the ORP electrode or instrument is accurate or not.

⚠ The surface of the ORP measurement electrode (platinum or gold) should be bright. When the electrode used over a long period, the platinum surface will get polluted, which causes inaccurate measurement and slow response. In this case, please refer the following methods for cleaning and activation:

a) For inorganic pollution, the electrode can be immersed in 0.1mol/L dilute hydrochloric acid for 30 minutes, washed with pure water, and then immersed in the electrode soaking solution for 6 hours before use.

b) For organic oil and oil film contamination, clean the platinum surface with detergent, then rinse the electrode in pure water. After that, submerge the electrode in electrode soaking solution for 6 hours before use.

c) For heavily polluted platinum surface on which there is oxidation film, polish the platinum surface with toothpaste, then wash it in distilled water, then submerge it in the 3M soaking solution for 6 hours.

9. Conductivity Module

9.1. Conductivity calibration

- Short press ⏻ to power on, short press to MODE switch to Cond mode.
- Long press CAL ENT to enter calibration mode, the color of screen turns to green.
- Rinse the electrode in pure water, shake-dry, submerge the electrode in calibration solution 1413μs/cm, shake the electrode for a few seconds, then let it stand still.
- Get the readings when the smile icon ☺ stays on the screen, short press CAL ENT to confirm the calibration, the tester returns to measurement mode, and shows up on the screen, indicating the one point is calibrated successfully.

9.2. Conductivity measurement

- Submerge the electrode in sample solution, stir gently, let it still, get the conductivity readings ☺ when the smile icon stays on screen. If the auto-hold function was preset, the readings will be hold automatically, you can short press to release the readings.
- Short press MODE key, switch among Cond/Res/TDS/SAL.

9.3. Conductivity measurement notes

a) Check whether the platinum rod is well. Any damage or surroundings on the electrode will cause measurement failure.

b) The tester is calibrated at the factory. You can perform the measurement directly. If there`s big error, please recalibrated the tester as required.

c) The RES/TDS/SAL parameter was converted from conductivity automatically.

d) You can select USA/CN standard series solution as below:
USA— 84μS/cm, 1413μS/cm, 12.88 mS/cm

CH — 146.6μS/cm, 1408μS/cm, 12.85mS/cm

e) The conductivity electrode is coated with a fluffy platinum black layer, to minimize the polarization effect and enlarge the measurement range. Therefore, Do Not wipe the platinum rod, you can rinse it in water or use warm detergent to clean the organic contamination, or use alcohol to clean it.

f) The default setting of the temp. compensation factor is 2.0%/˚C. User can adjust the factor based on sample solution and experimental data in parameter setting P10. The following table is some examples for setting up the temp. compensation factor.

Solution	Temperature compensation coefficient
NaCl	2.12%/℃
5%NaOH	1.72%/℃
Dilute ammonia	1.88%/℃
10% Hydrochloric acid	1.32%/℃
5% Sulfuric acid	0.96%/℃

Note:

When the coefficient for the temperature compensation is set to 0.00 (no compensation), the measurement value will be based on the current temperature.

10. Probe Replacement

- Twist the electrode ring counter clockwise, pull out the old probe from the tester.
- Align the groove of the new electrode module to the tongue on the tester, gently push the electrode into the slots to twist it in position.
- Wear the new electrode ring and twist on tightly.

11. Warranty

The warranty covers (from delivery):

Dlab warrants the tester against defects in material and workmanship when used in a normal manner for a period of two (2) years (12 months to the electrode).

Note: The electrodes are consumables, and the service life depends on careful maintenance, usage conditions, frequency of use, etc. Within 12 months from delivery, if the user finds that the electrode cannot be used due to processing and manufacturing problems when unpacking it for use, it can be repaired or replaced free of charge.

The limited warranty does not cover the following:

- Wear and tear to parts.
- Accidental damage, as the pH bulb broken from shocking.
- Misuse, uncarefully handling.
- Unauthorized maintenance, soldering, counterfeiting and others.

Appendix：Troubleshooting

Error	Reason	How to solve problem
Can`t power on	No battery power	● Replace 4pcs new AAA alkaline battery, don`t mix the used one. ● All the positive polarity of the batteries must face up. ● Weak connection between battery lip and the batteries. Widen the spring tongue on the battery lid.
	Inactive power key	Contact the supplier
Incorrect Temp. readings	The Temp. thermistor failure	Replace electrode
Strokes missing	LCD screen defective	Contact the supplier
The reading is nearly stable in all kinds of solutions	Short circuit	● Step 1: Replace electrode ● If still in failure with Step 1, contact the supplier for meter maintenance
Calibration failure	● Electrode ageing ● Air bubbles surrounding the electrode shield ● Incorrect/Expired calibration solution ● The electrode was not activated	● Replace electrode ● Stir in the solution to remove the air bubble ● Always Cal with pH7.00 and fresh solutions. ● Soak in the pH/ORP electrode soaking solution for 24 hours
Reading keeps jumping/ Response slow/ Readings won`t stabilize	● There`s impurities surrounding the bulb/ junction ● pH electrode ageing ● There`s air bubble in the electrode	● Rinse clean ● Replace electrode ● Shake the electrode, to remove the air in the electrode
Er1	Incorrect calibration solution	Press ⏻ to cancel Er1, calibrate pH7.00 first
no response when long press CAL ENT	For ORP mode, calibration is not required.	Switch to pH mode, recalibrate the tester as required.

Note:

Never rub the electrode tip with a cloth or hand, this will introduce an undesirable static electricity into the glass shaft of the electrode and prolong the response time considerably.

DLAB SCIENTIFIC CO., LTD.
Add: No.31, Yu'an Road, Beijing Airport Economic Core Zone, Shunyi District, Beijing101318, China
E-mail: info@dlabsci.com
Service: service@dlabsci.com
Tel: 86-10-85653451/52/53