

# Portable Residual Chlorine Analyzer

LH-C10F



*Instruction Manual*

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## **Instrument Overview**

This instrument operates on principle of DPD spectrophotometry, which is specially used to determine the concentration of residual chlorine in water sample. A large number of experiments have proved that this method is simple, quick and sensitive. The instrument is small in size, light in weight, easy to carry, suitable for use in the field and on-site, and has the following notable features:

- Small size, light weight, protection grade IP65.
- Professional optical path design, good optical system stability.
- Small amount of samples and reagents need, fast analysis speed.
- With automatic shutdown and power saving function, long standby time.
- Clear display and easy operation.

This instrument is produced in strict accordance with the requirements of the ISO9001 2015 quality management system, and has been strictly tested and calibrated before leaving the factory.

## Safety Warning

The test reagent are irritating, please do not directly touch the skin. Please wear gloves and protective glasses. If you come into contact with the chemicals, immediately wash with water. Please read the measurement procedures carefully, and specially notice the danger precaution. Incorrect operating may result injury to the operator or damage to the instrument. If you have any questions about reagents or operating procedures, please contact our company.

**Warning:** Keep chemical reagents away from minors.

**Hazard information prompts:** this manual will use slogans (danger, warning, attention) to try to avoid the occurrence of hazards.

**Danger** indicates the existence of a potentially dangerous situation, which, if not avoided, may cause death or serious injury.

**Warning** indicates that a potentially dangerous situation may cause injuries.

**Attention** indicates to notice special information.

**Warning labels** Please pay special attention to the labels attached to the instrument. If not noticed may cause damage to the operator or the instrument.

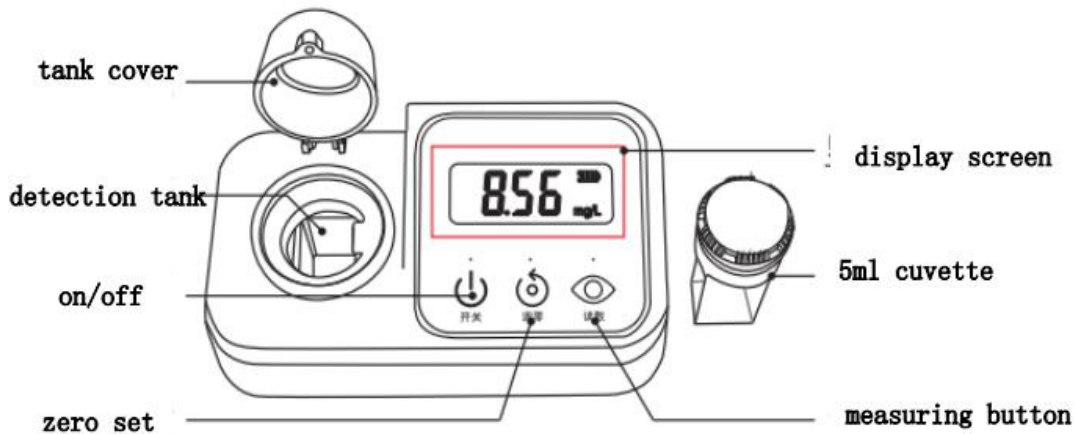
## Precautions

- ◆ When the sample is turbid or colored, which will affect the test. Do not filter or decolorize the sample, in case cause losing residual chlorine. Please use the water sample as a reference to zero the instrument before testing, it could compensate effect of interference.
- ◆ Indoor environment without direct sunlight, if not close the detection tank cover will not effect the test. Outdoor environment with direct sunlight, please close the detection tank cover.
- ◆ The instrument must be completed within 1 minute after adding the reagent, otherwise it will affect the detection accuracy, and little reagent are insoluble will not affect the instrument.
- ◆ Any liquid or foreign matter entering the measurement basin may damage the instrument, please to wipe clean the basin.
- ◆ When the concentration of residual chlorine of the sample is high, the dark red color appeared after adding reagent will quickly fade away. Because the oxidized reagent is bleached by the residual chlorine. If the concentration of the water sample exceeds the range of the instrument, please dilute the water sample with distilled water or pure water (boil it and let it cool for use) by a certain multiple and re-measure. The measured value multiplied by the dilution multiple is the actual concentration of the water sample.
- ◆ The reagent packaging bag is an easy-to-tear bag, which can be torn on any surface.
- ◆ Please clean the cuvette after each test, and the straw needs to be cleaned several times; If the inner face of the cuvette is dirty, please clean it with detergent, then rinse with clean water and dry it before use.
- ◆ Do not expose the cuvette to organic solvents such as alcohol.
- ◆ Please sure no water stains, scratches, dust, fingerprints etc. On the surface of the cuvette.
- ◆ The water sample in the cuvette must have no bubbles, which will affect the accuracy of test.





# Instrument Description

## Instrument structure

The instrument is composed of plastic structure, electronic system, display screen, touch buttons and cuvette.



## Instrument Diagram

Display icon	Function definitions
<b>C10F</b>	When the instrument is being turned on, it will display in the middle of the screen; it indicates the date of the total chlorine detection item
<b>IdLE</b>	Indicates that the instrument is in standby
<b>0.00</b>	Indicates that have been zero set or the concentration of the solution is 0.0
<b>8.56</b>	Indicates the current concentration value of the solution.
<b>mg/L</b>	Indicates the unit of solution concentration
	Indicates the current power of the instrument, and reminds to replace the battery when the space flashes.
<b>OFF</b>	Turn off the instrument after long pressing the power button
<b>HHHH</b>	Indicates that the detection value of the solution exceeds 20% of the upper limit of the range.
	Zero set button
	Start measuring button
	Power button, long pressing switch ON/OFF

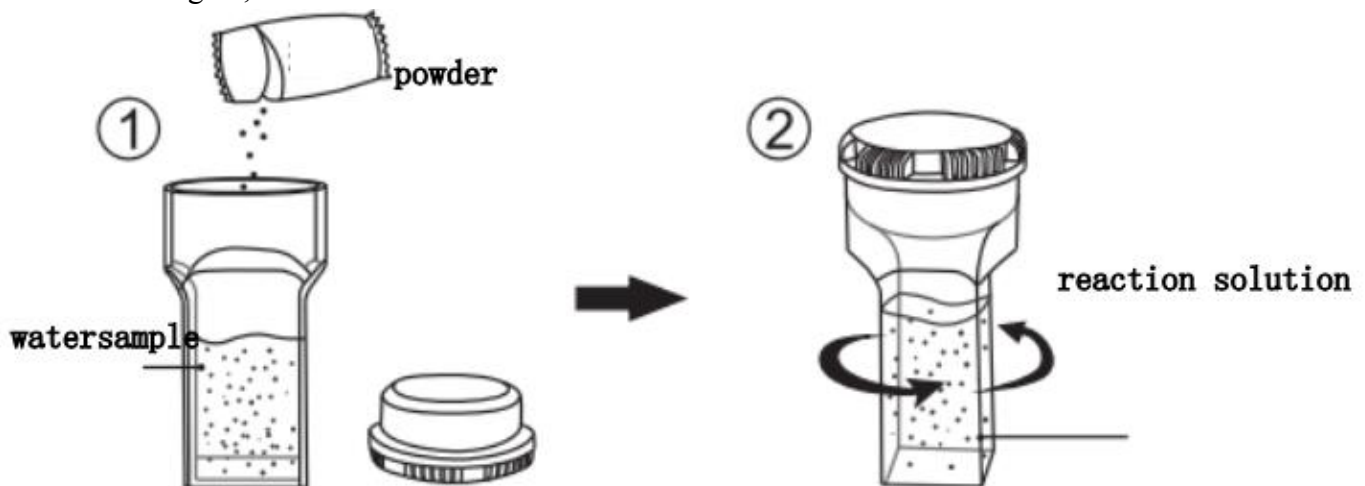
## Instrument Operation

Before the test:

1. Handhold bottleneck of cuvette, and wipe the surface of the cuvette with a lens cloth before inserting it into the detection tank.
2. Wash the pipette and cuvette when absorb the solution.
3. Add the residual chlorine reagent and shake as soon as possible, and complete the test within one minute after covering the detection tank cover.
4. Open the detection tank cover to check whether there are foreign matters, water stains etc. Please clean it before using if there exist.

Measurement steps:

- (1) Press the “on/off” button, the screen displays “C10F” and finally displays “IdLE” that indicate the instrument is waiting for the test.
- (2) Take an appropriate amount of water sample to wash the cuvette and cap and pour it out. Then take 5mL water sample (scale position) into the cuvette, cover the detection tank cover, wipe the water stains or fingerprints on the surface of the cuvette with a lens cloth, and put it into the detection tank. Please notice below diagram:
- (3) Press the “Zero” key to zero test.
- (4) When the instrument displays “0.00”, take out the cuvette and open the cap, add a pack of residual chlorine HR reagent, then cover the detection tank cover.



- (5) Shake the cuvette up and down 40 seconds to dissolve the reagents as much as possible. If there are bubbles, tilt the cuvette slightly to drain the bubbles and wipe off any water stains or fingerprints on the surface.
  - (6) Put the cuvette into the detection tank and let it stand for 20 seconds, and then press the “Measuring” button. The value displayed on the screen is the measured concentration value (unit: mg/L)
- Note: After adding the residual chlorine HR reagent, please shake it as soon as possible and complete the test within one minute, otherwise the test accuracy will be affected.
- (7) After testing, please clean the foreign matters in the detection tank in time, and return the detection tank cover to keep the interior clean.

Measurement range	0.10~10.00mg/L
Light source	LED emitting diode
Wavelength	520nm
Accuracy	<1.0mg/L,error: $\pm 0.05$ mg/L >1.0mg/L,error:< $\pm 5\%$
Principal	Residual Chlorine reacts directly with N,N-diethyl-1,4-phenylenediamine(DPD) at PH 6.2~6.5 to form a red complex,which is measured by spectrophotometry at 520nm.
Battery capacity	40 hours plus
Size	128*70*48mm
Weight	188g(include battery)



## Instrument Maintenance

Sample collection,preservation and storage.

The residual chlorine in the water sample is extremely unstable.It should be measured immediately after sampling,and strong light vibration and warmth should be avoided from beginning to end.

Standard solution configuration:Refer to HJ586-2010 of China National Environment Protection Standard.

Interface factors

- ◆ Oxidant:amine,iodine,bromine,amine,iodoamine,hydrogen peroxide,chromate,ytterbium oxide,ozone etc.
- ◆ Reducing agent:nitrite etc.
- ◆ If the alkalinity of the water exceeds 250mg/L or the acidity exceeds 150mg/L,the measured value will be unstable,and it can be adjusted by adding dilute hydrochloric acid or sodium hydroxide solution.

Battery replacement

- 1.Use a Phillips screwdriver to remove the battery cover at the bottom of the instrument.
- 2.Take out the battery,don't place it randomly,and recycle it in an environmentally friendly way.
- 3.Put 2 new AA batteries into the battery slot,paying attention to the direction of the batteries.
- 4.Reassemble the battery cover with the removed screws.
- 5.If the battery is not used for a long time,the battery must be taken out to prevent battery leakage.

## Common Troubleshooting

Before starting up, check whether the battery is properly installed.

If you still can't troubleshoot the fault or other faults occur, please contact us for after-sales service.

Phenomenon	Cause	Solution
Press ON/OFF, no display	Battery power off	Replace battery
Button insensitive	Water or oil stains on the surface of the instrument	Wipe clear
Large measurement error	Have bubbles in cuvette	Remove bubbles, test again
	Detection tank not clean	Clean detection tank, test again
Display Err 1	Detected value is too low during zero set	Use pure water zero set
		Shutdown instrument then start on again
Display Err 2	Detection of effective value out of tolerance	Replace low concentration solution
Display Err3	The absorbance of the detection solution is out of range	Replace low concentration solution
Display HHHH	The detected solution concentration exceeds the set range 20%	Replace low concentration solution

## **After Service**

1. Sper Scientific warrants this product to the original purchaser against any defects that are due to faulty material or workmanship for a period of one year from date of purchase. In the event that a defect is discovered during the warranty period, Sper Scientific agrees that, at its option, it will repair or replace the defective product.
2. This warranty does not apply to the condition listing below:
  - The damage of the product caused by the improper installation or use
  - Damage by the force majeure, such as earthquake or fire
  - The product is out the time limit
3. Keep the manual and warranty card properly.