

Content

Chapter 1 Product Overview.....	1
1. Overview.....	1
2. System features.....	1
3. Technical Indexes.....	2
Chapter 2 Product Appearance And Structure.....	3
Chapter 3 Software Interface Operation Instructions.....	5
Chapter 4 Instrument Calibrate And Setting.....	10
1. pH Calibrate.....	11
2. DO Calibrate.....	12
3. Conductivity Calibrate.....	13
4. Residual chlorine configuration and calibration.....	14
(1)Key description.....	14
(2)Menu description.....	15
(3)Residual chlorine zero calibration operation.....	16
(4)Residual chlorine slop calibration operation.....	17
(5)4-20 mA current output setting.....	18
(6)Temperature compensation setting.....	19
(7)Residual chlorine calibration parameter E0 viewed and modified.....	20
(8)Residual chlorine calibration parameter S0 viewed and modified.....	20
(9)Residual chlorine calibration parameter T viewed and modified.....	21
Chapter 5 Common Faults And Treatment.....	21
Chapter 6 First Use Precautions.....	21
Chapter 7 Multi-parameter MODBUS Communication Protocol.....	22

Chapter 1 Product Overview

1. Overview

Multi-parameter water quality analysis system integration platform, can directly integrate a variety of water quality online analysis parameters in a whole machine, in the touch screen panel display focused on viewing and managing; the system set on-line analysis of water quality, remote data transmission, database and analysis software, system calibration functions in one, the modernization of water quality data collection and analysis provides a great convenience.

Flexible configuration, the sample and analysis of the internal part of the cabinet can be flexible matching (Note: specific parameters to the actual ordering parameters prevail): pH, conductivity, temperature, and other conventional parameters, the actual needs of customers should be combined or extended ; Water part of the use of the company's latest application research results - tandem flow analysis device, the water required little, real-time strong, a small water flow through a variety of sensors in accordance with the different technical characteristics and response order , Water samples through the flow of all parameters when the real-time capture, but also to achieve the external large-scale continuous expansion of the unit.

2. System features

- 2.1 Parameters of personalized custom combination, according to customer monitoring needs, flexible combination, matching, custom monitoring parameters;
- 2.2 Through the flexible configuration of intelligent instrument platform software and combination of parameter analysis module to achieve intelligent online monitoring applications;
- 2.3 Integrated drainage system integration, uses a small amount of water samples to complete a variety of real-time data analysis;
- 2.4 With automatic online sensor and pipeline maintenance, very little need for manual maintenance, parameter measurement to create a good operating environment, the complex field problems integrated, simple processing, eliminating the uncertainty of the application process;
- 2.5 Built-in decompression device and constant flow of patented technology, not affected by changes in pipeline pressure to ensure a constant flow rate, analysis of data stability;
- 2.6 A variety of optional remote data link, can be leased, can build a remote database, so that customers strategizing, winning thousands of miles away. (Optional)

3. Technical Indexes

Model		DCSG-2099
Measuring parameter		pH/EC/CL/Turbidity/Temp (Note: the specific parameters are based on the actual order parameters)
Measuring range	pH	0-14.00PH
	Conductivity	0-2000uS/cm
	Chlorine	0-20.00mg/L
	Turbidity	0-20NTU
	Temperature	0-100°C (Thermal element: PT1000)
Resolution and accuracy	pH	Resolution: 0.01pH Accuracy: ±1%FS
	Conductivity	Resolution: 1μS/cm Accuracy: ±2%FS
	Chlorine	Resolution: 0.01mg/L Accuracy: ±1%FS
	Turbidity	Resolution: 0.01NTU Accuracy: ±1%FS
	Temperature	Resolution: 0.1°C Accuracy: ±0.5°C
Communication Interface	RS485	
Working power supply	AC 220V±10%	
Working environment	Temperature: (0-50) °C;	
Storage environment	Relative humidity: ≤85% RH (No condensation)	
Size	1100mm×420mm×400mm (L*W*H)	

Chapter 2 Product Appearance And Structure

Product Appearance:



Product appearance structure: by the touch screen, front door, fixed lock composition.

Touch screen: real-time display monitoring parameters, and can be operated by touch.

Front door: can be opened, the equipment maintenance operations.

Lock: The lock acts as a door lock and handle.

The upper part of the instrument has built-in electronic monitoring and control unit, and the lower part of the instrument has built-in water flow sampling mechanism and measuring electrode. As shown below:



Open the front door of the instrument, the inside of the door inside, you can see the touch screen plug-in USB interface, when used in the data lead. See below:



The flow cell is equipped with: PH electrode, residual chlorine electrode, conductivity electrode etc. (Note: The number of electrodes according to the actual order of the customer shall prevail, the flow cell will be customized according to customer requirements, shape to the actual receipt of goods), see below:



On the left side of the water inlet, the middle of the sewage valve, the right side of the outlet

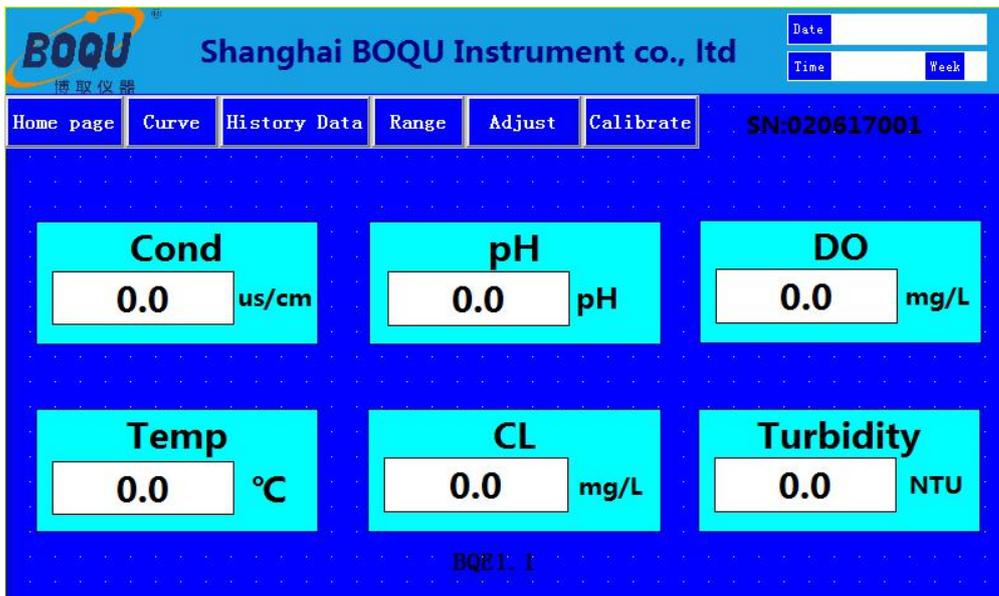
Chapter 3 Software Interface Operation Instructions

Overview:

The software interface operating system includes: home page, real-time data, real-time curve, historical data, range setting, adjust and calibration operation items.

After the device is powered on, it will automatically enter the main interface of measurement - real-time data interface.

Real-time data interface display real-time measurement data, can clearly and intuitively reflect the current water quality of the indicators to facilitate customers timely and accurate understanding of the current water quality of the parameters of the situation, scientific management. as the picture shows:



Click "Curve" to display the real-time curve. Click the corresponding parameter key on the left to view other parameter curves.

The real-time curve is the change curve of the current data measured by the equipment, which can clearly and intuitively reflect the change of the current water quality parameters, so as to facilitate the customer to make the adjustment of the water treatment equipment for the change of the water quality. See below:



Click on "historical data", can view the data records:

The historical data is a record of the measurement data for a period of time before the current measurement data of the device. This data provides a reliable guarantee for the user to grasp the data measured by the user in unattended and custody state, and also facilitates the customer to inquire about the water quality change of the specified time period strong guarantee.

Number	Times	Cond	pH	DO	Temp	CL	Turbidity
1.00	2017-06-27 15:57:47	0.05	0.00	0.00	0.00	0.01	0.01
2.00	2017-06-27 15:57:37	0.05	0.00	0.00	0.00	0.01	0.01
3.00	2017-06-27 15:57:27	0.05	0.00	0.00	0.00	0.01	0.01
4.00	2017-06-27 15:57:17	0.05	0.00	0.00	0.00	0.01	0.01
5.00	2017-06-27 15:57:07	0.05	0.00	0.00	0.00	0.01	0.01
6.00	2017-06-27 15:56:57	0.05	0.00	0.00	0.00	0.01	0.01
7.00	2017-06-27 15:56:47	0.05	0.00	0.00	0.00	0.01	0.01

In the "Historical Data" interface, click "Data Backup", can pop up the data export interface, you can insert the USB, select the data need to export the start time, click the corresponding export button to export data to the USB.

Button function description:

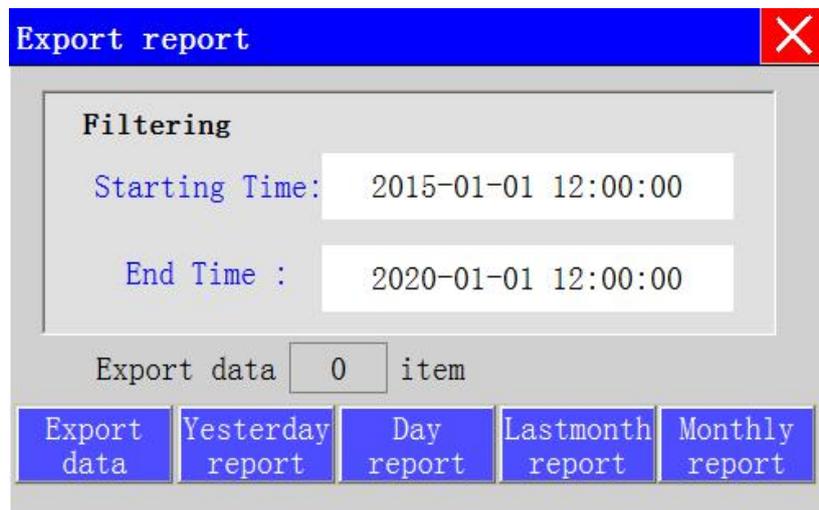
Export data: Export all data to the USB disk.

Yesterday report: export yesterday data to USB disk.

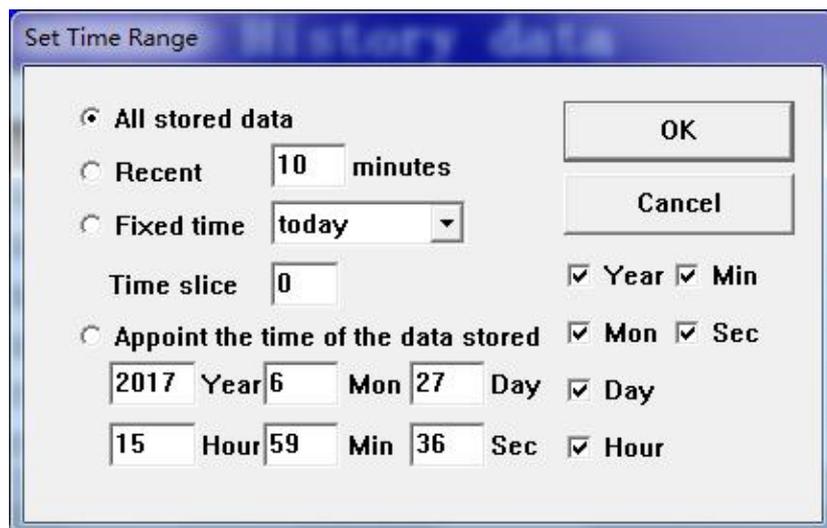
Day report: export the day data to the USB disk.

Last month report: Export last month data to USB disk.

Monthly report: Export this month data to USB disk.



In the "Historical Data" interface, click "Settings", the setup time range interface appears, can select the data list in the interface view time. See below:



Click the "Historical Curve" on the main toolbar to view the historical data curve:



Left yellow list area: shows the current cursor position of the specific parameters of data and recording time, see below:

	Content	Coordinate Range	Value	Unit
■	Absolute clock	1Hour	15:27:56	
■	Cond	0.0~100.0		uS/cm
■	pH	0.00~100.00		PH
■	DO	0.00~100.00		mg/L
■	Temp	0.0~100.0		°C
■	CL	0.00~100.00		mg/L
■	Turbidity	0.00~100.00		NTU

History curve key function description:



Backward (X axis left) scroll curve one page



Backward (X axis left) scroll curve half page



Rearward (X-axis left) rolling a main chain line position



Forward (X-axis right) to scroll through a master line position



Forward (X axis, right) scroll curve half page



Forward (X axis, right) scroll curve one page



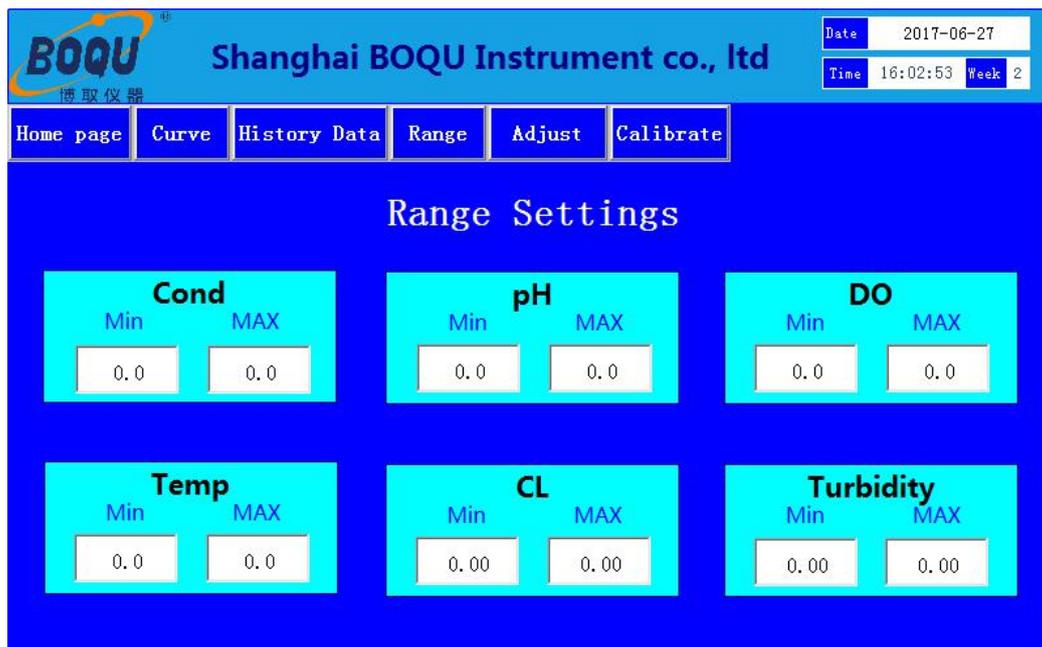
Set the start time of the curve



Click key, choose the time period for historical data curve view, see below:



Click on the main toolbar of the "range settings" can be set on the instrument range, the minimum value of the range of low limit, the maximum value of the range of high limit, see below:



Instrument range setting:

Conductivity: low limit is 0, high limit is 2000

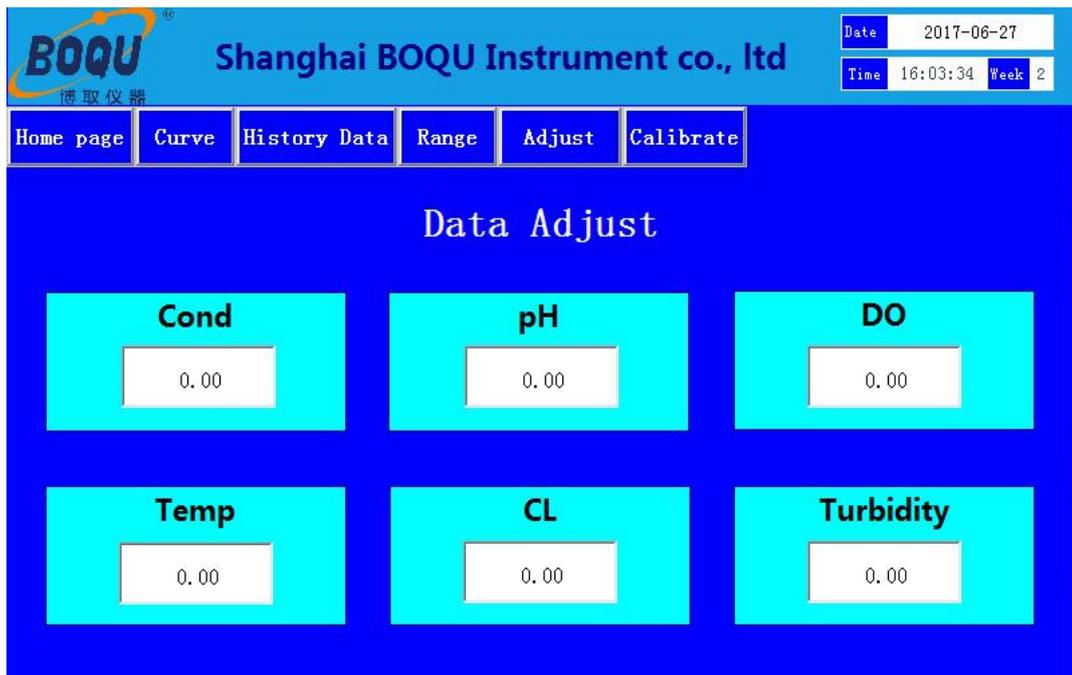
PH: low limit is 0, high limit is 14

Temperature: low limit is 0, high limit is 150 °C

Turbidity: Low limit is 0, high limit is 20NTU

Residual chlorine: low limit is 0, high limit is 20mg / L

Click "Adjust" on the toolbar to set the parameter adjust value for the instrument:



The function for the project backup function, the general set to 0.

Chapter 4 Instrument Calibrate And Setting

Instrument calibrate:

Click the touch screen main toolbar "calibrate" key appears calibration selection interface:



Click "pH calibrate", enter the pH calibrate interface.

1.pH Calibrate

The screenshot shows the 'pH Calibrate' interface. At the top, the BOQU logo and 'Shanghai BOQU Instrument co., ltd' are displayed. The date is 2017-06-27 and the time is 16:05:41. A navigation bar includes 'Home page', 'Curve', 'History Data', 'Range', 'Adjust', and 'Calibrate'. The main display area shows 'pH Calibrate' with the following parameters: pH: 0.00, Temp: 0.0 °C, Voltage: 0.00 mV, and Slope: 0.00. The 'Standard solution type' is set to 0. A dropdown menu is open, showing two options: '0:International standard 4.00,7.00,10.00' and '1:Chinese standard 4.00,6.86,9.18'. Below the dropdown are two buttons: 'Zero qualified' and 'Slope qualified'.

The page displays the current pH value, temperature, slope and other parameters.

Standard type description:

0: on behalf of 4.00, 7.00, 10.00 standard solution.

1: on behalf of 4.00, 6.86, 9.18 standard solution.

Zero calibration: the electrode into the 7.00 or 6.86 standard solution, to be stable after the electrode "zero qualified" button.

Slope calibration: the electrode into the 4.00 or 9.18 / 10.00 standard solution, to be stable after the electrode "slope qualified" button.

PH calibration steps:

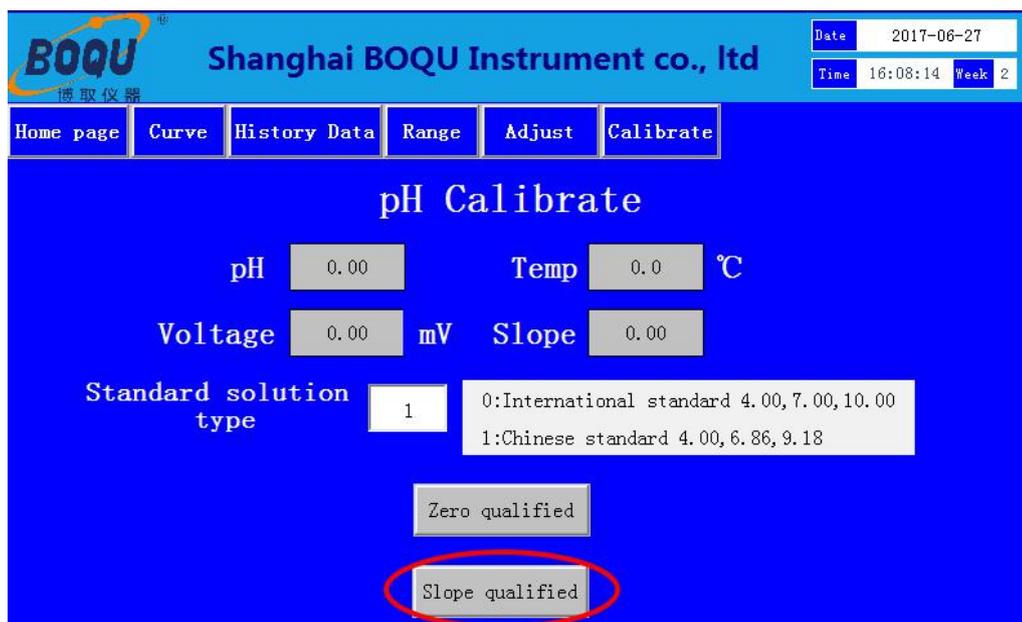
Enter the pH calibration interface, the "standard type" is set to 1:

This screenshot is identical to the previous one, but the 'Standard solution type' dropdown is now set to 1. The dropdown menu is still open, showing the same two options: '0:International standard 4.00,7.00,10.00' and '1:Chinese standard 4.00,6.86,9.18'. The 'Zero qualified' and 'Slope qualified' buttons remain visible below.

Put the pH electrode into 6.86 standard solution, click“Zero qualified”key



Then put the pH electrode into 4.00 or 9.18 standard, when the data stable, click “Slope qualified” key



After completing the calibration as described above, click on the home page and return to the main measurement interface.

2. DO Calibrate

Click "DO Calibrate" to enter the DO calibrate interface. As shown below:



After entering the calibration interface, the dissolved oxygen electrode is taken out and placed vertically in saturated oxygen or air. After the current value is stable, the calibration is completed according to the slope. Under normal circumstances, do not need to zero calibration. For calibration, then the electrode placed in oxygen-free water, according to zero qualified to complete zero calibration.

Note: This multi-parameter installation method is generally only applicable to the measurement of mg level oxygen content.

3. Conductivity Calibration

Click "Cond Calibrate" to enter the conductivity calibrate interface. As shown below:



After entering the calibration interface, the conductivity electrode is taken out and placed vertically in 1413us/cm standard solution. After the measured value is stable, the calibration is completed according to the calibration.

Note: Conductivity calibration can only be calibrated using a 1413us/cm standard solution.

4. Residual chlorine configuration and calibration

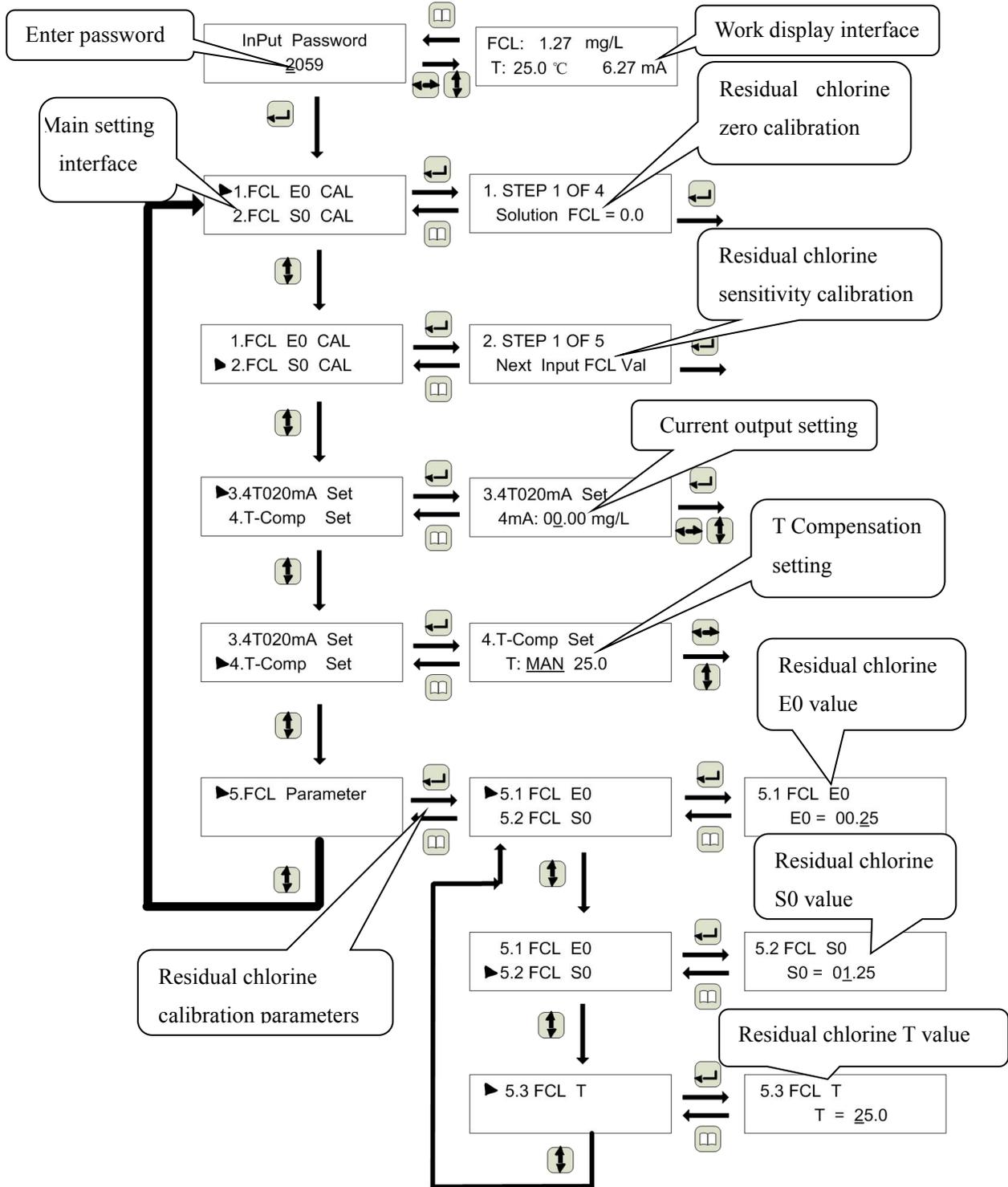
(1) Key description

Residual chlorine module has four keys are the page key, loop plus key, loop right key, set the key.

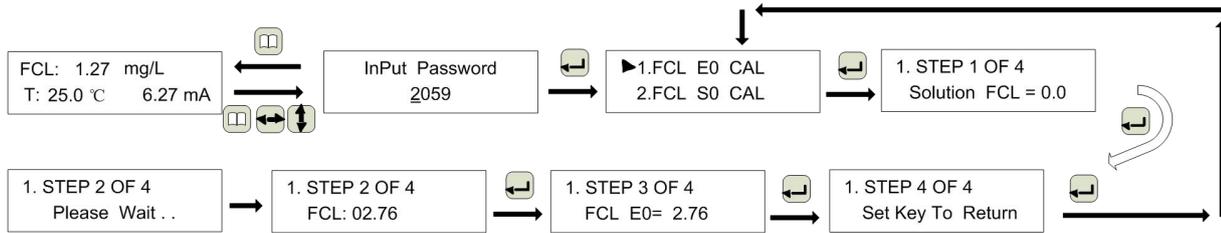
Key	Description
	<p>In the working state, press the page key, enter the password 2059 can enter the settings interface.</p> <p>In the set state, press the page key, you can return to set the main menu or return to work status, return to the previous menu function</p>
	<p>Loop plus key: Modify the cursor at the parameter, the cycle increases from 0 to 9.</p>
	<p>Loop right key: Can circle the cursor right and select a different parameter bit.</p>
	<p>Set key: This key allows to enter the next level menu from the previous menu. When the parameter is modified, press the key to achieve the storage of the modified parameters and return to the previous menu function. When in the calibration operation, the key can complete the calibration process.</p>

(2)Menu description

The following figure is the context between the menu.

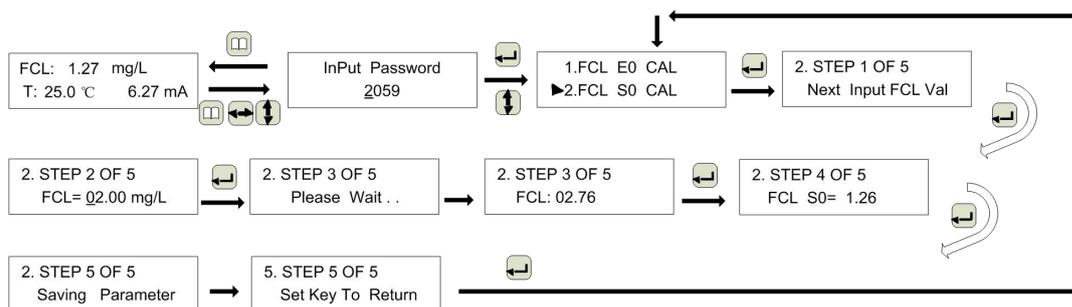


(3)Residual chlorine zero calibration operation



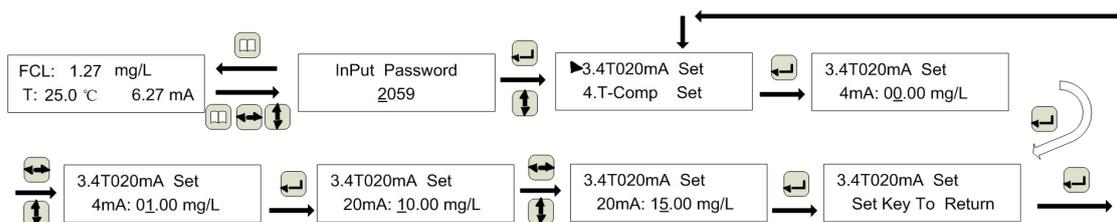
Part Name	Legend	Key	Action
Confirm: NTC thermistor (using temperature compensation) and instrument connection Confirm: Power supply is normal Confirm: The operator has a thorough understanding of the calibration principle and gives the appropriate authorization to fully understand the safety and potential risks.			
In the instrument	1. STEP 1 OF 4 Solution FCL = 0.0		Tip: Put the residual chlorine electrode into the chlorine-free calibration solution.
In the electrode			Put the residual chlorine electrode into the chlorine-free calibration solution, press key, into the residual chlorine zero calibration Step 2 of 4.
In the instrument	1. STEP 2 OF 4 Please Wait . .		Start sampling the calibration solution, please wait.
	1. STEP 2 OF 4 FCL: 02.76		Shows the calibration current value of the calibration fluid, the display value is refreshed, when the displayed value fluctuates very little, can press key, enter Step 3 of 4.
In the electrode	1. STEP 3 OF 4 FCL E0= 2.76		Show new calibration parameters E0. Press key, save the new calibration data.
	1. STEP 4 OF 4 Set Key To Return		After saving the calibration parameters, press key, return to the previous menu.

(4)Residual chlorine slop calibration operation



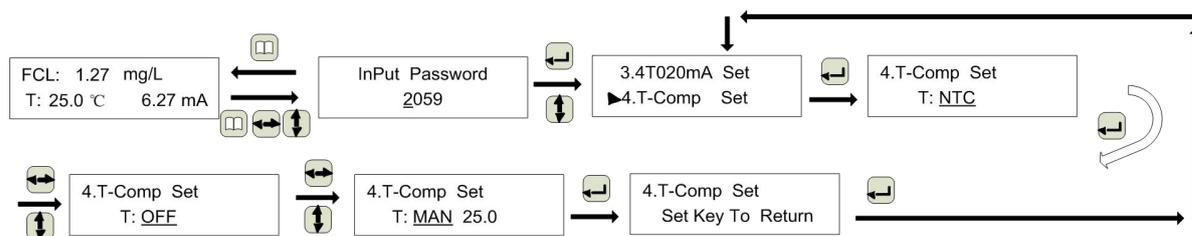
Part Name	Legend	Key	Action
<p>Confirm: NTC thermistor (using temperature compensation) and instrument connection</p> <p>Confirm: Power supply is normal</p> <p>Confirm: The operator has a thorough understanding of the calibration principle and gives the appropriate authorization to fully understand the safety and potential risks.</p>			
In the instrument	2. STEP 1 OF 5 Next Input FCL Val		Tip:Put the residual chlorine electrode into the chlorine-free calibration solution, press key, enter the residual chlorine slop calibration Step 2 of 5.
	2. STEP 2 OF 5 FCL= 02.00 mg/L	 	Users can pass key and key, complete the input to the calibration residual chlorine value.
In the electrode			Place the residual chlorine electrode in the corresponding calibration solution. press key, enter the residual chlorine slop calibration Step 3 of 5.
In the instrument	2. STEP 3 OF 5 Please Wait . .		Start sampling the calibration solution, please wait.
	2. STEP 3 OF 5 FCL: 02.76		Display the calibration liquid sampling current and temperature value, the display value refresh, when the display value fluctuation is very small, press key, enter calibration parameter display Step 4 of 5.
	2. STEP 4 OF 5 FCL S0= 1.26		Show new calibration parameters S0. Press key, save the new calibration data.
	5. STEP 5 OF 5 Set Key To Return		After saving the calibration parameters , press key, return to the previous menu.

(5)4-20 mA current output setting



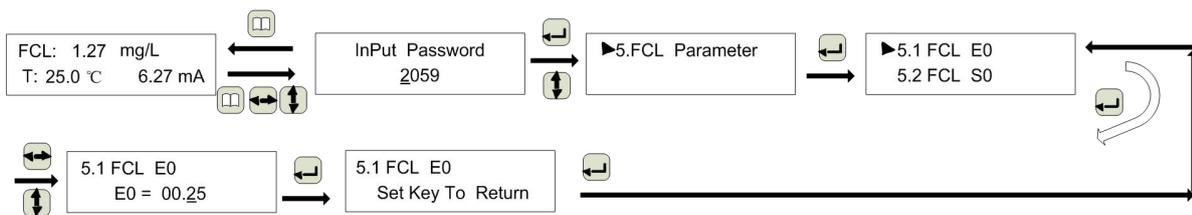
Part Name	Legend	Key	Action
<p>Confirm: Power supply is normal</p> <p>Confirm: The operator has a thorough understanding of the calibration principle and gives the appropriate authorization to fully understand the safety and potential risks.</p>			
In the instrument	<div style="border: 1px solid black; padding: 5px; width: fit-content;">▶3.4T020mA Set 4.T-Comp Set</div>		Display 4-20 mA current output setting Complete the 4-20mA current output parameter setting.
	<div style="border: 1px solid black; padding: 5px; width: fit-content;">3.4T020mA Set 4mA: 00.00 mg/L</div>	 	Set the residual chlorine value corresponding to 4mA current, the default is 0.00mg / L.User can use key and keyadjust the corresponding residual value.
	<div style="border: 1px solid black; padding: 5px; width: fit-content;">3.4T020mA Set 20mA: 10.00 mg/L</div>	 	Set the residual chlorine value corresponding to 20mA current, the default is 0.00mg / L.User can use key and keyadjust the corresponding residual value.
	<div style="border: 1px solid black; padding: 5px; width: fit-content;">3.4T020mA Set Set Key To Return</div>		After saving the calibration parameters, press key, return to the previous menu.

(6) Temperature compensation setting



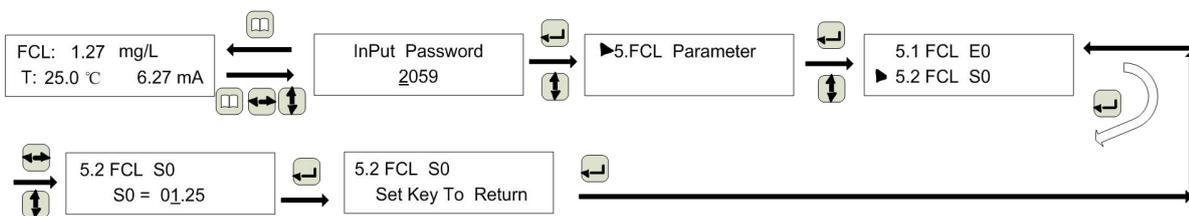
Part Name	Legend	Key	Action
Confirm: Power supply is normal			
Confirm: The operator has a thorough understanding of the calibration principle and gives the appropriate authorization to fully understand the safety and potential risks.			
In the instrument	3.4T020mA Set ▶4.T-Comp Set		Show 4. Temperature compensation setting The setting of the setting of the temperature value is set by the electrode sampling, or manually set the value.
	4.T-Comp Set T: <u>NTC</u>	 	T: OFF/NTC/MAN. Temperature compensation mode: Off/NTC/Manual
	4.T-Comp Set T: <u>OFF</u>	 	Temperature compensation mode: off
	4.T-Comp Set T: <u>MAN</u> 25.0	 	In manual mode, the user can use key and key to complete the modification of the temperature value.
	4.T-Comp Set Set Key To Return		User press key, complete the preservation of the new parameters, return to the previous menu.

(7)Residual chlorine calibration parameter E0 viewed and modified



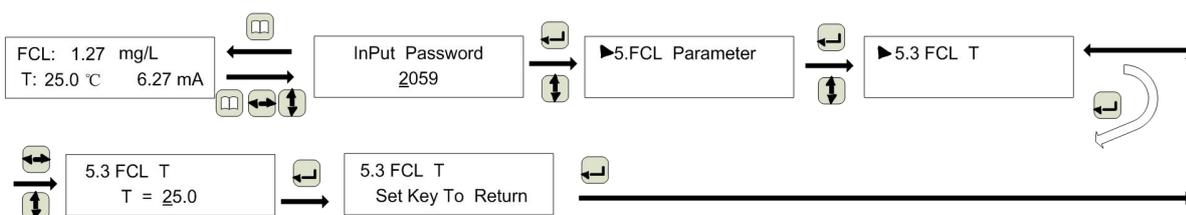
Part Name	Legend	Key	Action
In the instrument	▶5.1 FCL E0 5.2 FCL S0		Choose residual chlorine calibration parameter E0.
	5.1 FCL E0 E0 = 00.25	 	Through loop key, can modify parameter bit value. Through loop key, can select different parameter bits.

(8)Residual chlorine calibration parameter S0 viewed and modified



Part Name	Legend	Key	Action
In the instrument	5.1 FCL E0 ▶5.2 FCL S0		Choose residual chlorine calibration parameter S0.
	5.2 FCL S0 S0 = 01.25	 	Through loop key, can modify parameter bit value. Through loop key, can select different parameter bits.

(9)Residual chlorine calibration parameter Tviewed and modified



Part Name	Legend	Key	Action
In the instrument			Choose residual chlorine calibration parameter T.
		 	Through loop key, can modify parameter bit value. Through loop key, can select different parameter bits.

Chapter 5 Common Faults And Treatment

No.	Fault phenomenon	Treatment method
1	The touch screen is not displayed	Check if the power supply has electricity; Whether the power cable is in good contact; Whether the power switch is turned on
2	Measurement parameter is displayed as 0	Operation touch screen interface, enter the range setting interface, set the corresponding range
3	Significant difference in measurement data	Check whether there is a water sample in the circulation pool and flow normally

Chapter 6 First Use Precautions

For the first time, first put the instrument safe, then connect to inlet and outlet pipes, open the flow cell discharge valve and turbidity probe sewage valve, and then open the water pump or switch, to be measured water flow 2 to 3 minutes or so, and then close the flow cell drain valve and turbidity sensor blown valve, so that the flow of the pool has a certain rinse effect, and also to ensure that the turbidity sensor will not leave the air, is conducive to accurate measurement of the instrument. When the instrument is properly measured, it is possible to adjust the inlet pump flow rate or the inlet valve to ensure that there is a small amount of water flow in the overflow of the circulation tank.

Chapter 7 Multi-parameter MODBUS Communication Protocol

This product MODBUS communication protocol:

This instrument complies with the standard MODBUS RTU communication specification.

Device Address: 05

Communication baud rate: 9600bps, 8-bit data bits, 1 stop bit, no parity

Function code: 03

The data address is assigned as follows (32-bit floating point):

Conductivity register: 1 PH register: 3

Reserved register: 5 Temperature register: 7

Turbidity register: 9 Residual chlorine register: 11