



# Online Total Arsenic Analyzer

## Model:TAsG-3057 User Manual



**Shanghai BOQU Instrument Co.,Ltd**

Address:No. 118 Xiuyan Road,Pudong New Area,Shanghai,zip code:201315,China

Mob:86-15000087545 | web:www.boquinstrument.com | Email:michael@shboqu.com

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## Chapter One Special statement on safety precautions

### 1.1 General provisions

Please read this manual carefully before running in the boot, and in strict accordance with the manual operation, with particular attention to all relevant risk and careful description of the problem, please do not attempt to repair any component disassembly instruments, otherwise may cause serious damage to the operator and severe damage to the instrument.

### 1.2 Electric shock and burn prevention

1.2.1 You must disconnect the power supply before maintenance or repair;

1.2.2 The power connection in accordance with local and national rules;




1.2.3 As far as possible use the ground of fault circuit breaker;

1.2.4 The operation unit is connected to ground under connection operation conditions.

### 1.3 Prevention of dangerous chemicals

Part of the chemical equipment needed for toxic and corrosive substances in the treatment of these drugs, please refer to the manual reagent related content in the chapter and take some preventive measures.

### 1.4 Mark

	For that special attention.
	Indicate the existence of chemical hazard risk, equipment maintenance and chemical delivery system or chemical treatment can only trained with operation qualification person.
	That required to wear eye protection equipment.

**Note: the performance of this product is constantly improving. Subject to change without notice**

## Chapter Two Technical specification

1. Methods: Arsenic molybdenum blue spectrophotometric method
2. Measuring range: 0.000-3.000mg/L (customized up to 10.000mg/L)
3. Indication error:  $\leq 0.2\text{mg/L}$ :  $\pm 0.02\text{mg/L}$ ;  $> 0.2\text{mg/L}$ :  $\pm 10\%$
4. Stability: No more than  $\pm 10\%$  within 24h
5. Repeatability:  $\leq 3\%$
6. Measurement period: minimum measuring period of 30 min, according to actual water samples, can be modified at 5 ~ 120min arbitrary digestion time.
7. Sampling period: the time interval (10 ~ 9999min adjustable) and the whole point of measurement mode.
8. Calibration period: 1~99 days, any interval, any time adjustable.
9. Maintenance period: once a month, each about 30 min.
10. Reagent for value-based management: Less than 5 yuan/samples.
11. Output: RS-232; RS485; 4~20mA three ways
12. Environmental requirement: temperature adjustable interior, it is recommended temperature 5~35°C ; humidity  $\leq 85\%$  (no condensing)
12. Power supply: AC220 $\pm 10\%$ V, 50 $\pm 10\%$ Hz, 5A
13. Size: 1570 x 500 x 450mm (H\*W\*D).
14. Others: abnormal alarm and power failure will not lose data;  
Touch screen display and command input;  
Abnormal reset and power off after the call, the instrument automatically discharge the residual reactants inside the instrument, automatically return to work

## Chapter Three System survey

### 3.1 Application

The method is suitable for wastewater having a total arsenic in the range of 0 to 3 mg/L.

### 3.2 System description

The unique design, making the products than similar products with lower failure rate, lower maintenance, lower consumption of reagents and more cost-effective.

1—Select valve assembly: reagent sampling sequence;

2—The measurement component: through the visual system to achieve accurate measurement of photoelectric reagent, overcome the peristaltic pump pump due to quantitative error caused by abrasion; at the same time to achieve a precise quantitative trace reagent, each dose was 1.5 ml, greatly reducing the amount of reagents used.

3—Sample components: peristaltic pump suction, there is an air buffer between the reagent and the pump, avoid the tubing corrosion;

4—Sealed digestion module: high temperature and high pressure digestion system to speed up the reaction process, to overcome the open system corrosive gas volatilization of equipment corrosion;

5—Reagent tube: imported modified PTFE transparent hose, diameter greater than 1.5mm, reduce the water particle blocking probability.

### 3.3 Electric component

Use Panasonic imported PLC and other control components to reduce environmental interference and equipment failure

### 3.4 Basic principle

After the water sample is digested by acid at high temperature and then mixed with the regulator, the arsenic in the sample reacts with the indicator to form a colored complex in the presence of an acidic environment and an indicator, and the analyzer detects the change of the color. And convert this change into the total arsenic value output. The amount of colored complex formed is equivalent to the total amount of arsenic.

### **3.5 Detection step**

1. Rinse the quantitation sample, reagent quantification tube, and digestion tube with fresh water.
2. Turn on peristaltic pump injection. The water sample does not come into direct contact with the peristaltic pump tube. There is an air buffer between the pump tube and the water sample. The volume of the injection is controlled by a visual measurement system.
3. Turn on the peristaltic pump and add the reagent. The volume of the reagent is also controlled by the visual measurement system.
4. Mix the water sample and reagent by bubbling.
5. After the solution develops color, the solution is drained by a peristaltic pump.
6. In the user-defined measurement cycle, the analyzer automatically calibrates and cleans using the built-in calibration standards and cleaning solutions.

## Chapter Four Unpacking And Installation

### 4.1 Unpacking

Products have been tested in the factory, please check thoroughly transport containers and analyzer in unpacking, to prevent equipment damage during transport or loose parts, Carefully record all the equipment and contact the supplier make properly resolve if it necessary.

### 4.2 Installation

#### 4.2.1 The construction of monitoring sub station

The monitoring sub station should be built in the near sample source (discharge or channel) position to reduce delay analysis.

The monitoring sub station area should be greater than 10 m<sup>2</sup>. The instrument was placed on the ground should be tiled, and the level of requirements for ground leveling, corrosion resistance, no vibration. The instrument should be higher than the ground sampling port 300mm above the ground, to ensure that the cloth pipe shall not be convex or concave.

The monitoring sub station near the sewage side wall ( refer to 4.3), According to section 4.2.3.2.2 required to open the corresponding hole, and pre laid pipe required( refer to 4.5).

The most widely used is the color plate, color plate has the advantages of construction speed, low cost, beautiful appearance and no decorative .

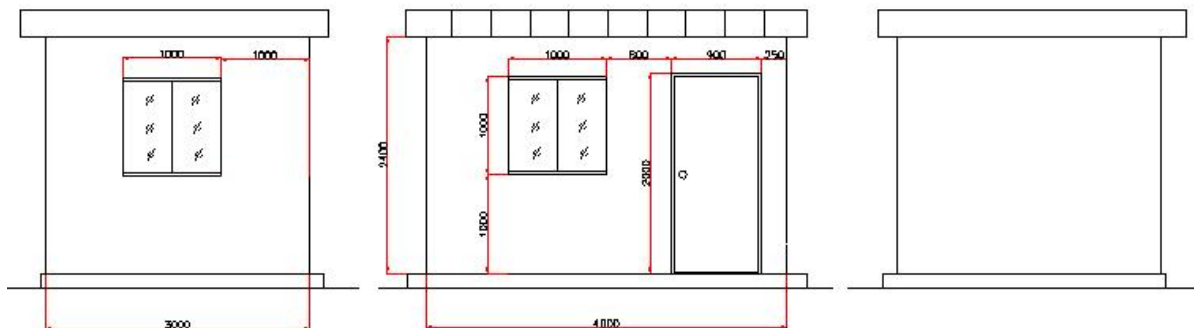


Figure 4.1 Color steel plate monitoring station recommended size map



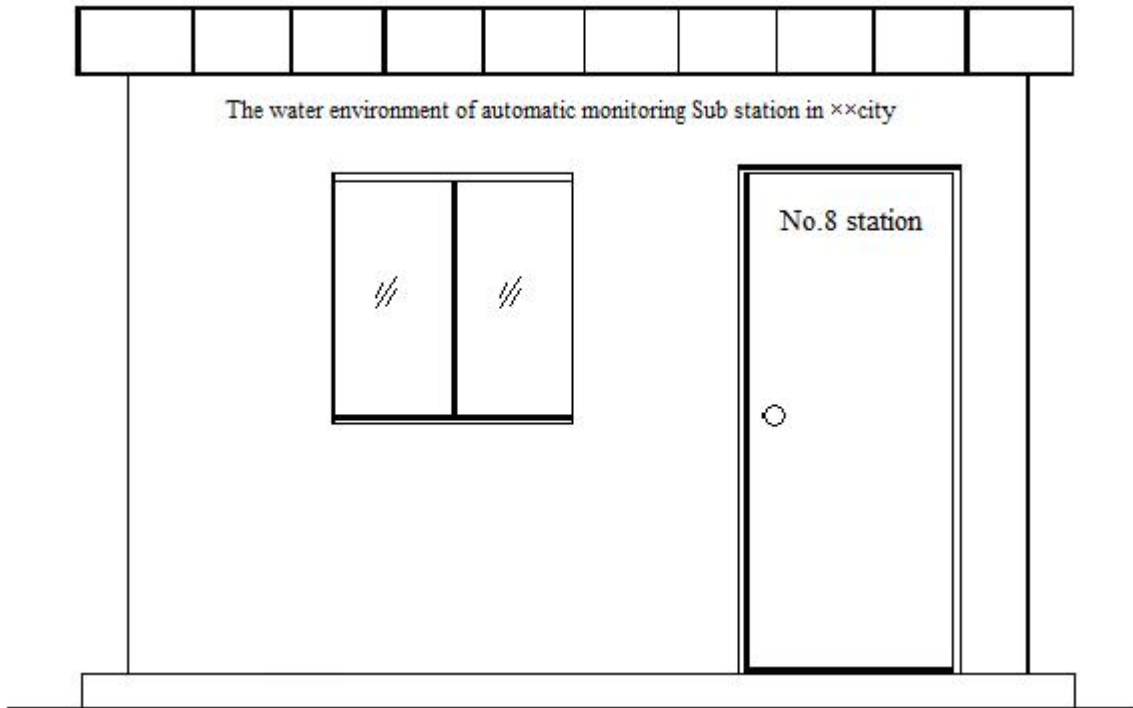


Figure 4.2 Steel plate monitoring sub station proposed text map

## 4.2.2 The monitoring sub station indoor requirements

### 4.2.2.1 Power supply

Single phase alternating current : supply voltage:220V±15%AC ,5A , supply frequency:50Hz±5%,Power of supply:1000w, **good grounding shall be provided.** It has at least 5 sockets of three eyes and 2 sockets for two eyes and fixed at 1.2 meters high or equipped with two multifunctional power supply boards, which can be used for expansion pumps, computers and other electrical equipment.

For the voltage instability and frequent power outages, AC power regulator recommends the use of power and to protect the equipment.

### 4.2.2.2 Room requirements

Indoor lighting should be able to irradiate instrument positive (40W fluorescent lamp);

Dry, ventilated and equipment to meet the operating environment (temperature should be equipped with air conditioning, keep constant temperature at 5-30 Deg. C) and avoid direct sunlight

To avoid strong electromagnetic interference;

To avoid strong corrosive gases.

Hand wash basins are available for hand washing during maintenance.

## 4.2.3 Installation

### 4.2.3.1 Instruments placement

Instrument size Width x Height x Depth= 500×1570×450(mm), the requirement of the instrument about keep  $\geq$  600mm space, keep ahead  $\geq$  1000mm space.

The instrument is usually installed workstation as shown below:

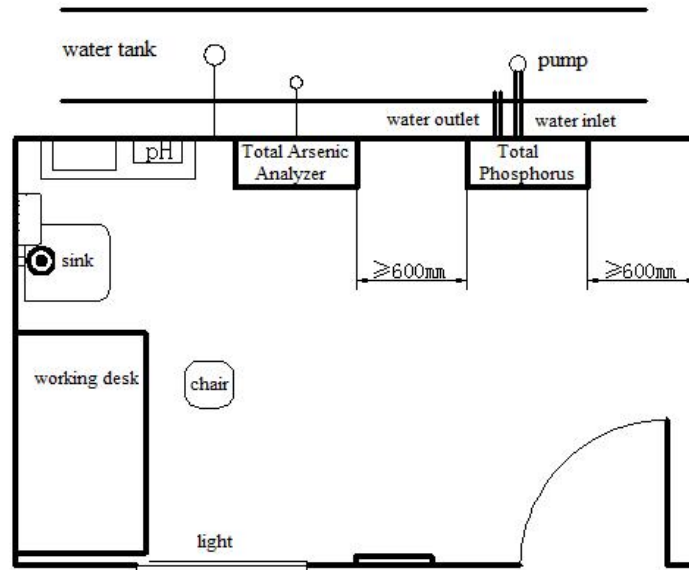


Figure 4.3 Workstation installation (recommended) plane sketch diagram

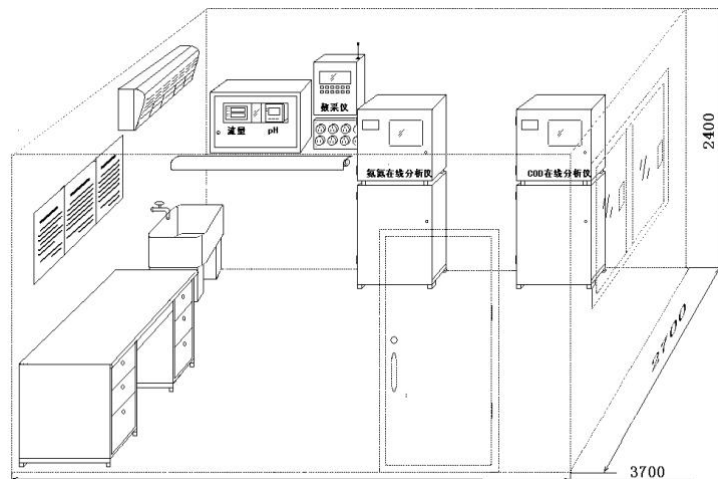


Figure 4.4 Workstation installation (recommended) stereo diagram

### 4.2.3.2 Pump selection, piping layout and installation

#### 4.2.3.2.1 Pump selection

Water pump for conveying water sample from sampling point, Its power shall make the flow rate of the water transported to the instrument not less than 50L/min and not more than 200L/min. Usually the sampling point and

instrument distance less than 20 meters chose the 350W submersible pump and chose 550-750W when distance greater than 20 meters ,In addition, should also be based on the corrosion of water to consider whether the use of corrosion-resistant pump.

#### 4.2.3.2.2 Pump and piping layout

Sampling point to the instrument installation should be pre-installed pump, threading pipe, water sample inlet pipe, outlet pipe and overflow pipe. The connected pipeline should be based on the specific circumstances of hard PVC plastic, ABS engineering plastics or steel (in the water where acid and alkali can not be metal pipe), stainless steel and other materials of rigid pipe. In order to facilitate the connection with instruments and equipment, it is recommended that rigid PVC pipes be used.

#### Requirement:

① Place the instrument should be higher than the ground water tank wall, pipe from the instrument to the sink is a slope down to minimize the number of pipe elbow, pipe and midway should not be raised or sunken place, avoid water pipe, water inlet pipe for emptying and anti freezing in winter.

② The installation of the pipeline should be very careful, the installation of the pipeline should be clean, not more than 2mm diameter of debris, so as not to damage the sewage pump or plug the pipe. The pipe mouth is blocked with clean things before the instrument is installed so as not to enter the sundries.

③ Where the submersible pump is located, the flow should be laminar and the water pumping should not be dissolved in air (water contains a large number of bubbles). The aerosol entering the instrument will make the measurement result inaccurate or make the instrument alarm. Aerosol causes drainage system, mainly submersible pump placed water is falling from height and a lot of bubbles into the water coerced formation.

④ If the submersible pump is used, the outside of the original filter screen of the submersible pump is coated with a stainless steel filter screen and the diameter of the filter hole is between 1.0-2.0mm. The pre installed piping shall be sealed so as to avoid entry of particles.

⑤ Submersible pump and intake should be easy to maintain, encountered such as larger film wrapped water pump can be easily removed.

⑥ Connection method of sewage pump electric appliance:

The instrument panel has sewage pump control power supply interface, can directly control the open sewage pump is less than 500W.

**When the sewage pump power > 500W, the AC relay corresponding to the power is added to the external of the instrument and the control circuit of the AC relay is controlled by the sewage pump of the rear panel of**

the instrument to control the opening of the sewage pump.

**Note:** not high power (especially the sewage pump sewage pump  $\geq 750\text{W}$ ) directly connected to the sewage pump control interface, otherwise the instrument internal fuse is easy to burn. The sewage pump should be immersed in the water as much as possible.

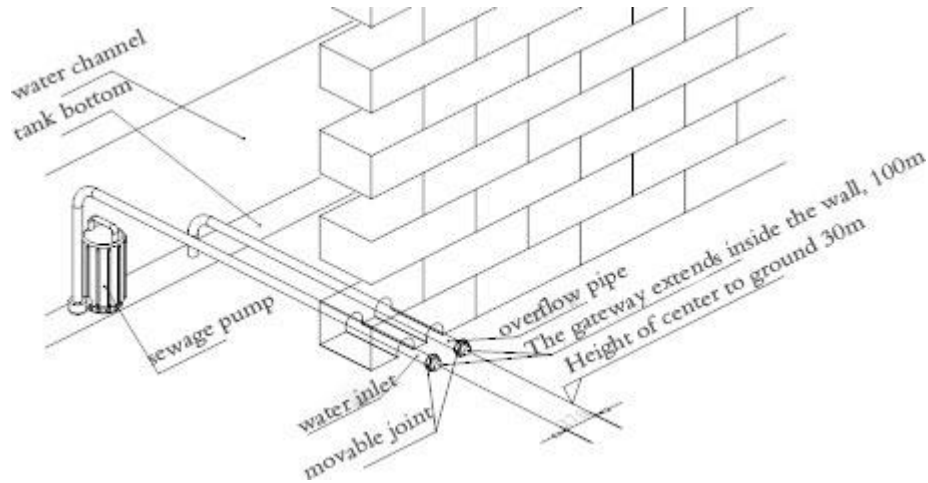


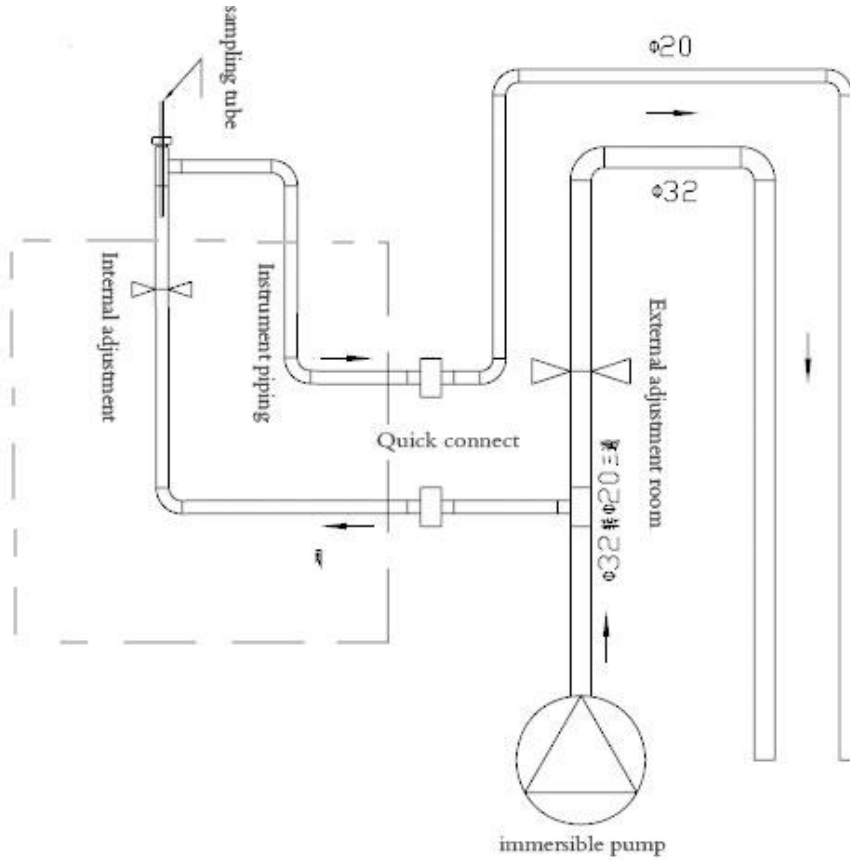
Figure 4.5 Schematic diagram of pipe installation

**Instruction:** When the actual pipe is installed, it should be equipped with 4 lines pipes, 2 lines  $\Phi 32$ , 1 line  $\Phi 50$  (When this pipe is short, a strong  $\phi 5\sim\phi 10\text{mm}$  nylon rope needs to be pre-threaded to facilitate the threading when installing the equipment. When this tube is long, you need to lay  $3\times 0.75\text{m}^2$  rubber cable in advance to use it for water pump. If you need to install flow meter, PH meter, etc., please lay the wire for such equipment according to the requirements.) 1 line  $\Phi 20$ , respectively for water inlet pipe, outlet pipe, threading pipe and overflow pipe.

#### 4.2.3.2.3 Installation

Piping installation please refer to the following diagram. When installing, at first the internal regulating valve and the external regulating valve are opened, and the sampling tube is blocked by hand, the submersible pump is turned on, the sampling tube is gradually loosened, and the external regulating valve is gradually closed until the sampling tube has strong water flow. Then gradually close the internal regulating valve until the water in the sampling tube is dripped downward or has not flowed out.  $\Phi 20$  overflow pipe and  $\Phi 32$  outlet pipe must be installed separately. Otherwise, the water pressure at the sampling pipe will be too large and the equipment will not operate normally. Alternatively, the outlet of the  $\Phi 20$  overflow pipe can be directly connected to the nearest

sewer, or the overflow pipes of all the similar devices can be connected to the same pipe (diameter  $\geq \Phi 50$ ) where the water is flowing smoothly.



Picture 4.5 Piping installation principle diagram

#### 4.2.3.3 Electrical connection

The circuit connection of the instrument is mainly for the connection of the power line and the submersible pump line, as shown in the diagram, it can be reliably connected with the instrument.



## Chapter Five Reagent



**Dangerous! To be on the safe side, chemical reagent should be prepared by professionals.**

**Please follow the following protection measures when preparing reagents:**

**Put on a safety suit (lab work clothes);**

**Wear a safety mask or mask;**

**Wearing rubber gloves;**

**In this chapter, the entire dispensing process can only be made using glass or polytetrafluoroethylene material.**

### 5.1 zero standard solution

	Basic raw materials	Need
A	Distilled water	1 Litre

### 5.2 total arsenic standard solution

	Basic raw materials	Need
A	total arsenic standard solution (Certified reference material)	1 copy
Configuration method: 1. Purchasing the corresponding total arsenic standard solution according to the equipment range: the expanded uncertainty is not more than 3% (K=2)		

### 5.3 Reagent A solution

	Basic raw materials	Need
Oxidant	MaterialA	1 copy
	MaterialB	1 copy

**Configuration method:**

Add about 800 mL of distilled water to a clean 1000 mL beaker, slowly add substance A while stirring, stir until the substance is completely dissolved, then add substance B to make it to 1000 mL with distilled water; bottle for use. Never inject the insoluble material into the reagent bottle in the device.

**Note**

: Brown bottle preservation

**5.4 Reagent B solution**

Reagent B	Basic raw materials	Need
reducing agent	MaterialA	1 copy
	MaterialB	1 copy

**Configuration method:**

Add about 800 mL of distilled water to a clean 1000 mL beaker, slowly add substance A while stirring, stirring until the substance is completely dissolved, and then add substance B to make it to 1000 mL with distilled water; bottling for use. Never inject the insoluble material into the reagent bottle in the device.



Note: Brown bottle preservation

### 5.5 reagent C solution

	Basic raw materials	Need
Reagent	MaterialA	1 copy
	MaterialB	1 copy
	MaterialC	1 copy
Configuration method: Add about 600mL of distilled water to a clean 1000mL beaker, slowly add substance A while stirring, stir and cool, then add substance B and substance C in sequence to stir and dissolve, then inject distilled water to make up to 1000mL; bottle ready for use . Never inject the insoluble material into the reagent bottle in the device.		
<b>Note:</b> Brown bottle preservation		

### 5.6 Use and preservation of reagents

5.6.1 Use: only in a well ventilated place.

5.6.2 Storage: keep away from light. Some should be stored in cold storage. It should be kept only where professional or authorized personnel can get it.

### 5.7 Stability and reactivity

When preparing reagents, pay attention to the following reactions: Redox reaction, reaction with acid and alkali, sudden thermal reaction after adding water.

Hazardous substances that may be generated when preparing reagents: Cyanide.

### 5.8 Reagent placement

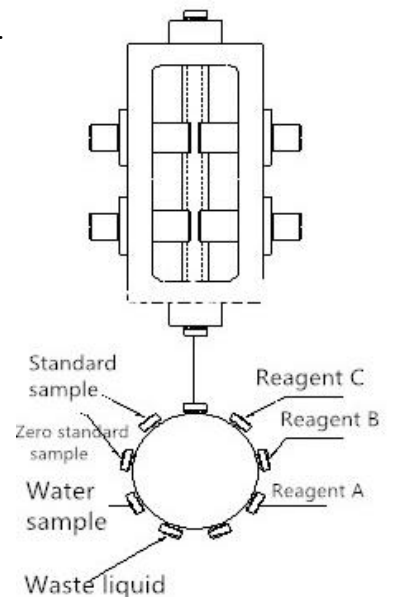
To be on the safe side, place the reagents in the instrument as per the following items:

Put on a safety suit (lab work clothes);

Wear a safety mask or mask;

Wearing rubber gloves;

As shown in the hose on the label or below, the corresponding position in the reagent bottle, extract or insert the hose from the bottle, should pay special attention to prevent the hose hose jitter wall corrosion toxic reagent splashed around the object, be sure to promptly wipe off splashing out of





the liquid reagent.

### 5.9 Waste liquid disposal

Analytical instruments are corrosive and must be disposed of by a dedicated waste disposal company.

## Chapter Six Instrument Operation



**When the instrument is started, make sure that all reagents are properly placed.**

### 6.1 Instrument initialization

Instrument initialization condition:

- (1)Initial operation of instrument;
- (2)The reagent concentration fluctuates greatly after reagent replacement;
- (3)When the instrument is checked and repaired, no reagent is found in the tubes of all sampling tubes;
- (4)When the equipment outage time is greater than 3 days, it is recommended to insert all reagent sampling tubes into distilled water, and perform the operation to flush the instrument.

Instrument initialization method: when the instrument is in standby state, after entering the setting interface, start the initial liquid button, and then finish it immediately.

### 6.2 Calibration

After the initial operation of the instrument, and after the initial operation of the instrument, or at the set calibration time, the instrument performs calibration procedures.

After the device is in standby mode, the "immediate calibration" can be started immediately after entering the setting interface, and the calibration program can be started immediately. When the instrument is in standby mode, the instrument clock reaches the set calibration time, and the calibration program can also be started.

### 6.3 Clean

Use hot acid solution to clean the entire contact area of the water sample until the end of the water sample tube. It is recommended that the instrument be cleaned for 10 days to prevent the crystallization of the reagent in the pipe and to affect the measurement or blockage of the hose.

After the device is in standby mode, the "immediate cleaning" can be started immediately after entering the setting interface, and the cleaning program can be started immediately. In the standby state of the instrument, the instrument clock reaches the set cleaning time, and the cleaning program can also be started.

## 6.4 Measurement



before the instrument runs, please make sure that the instrument has been completed, initialized and calibrated.

After the instrument is in standby mode, the "immediate measurement" can be started immediately after entering the setting interface, and the measurement program can be started immediately. The measuring program can also be started at the standby state of the instrument and when the instrument clock reaches the set sampling and measuring time.

## 6.5 Touch screen introduction

This instrument adopts industrial touch screen technology, Users can view measurement data or set parameters through this touch screen.

### 6.5.1 Data setting method

When setting or modifying parameters, touch this data, the screen will automatically pop up an input keyboard, enter the corresponding number or letter, press the Enter key, the data will be modified. When the data input is wrong, press "CLR" to clear and re-enter.

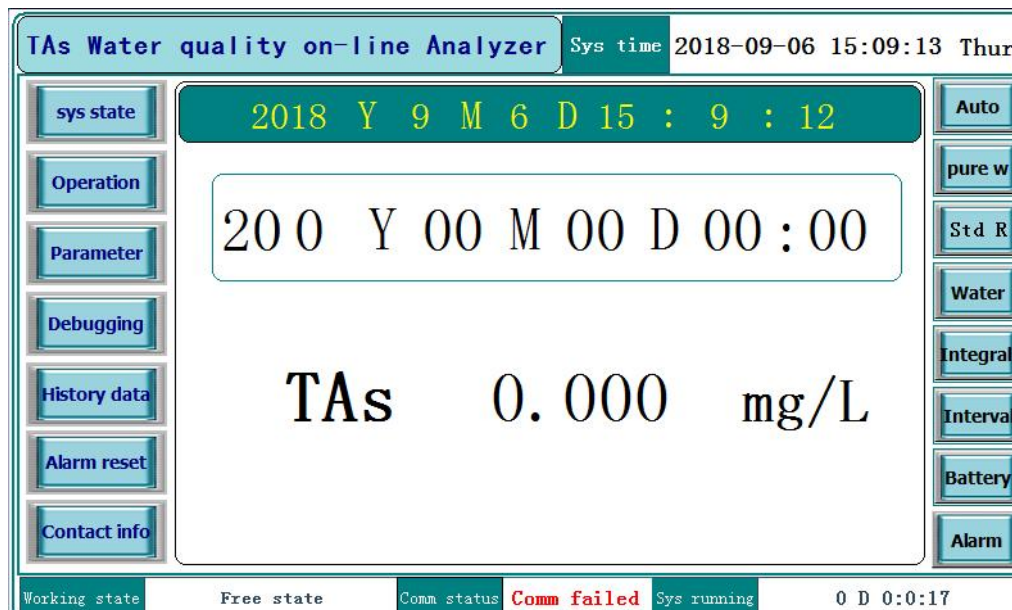
### 6.5.2 Command input and effective display

When the background of the button is black, it is turned on. When the background is transparent, it is turned off. The button is an alternate type switch. Press it once to turn it on and press it again to turn it off. Press "Prev", "Next" or "Back" to enter the corresponding page.

### 6.5.3 Screen Operations

#### 6.5.3.1 Data Display

After the instrument is turned on, the screen automatically goes to main page A.



### The main pages A

The illustration shows that the last measurement time is 00:00, 00:00, 200, and the measured value at this time is 0.000 mg / L. The current Beijing time is 14:07:56 on Sep 4, 2018.

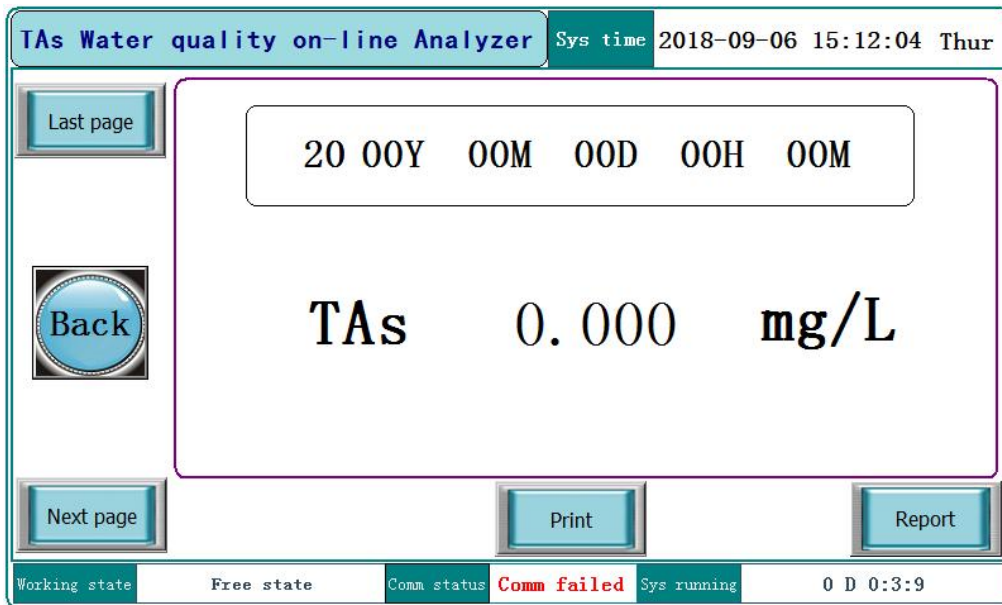
Press "history data" button to enter page B for historical data query;

Press "Parameter Settings" button to enter page D to set the system;

Press the "system status" button to enter the monitoring page P for system operation monitoring;

When the instrument alarms, the "operation status" column shows "abnormal". Press "Abnormal reset" to enter page C to view the alarm exception information.

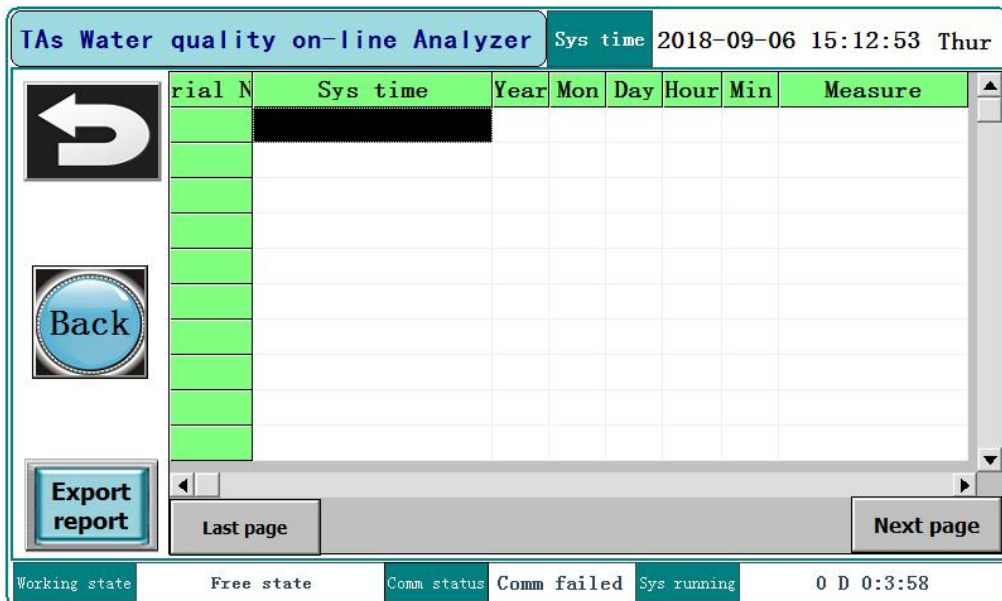
6.5.3.2 View or query historical data

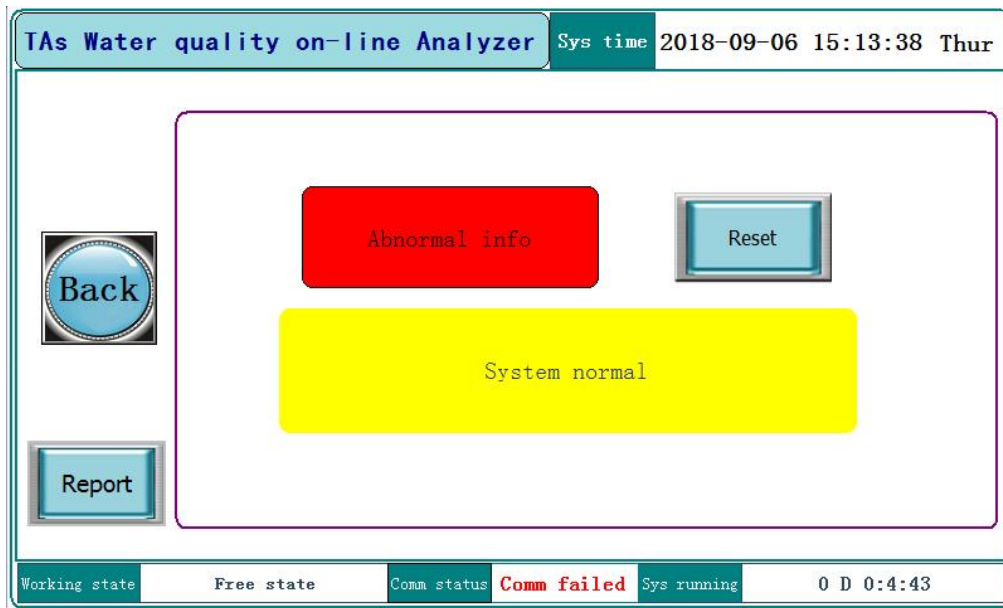


Pages B

Press "Report" button to display the overall history, you can export to U disk;

Press "Back" to return to main page A.

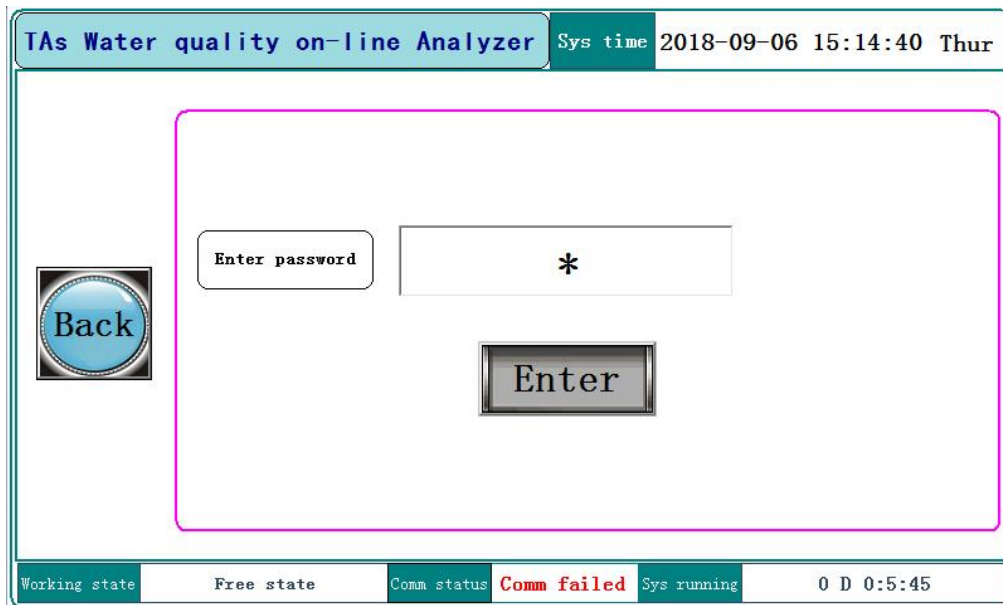




Pages C

After cleaning the instrument, Press reset and continue for 3 seconds to clear the abnormal information, and then press the return key to return to the home page A.

#### 6.5.3.4 User Settings



Pages D

On the page "D", touch "\*", use the pop-up keyboard to enter the correct password, and press "Enter" to enter page E. The factory default password is "1231". Modify this password, see subsequent instructions.

#### 6.5.3.4.1 Standard solution/Alarm value/temperature/timing

TAs Water quality on-line Analyzer		Sys time 2018-09-06 15:15:31 Thur			
Parameter Set		Temp Set		Time Set	
Pure water	0.0mg/l	20mA value	0.000	Sample delay	0S
Std Reagent	0.0mg/l	Comm mode	0	Correc value *	0.00
Water Alarm	0.000mg/l	Comm time	0	Correc value +	0.000
Working state		Free state	Comm status	Comm failed	Sys running 0 D 0:6:36

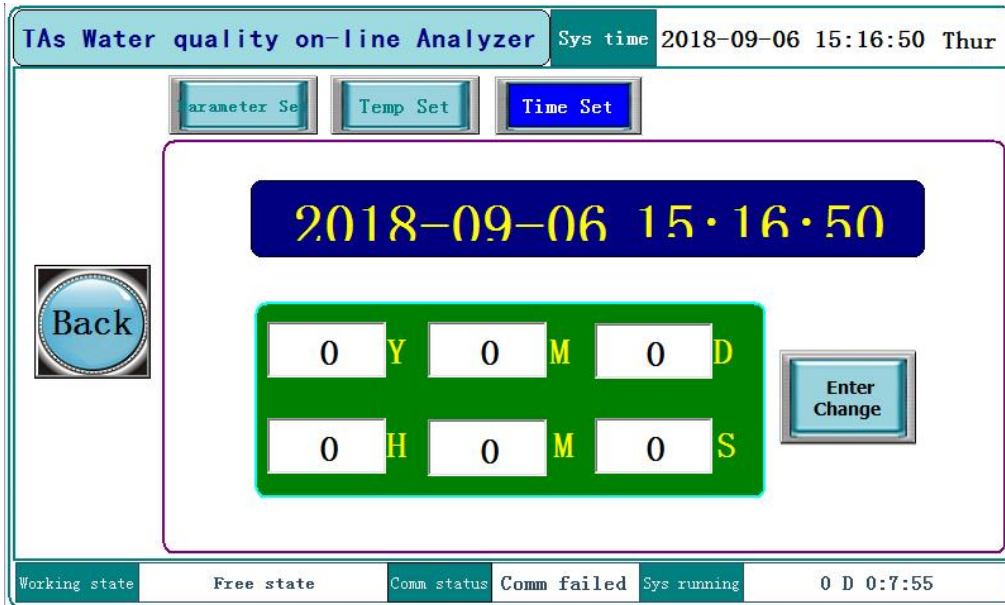
Pages E

Touch the data, use the pop-up keyboard to enter the modified value, press "Enter" to end;

TAs Water quality on-line Analyzer		Sys time 2018-09-06 15:16:10 Thur			
Parameter Set		Temp Set		Time Set	
Water digest setting		Digest Temp	0.0	°C	
		Digest time	0	S	
Water color setting		Color Temp	0.0	°C	
		Coloring time	0	S	
Working state		Free state	Comm status	Comm failed	Sys running 0 D 0:7:15

Pages F

Press "Temperature Setting" to enter page F, and press "Time Setting" to enter Page G. Press the "Back" button to return.

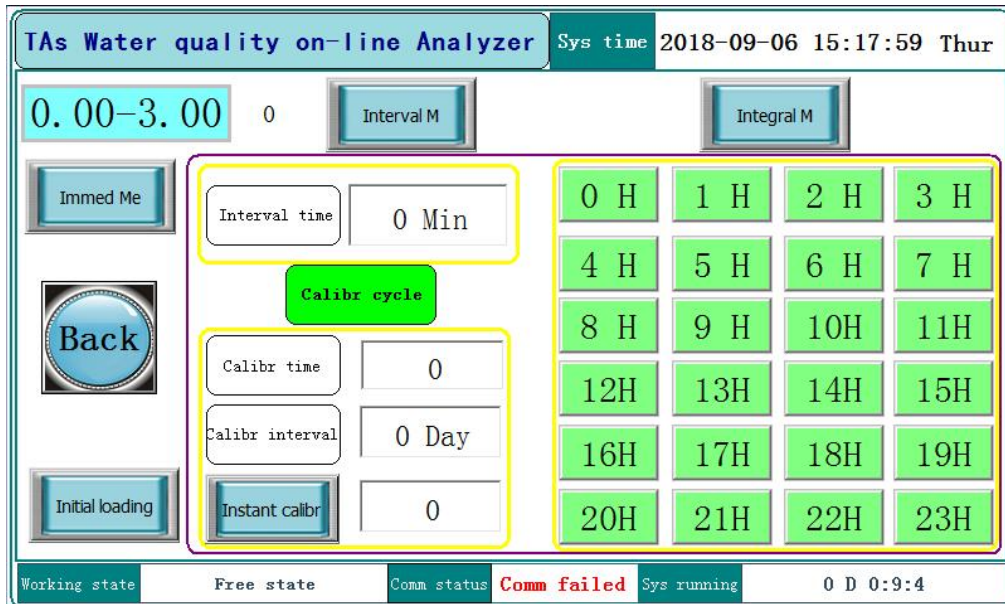


Pages G



After the setting is completed, be sure to press the "End" button to return to page A to prevent misoperation.

**6.5.3.5 range selection/immediate measurement/initial loading/calibration period/Sampling period setting**



Pages H

“0.00-3.00” means the current device selection range, you can tap the right output box and use the pop-up keyboard to input “number” to select the corresponding measurement range:



Numeric number	Measuring range	Standard solution
0	(0.00-3.00)mg/L	2mg/L
1	(0.1-10.0)mg/L	5mg/L

In the instrument standby state, press "immediate measurement" for 3 seconds to start measurement immediately;

In the standby state of the instrument, press "Initial Liquid Loading" for 3 seconds to start initialization immediately. Normally, it is used only during installation, adjustment and replacement of reagents. This function is not used in daily measurement.

Select one of the two sampling periods "Interval" and "Integral Measurement", and select according to your needs.



**The whole point measurement and interval measurement can only be effective and can not be effective at the same time.**

Touch the "calibration interval" input box, use the pop-up keyboard to enter the modified value, press "Enter" to end;

In the instrument standby state, press "immediate calibration" to start the calibration process immediately. Generally, after the reagent is changed, or when the deviation of the measurement data is large, "immediate calibration" is enabled. The automatic calibration cycle is recommended for 3 days. When the calibration interval is set to 99 days, the instrument will cancel the automatic calibration function. The "immediate calibration" right input box indicates the calibration method, generally select 3

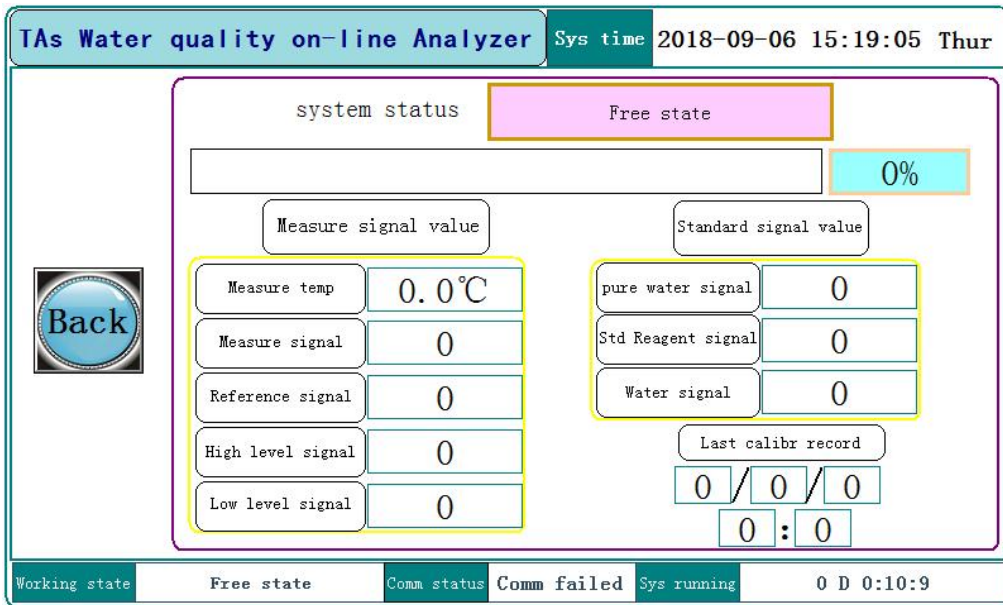
Press "End" to return to page A.



At the end of the setup, be sure to press the "End" button to return to page A to prevent misoperation.

#### 6.5.3.6 System real-time state monitoring





Page I

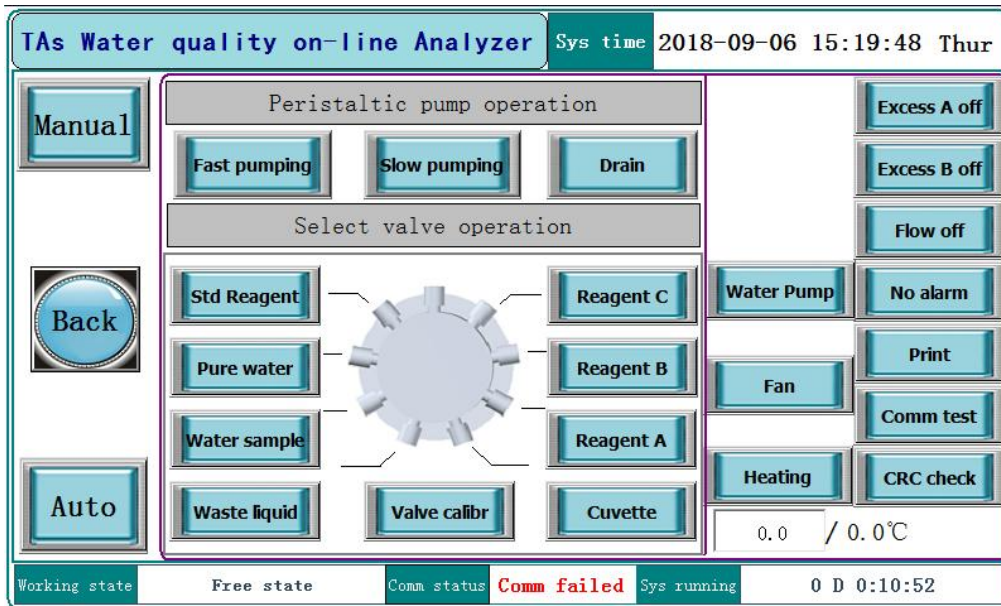
Press the "System Status" button to enter the monitoring page, display the instrument status and the system temperature. If the instrument is running, the system status bar will display the corresponding operation, and in the following progress bar, the percentage of the process is displayed. This process bar only can generally reflect the entire process of measurement and analysis cycle, and there may be some deviation from the actual completion schedule;

Display device-related photoelectric signals, in the standby state, the general device measurement signal in the 1800 ~ 2200, high / low signal in the 1350; when the high or low signal any signal within 800, the instrument will stop running.

The calibration signal value shows the last calibration result and the calibration time;

Press "Back" to enter main page A.

### 6.5.3.7 General Debugging



Page J

Press "General Debugging" to enter the debugging page J,

Long press the "manual debugging" button for 3 seconds, the instrument enters the debugging inspection state, which is used to separately debug the various components on the inspection equipment. In this state, any automatic program on the instrument will not start;

Touch the "Auto Measure" button and the instrument is in automatic measurement. Only one type of manual or measurement status is available. After the maintenance personnel completes the debugging inspection, be sure to select the "Measurement" state before pressing "Return", otherwise the instrument will remain in the "Manual" state.

When the instrument is powered off, whether the instrument is in "manual" or "measurement" before power off, the instrument will be automatically placed in "measurement" state after power on.



When the instrument is abnormally alarmed, if a "reset" operation is performed directly on page C, the instrument will automatically determine the condition of the residual liquid in the instrument and remove it; if the alarm occurs, before the instrument is reset, enter the page J to select "manual" and then reset the instrument, the residual liquid in the instrument will not be automatically drained. In this case, you need to manually remove the residual liquid in the "manual" state.

After debugging, select "Measure" and press "Back" to enter main page A.



After the end of the setup, be sure to press "Back" to enter Home Page A to prevent human error.

#### 6.5.3.7.1 Selection valve test

In the "manual" state, you can manually select the corresponding valve position, all eight valve positions can only have one of the valve position valid.

When you need to check a valve position is normal, the general can select the appropriate valve position, such as chromium reagent, and then start the pump "fast forward" or "slow forward" on page W, see whether the corresponding reagent can smoothly inhalation; or start the "fast reversal", see whether there is a corresponding reagent tube smooth air bubble discharge.



When the actual temperature is higher than 80 °C, the corresponding valve position cannot be manually selected. At this time, only wait for the temperature to drop below 80 °C, or turn on the fan to forcibly cool to below 50 °C.

During manual commissioning inspection, it is strictly forbidden to extract reagent B and reagent C at intervals, which will cause clogging of the public pipeline. For example, the following operations are strictly prohibited:

Select "Reagent B" - Start "Fast Forward" (slow forward) - Select "Waste Valve" - Start "Fast Reverse" - Select "Reagent C" - Start "Fast Forward" ( Slow forward)

In the above operation, since the reagent B remains in the common pipe after the end of the fast reversal, if the reagent C is taken up, it will react in the common pipe, and in severe cases, the reagent will be ineffective.

The above operation is only one example, and any similar precipitation operation may be avoided. The correct operation of the above example is to select any reagent other than C reagent after fast reversal, first rinse the pipeline once, and then select C reagent.



For the above reasons, it is recommended that general users and unskilled engineers strictly prohibit the manual use of the above functions. When there is a residual liquid in the system that needs to be manually drained, please perform the following cycle:

Manual - digestion valve - fast forward - pump stop, select waste valve - fast reverse - pump stop, and then select the digestion valve.....

So cycle until emptying.

#### 6.5.3.7.2 Peristaltic pump test

Manual mode, in this page start fast forward, slow forward or fast reverse, check the peristaltic

pump action is correct.

#### **6.5.3.7.3 Fan or submersible pump test**

In manual mode, start the fan on this page and check that the fan is working properly.

In manual mode, start the submersible pump on this page, check whether the submersible pump works correctly, or whether the corresponding terminal has AC220V output.

When installing the equipment in the field, it is necessary to start the submersible pump manually to adjust the pressure in the sampling tube.

Valve calibration: generally only used in the production of debugging, or use after replacing the selector valve. In manual mode, first select the "valve calibration", when the "valve calibration" background is blue, and then hand hold down the "valve calibration" does not let go, until you hear a "KaKa" sound in the valve, please let go, at this time, the valve is adjusted to complete.

Under normal circumstances, do not often use this function.

#### **6.5.3.7.4 Heater test and digestion condition setting**

In manual mode, start the heater on this page and check that the heater is working properly.

When heating the tube without liquid, it is forbidden to be heated to over 100 centigrade.

On the temperature of the actual temperature and lower temperature as the heating temperature control, is set between 150 to 165°C.

Heating time is from the temperature to set the temperature when the timing, the need for heating digestion time, generally set at 8 ~ 15min can be, for most water samples, generally set at 10min is appropriate.

Time delay of sampling, the sampling time of arrival, the submersible pump start the work, work 20 seconds (not less than 3S in any set time), the instrument before starting work, the main function is to prevent water samples behind.

## **Chapter Seven Breakdown maintenance**

When the instrument is abnormal, it will beep and alarm and interrupt all the running programs, and then reset the instrument until the equipment is out of order, so that the instrument can resume

its normal operation.

Abnormal information	Reason		Take action
Thermocouple anomaly	The actual temperature is greater than 500	Temperature transmitter or A/D damage Temperature transmitter or A/D conversion line is loose	Reconnect the connection between A/D, temperature transmitter and thermocouple. If it still cannot be excluded, replace the temperature transmitter, thermocouple or A/D
	The actual temperature is about 200	Thermocouple or A/D damage Thermocouple and temperature transmitter are loose	
Reagent A was not collected	No corresponding sample Leaking pipe Peristaltic pump driver loosely connected Peristaltic pump or pump tube or corresponding drive is damaged Pipeline blockage Select valve fault Circuit board relay is damaged		Make up the appropriate reagent Replace the clogged pipe or reconnect the leak connector Make sure the 2 outlets of the submersible pump are unblocked Check whether the peristaltic pump works normally or not. If it is abnormal, check the connection, relay or replace the pump driver. Check whether each channel of the selector valve is unblocked. When it is not unblocked, check whether the corresponding channel is blocked. If it is clogged, replace the selector valve. When it is not blocked, check the connection or replace the valve driver. Check or replace circuit board relays
Reagent B was not collected			
Reagent C was not collected			
Sample 1 was not collected			
Sample 2 was not collected			
Water sample was not collected			
Condensation failure	Cooling fan is bad Excessive ambient temperature Loss of thermocouple or temperature transmitter Circuit board relay is damaged		Check or replace the fan Lower the ambient temperature Check or replace thermocouple, temperature transmitter Check or replace circuit board relays
feed liquor/Drain error	Pipeline blockage Select valve fault Metering photoelectric failure Peristaltic pump or its corresponding parts are		Replace blocking line Check whether each channel of the selector valve is unblocked. When it is not unblocked, check whether the corresponding channel is

	<p>damaged or loosely connected</p> <p>Circuit board relay, solenoid valve relay damage</p>	<p>blocked. If it is clogged, replace the selector valve. When it is not blocked, check the connection or replace the valve driver.</p> <p>Check the measurement photoelectric signal is normal, otherwise replace the photoelectric measurement device</p> <p>Check whether the peristaltic pump works normally or not. If it is abnormal, check the connection, relay or replace the pump driver.</p> <p>Check or replace circuit board relays, solenoid valve solid state relays</p>
Heater exception	<p>Temperature setting is less than 100</p> <p>The heating wire is damaged or the connection is loose</p> <p>Solid state relay damage</p> <p>Thermocouple, temperature transmitter or A/D damage</p>	<p>The temperature setting should be higher than 150</p> <p>Check heating wire and wiring and replace heater when there is a problem</p> <p>Check or replace the heating solid state relay</p> <p>Check or replace thermocouple, temperature transmitter, etc.</p>
Photoelectric anomaly	<p>High chlorine water samples were measured under low chlorine condition, and the precipitate in the heater was serious when heating</p> <p>Measure damage to photoelectric system or loose wiring</p> <p>Measuring photoelectric system damage or loose connection</p>	<p>For high chlorine water samples, measures should be taken to measure them</p> <p>Check all photoelectric signals are normal</p> <p>Check abnormal optoelectronic circuits, devices, and wires</p>
Measurement data fluctuates greatly	<p>The environment temperature fluctuates greatly</p> <p>High ambient temperature</p> <p>The heating temperature is not stable</p> <p>Reagent contamination</p> <p>Other hardware faults</p>	<p>Install air-conditioning</p> <p>Reconnect and replace the temperature transmitter or heater</p> <p>Reagent replacement</p> <p>Contact maintenance department</p>

## Chapter Eight General Maintenance

8.1 Check and replenish reagents regularly.

8.2 Periodically inspect the waste liquid in the waste bottle and dispose of it in a timely manner.

Do not overflow the waste liquid.

- 8.3 Check the inlet and outlet of the submersible pump periodically to ensure smooth flow.
- 8.4 Check the cleanliness of the buret regularly. When the signal of any signal of the high or low signal is lower than 600, please perform "immediate cleaning". If the cleaning is completed, the buret still cannot be cleaned. Please remove the metric tube after shutdown manual brushing.
- 8.5 When configuring the reagents, be sure to follow the configuration method in this manual. Otherwise, black insoluble crystals may form in the heater. In severe cases, the pipelines of the equipment will be clogged.