

Operating Instruction Manual

WBG6x(N)Series UF Equipment

海南立昇净水科技实业有限公司

**Note: Please read this manual carefully before operating
the device**

Dear User,

Thank you for using Litree's Ultrafiltration Equipment. In order to give you a clearer understanding of how to use the equipment, please read this manual carefully before use. And keep it properly for reference.

Warning symbols and definitions:



Warning

Danger sign, incorrect operation may cause serious personal injury or death.



Attention

Warning sign, incorrect operation may cause minor personal injury or equipment damage.



Electrical symbol

There is an electrical symbol, which may cause electric shock injury.



当心腐蚀

Corrosive symbol

Please note that there is corrosive liquid.

Contents

| | |
|----------------------------------------------------------|----|
| 1. About..... | 1 |
| 2. Safety and Responsibility | 1 |
| 2.1 Fair use | 1 |
| 2.2 User Instructions | 1 |
| 2.3 Safety Device | 2 |
| 2.4 Hazard | 2 |
| 2.5 Prevention and handling of emergency situations..... | 3 |
| 2.6 Environmental Protection..... | 3 |
| 3. Technical parameters | 4 |
| 3.1 Equipment standards | 4 |
| 3.2 Performance and structural parameter table | 4 |
| 4. System Structure and Installation Commissioning..... | 6 |
| 4.1 Working principle and characteristics | 6 |
| 4.2 Membrane Modules Operation..... | 7 |
| 4.3 Equipment Structure Description | 8 |
| 5. Installation..... | 9 |
| 5.1 Installation environment..... | 9 |
| 5.2 Membrane Component Installation | 11 |
| 5.2 Equipment Installation | 11 |
| 6. System Operation | 13 |
| 6.1 Operating Conditions | 13 |
| 6.2 Operation Interface Explanation | 13 |
| 6.3 NOTE | 18 |
| 7. Equipment Maintenance..... | 19 |
| 7.1 Regular maintenance of equipment | 19 |
| 7.2 Membrane module maintenance | 23 |
| 7.3 Preparation of pharmaceuticals | 23 |
| 8. Problems and solutions..... | 24 |
| 8.1 Equipment Inspection and Repair Instructions..... | 24 |
| 8.2Electrical Inspection and Repair Instructions..... | 24 |

1. About

- ✧ Unauthorized use or reproduction of any or all content contained in this manual is strictly prohibited
- ✧ The copyright of this manual is owned by Litree.

2. Safety and Responsibility

Carefully read the contents of the manual and understand the precautions

2.1 Fair use

- ✧ The medium meets the design requirements, and the environment conforms to the design requirements;
- ✧ Do not artificially reduce the frequency and time of rinsing, backwashing, and chemical cleaning to get more output medium;
- ✧ Strictly follow the manual requirements and prohibit arbitrary modification of program parameters;

2.2 User Instructions

- ✧ Users must comply with relevant laws and regulations in the installation, operation, maintenance, and repair of the equipment;
- ✧ If an operation error occurs causing damage to the equipment, a clear explanation report must be provided;
- ✧ Moving equipment and replacing parts must comply with relevant regulations, and report to Litree Company

2.2.1 Personnel qualifications

- ✧ Operators, installers, and maintenance personnel are only qualified after being authorized by Litree Company;

2.2.2 Operators, installers, and maintenance personnel

- ✧ Must be familiar with and abide by relevant safety rules and familiar with relevant operating instructions in the manual;
- ✧ Must understand the potential safety risks to ensure the safety of on-site personnel and property;
- ✧ Must be fully familiar with safety concepts and electrical regulations;
- ✧ Only after professional training and obtaining authorization from Litree Company, can one operate electrical components and equipment;

2.3 Safety Device

- ✧ Do not arbitrarily replace any parts of the device;
- ✧ Do not move or replace the labels on the device, and ensure their clarity;

2.4 Hazard

Laws and regulations about safety must be strictly enforced from beginning to end

2.4.1 Electrical hazards



Contact with live components may result in severe bodily injury or death

- ✧ Ensure all phases and live conductors are isolated from the power source (turn off the main switch);
- ✧ Ensure the power switch will not close again;
- ✧ Ensure there is no voltage present in the equipment;

2.4.2 Other hazard

- ✧ When taking water samples, accumulated water on the ground can cause slipperiness;
- ✧ Leakage in the pipeline can cause electrical components to fail due to water ingress;

2.5 Prevention and handling of emergency situations

2.5.1 Prevention

- ✧ Post the contact numbers of relevant units and personnel for emergency incident handling in conspicuous places;
- ✧ All operators should be familiar with the shut-off positions of all pumps and valves, and be familiar with safety protection measures;
- ✧ Ensure that the passages around the equipment are unobstructed, the lighting is sufficient, and the air circulation coefficient is maintained;

2.5.2 Handling

When preparing reagents:

- ✧ If skin contact occurs, rinse immediately with clean water;
- ✧ If eye contact occurs, rinse immediately with a large amount of clean water and seek treatment at a nearby medical institution;

When working with electricity:

- ✧ If electric shock occurs, cut off the power in accordance with safety operation standards;

When there is a pipeline leak:

- ✧ Immediately shut down the equipment and contact the relevant technical personnel;



Caution: When using chemical substances for cleaning and performing tasks involving electricity, it is essential to wear safety protective equipment.

2.6 Environmental Protection

- ✧ The discharge of protective fluids and chemical cleaning solutions from pipelines is strictly prohibited;
- ✧ The cleaning solution must be treated collectively until it reaches the range stipulated by law before it can be discharged;

3. Technical parameters

3.1 Equipment standards

- ✧ Equipment effluent: Up to GB5749 standard for drinking water;
- ✧ Equipment execution standard: CJ/T 170 UF water treatment equipment;

3.2 Performance and structural parameter table

| Item | LGW6-0980×2 | LGW6-0980×4 | LGW6-0980×6 | LGW6-0980×8 | LGW6-0980×12 | LGW6-0980×16 | LGW6-0980×20 |
|------------------------------|---------------------------------------|---------------|---------------|----------------------------|----------------|----------------|----------------|
| Model | LW6-0980-PF | | | | | | |
| Module Qty | 2 PCS | 4 PCS | 6 PCS | 8 PCS | 12 PCS | 16 PCS | 20 PCS |
| Capacity (m³/d) | 15 | 30 | 45 | 60 | 90 | 120 | 150 |
| Pipe material | UPVC | | | | | | |
| Electronic control system | PLC module/Remote module/Touch screen | | | | | | |
| Dimension(mm) | 850×780×3550 | 1185×780×3550 | 1520×780×3550 | 1495×1500×3550 | 1830×1500×3550 | 2165×1500×3550 | 2500×1500×3550 |
| Structure | Two rows membrane modules | | | Four rows membrane modules | | | |
| Frame material | SUS304 | | | | | | |
| Weight (kg) | 255 | 355 | 455 | 660 | 850 | 1100 | 1290 |
| Power (kW) | 0.3 | 0.3 | 0.3 | 0.65 | 0.65 | 0.65 | 0.65 |

| | | | | | | | |
|---------------------------|------------------|-----------|-----------|------------|------------|------------|------------|
| Power supply | 220V/50Hz | | | | | | |
| Raw water interface (mm) | Ø32 Union | Ø32 Union | Ø32 Union | Ø40 Socket | Ø40 Socket | Ø50 Socket | Ø50 Socket |
| Production interface (mm) | Ø40 Union | Ø40 Union | Ø40 Union | Ø40 Socket | Ø40 Socket | Ø50 Socket | Ø50 Socket |
| Drain interface (mm) | Ø40 Union | Ø40 Union | Ø40 Union | Ø50 Socket | Ø50 Socket | Ø63 Socket | Ø63 Socket |

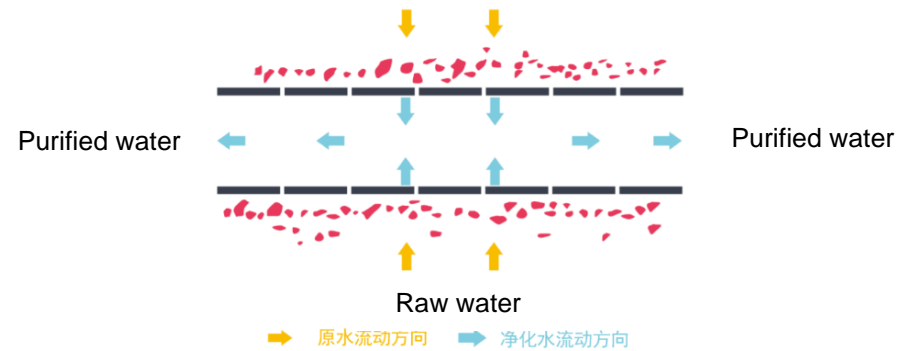
| Item | LGW6-0980×24 | LGW6-0980×28 | LGW6-0980×32 | LGW6-0980×36 | LGW6-0980×40 |
|---------------------------|---------------------------------------|----------------|----------------|----------------|----------------|
| Model | LW6-0980-PF | | | | |
| Module Qty | 24 PCS | 28 PCS | 32 PCS | 36 PCS | 40 PCS |
| Capacity (m³/d) | 180 | 210 | 240 | 270 | 300 |
| Pipe material | UPVC | | | | |
| Electronic control system | PLC module/Remote module/Touch screen | | | | |
| Dimension(mm) | 2835×1500×3550 | 3170×1500×3550 | 3505×1500×3550 | 3840×1500×3550 | 4175×1500×3550 |
| Structure | Four rows membrane modules | | | | |
| Frame material | SUS304 | | | | |
| Weight (kg) | 1500 | 1700 | 1910 | 2120 | 2330 |

| | | | | | |
|---------------------------|------------------|------------|------------|------------|------------|
| Power (kW) | 0.65 | 0.65 | 0.65 | 0.65 | 0.65 |
| Power supply | 220V/50Hz | | | | |
| Raw water interface (mm) | Ø63 Socket | Ø63 Socket | Ø75 Socket | Ø75 Socket | Ø75 Socket |
| Production interface (mm) | Ø63 Socket | Ø63 Socket | Ø75 Socket | Ø75 Socket | Ø75 Socket |
| Drain interface (mm) | Ø75 Socket | Ø75 Socket | Ø90 Socket | Ø90 Socket | Ø90 Socket |

4. System Structure and Installation Commissioning

4.1 Working principle and characteristics

The core treatment component of this device is the UF membrane module. Raw water enters the membrane chamber from outside and is forced to permeate through the capillary-type UF membranes inside the module due to the pressure difference between the two sides of the membrane. The permeate (with a mwco of 50,000 Da and a pore size of 0.01 μm) is collected as treated water for daily household use. Bacteria, algae, suspended solids, colloids, and large organic molecules in the raw water are retained by the UF membrane. The device periodically initiates the aeration cleaning, and the retained bacteria and other harmful substances are mixed with the raw water to form concentrate, which is discharged through the sewage pipe.



4.2 Membrane Modules Operation

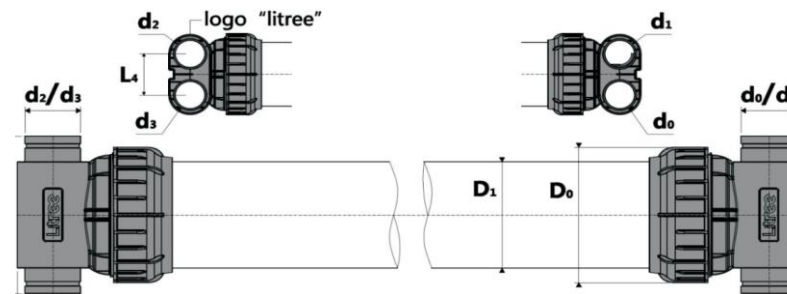
1) Filtration

Control the valves in the equipment to allow raw water to enter the membrane module from port D0, undergo filtration, and flow out as treated water from port D2

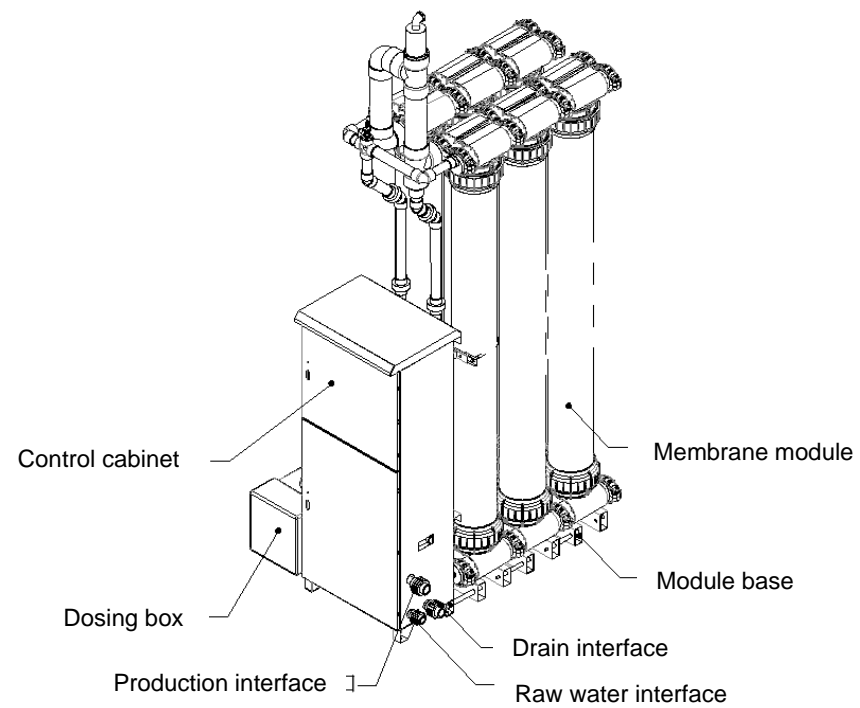
2) Rinse

a. Air rinsing: Control the valves in the equipment to introduce compressed air into the membrane module from port D1 and discharge it from port D3.

b. Back wash: Control the valves in the equipment to introduce backwash water into the membrane module from port D2 and discharge it from port D3 to perform backwashing.



4.3 Equipment Structure Description



WBG6X6 Equipment

5. Installation

5.1 Installation environment

5.1.1 Spatial Dimension Requirements

Equipment should be placed at least 700mm away from any obstructions to ensure smooth passage for personnel; If there are trenches or pipe galleries, their dimensions should be determined based on the actual drawings to ensure that the pipes can be installed smoothly;

5.1.2 Site Surrounding Requirements

- ✧ The equipment room should be close to a road to facilitate the transportation, handling, installation, and maintenance of equipment;
- ✧ The equipment room should be located as close as possible to existing power and water sources to facilitate the connection of power and pipes;
- ✧ The area around the equipment room should have direct drainage, and the ground elevation should not be lower than the outdoor ground elevation.;

5.1.3 Lightning Protection and Grounding System Requirements:

- ✧ Grounding Electrode: Utilize the foundation rebar as the grounding electrode. Employ a combined grounding system comprising substation grounding, equipment grounding, and lightning protection grounding. The grounding resistance shall not exceed 10 ohms. If the grounding resistance exceeds 10 ohms, an external artificial grounding electrode should be installed in the area with a number of grounding electrodes adjusted based on the test results. To prevent step voltage hazards, the depth of the artificial grounding electrode should be no less than 1.0 meter. All grounding steel components should be galvanized;

- ✧ The power supply system employs the TN-S system, maintaining strict separation between the N line and the PE line. All metal objects, such as enclosures of electrical equipment, conduit pipes, etc., must be connected to the PE line;
- ✧ Grounding conductor (wire): The main grounding terminal or main grounding busbar in electrical control cabinets and power cabinets must be connected to the grounding device PE, and the grounding resistance shall not exceed 10 ohms.;

5.1.4 Pressure Requirements for Equipment Ports:

- ✧ Connect the raw water inlet of the raw water inlet device, and the raw water pressure should be less than 0.15 MPa;
- ✧ The equipment's 'product water outlet' should be connected to a clean water storage tank (box). The product water should not experience backpressure;

5.1.5 Equipment Discharge Port Requirements

- ✧ Equipment discharge ports should be connected to drainage channels or other wastewater discharge facilities. The discharge ports must be open-type drains and should not have back pressure or backflow;
- ✧ The chemical cleaning inlet connects to the equipment labeled "Chemical Cleaning Inlet," and the chemical cleaning outlet connects to the chemical cleaning tank, forming a chemical cleaning circuit;

⚠ Litree shall not be liable for any injury or loss caused by failure to design and construct the grounding system in accordance with the above;

⚠ Ground conductors (wires) for electrical equipment must not be directly connected to the down conductor of a lightning protection system to prevent lightning backstroke;

⚠ Note: Backwash water and chemical wash water must be kept clean. Security filters with a pore size of less than 200μm can be used.

5.2 Membrane Component Installation

UF membrane modules are connected using groove-type double-head clamps for the inlet, aeration, and effluent ports. The inlet end cap at the bottom of the membrane component can support weight. During installation, first place the component vertically on the base bracket and align the component's inlet, aeration, and effluent ports with the corresponding connection pipes on the equipment. Use groove-type double-head clamps to tightly connect the component interfaces to the equipment interfaces. Finally, use stainless steel straps to vertically secure the membrane component body to the equipment.


5.2 Equipment Installation


The equipment provides corresponding ports for raw water, product water, concentrate, and circulation pipelines. The port form and dimensions are specified in the "Performance and Structural Parameters Table". Additionally, the equipment's footprint and power requirements can be configured according to the installation environment. To stabilize the raw water supply, a water tank or other regulating container can be optionally installed before the equipment. A product water tank can be installed after the equipment to store the treated water. To ensure safer and more rational use of equipment, pay attention to the following issues:

- (1) Equipment should be installed on a level indoor surface and protected from freezing;
- (2) To stabilize the influent flow to the ultrafiltration membrane system, a storage tank (box) should be installed before the equipment. The bottom of the storage tank (box) should be at least 3 meters higher than the highest point of the equipment, but not more than 15 meters;
- (3) The connection of flushing and discharge pipes can be implemented according to the following situations:
 - a. If not used for other purposes, a hose can be connected to the device's drain outlet and discharged into a trench;
 - b. If used for flushing toilets, car washing, lawn irrigation, and other purposes, the wastewater can flow naturally from the discharge port of the

equipment to the point of use. There should be no backpressure or backflow.

(4) 220V/50Hz AC power is supplied from the power distribution cabinet to the membrane control cabinet. The wires connecting the two should be single-phase three-core cables. For 220V AC power, connect the live wire to the "L" terminal of the membrane module, the neutral wire to the "N" terminal, and the ground wire to the "PE" terminal.

 **WARNING:** Equipment wiring must be performed by a qualified electrician in strict accordance with electrical codes;

 **Attention:** If you do not intend to use the raw water tank, please notify Rising Company of your installation requirements. Our professional staff will provide you with a tailored solution.

6. System Operation

6.1 Operating Conditions

- (1) Maximum Transmembrane Pressure (TMP): 60 Kpa;
- (2) Maximum Operating Pressure: 0.15 MPa;
- (3) Inlet Water Temperature: 5°C - 40°C;
- (4) Maximum Backwash Pressure: 0.1MPa;
- (5) Inlet Water Quality: Groundwater or surface water that meets the standard requirements for drinking water sources;

***1 The design water production volume is affected by the quality and temperature of the treated water source.**

6.2 Operation Interface Explanation

① Touch Screen Login Interface

Firstly, we should connect the power cord to the electrical cabinet. This equipment uses an AC220V power supply. Please use a cable with a wire diameter of RVV2*2.5+1PE or above for the power cable. The specific wiring location in the electrical cabinet can be referred to the electrical schematic diagram. The live wire needs to be connected to the lower part of the corresponding L terminal; the neutral wire needs to be connected to the lower part of the corresponding N terminal; and the ground wire needs to be connected to the lower part of the corresponding PE terminal.

After the equipment is powered on and started, the touch screen display interface is as shown in Figure 1. Enter the password and perform subsequent operations on the main interface. By operating the touch screen interface, you can manually operate the equipment or run it automatically. The interface content includes: manual operation, automatic operation, filter backwash process setting, parameter setting, system setting, data export, data display, and alarm information.

Please choose to log in with the username and password according to the actual user:

Username: **admin** - This account can set operating parameters and set the device to manual or automatic operation.

Username: **user** - This account can only set the device to manual or automatic operation and

cannot modify any parameters.

Username: **litree** - This account has the highest authority and can modify system operating parameters.

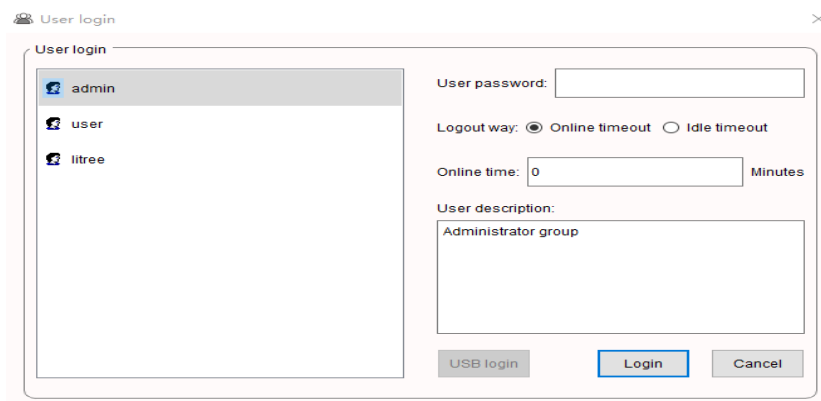


Figure 1 Login

- 1) Turn the manual/stop/auto knob on the control cabinet to the “manual” position, and click “manual operation” on the touch screen to enter the “manual” control mode of the equipment;
- 2) Touch the corresponding control keys to open and close the pump and automatic valve in sequence, confirm that the equipment action and rotation direction are correct, and the “open/close” time of the control valve should be more than 30 seconds;
- 3) The productive operation of this equipment is required to be carried out in the “automatic operation” mode. Specific operation: turn on the control power switch, connect the equipment control power, and turn the three switches of the electrical control cabinet to the “automatic state” (the equipment has already set the automatic operation parameters when it leaves the factory);

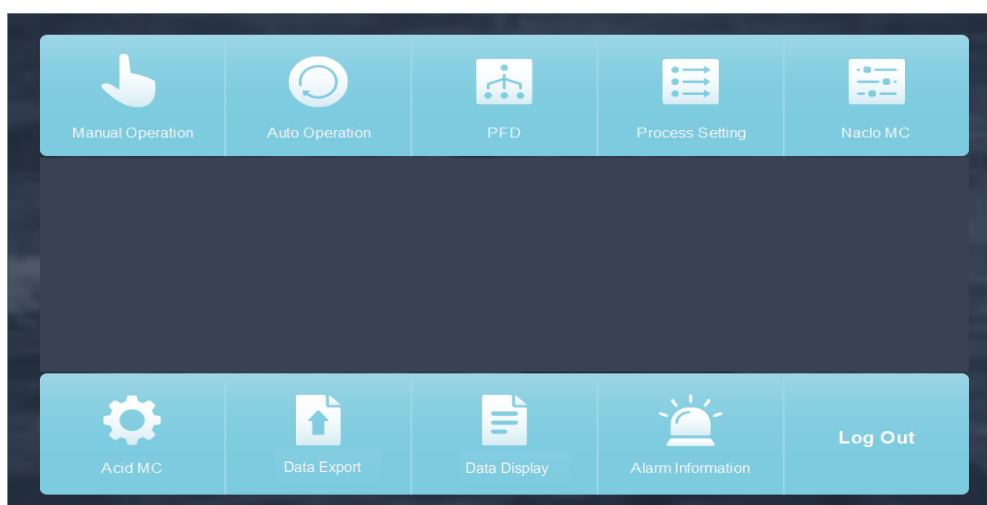


Figure 2

② Manual Operation Interface

When the knob on the control cabinet panel is turned to the “Manual” position, by clicking on “Manual Operation” on the screen, we can enter the manual operation mode of the device. In manual operation mode, we can control devices such as blowers, metering pumps, and electric valves through the “ON” and “OFF” buttons. When the symbol of the corresponding device is displayed in green, it is in the open state, and when it is displayed in red, it is in the closed state.

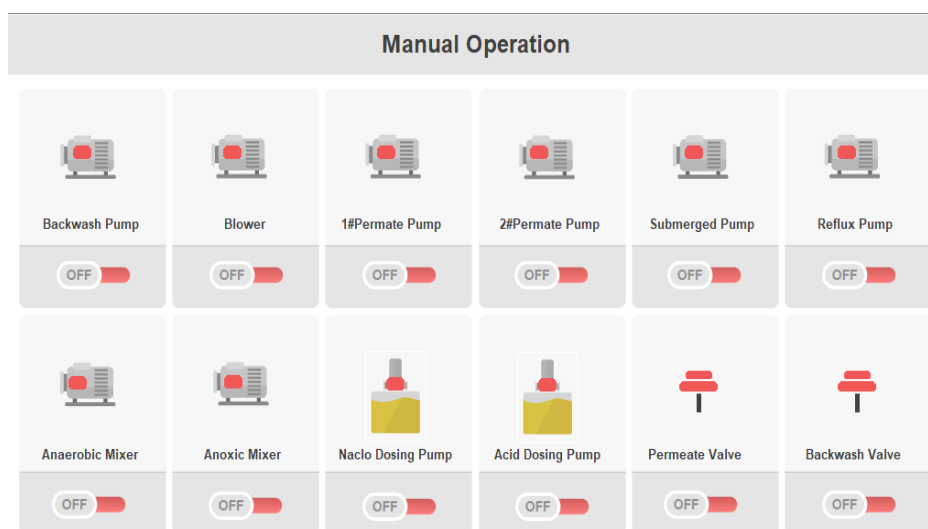


Figure 3 Manual Operation Interface

Note: When the UF equipment is in “Manual Operation” mode, the operator can independently operate any pump or automatic valve according to the operating principle. This design is for the convenience of equipment testing and maintenance. When the equipment is performing normal productive water production, it needs to switch to the “Automatic Operation” mode. It must not carry out long-term productive water production work in the “Manual Operation” mode.

③ Automatic Operation Interface

When the knob on the control cabinet panel is turned to the “Automatic” position, the equipment will enter the automatic operation state and filter the water according to the predetermined steps. Click on “Automatic Operation” on the screen to enter the “Automatic Operation Interface”. In this interface, you can see that the center of the equipment screen is the “One-Click Flush” button. When the equipment is running automatically, click the “One-Click Flush” button, the equipment will enter the flushing process. After the flushing is completed, it will

return to the automatic operation process.

(The remote water meter on the screen has been set at the factory, and the dosing method can be switched directly according to the demand.)

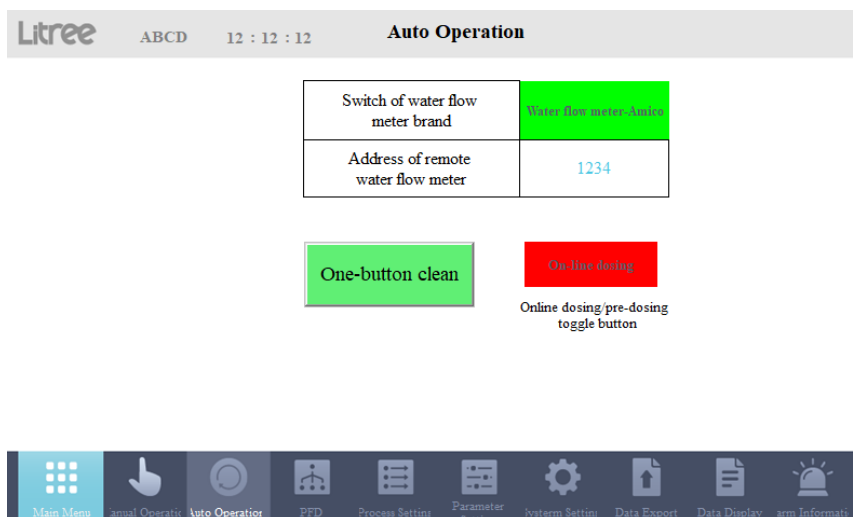


Figure 4 Automatic Operation Interface

④ Treatment Process Interface

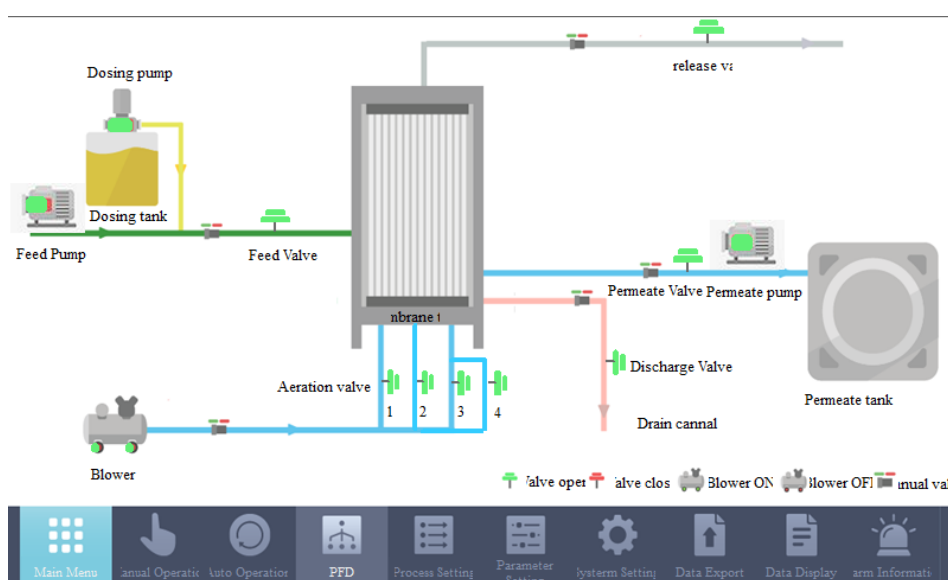


Figure 5 Treatment Process Interface

⑤ Settings and Data Interface

In this interface, you can perform the process settings, parameter settings, system settings, and data export operation;

Note: The factory preset parameters of the device can meet the common water source treatment requirements. So please do not arbitrarily change the preset parameters, otherwise, it may cause excessive pollution of the UF membrane, and lead to equipment operation failure.

⑥ Data Display Interface

The interface displays parameters during the operation of the device, including real-time display of product water temperature, product water turbidity, product water flow rate, cumulative product water flow, membrane pool liquid level, product water pressure and TMP.

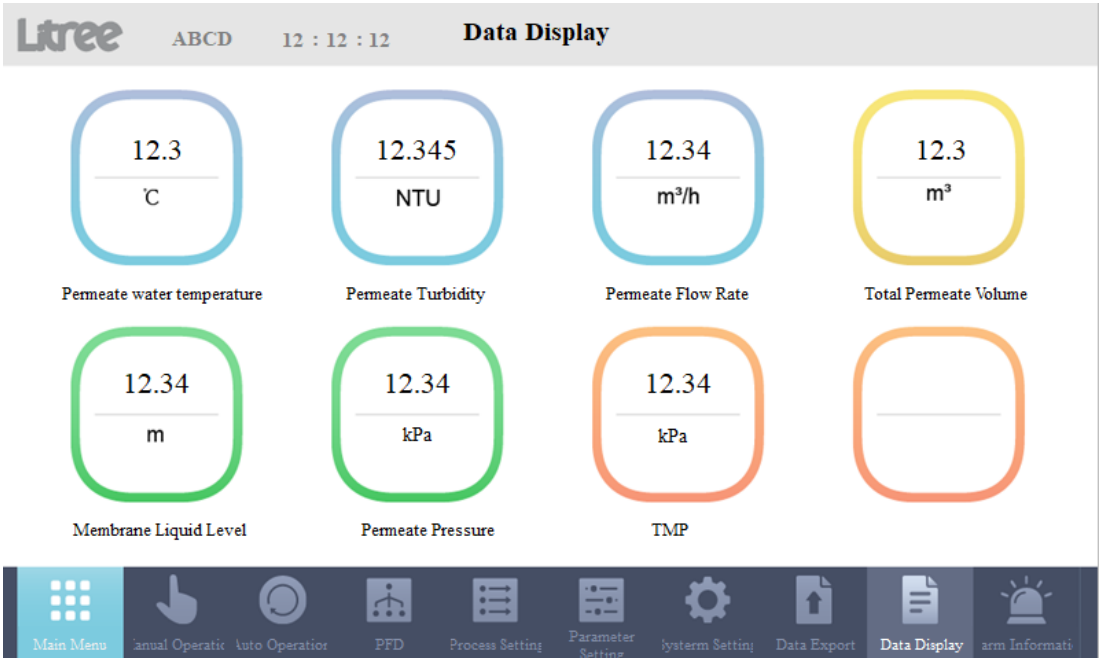


Figure 6 Data Display Interface

⑦ Alarm Information Interface



Figure 7 Alarm Information Interface

When issues such as abnormal opening or stopping of the electric valve, low liquid level in the raw water tank, pump overload, and system failure occur, this interface will display alarm information. The alarm indicator light on the electrical cabinet will light up, and the alarm will sound. After the equipment is successfully repaired, click the “Alarm Reset” button in the “Alarm Information” interface to clear the alarm.

6.3 NOTE

1) When using the UF equipment for the first time, it must be disinfected and debugged by Litree’s after-sales service personnel. The after-sales personnel will adjust some parameters according to the actual operating conditions to ensure the normal operation of the equipment and the standard quality of the produced water.

2) The UF membrane should work under the conditions specified by the technical parameters. The equipment should reach a balance of inflow and outflow during operation, or be in a state of slight overflow, to ensure that the water production of the equipment is carried out under reasonable conditions. After the equipment is debugged, do not arbitrarily adjust the size of the manual valve switch, otherwise it will affect the service life of the equipment.

3) After the UF equipment is put into use, the membrane modules should always be filled with water to avoid damage caused by dehydration.

4) Prevent branches, weeds, fish, shrimp, large-grain sand and stones, etc., from entering the UF equipment to avoid damage such as malfunction of the electric valve or blockage of the membrane modules.

5) If the equipment is running abnormally, please contact the technical personnel of Litree Company.

6) The above parameter settings have been set by our engineer before shipping, and no further changes are needed. If changes are needed under special circumstances, please consult Litree professionals for modification

7) After the equipment is installed, it needs to be reliably grounded to prevent lightning strikes

7. Equipment Maintenance

7.1 Regular maintenance of equipment

1) Routine Maintenance

| Subject | Maintenance Frequency | | | | | | |
|---------------------------------------------------------------------------|-----------------------|---|---|---|---|---|-------|
| | D | W | M | Q | S | A | Other |
| Pipeline and valve leak detection | | √ | | | | | |
| Fastener inspection | | | √ | | | | |
| Pressure gauges and control devices inspection | √ | | | | | | |
| Blower lubrication system inspection | | √ | | | | | |
| Pressure transmitter inspection | | √ | | | | | |
| Calibration and testing of turbidity meters | | | | | √ | | |
| Check and clean the level switches in each tank | | | √ | | | | |
| Inspect the pipes for any damage, wear, and corrosion | | | | √ | | | |
| Remark: D-Daily W-Weekly M-Monthly Q-Quarterly S-Every half year A-Annual | | | | | | | |

2) Part maintenance

| Part. | Maintenance methods |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Electric valve | <ol style="list-style-type: none"> 1. Before installation, please connect the valve to the power supply and observe whether it operates normally. 2. During installation, users should note that the adjustable side should be tightened by hand (do not use extended lever tools to avoid over-tightening and jamming the valve seat, making the valve ball difficult to rotate). 3. Adjustment: The tightness of the valve ball has been adjusted during product production, and users can install according to the above installation requirements. However, due to differences in user materials, pressure, and different usage times, the following phenomena may occur: <ol style="list-style-type: none"> a. If you hear the actuator struggling to drive the valve, you can slightly loosen the movable valve seat with the special tool provided with the valve (if there is leakage after adjustment, you can readjust it a bit). b. If the valve ball is not smooth after a period of use, you also need to slightly adjust the tightness of the valve ball. c. If the material is gas or the system pressure is relatively high, the above adjustment is even more necessary. 4. When the electric valve is not in use, it should be stored in a dry and ventilated indoor area, and both ends of the passage must be blocked. 5. Electric valves stored for a long time should be checked regularly, cleaned of dirt, and applied anti-rust oil on the surface. 6. After installation, regular inspections should be carried out. The main inspection items are: <ol style="list-style-type: none"> a. Wear condition of the sealing surface. b. Wear condition of the trapezoidal thread of the valve stem and valve stem nut. c. Whether the packing is outdated and ineffective, if damaged, it should be replaced in time. d. After the electric valve is repaired and assembled, a sealing performance test should be carried out. |
| Control cabinet | <ol style="list-style-type: none"> 1. The control cabinet must be moisture-proof and waterproof; 2. Check whether the exhaust port is blocked and whether the exhaust fan is operating normally; 3. Do not place miscellaneous items in the control cabinet, especially flammable and explosive items; 4. Use a brush and air gun to clean the control cabinet; 5. Regularly check whether the terminal screws are loose, if so, tighten them again; 6. The control cabinet should not be powered off for more than 7 days, otherwise, it will cause the components to be unable to use due to long-term power shortage. |
| Blower | <ol style="list-style-type: none"> 1. Check the oil storage volume and oil quality in the lubrication system, clean the oil filter, and check whether the oil dripping from the oil nozzle is normal. 2. Check whether the air filter is dirty. 3. Check the V-belt and adjust the tightness of the V-belt. 4. Check the flexibility of the safety valve to ensure reliable opening and closing. 5. Check for oil leaks and air leaks, if any, repair them in time. 6. Check the operation of the fan and motor, if there are any abnormalities, stop the machine for maintenance in time. |

| | |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pressure level transmitter | <ol style="list-style-type: none"> 1. Check if the power supply voltage is normal. 2. Regularly check the zero point for calibration. 3. The surface should be free of rust and damage, fasteners should not be loose, and terminal connections should be secure. <p>Note: If the pressure level sensor malfunctions, it may cause the entire set of equipment to stop operating.</p> |
| Turbidimeter | <ol style="list-style-type: none"> 1. Regularly calibrate, test, or inspect the sensor. 2. Regularly clean the sensor and circulation pool. 3. Keep all maintenance and calibration operation records. 4. When the equipment is not in use, please close the manual valve of the turbidity meter's water inlet. Otherwise, the water in the membrane module will be drained, damaging the membrane filaments. |

3) Equipment operation abnormalities and processing methods

| Faulty instrument | Specific fault | Cause | Solution |
|--------------------|---------------------------------|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Level Sensor | Abnormal level value | Incorrect setting of level range value | Enter the "Parameter Setting" interface on the touch screen, set the lower limit of the level range to 0, and the upper limit to 50 |
| | | Sensor anomaly or incorrect sensor range | Check if the sensor range is 0-50KPa. If the range is correct but the value is abnormal, it is recommended to replace the sensor |
| | Level value not displayed | Sensor wiring error | Check the wiring. The sensor wiring should be 24V+ connected to hole 1, and ground wire connected to hole B1+ |
| | | Incorrect wiring inside the electrical cabinet | <ol style="list-style-type: none"> 1. The level sensor corresponds to the 24V+ and B1+ wires inside the electrical cabinet; 2. Check if the wiring on the AE04 module is loose; |
| | | 24V power supply not connected | Check if the switch power supply is working normally. Use a multimeter to detect whether there is a 24V voltage between 24V+ and B1+; |
| Temperature Sensor | Abnormal temperature value | Incorrect setting of temperature range value | Enter the "Parameter Setting" interface on the touch screen, set the lower limit of the temperature range to 0, and the upper limit to 60 |
| | | Sensor anomaly | Replace the temperature sensor; |
| | Temperature value not displayed | Sensor wiring error | Check the wiring. The sensor wiring should be "+ hole" connected to 24V+, "- hole" connected to C1+; |
| | | Wiring error inside the electrical cabinet | <ol style="list-style-type: none"> 1. The level sensor corresponds to the 24V+, C1+ two-wire connection inside the electrical cabinet; 2. Check if the wiring on the AE04 module is loose; |
| | | 24V power supply not connected | Check if the switch power supply is working normally. Use a multimeter to detect whether there is a 24V voltage between 24V+ and C1+; |

| | | | |
|-----------------------------------------------------------------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Electric Valve | The switch of the water inlet electric ball valve is opposite to the actual one | Different membrane tank use different water inlet valves, and the switch signals of some valves are opposite when wired uniformly | For electric valves with opposite switches, swap the M142 and M152 wires in the electric cabinet, and swap the I1.3 and I1.4 wires, then it can be opened and closed normally; |
| | Valve cannot be switched | The relay corresponding to the valve (e.g., KA4) does not light up | Check if the relay is wired incorrectly, check if the relay is damaged; |
| | | The relay corresponding to the valve (e.g., KA4) is normal but the valve cannot be switched | 1. Use a multimeter to detect the voltage between the two M-starting wires of the valve and N11, such as the M12 and M22 of the water production valve. Only one line has a 220V voltage with N11, both or none have voltage then the wiring is wrong; 2. If the valve wiring and power supply are no problem and the valve still cannot be opened, there is a problem with the valve itself; |
| Blower | The blower cannot start | Blower overload alarm | Press the black button on the QF1 circuit breaker in the electric cabinet to eliminate the alarm |
| | The blower frequently overloads | Motor damage | Use a multimeter to check whether the motor coil is damaged, if it is damaged, replace the blower; |
| | | The pressure of the blower is too high, causing the current to be too large, and the water production is overloaded | Check if there is a blockage in the blower's exhaust pipe |
| | | Water enters the wiring place | Do waterproof work at the wiring place |
| The equipment does not produce water during automatic operation | Did not enter automatic operation | The wiring is loose after the automatic manual knob | Check the wiring, connect the wires well, turn the knob to the automatic position, observe whether the I0.2 light of the CPU is on, the light indicates that it has entered the automatic operation state; |
| | The switch of the water inlet electric ball valve is opposite to the actual situation | Because the water inlet valves used by different membrane pools are different, some valve switch signals are opposite when the wiring is unified | For the electric valve with the opposite switch, swap the two wires M142 and M152 in the control cabinet, and swap the two wires I1.3 and I1.4, then it can be opened and closed normally |
| | High liquid level alarm in the clear water tank | High liquid level in the clear water tank | After the liquid level in the clear water tank drops, the equipment can produce water |
| | | Float wiring error | The high-level float in the clear water tank is connected to the black and brown wires, the black wire is connected to 24V+, and the brown wire is connected to I0.7 |

7.2 Membrane module maintenance

- 1) At all times, the membrane module cavity must be filled with water or a protective liquid to keep the membrane moist and prevent dehydration. When the shutdown time does not exceed 7 days, we can operate the equipment for 30-60 minutes each day (backwash before shutdown) to replace the stagnant water in the equipment pipes with fresh water;
- 2) When the equipment is not in use for a long period, the modules should be thoroughly cleaned and disinfected beforehand. Then, inject the membrane protectant or bacteriostatic agent into the equipment, and all interfaces should be closed to keep the membrane moist and prevent the growth of bacteria and other microorganisms inside the equipment;
- 3) During the winter shutdown period, it is necessary to prevent freezing within the equipment;
- 4) After the UF membrane module has been running continuously for a period of time, the transmembrane pressure (TMP) will increase. When the TMP during filtration is $\geq 0.06\text{MPa}$, chemical cleaning is required;
 - **Alkali Wash:** Circulate on the concentrated water side and the product water side of the UF membrane module for approximately 30 minutes, then soak for 8 hours. Rinse until no residue remains, then proceed to the next chemical cleaning step;
 - **Acid Wash:** Circulate on the concentrated water side and the product water side of the UF membrane module for approximately 30 minutes, then soak for 8 hours. Rinse until no residue remains, then enter the normal operation stage;
 - **Disinfection:** Circulate on the concentrated water side and the product water side of the UF membrane module for approximately 30 minutes, then soak for 8 hours. Rinse until no residue remains, then enter the normal operation stage.

7.3 Preparation of pharmaceuticals

Suggested Common Cleaning Solutions and Protective Solutions

| Name | Composition | Amount per 100 liters of water | Application |
|-----------------------|-------------------------|------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Cleaning fluid | 1% Citric Acid | 1kg of solid citric acid | Suitable for hard river water, groundwater, and raw water with high iron content |
| | 0.5~1% Sodium Hydroxide | 0.5~1kg of solid sodium hydroxide | Suitable for raw water with high organic matter content |
| Disinfectant | 200ppm NaClO solution | 0.4 liters of commercially available NaClO solution (calculated as 6% NaClO) | Suitable for disinfection and short-term protection |

| | | | |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|--------------------------------------------------|
| Bacterios tatic Agent | 1% Sodium Bisulfite | 1kg of solid sodium bisulfite | Suitable for short-term shutdown preservation |
| Antifreez e | 20% Glycerin 0.9% Sodium Bisulfite | 20 liters of glycerin 0.9kg of solid sodium bisulfite | Low-temperature antifreeze preservation |
| Remark: | 1. It is recommended to use reagents of chemical purity or higher. 2. For drinking water projects, it is recommended to use food-grade reagents. | | |

8. Problems and solutions

8.1 Equipment Inspection and Repair Instructions

| Fault | Cause | Solution |
|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| water output decrease | a) Low water pressure b) Clogged bag filter | a) Increase water pressure; b) Clean or replace the bag |
| Production water becomes turbid | a) Membrane damage b) Water leakage from O-ring seal | a) Leak detection and leak repair; b) Replace the O-ring seal; |
| Water leakage from pipe joints and thread openings | a) O-ring seal is not pressed tightly b) Thread opening is not tightened | a) Adjust O-ring seal; b) Add Teflon tape; |
| The produced water has a peculiar smell | The UF equipment has been out of service for a long time, but the pipelines have not been disinfected in advance. | Rinse the equipment repeatedly or use disinfectant (sodium hypochlorite aqueous solution with an effective chlorine concentration of 200mg/L) to circulate in the equipment and soak it for 2 hours, then rinse until there is no residual disinfectant; |
| Equipment standby | a) Low water level in raw water tank b) High water level in the clean water tank | a) Wait for the water level in the raw water tank to rise; b) Wait for the water level in the clean water tank to drop; |

8.2Electrical Inspection and Repair Instructions

| No. | Fault | Cause | Solution |
|-----|---------------------------------------------------------------|------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| 1 | The device cannot be started and the power indicator | System power supply abnormality | Check whether the power switch is on, check the power voltage, check whether the wiring is loose, and repair; |

| | | | |
|---|------------------------------------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | light does not light up. | Power off | Turn on the power |
| | | fuse damaged | Check whether there is a short circuit in the circuit and replace the fuse |
| | | Power indicator light abnormality | Repair or replace indicator light |
| 2 | The power indicator is normal, but the equipment does not start. | Start switch abnormality | Check whether the wiring of the control switch is loose or broken, and check whether the control switch is damaged. |
| | | Abnormal relay in the control cabinet | Check each relay and check whether the terminal contact is normal and whether there is any looseness. |
| | | 24V DC power supply abnormality | Inspect or replace the 24V DC power supply |
| | | PLC abnormality / or not running | Check the input and output signals and whether the input and output voltages are normal |
| 3 | Relay working abnormally | Wrong relay model | Check whether the relay voltage is the same as the equipment power supply voltage (the relay voltage is usually written on the relay shell) |
| | | The relay sounds abnormally | Check whether the voltage between relay coils A1 and A2 is normal |
| | | Relay damaged | Replace relay |
| 4 | Circuit breaker frequently loses power | Wrong model or device damaged | The current capacity of the circuit breaker is small. Replace the circuit breaker. |
| | | Equipment leakage or overload | Check the equipment for short circuit or leakage |
| 5 | Valves start abnormally | There is foreign matter stuck in the valve | Clean the valve |
| | | The valve power supply is abnormal or the controller in the control cabinet is abnormal. | Inspect the valve control circuit and inspect/replace the control relay. |
| | | Valve limit switch abnormality | Repair or replace limit switch |
| | | Valve damaged | Replace valve |
| 6 | Dosing pump abnormality | Pump reverse (three-phase) | Replace the order of any two power supplies of the pump |
| | | Overload | 1) Check whether the inlet and outlet valves of the pump are open normally, whether there are foreign objects blocking them, and whether there is water in the pipelines. 2) Check whether the three-phase power supply of the pump is normal and whether there are any missing items 3) Thermal relay parameters are wrong, adjust the setting values. 4) The thermal relay is damaged, replace the thermal relay. |

| | | | |
|---|-------------------------------------------------------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | Abnormal vibration or sound | Check whether the pump fixation is loose and whether there are foreign objects in the pump. |
| | | Pump damaged | Repair or replace pump |
| 7 | The equipment is abnormal and does not produce water. | Autorun is not enabled | Recover after turning on automatic operation |
| | | Raw water tank low level | 1) The liquid level in the raw water tank is low, and the raw water pump is open and protected. 2) The liquid level switch is abnormal. Repair the liquid level switch. |
| | | Clean water tank high level | When the clean water tank is at a high level, water production will automatically stop. |
| | | Abnormal water inlet valve | Repair the water inlet valve or replace it |
| | | Abnormal water production valve | Repair the water production valve or replace it |



Web: www.litree.com

Hot line: 400 700 8090