

Laboratory Water Purification System

Instruction Manual

Model: Ultra MQ 3030 UT

Model		Ultra MQ 3030 UT
Quality of ultrapure water	Resistivity	18.2 MΩ cm@25°C
	Conductivity	0.055 μS/cm@25°C
	TOC	< 4 ppb
	Bacterial endotoxin	< 0.001 EU/ml
	Partical (0.2μm filter)	<18 partical/100ml
	Dispensing Flow rate	up to 2 liters/min.
Quality of RO water	Resistivity	< 15MΩ.cm
	Dispensing Flow rate	1 liters/min
	Conductivity	< 0.2 μS/cm@25°C
	Output	up to 25 ltrs/Hr
Control system	Mode display	Power on, program, inlet rinse, producing, full, circle, regular outlet, disinfection, consumables replacing remind
	Safety	Full water alarm, password , auto-reset, outlet forbidden when alarm or disinfection
	System monitor	Monitoring quality of inlet water, high pure water and ultrapure water, temperature , used and left time of consumables
Technical specification	Output	>1.5L/min
	Power	220V/50Hz, 120W
	Dimension	Length 550mm,Width 390mm,Height 610mm
	Weight	About 30KG
Inlet water requirement		Tap water Inlet.
Purification system	Sequence number	Specification
	LV-1	5μm spun fiber cartridge
	LV-2	Mixed KDF cartridge
	LV-3	Granular active carbon cartridge
	LV-4	150GPD RO membrane filter
	LV-5	water softener cartridge
	LV-6	EDI module
	LV-7	185nm&254nm UV lamp
	LV-8	Ultrapure polishing resin cartridge
	LV-9	MWCO 5000D UF eliminating endotoxion cartridge
LV-10	(0.45+0.1)μm importing PES terminal filter	

1. Preface

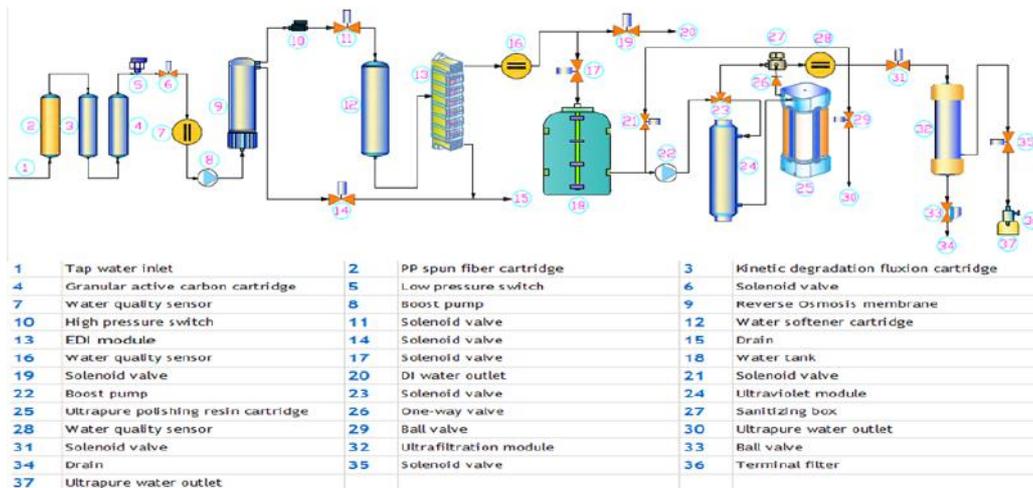
Dear customer, in the beginning, we sincerely thanks for your choosing our water purification system. This water purification system has incorporated new cutting-edge technology. It is installed and used easily, and can provide you with RO water and ultrapure water for science research. So, it will benefit your work.

For the water purification system's maximum efficiency, it is suggested that the user manual should be read before installation. Any question in the installation process, please contact our technology engineers or dealers.

2. Specification

REMARK

3. Water Flow Chart



4. Working Environments

- **Inlet water:** Tap Water
- **Work temperature:** 5-45℃
- **Pressure:** 1.0-4.0Kgf/cm²
- **Power:** 220V/50Hz,120W

【Clean, dry working environments would be suggested!】

5. Installation

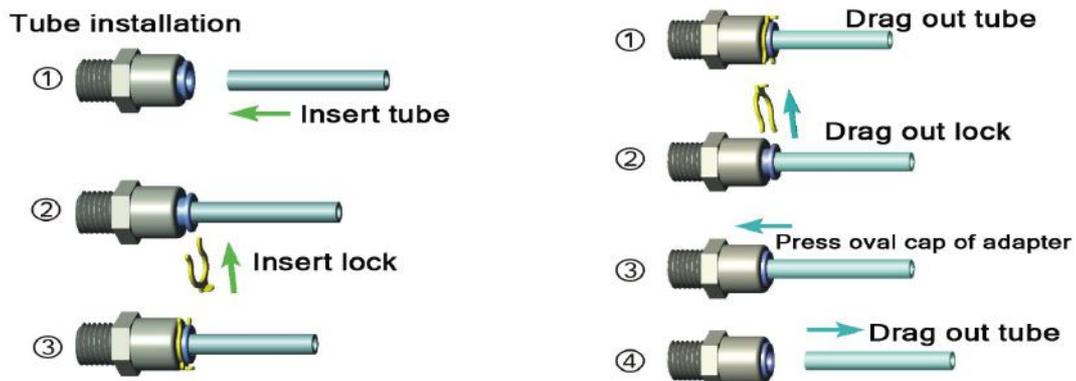
5.1 Preparation for installation

- The purification system should be installed horizontally and near to source water.

5.2 Tube and adapter's connection

The adapter of the machine is high quality easy-put adapter. And material of tube is high quality's PE.

Tube installation and drag diagram



■ **ATTENTION:**

- (1). The tube should be cut with special tube cutter for rounded cut section. And rounded cut section should be guaranteed as much as possible with other cut tools.
- (2). Connect the tube-press the oval cap of the interface strongly, then insert the tube to the bottom of adapter.
- (3). Take off the tube-press the oval cap of the interface strongly, then drag out the tube. Do not drag when the tube can not be dragged out any more.
- (4). The fore-end of the tube, which has been inserted to adapter, should be cut, when it will be used again.
- (5). Sufficient PTFE thread seal tape should be used in all the threaded joints for water leakage inhibitor or preventing.

5.3 Installation steps

- (1). Open the packing-case, take out main body, accessory box, water tank(optional).
- (2). Take out adapters and tube from accessory box, and read the Instruction Manual carefully.
- (3). External interface are on the back of machine, and it is labeled with different color's label. Moreover, its adapters are inserted with different color's stop plug.



■ **ATTENTION:**

Stop plug should be pulled out before the following steps.

(4). **Connect to water source**

Use 1/4" PE tube with a suitable length. One side connects with inlet water source (Tap Water) and the other connects with the interface with **blue label** marked "To inlet water" at the back of machine.

Remarks:

- Make sure of that the head face of inlet water tube is below liquid level of RO water. Insert
- inlet water tube into the bottom of water tank of RO water.
- Make sure of that liquid level of deionized water is not below machine for 20cm.

(5). **Connect to drain**

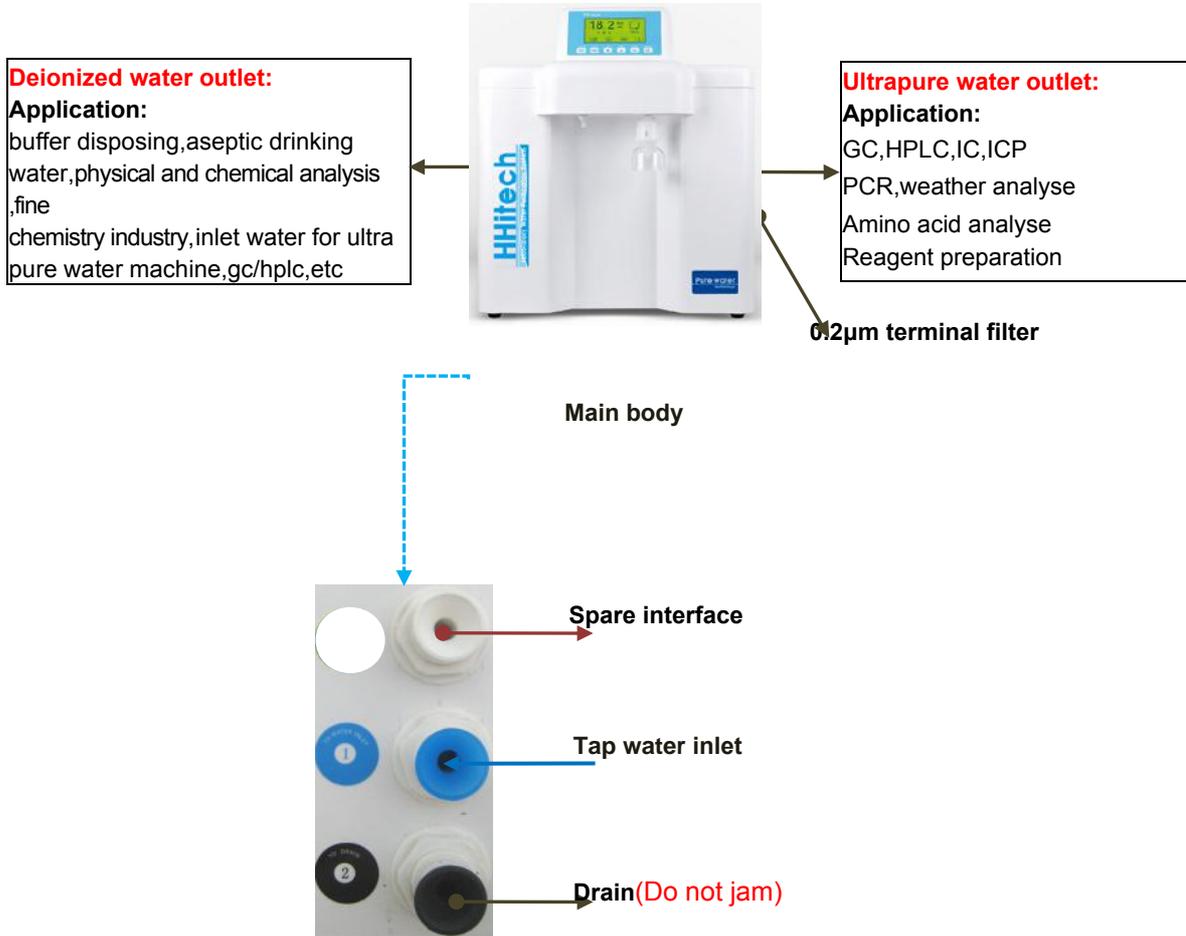
Use 1/4" PE tube with a suitable length. One side connects with the interface with **black label** marked "To drain" at the back of machine, and the other side is directed to gutter.

Remarks:

The waste water will flow out from the interface marked "To drain", only when the sanitizing function is on work.

Thus the installation is OK.

Installation Guide Chart

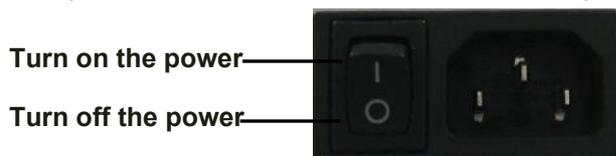


6. Usage Guide

All data have been set in the factory. The machine will operate smoothly without any data-setting and debugging.

All work state will display on the LCD. If there is abnormal state, the system will alarm automatically. If data modification is necessary, specific step is in “**Microcomputer Controller**”.

- The power switch is at the back of the shell. Specific picture is as follows



(1). Starting up:

At first, make sure of that the source water is connected to the main body's inlet. Then insert the power line into the power source and turn on the power switch, then the system begins to produce pure water.

(2). Getting corresponding pure water:

Press "DI" or "UP" buttons, which are on the panel, to get corresponding deionized water or ultrapure water(higher quality water than deionized water).

(3). Standby:

When deionized water and ultrapure water is not for use, the system will be in standby state. The system will begin to produce pure water again when any pure water is used.

(4). Shutdown:

Turn off the power switch. Then it is ok.

(5). Releasing internal air of terminal filter:

Unscrew the rounded bolt, which is on the side of terminal filter, open the valve of ultrapure water. When ultrapure water goes out, internal air of terminal filter will be released. Until terminal filter is nearly full of pure water, then tighten rounded bolt.



■ **ATTENTION:**

If the internal air of terminal filter is not released , pure water can not go through the terminal filter for air's resistance, then the system will stop working for high pressure.



■ **ATTENTION:**

Make sure that the water source and power source is not connected when the system is not in the use state for long time(for example, off duty).

■ The usage to keep high quality pure water

- (1). The Ultrapure water is easily polluted by surrounding environment. So getting fresh pure water is suggested.
- (2). Keep source water tank from sunlight for microbe's reproducing.
- (3). When get high pure water, initial high pure water is suggested to drain to get steady pure water.
- (4). Avoid air bubble when get pure water to reduce air pollution.



■ **ATTENTION:**

The microbe's reproducing will reduce the life of filter cartridge when the machine does not work for long time. So the machine's work every 7-10days is necessary.

7. Microcomputer Controller

■ **Panel**



6 buttons from left to right:

- (1). "RO" button: Control the solenoid valve of deionized water

- (2). **“MENU”** button: Main menu, all the data of the system will be set in the menu.
- ▶). **“ ”** button: Choose the 1000,100,or 10-bit of set data. Chosen position will show anti-color status.
- ▲). **“ ”** button: Adjust the data of chosen position(0-9circle)
- (5). **“OK”** button: Confirm the adjusted data and execute corresponding function.
- (6). **“UP”** button: Control the solenoid valve of ultrapure water

■ **The Specific operation method:**

(1). **Choose the menu item, which will be researched or modified.**

Press **“MENU”** button to move the cursor to the menu item. The chosen item will be allochroic state. Then press **“OK”** button to enter corresponding item.

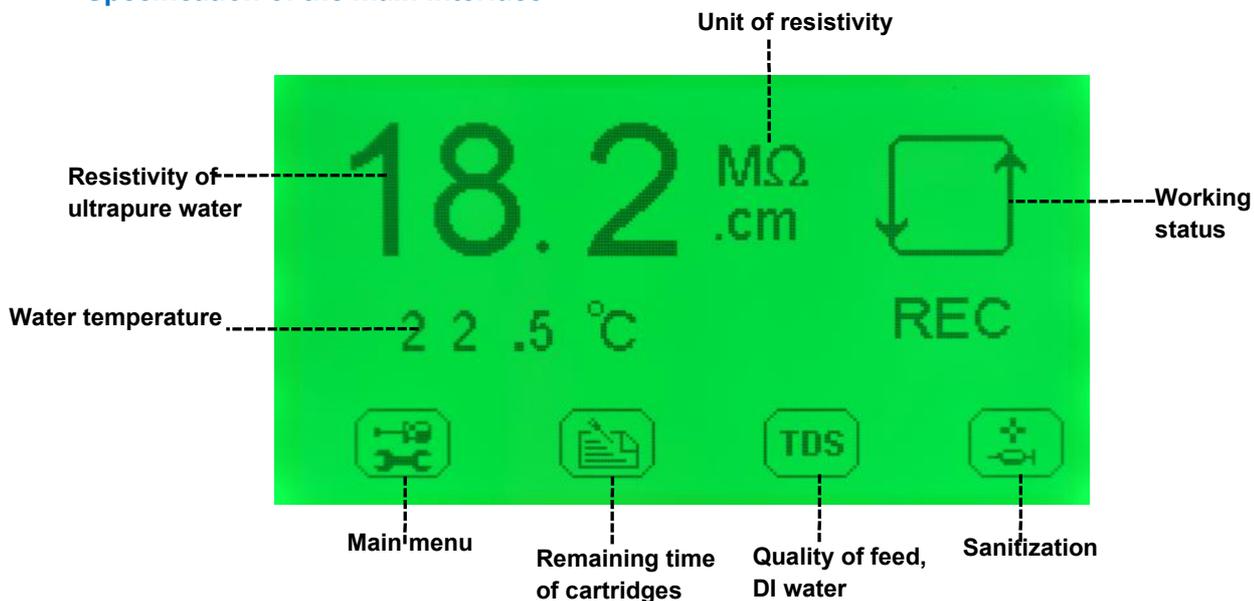
(2). **Modify the parameters of menu item or turn on/off the function of menu item.**

Press **“MENU”** button to choose item, shift button **▶** to choose the digital, figure button **▲** to modify the digital of digit or the turn on/off the function of menu item. when modification is ok, press **“OK”** button to confirm.

(3). **Return to upper menu or main interface**

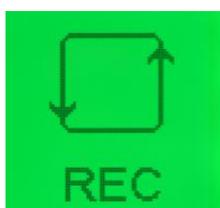
Press **“MENU”** button, and move the cursor to return icon  then press **“OK”** button.

■ **Specification of the main interface**



(1). **Specification of system’s working status icon**

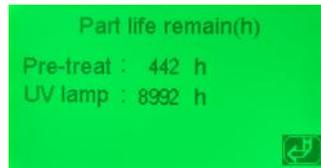
In the main interface, the status of recirculation is showed at the top-right corner, it means the ultra pure water is circulating.



Recirculation of ultrapure water

(2). Specification of cartridges' remaining time icon

Under the main interface, press “MENU” button, move the cursor to icon  press “OK” button to switch to interface of cartridges' remaining time (Picture 8).



Picture8

➤ Specification of the interface

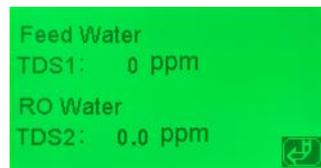
- “Pre-treat: 442h”: It means that the active carbon filter’s remaining time is 442 hours (Initial value is 450 hours);
- “UV lamp: 8992h”: It means that the UV lamp’s remaining time is 8892 hours (Initial value is 9000 hours).

REMARKS:

- UV lamp is optional. If there is no UV cartridge in the system, “UV lamp: 8992h” will not show.

(3). Specification of feed water and DI water’s quality icon.

Under the main interface, press “MENU” button, move the cursor to icon  press “OK” button to switch to interface of feed water and RO water’s quality (Picture 9).



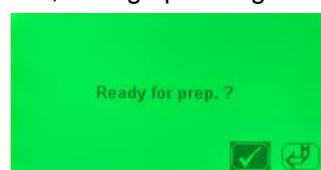
Picture 9

➤ Specification of the interface

- “Feed water”: It represents the source water or tap water;
- “TDS1: 0ppm”: It means that the value of feed water’s TDS is 0, the unit is ppm (mg/l);
- “DI water”: It represents reverse osmosis water;
- “TDS2: 0.0ppm”: It means that the value of DI water’s TDS is 0.0, the unit is ppm (mg/l).

(4). Specification of sanitization icon.

Under the main interface, press “MENU” button, move the cursor to icon  press “OK” button to switch to interface of sanitization(Picture 23).(Under the main interface, interface of sanitization also can be switched to, through pressing “OK” button 3 times continuously)



Picture 23

At this time, machine would stop working, and prepares for sanitization.

➤ **Method of sanitization**

At first, open top cap of disinfection box, then put 1 piece of disinfecting tablet inside, tighten the cap again. Lastly press “MENU” button, move the cursor to  , press “OK” button to start sanitization procedure (Picture 24).



Picture 24

Sanitization process will persist for 3-4 hours. During this time, the solenoid valve of pure water outlet will be closed and all the buttons in panel will not be operated.



■ **ATTENTION:**

Shutting off the power and restart are prohibited in sanitization process. Otherwise disinfecting tablet water will enter into pure water cartridge, the service life of cartridge will reduce greatly.

(5). **Specification of main menu icon.**

Under the main interface, press “MENU” button, move the cursor to icon  press “OK” button to switch to interface of password entry (Picture 10)



Picture10

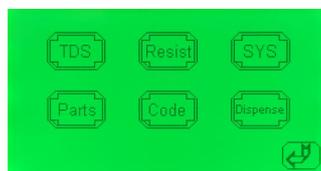
The initial code is “1000”.

Inputting initial code “1000” through shift button and figure button, then press “OK” button to confirm.

If code is wrong, system will warn and return to main interface.

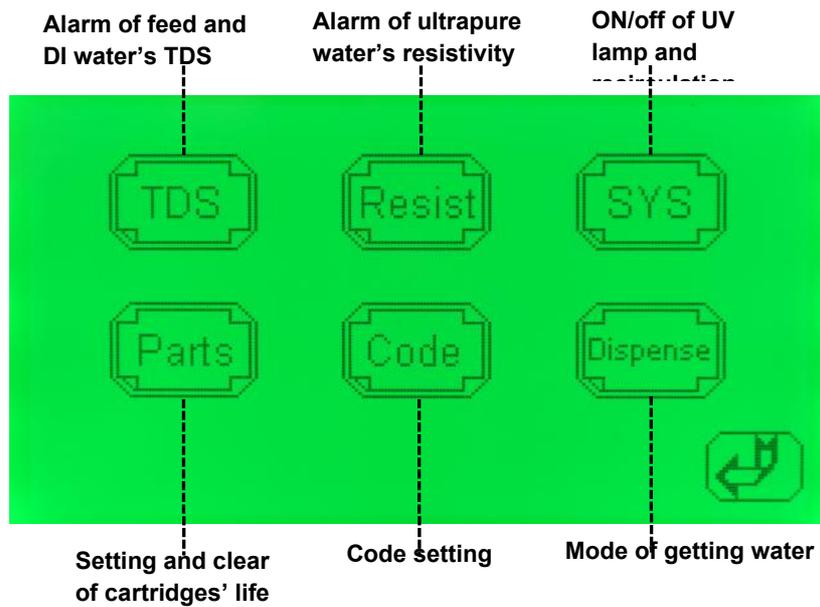
If code is right, system will switch to interface of main menu (Picture 11).

Under the main menu, press “MENU” button, move the cursor to corresponding icon, then press “OK” button to switch to the corresponding menu item.



Picture11

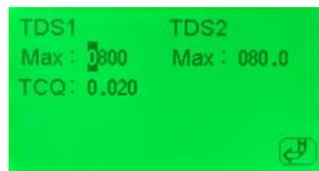
■ Specification of main menu



(1). Specification of icon- alarm of feed and DI water's TDS



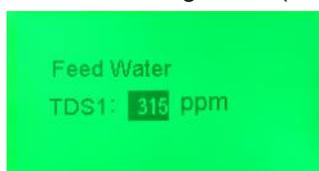
Under the main menu, press “MENU” button, move the cursor to icon  and press “OK” button to switch to interface of feed and DI water quality's standard-exceeding alarm setting (Picture 12).



Picture 12

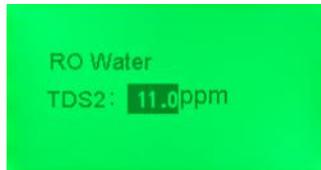
➤ Specification of the interface

- “TDS1”: It represents TDS of source water.
- “Max: 0800”: It means when the TDS value of TDS1 exceeds 800 ppm(**initial setting value**), the system will warn and display the interface of feed water quality's standard-exceeding alarm (Picture 13).



Picture 13

- “TDS2”: It represents TDS of DI water.
- “Max: 080.0”: It means when the TDS value of TDS2 exceeds 80 ppm(initial setting value), the system will warn and display the interface of DI water quality’s standard-exceeding alarm (Picture 14)



Picture 14

- “TCQ: 0.020”: It represents that temperature compensation coefficient is 0.020(initial setting value, any modification is prohibited).



REMARKS:

- TDS1-feed water quality’s standard-exceeding alarm is effective only when the machine just start.
- The value of TDS1 which system display is definite feed water’s quality (Picture 13). When the TDS value of actual feed water’s quality < Max(setting value),system will cancel the alarm.

➤ **The purpose of feed and DI water quality’s standard-exceeding alarm**

- The purpose of TDS1’s alarm(feed water quality’s standard-exceeding alarm):Remind that the feed water’s quality is bad, and the extra pretreatment is necessary to protect the cartridges of main body.
- The purpose of TDS2’s alarm(DI water quality’s standard-exceeding alarm):Remind that DI water’s quality is bad, and mixed bed resin cartridge should be replaced to protect the post cartridges.

➤ **Setting method of feed and DI water quality’s standard-exceeding value**

The TDS value of feed and DI water quality’s standard-exceeding alarm can be modified according to the local feed water’s quality in the course of machine.

- **General principles of alarm value setting**

TDS1 ‘s Max value: 20 ppm

TDS2’s Max value: 2 ppm

- **The method of alarm value setting**

In the interface of feed and DI water quality’s standard-exceeding alarm setting (Picture 12),press “MENU” button, move the cursor to corresponding item, reset it through shift and figure button, at last press “OK” button to confirm.

(2). **Specification of icon- alarm of ultrapure water’s resistivity**

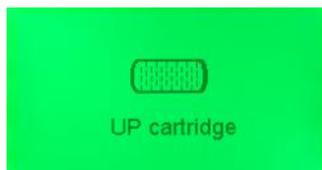
Under the main menu, press “MENU” button, move the cursor to icon  then press “OK” button to switch to interface of ultrapure water resistivity’s standard-exceeding alarm setting (Picture 15).



Picture 15

➤ **Specification of the interface**

- **“Max: 00.0”**:When the actual resistivity of ultrapure water is less than 0 MΩ.cm (**initial setting value**), the machine will warn to remind ultrapure water resistivity’s standard-exceeding. And system will display interface of ultrapure polishing resin cartridge replacement’s reminding (Picture 16).



Picture 16

REMARKS:

- When the resistivity of ultrapure water exceeds the standard setting value, the system will warn 1 times every 10 seconds. During this time, the solenoid valve of pure water outlet will be closed. If opening solenoid is necessary, the value of ultrapure water resistivity’s standard-exceeding must be reset.

➤ **The purpose of ultrapure water resistivity’s standard-exceeding alarm**

Remind that the actual value of resistivity is lower than the setting value. Maybe the quality of ultrapure is not suitable for the experiment. Replacing the ultrapure polishing resin cartridge is necessary.

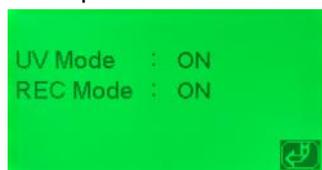
➤ **Setting method of ultrapure water resistivity’s standard-exceeding value**

The resistivity’s value of ultrapure water resistivity’s standard-exceeding can be reset according to actual requirement for ultrapure water.

- **General principles of alarm value setting**
According to actual requirement for ultrapure water.
- **The method of alarm value setting**
In the interface of ultrapure water resistivity’s standard-exceeding alarm setting (Picture 15), press **“MENU”** button, move the cursor to corresponding item, reset it through shift and figure button, at last press **“OK”** button to confirm.

(3). Specification of icon- ON/OFF of UV lamp and recirculation

Under the main menu, press **“MENU”** button, move the cursor to icon  , then press **“OK”** button to switch to interface of UV lamp and recirculation ON/OFF (Picture 17).



Picture 17

➤ **Specification of the interface**

- **“UV Mode: ON”**: It means that the monitoring function of UV lamp is turned on. (OFF means turning off)
- **“REC Mode: ON”**: It means that the recirculation function is turned on. (OFF means turning off)

REMARKS:

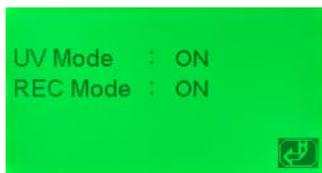
- UV lamp is optional. Some models have no UV lamp cartridge, if so, UV Mode’s initial setting is OFF. Otherwise, it is ON.
- Recirculation function is optional. Some models have no this function, if so, REC Mode’s initial setting is OFF. Otherwise, it is ON.

➤ **The purpose of UV lamp and recirculation ON/OFF**

- **UV lamp alarm**: means that life of UV lamp is over, replacement of UV lamp is necessary.
- **Recirculation ON/OFF**: system can restrain bacteria’s increase and keep high quality’s ultrapure water.

➤ **Setting method of UV lamp and recirculation ON/OFF:**

In the interface of UV lamp and recirculation ON/OFF (Picture 17), press **“MENU”** button, move the cursor to corresponding item, reset it through shift and figure button, at last press **“OK”** button to confirm.

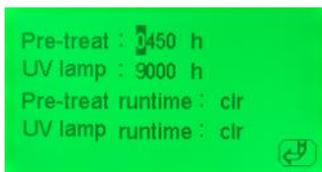


Picture 17

(4). Specification of icon- setting and clear of cartridges’ life



Under the main menu, press **“MENU”** button, move the cursor to icon , then press **“OK”** button to switch to interface of setting and clear of cartridges’ life (Picture 18).



Picture 18

➤ **Specification of the interface**

- **“Pre-treat: 0450h”**: It means that the active carbon filter’s initial setting time is 450 hours. When its runtime exceeds 450 hours, the system will warn and display the interface of pretreatment cartridge replacement’s reminding (Picture 19).



Picture 19

- **“UV lamp: 9000h”**: It means that the UV lamp’s initial setting time is 9000 hours. When its runtime exceeds 9000 hours, the system will warn and display the interface of UV lamp replacement’s reminding (Picture 20).



Picture 20

- **“Pre-treat runtime: clr”**: clear the runtime of pretreatment cartridges to zero, system will reset timer.
- **“UV lamp runtime: clr”**: clear the runtime of UV lamp to zero, system will reset timer.

REMARKS:

- The above 2 operation are implemented generally on the condition of replacing cartridges.
- UV lamp is optional. If there is no this part, “UV lamp: 9000h”, “UV lamp runtime: clr” and “Picture 20” will not display.
- The basis for pretreatment cartridge’s life-450 hours is the runtime of system-5 hours every day,30 days every month,3 months.
- The basis for UV lamp’s life-9000 hours is the runtime of system-24 hours every day with Uninterruptible power supply. If the lamp is turned on and off frequently, its life will reduce strikingly.

➤ **Setting method of setting and clear of cartridges’ life**

- **The principle of setting of cartridges’ life**: according to the actual replacement term.
- **Method of setting cartridges’ life**: In the interface (Picture 18), press **“MENU”** button, move the cursor to corresponding item, reset it through shift and figure button, at last press **“OK”** button to confirm.
- **Method of clear of cartridges’ life**: In the interface (Picture 18), press **“MENU”** button, move the cursor to “clr” item, then press **“OK”** button to confirm.



▪ **ATTENTION:**

Clearing cartridges’ life must be implemented once replacing new cartridge is ok.

(5). Specification of icon- code setting

Under the main menu, press **“MENU”** button, move the cursor to icon , then press **“OK”** button to switch to interface of code setting (Picture 21).



Picture 21

➤ **Specification of the interface**



“0000”: It means that the password is “0000”. **(ATTENTION:** Initial setting password is “1000”)

➤ **Method of code setting**

For enhancing management of the machine, if needed, password can be reset to protect system’s parameter from modification.

- **Specific method:** In the interface (Picture 21), move the cursor to corresponding item, through shift button to choosing the digit and figure button to modifying the digital of digit, at last press “OK” button to confirm. From now on, the initial setting password “1000” is invalid.



▪ **ATTENTION:**

Once new code setting is ok, please make sure to input new password in interface of password entry (Picture 10).

If new password is forgotten, please do not hesitate to contact with our company.

(6). Specification of icon- Mode of getting water

Under the main menu, press “MENU” button, move the cursor to icon button to switch to interface of getting water’s mode (Picture 22).



press “OK”



Picture 22

➤ **Specification of the interface:**

- **“Mode: Manual”:** It means that the current mode of getting water is manual.

Specification of manual mode:

Under this mode, press the dispense button first times, then the solenoid valve of pure water is opened. Press the dispense button again, then the valve is closed.)

- **“Mode: Auto”:** It means that the current mode of getting water is automatical.

Specification of auto mode:

Under this mode, press the dispense button, then the solenoid valve of pure water is opened. And the valve will be automatically closed after the setting time.



- **ATTENTION:** Initial setting mode of getting water is Manual.

- **“UP: 03min”:** It means that the getting ultrapure water’s time of auto mode is 3 minutes.
- **“RO: 05min”:** It means that the getting RO water’s time of auto mode is 3 minutes.

REMARKS:

- Time setting is effective only under auto mode;
- Time frame: 1 minute to 99 minutes.

➤ **Setting method of getting water’s mode:**

In the interface (Picture 22), press “MENU” button, move the cursor to corresponding item, through shift button to choosing the digit and figure button to modifying the digital of digit, at last

press “OK” button to confirm.

■ **Specification of alarm**

(1). Alarm of cartridges’ life

Including: pretreatment cartridge replacement’s reminding (picture 19), UV lamp replacement’s reminding (picture 20), ultrapure polishing resin cartridge replacement’s reminding (picture 16).

- **Alarm of pretreatment cartridge replacement’s reminding (picture 19), and UV lamp replacement’s reminding (picture 20).**

When the runtime is above the initial setting value of cartridges’ life, system will warn, and display warning picture 2, accompanied by buzzer alarm. Warning time will sustain 3 seconds, and system will monitor the pressure again every 1 hour. It means that system will warn 1 times every hour until the initial setting value is modified or the runtime is cleared to zero.

- **Alarm of ultrapure polishing resin cartridge replacement’s reminding (picture 16).**

When system’s real time resistivity is less than the initial setting value, system will warn, and display warning picture 16, accompanied by buzzer alarm. Warning will occur every 10 seconds. The solenoid valve of pure water’s outlet will not be opened when system is warning. If opening is necessary, please modify the initial setting value of resistivity’s alarm.

8. Water Quality Test

The system has 3 monitor sensors of water quality measuring.

- **The first, TDS1**, monitors feed water’s quality (Ro water, distilled water, deionized water).
Measure unit: TDS(total dissolved solid, ppm)
- **The second, TDS2**, monitors deionized water’s quality(high pure water).
Measure unit: TDS(total dissolved solid, ppm)
- **The third, Resist**, monitors ultrapure water’s quality (Ultrapure water).
Measure unit: Resistivity (MΩ.cm)

REMARKS:

- Conversion relations between TDS and conductivity rate(μs/cm):
If TDS<50ppm, conductivity rate(μs/cm) ≈TDS×2
If TDS>200ppm, conductivity rate(μs/cm) ≈TDS×(1.5~1.7).

9. Consumables

Item No.	Commodity	Quantity/set	Suggested replacement term
D-AC-P	D-ac-p post active carbon cartridge	1	About 2-6 months
D-Decart-P	D-decart-p mixed bed resin cartridge	2	About 4-6 months
D-Pocart	D-pocart ultrapure polishing resin cartridge	1	About 4-6 months
D-Tefit	D-tefit (0.45+0.1μm) terminal filter	1	About 12-24months

REMARKS:

- Worse inlet feed water quality or big dosage will reduce the life of above cartridges.

10. Trouble Diagnosis

t. Motor failure

- A. Check whether the pressure of the tap water is high enough. When pressure is low, low pressure switch will cut off power.
- B. Check whether the high pressure switch or water level controller is normal.
- C. Check whether special PP filter or Active carbon is blocked which cause the overload of the motor.
- D. Check whether control panel is OK (for full automatic model)

u. Pump Leaking

- A. Check whether special PP filter or Active carbon is blocked which cause the overload of the motor. Then high pressure lead to leaking. Resolution: change special PP filter or Active carbon and repair the pump.
- B. The expiring of the pump rubber membrane or the dirt will cause leaking too. Please repair the pump and pay attention to checking the LV. 1-special PP cotton.
- C. The block of the waste water proportion vessel will cause the block of the reverse membrane. Then pressure increase. Water with high pressure will break the pump rubber membrane, then causes leaking. Change relative components will be ok.

v. Motor working but no water

RO membrane is blocked or pump's pressure lost. For the former, change the RO membrane; For the later, check whether expiring of pump is caused by long time overload or blocking of the cartridge. Repair motor.

w. Motor works ever and again

The motor works ever and again. It is the reason that low pressure or blocking of LV.1cartridge. Please install a booster pump or replace LV.1cartridge.

x. The pressure tank is full of water, but pure water can not flow out

- A. Air in the pressure tank leaks. Please fill it with 7psi air and check whether air leaks. If air can not be put into tank, change the pressure tank..
- B. Backset active carbon is blocked. Please replace it with a new one.

y. Power is off, but RO water does not stop flowing.

- A. Check the four-side water circuit breaker, and replace it if it goes wrong.
- B. Pressure of inlet water is higher then the set pressure of high pressure switch. Please regulate the pressure of inlet water no more then 2kg/cm².

z. The machine can not stop running when pressure tank is full of water or it runs at once after one stop.

- A. High pressure switch or liquid level controller goes wrong. Repair it if it works after repairing, otherwise, replace it with a new one.
- B. Non-return valve leaks pressure so that it can not close. Replace it please.

11. Warranty & Repair Regulation

The products enjoy repair service since the day of purchase. In one year from the purchasing day, we are obliged to replace components for customers free of charge, due to non-human-behavior factors, **except for:**

- (1). All the consumables;
- (2). Damage caused by maloperation or use in abnormal situations;
- (3). Disassembly any part of the machine or human-behavior damage;
- (4). Not repaired by our serviceman.

Specification can be changed without any prior notice for development