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**RWD**

RWD Life Science Co.,Ltd



**Versatile Animal ICU**

**User Manual**

**C**

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# 1 -Introduction

## 1.1 Overview

First of all, thank you for choosing the Versatile Animal ICU manufactured by RWD!

Before the installation and application of this product for the first time, please read all supplied materials to help you use this product in a better way.

RWD is committed to continually improving product features and service quality, and reserves the right to make changes to the user manual and any product mentioned herein without prior notice.

For the latest product information, please call or write us or visit our website (<http://www.rwdstco.com/>). Please contact RWD in the case of any inconsistency between actual conditions of product and the user manual, or any question or suggestion, during your application of equipment.

The user manual applies to the following product:

- Versatile Animal ICU——R-CU510
- Versatile Animal ICU——R-CU509

## 1.2 Safety

When operating the system, please read the “**2- System Safety**” section carefully to avoid hurts to operators and damages to the equipment.

If you have any question or suggestion regarding safety, please contact RWD for after-sales support.



This equipment should be operated and managed by trained professionals!



This equipment is only used for animals, not for humans!

## 1.3 Intended use

The Versatile Animal ICU is mainly used to accelerate animal recovery and provide an oxygen-rich, warm and humid environment for post-surgical animals, animals in recovery or hypothermic newborn animals. This product is can be used in veterinary hospitals, agricultural and forestry colleges and research institutions.

## 1.4 Product features

- Built-in intelligent parameters, system recommended setting parameters can be called quickly.
- 7 inch high-definition touch screen, all parameters at a glance, easy to operate
- Equilibrium rise and drop along the inner wall to ensure the temperature in the chamber is balanced. Accurate temperature control, control accuracy is  $\pm 0.5^{\circ}\text{C}$
- High precision oxygen sensor, microcomputer automatic precise control and real-time monitoring of oxygen concentration in the chamber
- High concentration of anion purification function
- Efficient ultraviolet quartz coating sterilization system can avoid cross infection of animals
- Real-time and accurate monitoring of the  $\text{CO}_2$  concentration in the chamber, at the same time,

internal circulation purifies CO<sub>2</sub> in the chamber to provide a more comfortable environment for animals

- Built-in multiple alarm events. The system fully covers temperature and CO<sub>2</sub> concentration, sensor fault, temperature control fault and other abnormal alarms

## 1.5 Environmental requirements

Please prepare the equipment operating environment according to the conditions listed below to ensure the operability and safety of the system.

Working environment	Temperature: 20°C-25°C
	Humidity: 30% - 75% (non-condensing)
Storage environment	Temperature: -10°C-50°C
	Humidity: 15%-95% (non-condensing)
	Air pressure: 50kPa-106kPa
	Class of pollution: 2
Operating voltage	AC: 220-240VAC, 50/60Hz; 100-120 VAC, 50/60Hz

## 1.6 Parameters

Range of CO <sub>2</sub> concentration	500-4000ppm
Range of O <sub>2</sub> concentration	20-60%
Anion time range	5-30 minutes
Temperature range	R-CU510/Celsius (°C): 15.0~40.0°C Fahrenheit(°F): 59.0-104.0°F R-CU509/Celsius (°C): 20.0~40.0°C Fahrenheit(°F): 68.0-104.0°F
Humidity range	40-70%RH
Brightness Degree	1-3
UV lamp time range	5-60 minutes
Internal dimensions	690 mm * 470 mm *490mm;
Weight	≤65kg



## 1.7 Product list

**Note:** this product list is only for reference. Check with the packing list supplied when you receive the goods, please contact RWD service personnel immediately if you find any discrepancies.

<b>Configuration</b>	<b>Items</b>	<b>Qty</b>	<b>Description</b>
Standard	Device	1	Animal ICU
Standard	Power cord	1	For power input
Standard	Humidifier components (including power cord, holder, bottled water coupled apparatus)	1	Increase humidity for chamber
Standard	Humidifying silicone tube	1	Humidity transmission
Standard	Infusion support	1	For hanging infusion bottles
Standard	6*10 silicone tube	1	Oxygen delivery
Standard	Caster	4	Support equipment
Optional	Atomizer	1	Treatment of various diseases relating to the upper and lower respiratory system
Optional	Atomizing silicone tube	1	Atomized gas transmission
Optional	Stacking bracket	1	For stacking devices

## 2 -System Safety



Please read the safety instructions carefully. For safety's sake, please be aware of the following:

- **Correct connection cables**

Make sure all connection cables are safely and securely connected to the equipment.

- **Avoidance of all exposed electronic cables**

Do not touch any electronics and wiring inside the equipment!

- **Shutdown due to suspected failure**

In the case of equipment safety hazard or failure of normal operation, please contact the authorized technical support personnel.

- **Correct connection of equipment**

Connect the equipment correctly to avoid operation difficulty or even disconnection of equipment due to incorrect connection.



### 2.1 Notes

- Plug in the power cord to prevent improper power contact
- Pay attention to shockproof, waterproof, moisture proof, pressure proof and fireproof measures
- During moving and handling equipment, pay attention to handling strength to prevent damages to instrument or falling of instrument
- It is strictly forbidden for untrained personnel to operate the equipment. Please use a reliable grounding device
- The responsibility for equipment failure arising from any improper cleaning, maintenance and operation of the equipment should be borne by user
- If the equipment is disassembled without the authorization of RWD, RWD will no longer fulfill its commitments for quality assurance and technical maintenance services to the equipment. For any technical problems please contact the authorized personnel or RWD for supports



### 2.2 Warning

- Please place the instrument on a flat ground
- DO not unplug this unit while it is in use
- This equipment should be shockproof, waterproof, moisture-proof, pressure-proof and fireproof
- The air pressure shall not exceed 0.2MPa
- In the event of abnormal sounds or fumes from the unit, unplug it immediately and contact the after-sales personnel of RWD

## 3 -Assembling

### Note:

- 1) Do not put the unit in a dusty or dirty place to prevent the product from being damaged by dust or foreign bodies.
- 2) Do not install or use the unit in a damp place, as this will result in electric shock or fire accident.
- 3) Do not place the power cord near a heat source. The skin of the power cord may melt, causing fire or electric shock.
- 4) Do not turn the unit upside down, as it may be damaged.
- 5) Do not pour water or other liquids on top of the unit to prevent damage to the unit.
- 6) Do not place the product in a place featuring high temperature or direct sunlight, as this may cause color fading of the unit and a rapid increase in temperature may result in animal death.
- 7) For description of relevant components, please refer to section **4 - Product Structure and Buttons**.

### 3.1 Installation of humidifier components

Installation method: fix the humidifier holder on the elbow bracket, lock the screws to avoid the humidifier components loosening, and then insert the humidifier silicone tube into the port (refer to **4- Product Structure and Buttons**).

**Note:** The humidified silicone tube needs to be installed at a downward tilt or horizontally (refer to figure 3-1).

The bottle in figure 3-1 is not equipped, 550ml mineral water bottle could be selected and filled with clear water, and distilled water is recommended if possible.

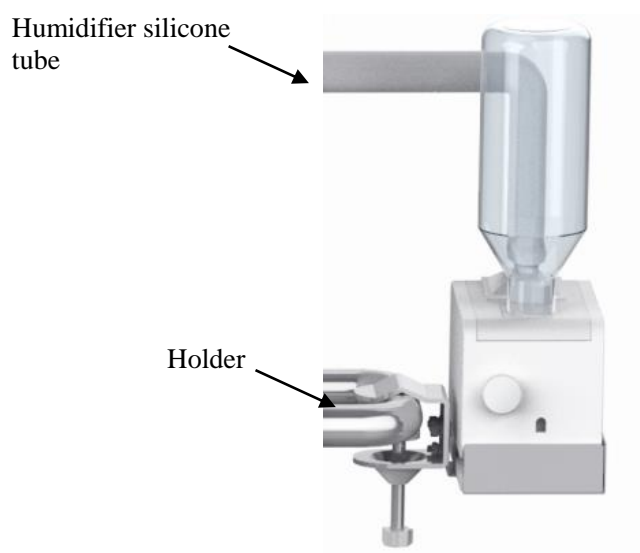


Figure 3-1

### 3.2 Installation of infusion support

Installation method: Insert the infusion support into the socket on top of the animal ICU.

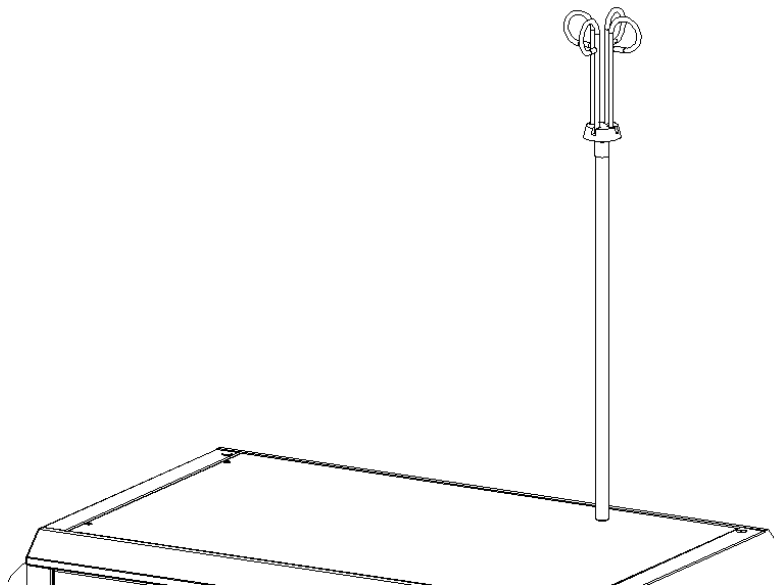


Figure 3-2

### 3.3 Atomizer installation (optional)

Installation method: refer to the above installation method of humidifier.

### 3.4 Caster disassembly/assembly



Figure 3-3

As shown in Figure 3-3, manually rotate the gear at the bottom of the caster counterclockwise /clockwise to remove/install the caster.

### 3.5 Equipment stacking

**Note:** if you need to stack the ICUs (refer to figure 3-4), make sure that the casters on both devices have been removed and replaced with support legs. For details about how to remove casters, please refer to section 3.4, after the casters have been removed, rotate to install the support legs.

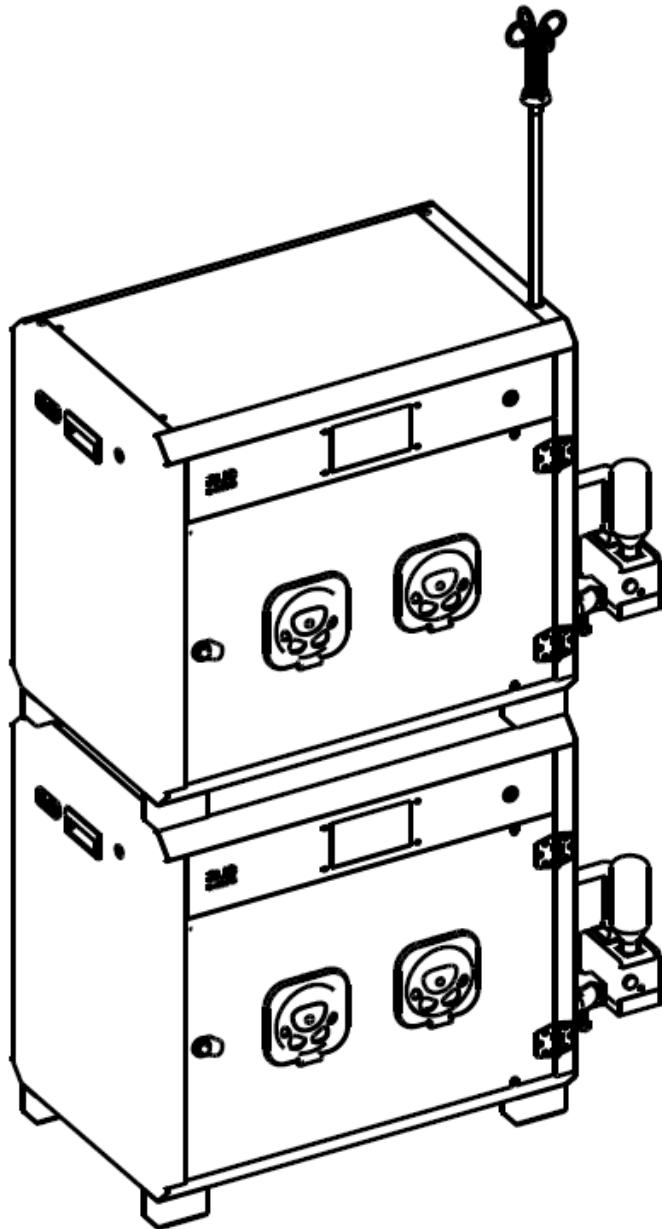


Figure 3-4

# 4 -Product Structure and Buttons

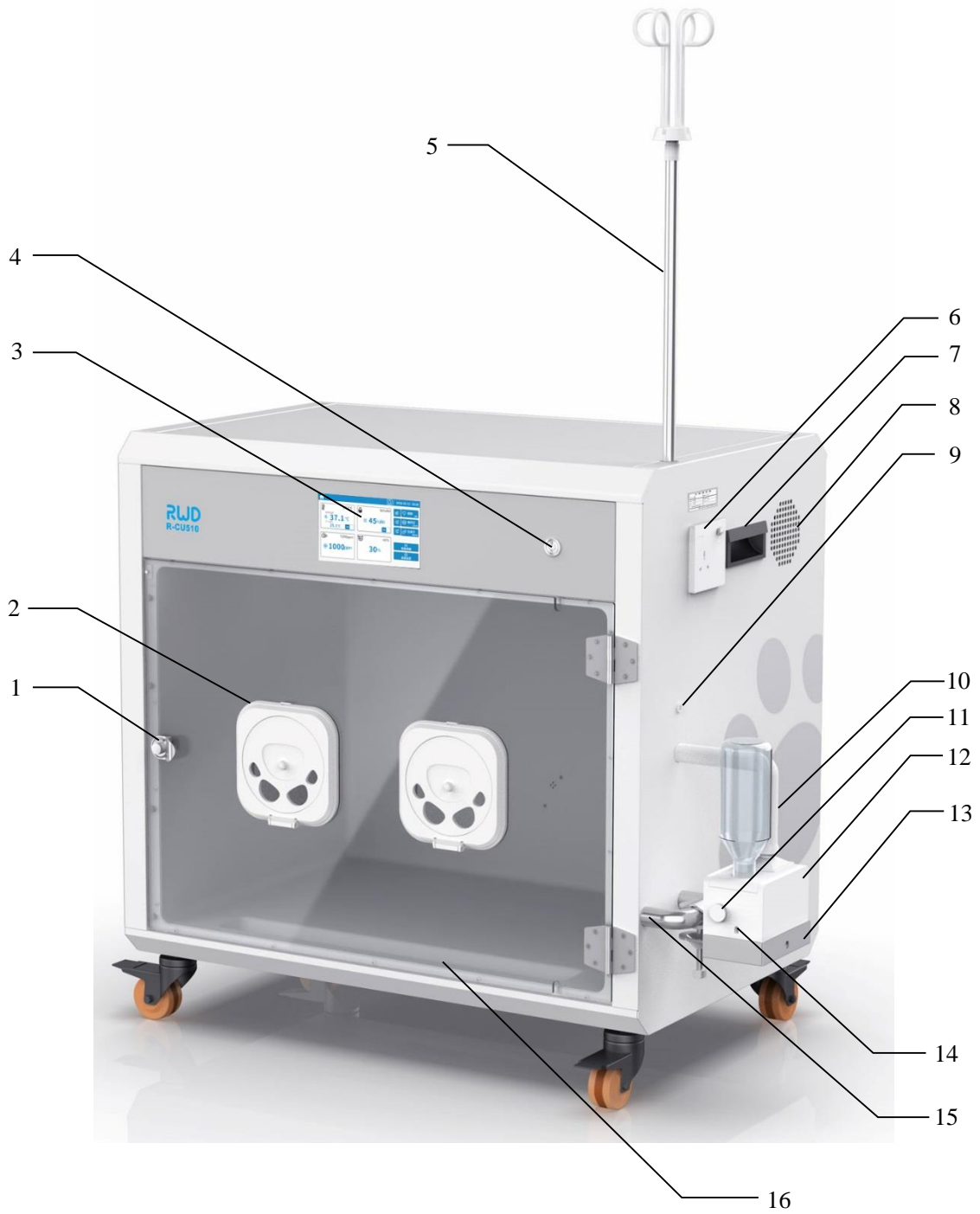


Figure 4-1



Figure 4-2

S/N	Part name	Description
1	Button switch	Press to unlock the door
2	Operating window	For the operator's hands to work in the chamber
3	Capacitive touch screen	Operation interface
4	On/Off button	For turning on/off the unit
5	Infusion bracket	Used for hanging infusion bottles
6	External socket (with switch)	Power supply to external equipment
7	Handle (at both sides)	For lifting or moving the unit
8	Ventilation opening	For cooling the unit

9	Power cord socket on the device	For plugging into the power cord of the humidifier
10	Humidifier/atomizer connector (shared)	For connecting humidifier/atomizer
11	Humidifier regulating knob	Turn clockwise to increase humidity and counterclockwise to decrease humidity
12	Humidifier	For humidifying the ICU
13	Humidifier tray	Place the humidifier
14	Power cord socket on the humidifier	For plugging into the power cord of the humidifier
15	Elbow bracket	Used to fix the humidifier
16	Urine collection slot	Collection of excreta
17	Oxygen input port	Connected to oxygen source (The air pressure shall not exceed 0.4MPa.)
18	Power input port (with switch and internal fuse)	Power supply to the ICU
19	Casters	It can be replaced with supporting legs for stacking of ICUs
20&21	Infusion tube hole	Pass the tube through the infusion

## 4.1 Electronic components

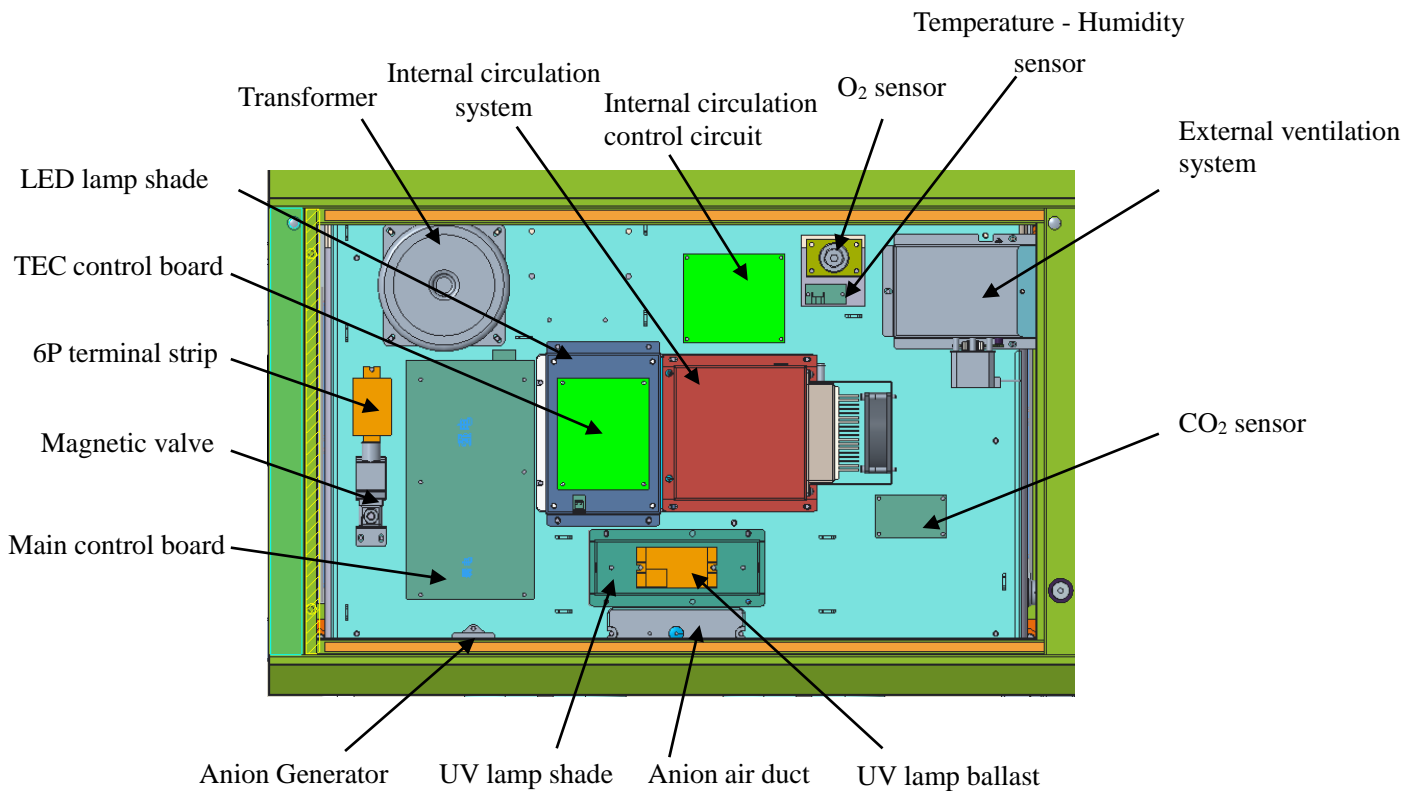


Figure 4-3



# 5 -Operation Instruction

## Operation steps:

- 1) After the unit is well installed, press the button switch to open the door, ensure the unit in a good condition with all functions working normally before place animal into the unit, and ensure meeting the requirements of the equipment operation environment (temperature: 20 °C ~ 25 °C humidity: 30% ~ 75% (non - condensing)), otherwise the equipment may not be able to achieve or maintain the customized parameter value.
- 2) Put the animals into the unit carefully and close the door.
- 3) Start parameter setting or call the preset parameter.

## 5.1 Start-up

Press the power button to start the equipment for the first time to enter the home page. (The details of Lighting/UV lamp/Anion function is shown as section 5.5)

Figure 5-1 is used for example only, the actual parameters on the home page are subject to the instrument display

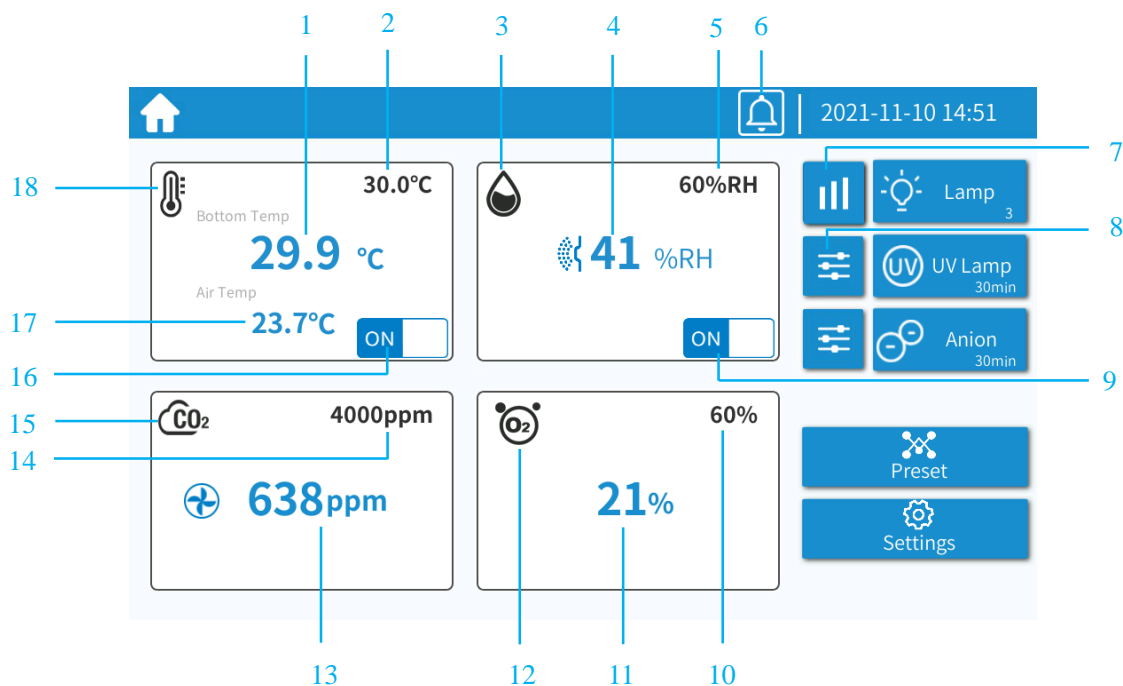











Figure 5-1

No.	Description	No.	Description
1	<p>Current bottom temperature. When the icon  flashes next to the temperature value, it indicates that the bottom is heating; When the icon  flashes, it indicates that the bottom is cooling.</p> <p><b>Note:</b> The cooling function is available only for the model R-CU510.</p>	10	Set O <sub>2</sub> concentration. O <sub>2</sub> concentration is displayed in this window. Tap in this window to set the target O <sub>2</sub> concentration.
2	Set temperature. Temperature is displayed in this window. Tap in this window to set the target temperature.	11	Current O <sub>2</sub> concentration (calibration is required if the oxygen concentration does not match the actual concentration. The calibration method is shown in section 5.4
3	Humidity identifier.	12	O <sub>2</sub> identifier
4	<p>Current humidity in the chamber. When the device is being humidified,</p> <p>The icon  flickers</p> <p>The icon  flickers</p>	13	<p>Current CO<sub>2</sub> concentration. After the device is turned on, the internal circulation is started and the icon  flickers</p>
5	Set humidity. Humidity is displayed in this window. Tap in this window to set the target humidity.	14	CO <sub>2</sub> concentration alarm limit
6	<p>Alarm sound on/off. Tap the mute button , and it will automatically recover after 10 minutes silence; Or manually tap  to actively restore to the alarm on state.</p>	15	CO <sub>2</sub> identifier. CO <sub>2</sub> concentration is displayed in this window. Tap in this window to set the target carbon dioxide concentration.
7	Brightness adjustment key	16	Temperature switch. Tap  to switch on/off state of temperature function
8	Adjustment keys	17	Air temperature in the chamber
9	Humidity switch. Tap  to switch on/off state of humidity function	18	Temperature identifier

## 5.2 Parameters setting

Click the “Temperature” window, the numeric keypad will pop up. The corresponding target temperature value can be set on the keypad. Other Settings such as setting humidity, O<sub>2</sub> concentration, CO<sub>2</sub> concentration are the same.

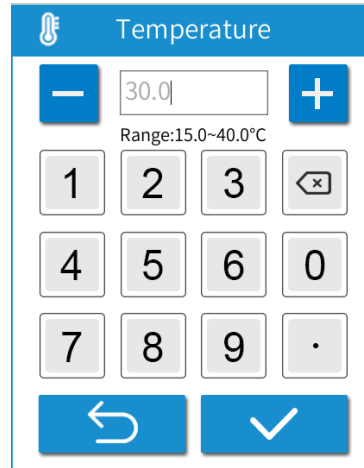



Figure 5-2

## 5.3 Intelligent parameters

Tap  to enter the animal species selection page (shown as Figure 5-3 and Figure 5-4). There are seven animal species, including **Canine**, **Feline**, **Leporidae**, **Birds**, **Murine**, **Reptile** and **Simian**.

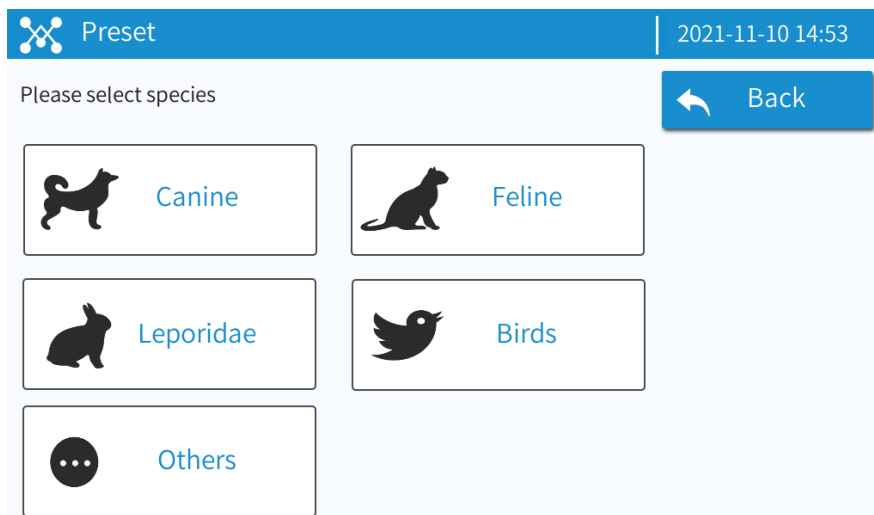


Figure 5-3

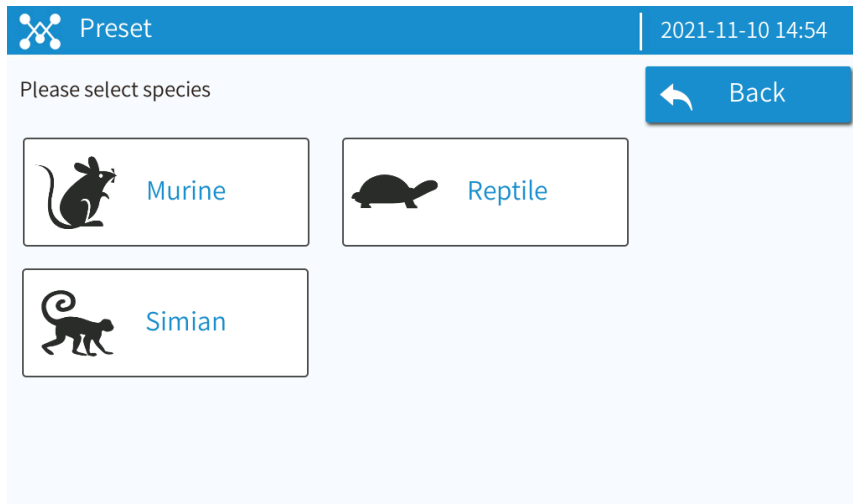


Figure 5-4

Click to select any animal species to automatically go to the age selection page (shown as Figure 5-5). There are three age groups in this page for selection, including Young/Adult/Senior aged groups.

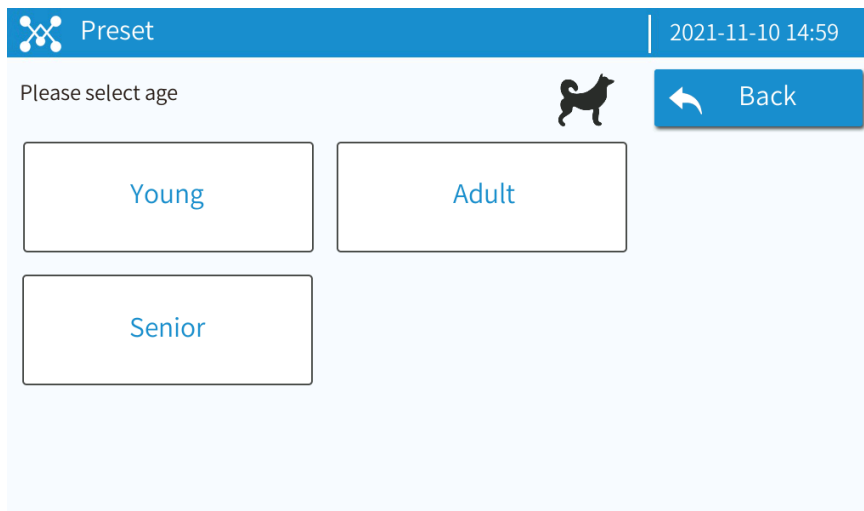


Figure 5-5

Click any one of age groups to enter the disease type selection page correspondingly (shown as Figure 5-6).

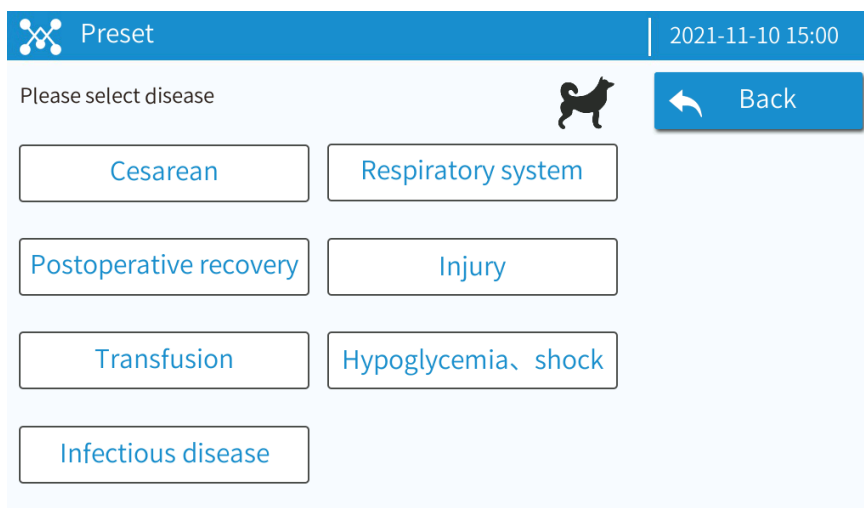




Figure 5-6

Select any one of the above to enter the recommended parameters page (shown as Figure 5-7).

Recommended parameters will be automatically called When click  , tap  to back or make a new selection.

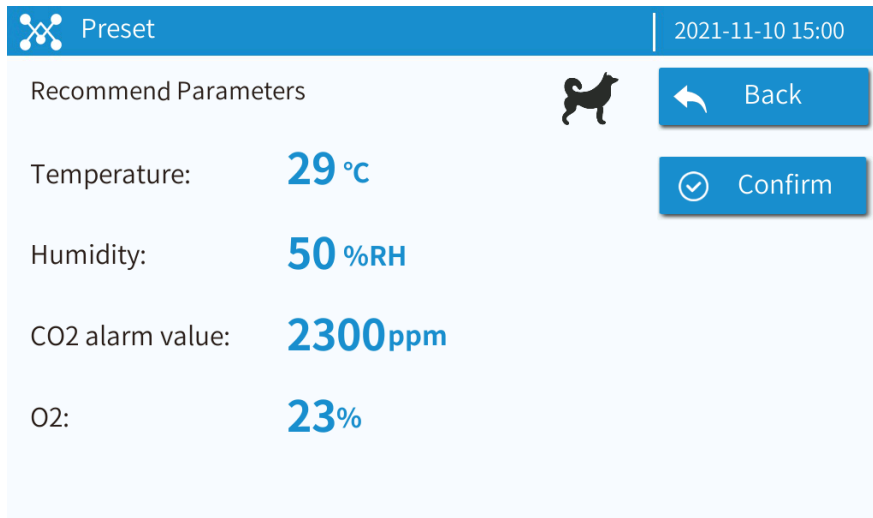



Figure 5-7

## 5.4 Settings

Tap  to enter the system setting page (shown as Figure 5-8)

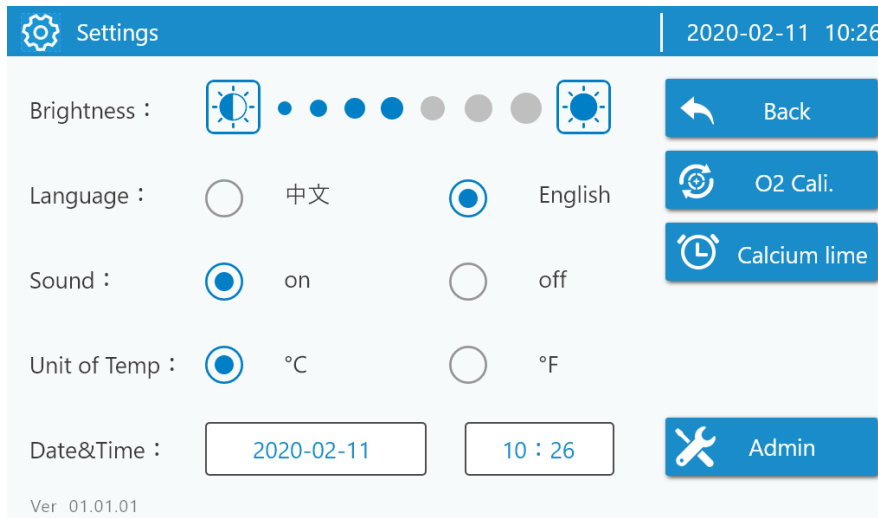





Figure 5-8

Function	Description
Brightness	Tap  icons to dim/brighten the display panel.
Language	Tap to switch between Chinese and English
Sound	Tap ON/OFF to enable or disable the key sound
Unit of Temperature	Tap to select Celsius (°C) or Fahrenheit (°F) to display the temperature value.
Admin	For after-sales maintenance personnel only

### 5.4.1 O<sub>2</sub> concentration calibration

**Note:** If the O<sub>2</sub> concentration does not match the actual concentration, it should be calibrated.

The method to judge whether the O<sub>2</sub> concentration is accurate or not: open the door of the chamber to make the O<sub>2</sub> concentration inside the chamber is consistent with the outside, and check whether the O<sub>2</sub> concentration displayed on the software page is the actual O<sub>2</sub> concentration (the actual oxygen concentration can be obtained by querying the comparison table between altitude and oxygen content according to the local altitude).

Click  to enter the page of calibration, enter the actual O<sub>2</sub> concentration on this page and click the  button.

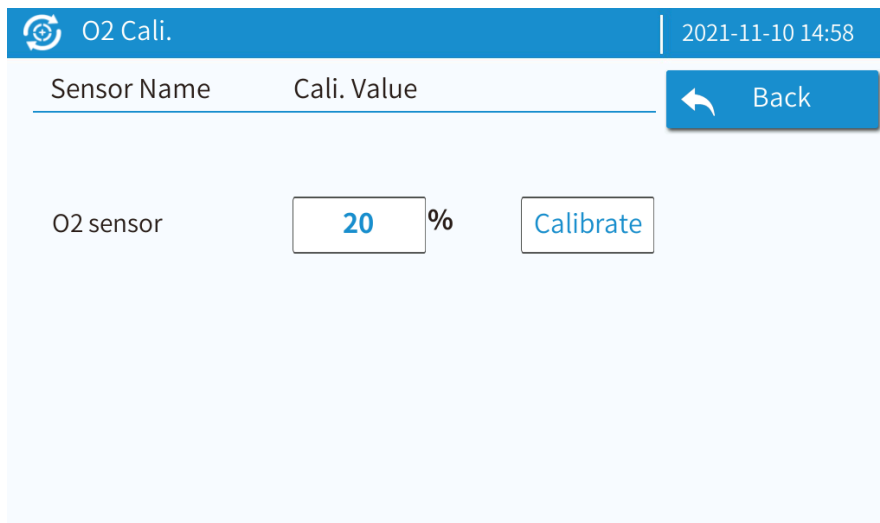
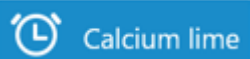




Figure 5-9

### 5.4.2 Calcium lime timing

Click the  on the "Settings" page to enter the calcium lime timing page.

The content in the table is the recommended time of calcium lime replacement for animals with different weights, it's only for reference. When the new calcium lime is replaced, click  to clear the current use time, and then click  to restart the timing.

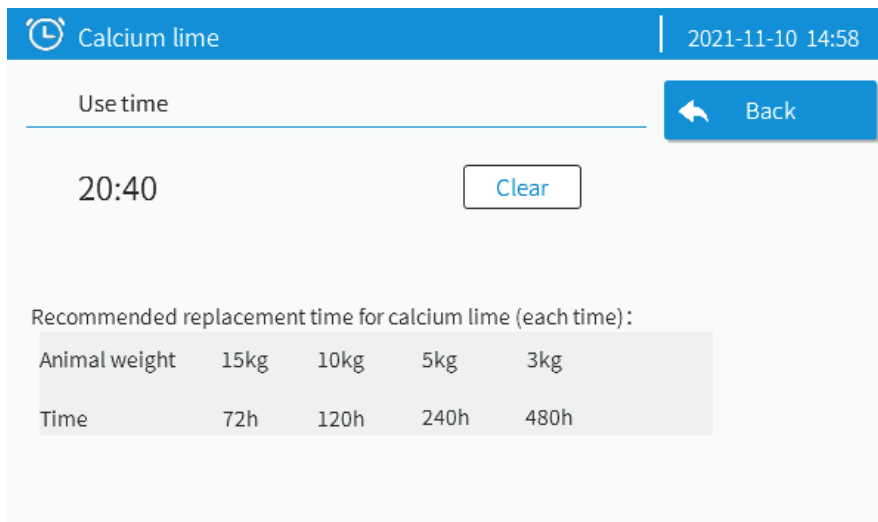








Figure 5-10

## 5.5 Lighting/ UV lamp/Anion

1) Lighting: Tap  to turn on the lighting system and tap again to turn it off. The default lighting is set at Level 1 and you can tap  to select from Level 1 to 3.

2) UV lamp: Tap  to turn on the UV lamp and tap again to turn it off. The default duration of UV lamp is 5 minutes and you can tap  to select from 5 to 60 minutes. UV lamp destroys the structure of microorganisms by the high energy of UV spectrum, with a strong bactericidal effect, such as improper use will cause damage to animals, only trained professionals should use this function.

**Note:** If you want to use UV for disinfection, tap  to pop up the following dialog box. Please make sure there are no animals in the unit before you tap  to enable the UV lamp.

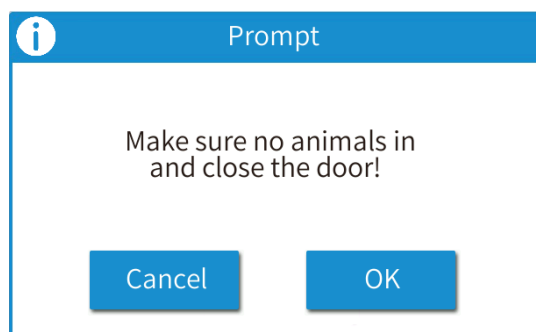




Figure 5-11

3) Anion: Tap  to turn on the anion cleaner and tap again to turn it off. The default duration is 5 minutes and you can tap  to set from 5 to 30 minutes.

When the anion acts on the animal skin, it can make the skin blood vessels contract briefly and then expand, improve the microcirculation and tissue nutrition, accelerate the regeneration of skin epithelium and promote the healing of wounds.

## 5.6 Operating window

Animals can be injected, transfused, and stuff can be took or preserved through the left and right operating windows without opening the door.

**Usage:** place your hand on the paw print of the operating window, rotate clockwise or counterclockwise to open part of the window, it will reach the limit when the window is rotated to 180°.

Lock. Press  
to open the  
operating  
window.

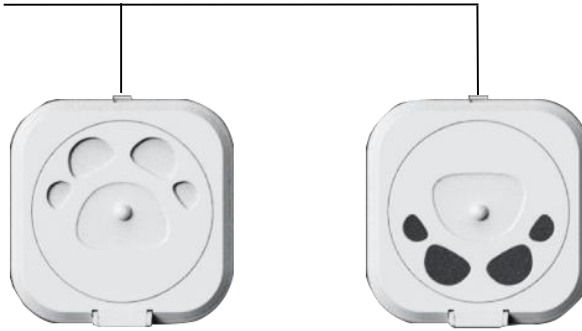


Figure 5-12



## 6 -Alarm prompts

Alarm prompts	Solution
“Abnormal temperature, please restart!”	<ol style="list-style-type: none"> <li>1) Turn on the temperature switch;</li> <li>2) Restart the unit;</li> <li>3) Contact RWD after-sales personnel;</li> </ol>
“Dehumidification Fault!”	<ol style="list-style-type: none"> <li>1) Turn on the humidity switch;</li> <li>2) Restart the unit;</li> <li>3) Contact RWD after-sales personnel;</li> </ol>
“High CO <sub>2</sub> , please replace the calcium lime!”	<ol style="list-style-type: none"> <li>1) Check whether the cooling fan is working.</li> <li>2) Check whether the calcium lime needs to be replaced.</li> <li>3) Contact RWD aftersales personnel.</li> </ol>
“O <sub>2</sub> Sensor Fault!”	<ol style="list-style-type: none"> <li>1) Restart the unit;</li> <li>2) Contact RWD aftersales personnel.</li> </ol>
“CO <sub>2</sub> Sensor Fault!”	<ol style="list-style-type: none"> <li>1) Restart the unit.</li> <li>2) Contact RWD aftersales personnel.</li> </ol>
“Humidity Sensor Fault!”	<ol style="list-style-type: none"> <li>1) Restart the unit.</li> <li>2) Contact RWD aftersales personnel.</li> </ol>
“Temperature control fault, please restart!”	<ol style="list-style-type: none"> <li>1) Turn on the temperature switch;</li> <li>2) Restart the unit;</li> <li>3) Contact RWD after-sales personnel;</li> </ol>

## 7 -Troubleshooting

Problem	Possible cause	Solution
Equipment not powered	<ol style="list-style-type: none"> <li>1) Check if the power cord is connected.</li> <li>2) Check if the socket fails.</li> <li>3) Check if the power switch and power indicator are turned on.</li> <li>4) Switch on/off the panel socket on the right side of the unit to observe if the indicator lamp is on.</li> </ol>	<ol style="list-style-type: none"> <li>1) Make the power cord connected reliably.</li> <li>2) Move the plug to other socket to observe if it works normally.</li> <li>3) Dismount the fuse from the power input socket to observe if the fuse fails and contact RWD after-sales personnel.</li> <li>4) Contact RWD after-sales personnel.</li> </ol>
Noise from the unit	<ol style="list-style-type: none"> <li>1) Check if there are other objects on the unit.</li> <li>2) Check if the unit is placed on a flat surface.</li> <li>3) Check if there are foreign matters attached around the ventilation opening.</li> <li>4) Check if the four supporting legs or casters are at the same level.</li> </ol>	<ol style="list-style-type: none"> <li>1) Remove objects from the unit.</li> <li>2) Move the equipment to a level surface.</li> <li>3) Turn off the power and unplug the unit. Carefully clean the ventilation opening with a brush.</li> <li>4) Adjust the height of the four supporting legs or casters so that they are at the same level.</li> </ol>
Temperature Extremes	<ol style="list-style-type: none"> <li>1) Check if the set temperature is too high/too low.</li> <li>2) Check if the ambient temperature around the unit is too high/too low.</li> </ol>	<ol style="list-style-type: none"> <li>1) Set the temperature to a proper value.</li> <li>2) Move the unit to the environment at recommended working temperature.</li> </ol>
Condensed water is found inside the unit	<ol style="list-style-type: none"> <li>1) Check if high humidity is set.</li> <li>2) Check whether it is in the cooling state (Only for R-CU510)</li> </ol>	<ol style="list-style-type: none"> <li>1) Set the humidity to below 40%.</li> <li>2) When the set temperature is lower than 20°C, it's advised to set the humidity to 30% to reduce the condensed water</li> </ol>

## 8 -Maintenance

**Note:** During the maintenance of the unit, be sure to turn off the power supply and unplug the power cord out of the socket.

### 8.1 Routine cleaning and maintenance

To clean the device: Firstly turn off the power supply and disconnect the power cord. When animals and other items are removed from the ICU, wipe the exterior with a piece of soft cloth moistened with 75% alcohol. Do not use benzene, thinners or other organic solvents for wiping, as they may cause deformation and discoloration. The inside of the ICU should be cleaned every day.

To clean the humidifier: Separate the power line and water bottle from the humidifier and ensure that there is no water in the humidifier. Reserve the humidifier to further remove the water inside, make sure that no water gets inside the humidifier vent. Wipe it with a piece of water-moistened soft cloth and allow it to dry completely.

### 8.2 Replacement of calcium lime

**Note:** When the system indicates that the CO<sub>2</sub> concentration is too high, please check whether the calcium lime has been out of work. If so, please replace it in time.

The replacement method is as follows:

- 1) As shown in Figure 8-1, find the calcium lime container at the top of the ICU chamber and pull out the calcium lime box horizontally with slight force as shown in Figure 8-1, hold the box firmly and carefully to prevent the calcium lime particles from falling off.
- 2) Empty the calcium lime that has been out of work, shown as figure 8-2, and do the recycling. Filling in with the new calcium lime (60g is recommended). Follow the direction of the arrow on the calcium lime box and put it back in its original position



Pull out the calcium lime box by gripping the edge with your hand

Figure 8-1



Figure 8-2

### 8.3 Replacement of UV lamp

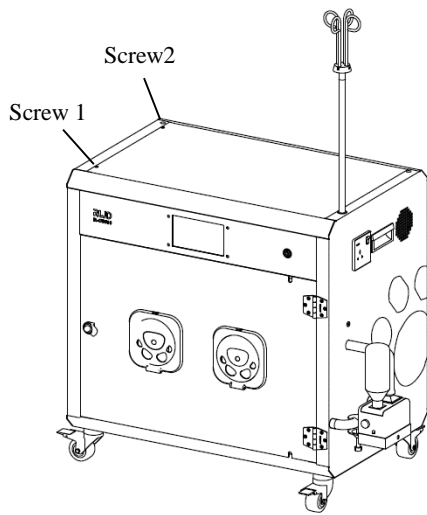


Figure 8-3

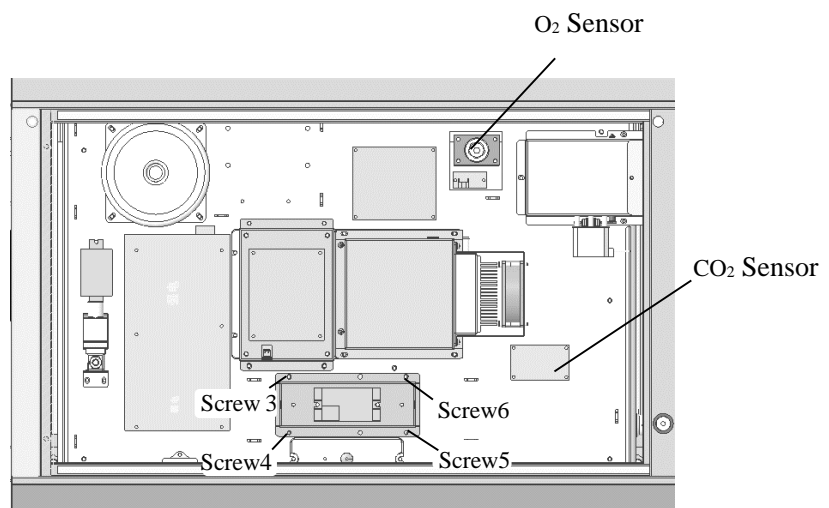


Figure 8-4

- 1) Shown as Figure 8-3 and Figure 8-4. Use a Phillips screwdriver to unscrew screws 1 and 2 in Figure 8-3 to open the top cover.
- 2) Please remove the screws (3~6) to replace the UV lamp, remove the old lamp and replace it with a new one, and then fix the screws.

## 8.4 Replacement of CO<sub>2</sub> sensor

The CO<sub>2</sub> sensor is consumable, and its service life is about one year. It needs to be replaced every year to maintain the accuracy of the sensor, please contact RWD after-sales personnel to purchase a specified and validated sensor when it is required replacement.

Replacement method: Firstly dismantle the cover plate according to the steps shown as Figure 8-3, remove the 4 screws in the installation position of CO<sub>2</sub> sensor, loosen the sensor installation plate, unplug the old sensor and replace with a new one, as shown in Figure 8-5.



Figure 8-5

## 8.5 Replacement of O<sub>2</sub> sensor

The O<sub>2</sub> sensor is consumable, and its service life is about one year. It needs to be replaced every year to maintain the accuracy of the sensor, please contact RWD after-sales personnel to purchase a specified and validated sensor when it is required replacement.

Replacement method: Firstly dismantle the cover plate according to the steps shown as Figure 8-3, remove the 4 screws in the installation position of O<sub>2</sub> sensor, unplug the connection cable and replace with a new sensor, as shown in Figure 8-6.



Figure 8-6

## **9 -Warranty**

The warranty period of this equipment starts from the delivery date. During the warranty period, if the equipment cannot be used normally due to problems such as material and process defects, the Company should be responsible for providing after-sales services such as equipment maintenance and parts replacement.

Any damage caused by improper or over-range use is not covered by the warranty. If repair or replacement of parts is required, relevant costs will be borne by user.

When the equipment to be reworked arrives, if it has been dismantled without authorization from RWD, the Company will not provide after-sales services such as warranty, free maintenance and parts replacement.

The warranty statement (including its restrictions) is exclusively issued by RWD and covers all other warranties.



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