User Instruction Manual

Veterinary Smart Intensive Care Unit

(Super Air Series)

For Veterinary Use Only

Contents

1. Product Structure

2. About Connections

2.1 Connect the power

Step 1:Plug in the power cord

Step 2: Turn on the overload protection switch

Note:

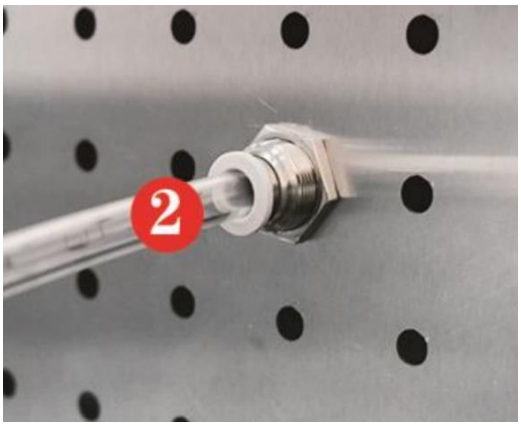
Make sure the electrical socket meets the ICU electrical requirements, and must have a ground wire.

2.2 Connect oxygen concentrator

Step 1: Connect the oxygen tube to the T joint, like below picture.

Step 2: Connect the oxygen tube marked with number 1 to the oxygen inlet port of the upper ICU cage,like below picture.

Step 3: Connect the oxygen tube marked with number 2 to the oxygen inlet port of the lower ICU cage. See below picture.



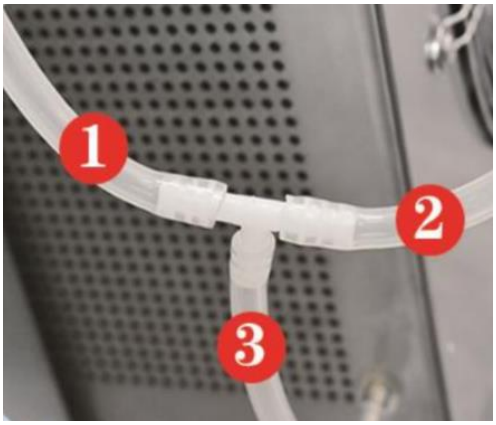
Step 4: Connect the oxygen tube marked with the number 3 to the oxygen concentrator (≥10LPM).

Step 5: Turn on the oxygen concentrator and adjust the oxygen flow to 10L/min, and don't beyond the red line.

Step 6: Turn on the oxygen flow meter on the front panel of the ICU cage and adjust it to the appropriate flow rate.

2.3 Connect the Drainage

Step 1: Connect the drain tubes to the T joint, see picture below



Step 2: Connect the tube marked with number **1** to the port on the upper ICU

Step 3: Connect the tube marked with number **2** to the port on the lower ICU

Step 4: insert the air conditioner tube marked with number 3 into the cooling water storage container

Attention:

1) The water level of the storage container should be lower than the outlet position from the lower ICU drain tube, so to avoid the water being drained unsmoothly.

2) It is important to check the water storage container every 2 to 3 days, and empty it in time to avoid overflow.

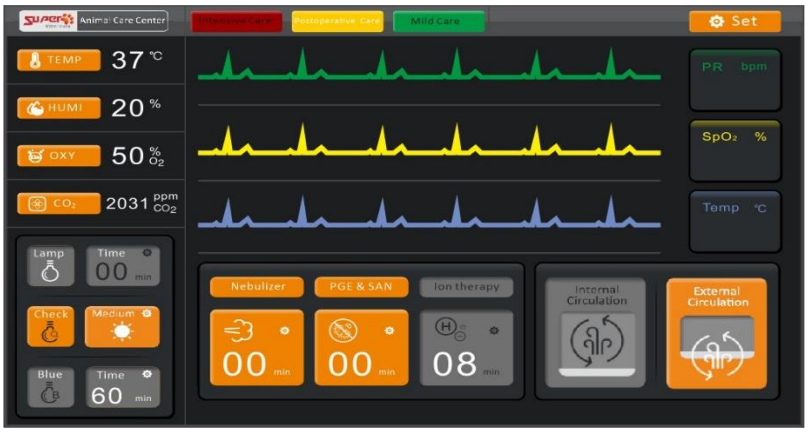
3) Observe the water amount in the container every time when you pour it. If you find that there is no condensate in the container after use, probabley the drain tube is blocked. Clear the tube in time to allow the condensate to drain smoothly to prevent damage to the machine.

3. Start Up & System Operation

3.1 Power on

Press the On/Off button to turn on the machine, and then unlock the screen.

The display screen will then enter the system, as shown in the figure below.



3.2 Adjust Parameters

Below part in red square is to set and display the environment parameters in the ICU cage, like temperature, humidity, oxygen concentration and CO2 concentration.

3.2.1 Adjust temperature

"**TEMP**" is to set/display the temperature in the ICU cage. Click the icon 

, you will see this interface 

.To increase and decrease the temperature needed by clicking"+"or "-", then click "Confirm".

3.2.2 Adjust OXYGEN Concentration

"**OXY**" 

is used to set and display the oxygen concentration in the cage. The default oxygen concentration preset value is 45%. You can adjust the value by clicking the icon 

, then enter to this interface 

. To increase and decrease the oxygen concentration value needed by clicking "+" or "-", then click "Confirm".

3.2.3 CO2 Controlling

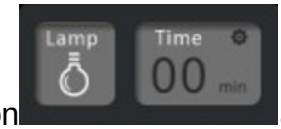
"CO2" 

is the CO2 concentration in the cage. When the CO2 concentration higher than 2000PPM, the system will automatically switch to the external circulation to discharge the carbon dioxide. When the CO2 concentration is equal to 600PPM, the system will switch back to the internal circulation mode.

3.3 Light Manage System

Below picture in blue square is the light manage system in the ICU cage.

3.3.1 LED Indoor Lamp

“Lamp”& “Time” icon 

are used to control the LED lamp and timing, for ordinary lighting. Click “Lamp” 

to turn on the light， and the icon will turn to orange color. The system will automatically turn off the light after 20 minutes, and the icon become grey again. Click “Time” icon to adjust the brightness and lighting-on time 

. Three brightness can be selected as: Low, Medium, High. Click the “+” and “-” to set lighting-on time, the setting range is 1~60 minutes, then click “Confirm”.

3.3.2 Examination Lamp

“Check”& “Brightness” 

are to control the examination lamp and timing. Examination lamp is used for check the mucosal tissue of the animals. Click 

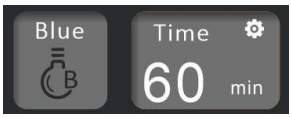
to turn on the light, and the icon will turn to orange color. The system will automatically turn off the light after 20 minutes, and the icon become grey again. Click brightness

icon 

, it will enter to the interface to adjust the brightness and lighting-on time 

. Three brightness can be selected as: Low, Medium, High. Click the “+” and “-” to set lighting-on time, the setting range is 1~60 minutes, then click “Confirm”.

3.3.3 Blue Light



This is to control the blue light and time of lighting-on, the blue light is for the treatment of animal jaundice. Click 

, to turn on the blue light, and the icon will turn to orange color. The system will automatically turn off the light after 60 minutes, and the icon become grey again. Click 

icon, it will enter to the interface to adjust the brightness andlighting-on time 

. Three brightness can be selected as: Low, Medium, High. Click the “+” and “-” to set lighting-on time, the setting range is 60~600 minutes, then click “Confirm”.

3.4 Nebulization, Disinfection and Ion-therapy

3.4.1 Connect the Nebulizer

Step 1: Connect the orange connector of the nebulizer accessory kit to the metal head (pay attention to the direction)

Step 2: connect one end to the Atomization interface of the ICU cage.

Step 3: Connect the other end to the atomizing cup, and put the cup into the atomizing port of the ICU. (Note: The liquid in the atomizing cup cannot be higher than the maximum mark on the cup)

Set atomization and atomization time. Click 

to turn on the atomization function and the icon will turn to orange color. Default atomization time is 30 minutes. Click 

, it will enter to this interface 

to adjust the atomization time. Click the “+” and “-” to set the atomization time, then click “Confirm”.

3.4.2 Disinfection

To control disinfection function and its working time. Click 

to turn on the function, the icon will then turn to orange color. Click 

, it will enter to the interface 

to set the working time. Vets can adjust the disinfection time by click the “+” and “-”, then click “Confirm”. Or use system default time directly.

3.4.3 Ion-Therapy

is to control the ion therapy function and its working time. Click

to turn on the therapy function, the icon will turn to orange. Click

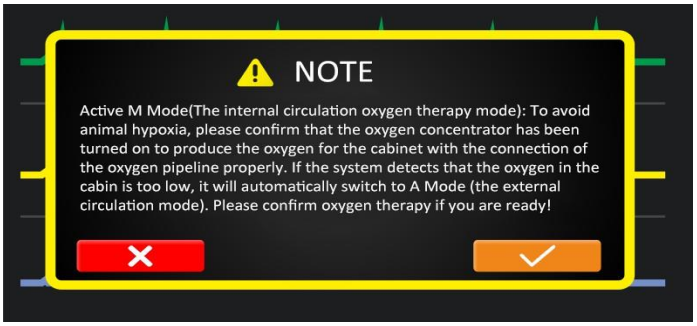
, it will enter to the interface

to set the working time. Vets can adjust the disinfection time by click the “+” and “-”, then click “Confirm”. Or use system default time directly.

3.5 About Internal & External circulation

When the ICU machine is turned on, the default working mode is **external circulation**, and the icon shows in orange color. At this time, the oxygen concentration inside and outside the ICU cage are the same. Or you can click the icon to turn on the external circulation.

If the animal need a richer oxygen environment, please click the **internal circulation** icon ,and a NOTE interface (in below picture) will pop up:



Pay special attention and double check:

- Please confirm the ICU is connected well with an oxygen concentrator
- the oxygen concentrator has been turned on
- the flowmeter on the ICU has been turned on
-

When all above confirm OK, vets can click "√" to enter to the internal circulation mode. If click "×" , means keep on external circulation.

3.6 Precautions – Correct Steps to start up

1) Turn on the machine;
2) Keep the chamber empty, but keep the **external circulation first (not open the oxygen supply);**
3) Wait for about 2 minutes;
4) Observe that the oxygen concentration, It should be **20% or 21%** (if the oxygen concentration < 20%, system calibration will be required. If oxygen concentration is normal, you can then turn on the oxygen concentrator / other gas supply & the flow meter on the ICU).
5) Set other Parameters accordingly.
6) Put animals into the ICU cabin.

Parameters such as oxygen concentration need to be observed regularly during treatment.

3.7 Precautions –tips to adjust oxygen concentration

- Each ICU Space need at least 5LPM oxygen flow
- When only use one space for treatment, then open 10LPM or more oxygen flow
- When need use two spaces for two animals, you can evenly set like 5LPM for each
- **Special Note:** when need adjust oxygen flow for one of the spaces, please adjust **all together**, which means, zero the oxygen first for the space under using, then turn on and adjust oxygen flow together for different spaces, so to avoid inaccuracy caused by gas pressure in the pipeline.

3.8 Ends treatment & Power Off

Correct steps to end treatment and turn off the ICU:

1) turn on the external circulation & open the ventilation window
2) turn off the oxygen generator & flow meter
3) wait for the oxygen concentration in the cabin to 20~21%,
4) Taking the animal out
5) Shut down the machine

3.9 Pay Special Attention - Operation Case Study:

The key role of the ICU is to provide a good environment suitable for the patients. Therefore, when using the ICU, please follow this important principle - **let the environment wait for the patient!**

Below two daily operations for same case "ICU care for surgery" help you understand how to use the ICU correctly.

Operation A:

After the surgery, we put the anesthetized animal into the ICU, then set the ICU to the corresponding temperature and oxygen concentration and observe the animal's reaction regularly.

Operation B:

Before surgery, open the ICU and make relevant settings and preparations. After the surgery, put the patient directly to the ICU already with appropriate environment standby, and observe regularly.

The specific steps as below:

1) Turn on the ICU machine, keep the cabin door open when it is empty, wait for 1 to 2 minutes, and then observe whether the oxygen concentration is normal (21%). (If there is an abnormality, higher or lower than 21%, system calibration will be required.)

2) Turn on the oxygen concentrator (or other oxygen source), open the oxygen flow meter and set appropriate flow rate, close the door, select internal circulation, and then set the required oxygen concentration and temperature values.

When needs to end the ICU treatment:

Operation A:

Open the door directly and take out the animal, then shut down the ICU.

Operation B:

Adjust the temperature and oxygen concentration first, especially the oxygen concentration value. After the oxygen concentration inside and outside the cabin becomes consistent, open the door and take the animal out.

The specific steps as below:

1) Adjust the temperature (if necessary), open the external circulation, close the oxygen flow meter, and allow the oxygen concentration to decrease slowly and normally.

2) After 2-3 minutes, observe that the oxygen concentration drops to about 21%. Open the door and take out the animal.

3) First turn off the oxygen concentrator (or oxygen source), and then shut down the ICU machine.

Obviously, operation A does not comply with our recommended ICU usage principles - let the environment wait for the patient. Operation B is the correct way to use the ICU.

4 Specification Sheet

Items	Parameters
Environment for proper use	-10~40°C room temperature
Display	10-inch LCD Touch Screen
Temperature Control	Air-conditioner for AIR heating/cooling
Temperature Control Range	15-36℃
Humidity Control Range	55-75%RH
Oxygen Concentration Control Range	21-80%
CO2 Concentration Monitoring Range	400-2000PPM, ± 10PPM
Medical Nebulizer	1~60min(adjustable) Maximum atomization rate=0.2ml/min Mist particles (0_5-2um) Noise≤40dB(A)
LED Indoor Lamp	1~60min(adjustable); 3 different brightness levels can be setted
Examination lamp	1~60min(adjustable); 3 different brightness levels can be setted
Blue Light Therapy lamp	415nm blue light can penetrate into hair follicles and sebaceous glands, inhibit the growth of bacteria and reduce skin inflammation, and can also treat jaundice. 60~600min(adjustable); 3 different brightness levels can be setted
Backup battery	6000mAH
External Power Outlet	600W
Power Supply Voltage	AC 100~120V / 220~240V, 50/60Hz

Sensor calibration function	Automatic or manual sensor calibration to ensure accurate parameters
Main Material	304 Stainless Steel
Measurement Super Air-C1	External: L884xW770xH1710mm Internal: L700xW500xH518mm (upper & lower the same)
Measurement Super Air-C2	External: L1250xW890xH1890mm; Internal: L1066xW620xH608mm (upper & lower the same)
Measurement Super Air-C4	External: L1400xW890xH1910mm; Internal: L546xW620xH518mm (Upper x 2) L1216xW620xH718mm (Lower cage)

5 Cleaning & Maintenance

- Clean the ICU cabin in time after each treatment. You can use gauze moistened with medical alcohol to wipe away the dirt. Since there are electronic devices in the cabin, high-pressure water guns or flames cannot be used.

- If necessary, you can open the disinfection function (refer to clause 3.4) for some time after cleaning the cabin, for disinfection & air purification.

- Empty the container of the air conditioner condensed water on the same day or 2 -3 days depending on the usage. If no condensed water is found in the container, it is suspected that the air conditioner drain pipe is blocked. Clear the pipe in time to allow the condensed water to drain smoothly to prevent damage to the machine.

- If not use the ICU for a long time, you need turn it on regularly to charge the battery. The screen of the ICU may flick when the battery is low. Besides, the backup battery is easily damaged if it is not charged for a long time.

- After each use, turn off the oxygen concentrator, open the external circulation and open the door first to make the oxygen concentration in the ICU cabin about 20~21%, and then shut it down. This can extend the service life of the oxygen sensor.

5.1 Instructions of oxygen sensor calibration

Everytime when turning on the machine, please keep the external circulation for about 2 minutes (before turning on the oxygen supply), and observe the oxygen concentration. If the oxygen concentration is found < 20%, oxygen sensor calibration will be required. You can follow steps below:

Step1: Open the ICU door to allow air in. (Ensure the oxygen supply is turned off.)

Step2: Click the “SET” button in the upper left corner of the interface, enter password “ 66 ”, Then  press “Enter” key. System will automatically enter the calibration interface.

Step3: After entering calibration interface, please **do not click any buttons** first. We need wait for a few minutes to let the oxygen concentration gradually stabilized, until this value no longer changes, and the fluctuation range around “1”. Then click on the “OK” button under "In the air", and click “Save” button. Last, click the “Return” button to return to the main page.

After calibration, the oxygen concentration will recover to 20~21%. At this time, you can start using the machine.

6 Trouble Shooting

Problems	**Solutions**
Oxygen concentration cannot reach the set value	When turning on the machine, make sure the oxygen concentration is normal between 20%-21% **(under external circulation & oxygen supply off)**. If the oxygen concentration is found < 20%, then consider whether the oxygen sensor need calibration. Please pay special attention to the process of turning on and off the machine (clause 3.6 and 3.8 in this manual). Avoid sensor calibration deviations. After confirm the oxygen concentration is between 20%-21%, you can then check below: 1-Check whether open the internal circulation, whether the ICU door is closed. 2-Check whether the oxygen concentrator operating status and oxygen flow meter parameter settings are correct. 3-Check whether the oxygen connection pipe is well. If necessary, please contact manufacturer for after-sales service support.

Abnormal alarm occurs	Solve the problems according to the alarm content. If necessary, please contact manufacturer for after-sales service support.

7 About Warranty

7.2 Warranty time

Guarantees 18 months warranty for the main parts since the date of shipping out.
When the warranty period expires, the company will be responsible for lifelong maintenance (maintenance fees will be charged according to real situation regulations).

7.3 Situations not covered by warranty

For failures caused by the following reasons, no free service is provided:

- Failure caused by unauthorized disassembly and modification
- Damage caused by accidental factors or improper use
- Failure caused by lack of reasonable maintenance or failure to meet environmental usage requirements
- Damage caused by failure to operate normally in accordance with the instruction manual
- Damage caused by human factors
- Damage caused by local voltage instability
- Failure or damage caused by force majeure such as fires or earthquakes, etc..

8 FAQ

1) Where to check the battery power?

The ICU cage do not have battery indicator, because the battery is for back-up, and be charged whenever the machine is turned on, so normally it will always be fully charged. If not use the ICU for a long time, you need turn it on regularly to charge the battery. Otherwise, screen

flickering (the screen switching back and forth) may happen, reminding you that the backup power supply is low.

2) Is there a password for the setting page?

Yes, but normally no need use it. This is used to calibrate the parameters from sensors. Only when the sensor deviates during use, we need enter the setting page and recalibrate parameters to ensure accuracy. You can refer to Clause 5.1 about calibration steps.

3) If patients in the ICU for 24 hours, how often should we turn on the disinfection and ion-therapy function?

You can turn them on all the time for real-time disinfection and deodorization.

Ion therapy is good to SPO2, which helps recovery. Besides, the ion can reduce ROS (reactive oxygen species);

4) During blue light treatment, does the animal need to cover its eyes?

Normally it is fine, but because animals will stare the light curiously, so we suggest to cover the eyes or wear glasses.

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