Haier

Operation Instruction of CO_2 Incubator

Model:
HCP-80
HCP-168
HCP-258

- Please read this manual carefully before using the equipment.
- The company reserves the right to interpret the content of this manual.
- Please keep it with your you for future reference.
- Product technology or software is subject to upgrade without prior notice.
- The image in this manual does not necessarily reflect the product appearance of the actual product.

Content

Safety

Dear Haier Biomedical Customers:

Thank you for choosing Haier CO_2 incubator. To prevent potential personnel injury and product damage, we recommend that the contents of the manual be followed closely. Pay special attention to the following symbols in this manual. The CO_2 incubator will be referred to as incubator hereinafter.

Safety label

Warning

High Temperature

Caution, risk of electric shock

Earthing Mark

MD	Symbol for "Medical device"

The upper and lower limits of temperature shall be indicated adjacent to the upper and lower horizontal lines.	Symbol for "Manufacture"
Symbol for "Consult instructions for use"	Symbol for "Date of manufacture"
EC REP European Authorized Representative	Elscolab BV. Tolboomweg 10, 3784 XC Terschuur, the Netherlands

CE

Complied with the regulation(EU) 2017/745 annex Ⅷ

Safety Precautions

Check this manual in all cases marked with ⚠, to learn the nature of potential hazards and any countermeasures that must be taken.

⚠Warning — Failure to comply with the items under warning signs may result in serious personal injury or even death.

⚠Caution — Failure to comply with the items under precaution signs may result in personal injury or damage to the refrigerator and related property damage.

Actions that must be prohibited

Actions that must be followed

- It is very important to read this instruction manual when using this machine. Safety protections provided by the device may be damaged if they are not followed in accordance with the methods specified in this instruction manual.
- Only professional Haier technicians or Haier authorized after-sales service personnel should install and maintain the incubator to prevent potential electric shock or fire.
- Be sure to place the incubator securely on solid and flat surface. If the incubator is not secured firmly or the installation place is inappropriate, the incubator may fall to cause damage or personal injury.
- This product cannot be installed on combustible surface.

- The incubator should only be operated by trained and authorized personnel.
- Please use a dedicated and specified power supply indicated on the nameplate of the incubator. Potential fire or electric shock may be resulted otherwise.
- If the supply voltage is lower than 198V or higher than 264V, an automatic voltage regulator is required, to ensure that the voltage meets the installation requirements.
- If replacing the power cord, the cross-sectional area of the extension part shall not be less than 2 mm² and the length shall not be longer than 3 m; Potential fire or electric shock may be resulted otherwise.
- The power cord of this incubator is equipped with a three-prone plug and a standard three-prone socket. Grounding pin of the power cord must not be cut or removed under any circumstances. Be sure that the power plug and socket are tightly and reliably connected. Potential fire or electric shock may be resulted otherwise.
- Please use a power socket with a grounding wire to prevent electric shock. If the power socket is not grounded, be sure to install the grounding wire by a professional technician.
- The power cord of this incubator is properly grounded.
- In case of leakage of flammable gas such as coal gas, close the gas supply valve. Open the doors and windows for ventilation. Do not plug in or unplug the power plug of the incubator. The action may cause explosion and fire.
- The pressure of the CO_2 inlet can be adjusted to the range of 1.0 Bar ± 0.2 Bar. It cannot be changed.
- CO_2 is a harmful gas that may cause harm to human health.
- Only qualified service personnel are allowed to operate the incubator's intake pipe, gas cylinder or system that stores CO_2 with appropriate tools.
- Be sure that the CO_2 concentration in the workplace does not exceed the safety limit.
- Release of large amount of CO_2 into a closed indoor space may cause suffocation. In the case of CO_2 leakage, take safety measures immediately! Leave the room immediately and prevent others from entering the room! Notify the security or fire department!
- When removing the plug from the power socket, hold the power plug tightly instead of pulling the plug cord. Pulling the cord with hands may cause electric shock or fire due to a potential damage.
- If the incubator does not operate normally, unplug the unit. Operating the incubator in an abnormal state may cause electric shock or fire.
- Be sure to disconnect the power supply of the incubator before performing any repair or maintenance to avoid potential electrical shock or personal injury.
- Be sure to disconnect the CO_2 gas supply to the incubator before performing any repair or maintenance to avoid excessive indoor CO_2 concentration caused by leakage.
- Do not inhale medical fume or suspended particles inside and around the incubator during maintenance as they may be harmful to your health.
- When culturing tissues such as viruses and germs that are harmful to humans, please use the incubator in a safe area with appropriate precautions. Improper installation may be harmful to human health or the environment.
- The incubator meets the requirements of the internationally recognized "Laboratory Biosafety Manual", published by the World Health Organization in Geneva, which gives information on decontaminants, their use, dilutions, properties and potential applications.

- When the incubator is not in use for a long time, unplug the unit to prevent potential electric shock, electric leakage or fire due to aging of the plug cord.
- If the incubator is left unused for a long time in an unsupervised area, make sure that no child can get access to it and the door is not completely closed.
- Decommissioning of an incubator shall be carried out by appropriate personnel. Dismantling the door to avoid accidents such as suffocation.
- When restarting the incubator after power failure or power off, check the settings of the incubator. Change of settings may lead to changes of the culture results.
- Wear gloves when repairing it to avoid personal injury caused by sharp edges or corners.
- When handling the incubator, make sure it does not fall down to avoid damage to the incubator or personal injury.
- Make sure no obstructions are around the incubator and keep good ventilation condition.
- Any tissue, material or liquid substance that are flammable or may explode shall not be used, otherwise the vapors emitted from them or fragments of explosives may release toxic substances.
- Do not place the incubator in a humid place or where may subject to splashing water. Otherwise, it may cause electric leakage or electric shock due to compromised insulation.
- Do not pour water directly onto the incubator, otherwise may cause electric shock or short circuit.
- Do not place any container with water or heavy objects on the incubator. If the object falls, it may cause personal injury; or the spilled water may cause electric leakage or electric shock due to compromised insulation.
- Do not ground the incubator through a gas pipe, power hose, telephone line or lightning rod. The above grounding methods can cause electric shock or other dangers.
- Do not touch any electrical parts such as power plugs or any switches of the incubator with wet hands, Electric shock may be resulted.
- Users should not disassemble, repair or modify the incubator by themselves to avoid potential fire or personal injury due to improper operation.
- Do not store flammable or explosive dangerous goods or volatile goods in the incubator, or use flammable sprays near the incubator; Otherwise, it may cause explosion or fire.
- Do not put the packing plastic bag in a place that is accessible to a child, otherwise may cause suffocation accident.
- Do not climb to the incubator or place objects on the incubator, otherwise the incubator may fall and cause potential personal injury or damages on the incubator.
- Do not insert metal objects such as nails or wires into any openings and gaps or any air vents for internal air circulation on the incubator, as this may result in electric shock or injury due to possibly contacting moving parts behind.
- Please do not use the door handle when lifting, pulling or handling the incubator to avoid damage to the incubator or personal injury.
- Do not use electrical appliances in the working chamber of the incubator other than the models recommended by the manufacturer.

Precautions for Use

1. Structure and components: this product include insulation box, heating system, control system (including alarm system), data recording system (optional) and shelves with freely adjustable spacing.

2. The displayed temperature of the incubator is the value at the temperature sensing probe in it. Although the displayed temperature sometimes differs from the actual value at center of the incubator, it will gradually reach the actual temperature.

3. Clean the incubator with diluted neutral detergent. Do not use brushes, acids, gasoline, polishing powder, polishing powder or hot water to clean the incubator. as these materials may damage painted surfaces and plastic and rubber parts. Do not use volatile solvents such as gasoline to wipe plastic and rubber parts.

4. The stainless steel parts inside the incubator are not acid-resistant, please take measure to prevent. Never use acidic media in the incubator!

5. Unplug the power supply if the incubator is not in use for a long time.

6. When placing or taking samples, please minimize the the time of door opening to avoid fluctuations of temperature, humidity and CO_2 concentration inside the incubator.

7. After opening the door, the temperature and CO_2 concentration inside the incubator will change sharply for a short time, which is normal; The temperature and CO_2 concentration will generally recover within 10 min after closing the door.

8. Do not open the door randomly under dry heat sterilization mode.

9. Pay attention to the calibration periods of the pressure reducing valve and pressure gauge.

10. User-prepared CO_2 cylinders are pressurized vessels and must comply with relevant national regulations and management specifications for pressure vessels.

11. Be sure to reserve certain clearance around the product, with a clearance of no less than its right-side dimension. This space will easily cut off the power supply in an emergency.

12. After each test, dry the water in inner walls of the working chamber to avoid growth of bacteria.

13. The basic functions claimed by the electromagnetic compatibility test:

the basic function of incubator are: heating system working normally to realize temperature control inside the incubator; controlling of CO_2 concentration in the specified range to realize CO_2 concentration control inside the incubator;the data recording system (if any) working normally to realize the data record transmission function; the electronic door lock (if any) working normally to realize the corresponding function; buzzing or text display on the screen in the case of alarm.

14. Electromagnetic compatibility requiremen:

a) This machine complies with the emission and immunity requirements specified in EN 61326-1;

b)This machine is designed and tested as Class A equipment specified in CISPR:11. In domestic situations, this machine may cause radio interference and protective measures shall be taken;

c) It is recommended to evaluate the electromagnetic environment before using the machine;

d)It is prohibited to use this machine near strong sources of radiation (such as unshielded video sources), otherwise it may interfere with normal operation of this machine.

Product Description

1. Expected application

This product is a sophisticated laboratory instrument suitable for culture of biological cells, tissues and bacteria used for biological experiments,which are widely used in the hospitals; research laboratories; microbiological laboratories; sanitary-epidemiological surveillance service. It adopts a fuzzy PID control algorithm to precisely control all parameters in the incubator to maximize the culture success rate and culture efficiency of biological cells and tissues. There are no absolute contraindications to the product.

⚠Caution The incubator must not be used for any purpose other than the expected function.

2. Product categories

This series of products is an directly-heated incubator.

3.Parameter control

The product is used to provide a culture environment with temperature range of ambient temperature+3℃ ~ 55 ℃ , CO_2 concentration range of 0 ~ 20% and relative humidity of > 90%. It adopts a computer control for the temperature parameters and CO_2 concentration parameter with a digital display. The temperature display accuracy is 0.1 ℃ and the CO_2 concentration display accuracy is 0.1%.

4.Product structure

•The incubator body adopts table-type frame structure; the control circuit and the gas path are installed behind the CO_2 incubator, and the main power switch is set at left side facing to the incubator body; the 7-inch color touch screen is installed on the front of the CO_2 incubator door;

•The bottom of the working chamber adopts a water basin design, you can directly inject water into the inner container by utilizing the inclined structure with high outer portion and low inner portion;

•The temperature control circuit is controlled by a microcomputer and is equipped with functions such as automatic regulating characteristics and over temperature alarm. The incubator adopts highprecision temperature sensor which greatly improves the control accuracy and reliability; besides, it is also equipped with RS485 communication interface which making it possible to realize remote control;

•The cabinet is built with a dual-door structure. The outer door is equipped with heating function to ensure that there is no condensation on the inner glass door, making it convenient to observe the product. At the same time, there is a door contact switch installed on the body behind the glass door. When the glass door is opened, this switch can automatically close the CO_2 solenoid valve and turn off the fan provided for the gas circulation device, to avoid waste of CO_2 or increase the indoor CO_2 concentration caused by release of CO_2 into the air;

•Double-layer medical grade silicone sealing strip is used to ensure product sealing performance;

•For the convenience of users, there is a CO_2 monitoring port on the glass door of the CO_2 incubator for monitoring the CO_2 concentration during use.

5.Safety system

•Multiple fault alarms: high/low temperature alarm, over temperature alarm, high/low CO2 concentration alarm, and door closing delay alarm;

•Multiple alarm modes: buzzing alarm, touch screen display alarm;

•All individual components are safely grounded.

6.CO_2 concentration acquisit

The new type 190 ℃ high temperature infrared (IR) sensor is based on the NDIR measurement principle and adopts silicon MEMS emitter instead of conventional light source, and is able complete more than 300 dry heat sterilization cycles. Its service life is up to 15 years.

7. Pollution control system

•There is a microbial high-efficiency filter is installed at the front end of the gas path, and the gas will be filtered through it before entering the incubator to ensure the purity of CO_2; the high-efficiency filter is placed outside the electric cabinet for easy replacement;

•There is a stainless steel sintered filter element installed on the back of the working chamber to ensure that the gas inside the incubator is filtered before penetrating into the chamber;

•Dry heat sterilization at 180 ℃ : Maintain the temperature of 180 ℃ for at least 1.5 hours. The entire sterilization process takes only 12 hours from warming to cooling.

8.Humanized design

•Friendly touch-operated interface allows a sensitive response to finger movements with rubber gloves;

•Announcement design, paperless office message notepad function, and safety operation mode;

•The four corners of the liner is large arc-shaped, and the integrated stamping structure ensures complete cleaning without dead spaces;

•Convenient drainage design;

•Integrated anti-skid shelf design; adjustable horizontal feet;

•Large capacity data storage with 15 years of data traceability.

We apology for the differences between the Haier CO_2 incubator you received and the diagrams in the user manual due to product improvement. The contents of this manual are subject to changes without notice.

Product Installation

Product unpacking and handling

• Use a suitable unpacking tool such as scissors or wallpaper knife to cut the packing strap, Lift the outer box vertically and move it horizontally; after that, check that if the accessories are complete.

⚠Caution Avoid collision and scratches on the exterior of the incubator. For the sake of safety, please have at least two adults for unpacking

• Since the incubator body is heavy, please choose suitable mechanical handling tools.

⚠Caution For manual handling, be sure to have four adults (at least two) to lift the incubator vertically with hands holding the bottom of the incubator, and then move it horizontally to the position where the incubator is to be stored. Do not apply pressure on the outer door of the incubator during handling. The door body may be damaged.

Installation environment

- Ambient temperature: 18 °C ~ 32 °C;
- Ambient humidity: ≤ 80% Rh;
- Atmospheric pressure: 86kPa~106kPa;
- Indoor use;
- Installation environment must be free from dust, vibration and corrosion gas;
- Avoid direct sunlight or sources of cold and heat;
- Make sure no corrosive substances or high concentration of dust around the incubator;
- Power voltage: Within rated voltage±10%;
- Voltage frequency: 50Hz.
- Altitude of the working position of the box:below 2000m.
- Pollution Degree:2.
- The transient state is Category II facility (overvoltage category).
- The safety of any system incorporating the equipment is the responsibility of the assembler of the system.

⚠Warning • The operation of the incubator requires CO_2 gas flow. Excessive CO_2 can be harmful to health. Therefore, the installation position shall have good ventilation condition so that the exhaust gas from the rear wall can be quickly removed.

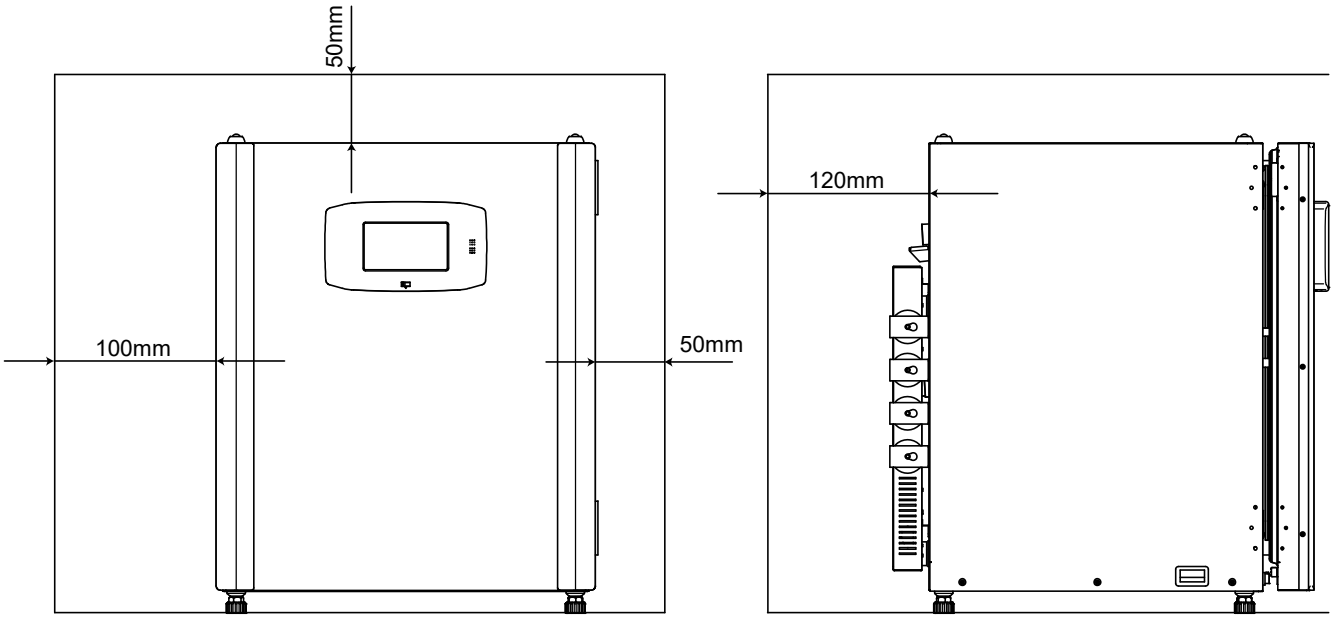
• The incubator shall not be placed in a place without a ventilation system. If there are several incubators in the same room or the incubator is placed on the bottom layer of the laboratory, an auxiliary ventilation system is recommended.

⚠Caution The expected performance of the incubator cannot be guaranteed when it is not used in the specified environment.

Spacing

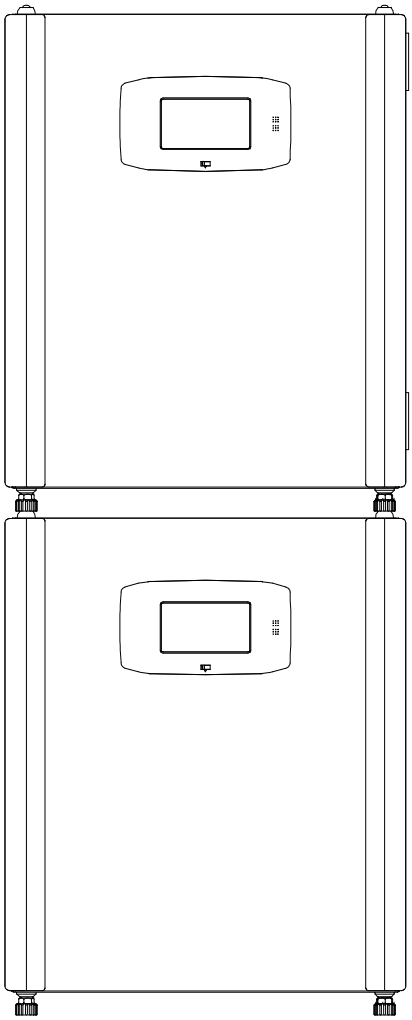
•The incubator must have a space from the adjacent wall/object, as shown in the figure below.

⚠Caution Do not block the pressure compensation hole on the rear wall. Do not place the incubator in any position where it is difficult to operate the disconnect device.



Stack installation

The incubator has stack feet to stack two incubators together. The 4 stack feet are fixed together with built-in mechanical screws.



Installation and connection of gas source

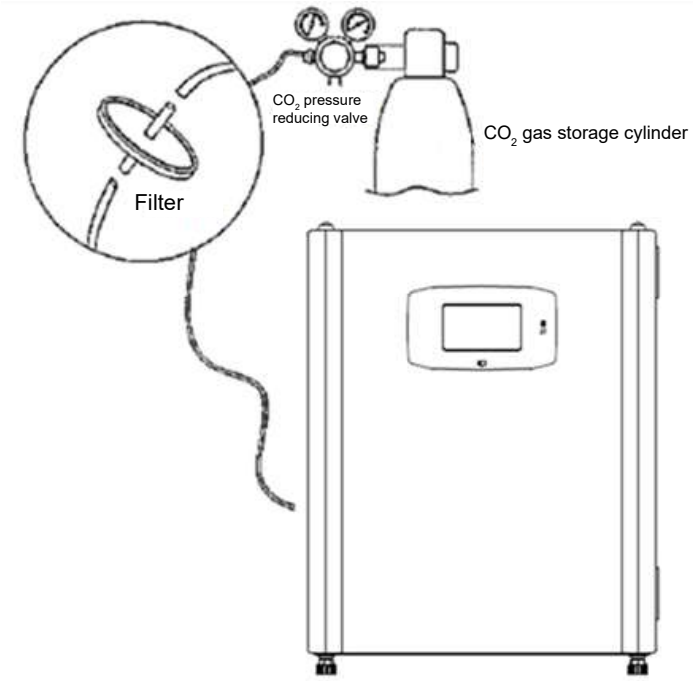
• The corresponding interface is provided on the side of the electric cabinet on the back of the incubator. There is hose supplied with the incubator. The gas entering the incubator must first pass through the pressure reducing valve to reduce the output pressure to 1.0 Bar ± 0.2 Bar. The pressure reducing valve needs to be provided by user.

• From the perspective of technical safety, the output pressure may vary within the range of 1.0 Bar ± 0.2 Bar.

Caution The pressure reducing valve is not a standard accessory for the incubator. Users may purchase it through standard channels. Please choose pressure reducing valves with stable quality, high resolution and stable pressure regulation performance. For assistance, please contact Haier or agencies designated by Haier for technical support.

CO_2 gas source connection

•Connect the gas cylinder with the pressure reducing valve, and then connect it to the incubator, as shown below:



Caution •The CO_2 gas storage cylinders are provided by the user. The user may decide to use an individual cylinder for gas supply or central gas supply. Safety use of CO_2 gas storage cylinders and of central gas supply shall be operated in accordance with relevant national standards.

•The CO_2 gas filter can filter out particles of 0.2 um and greater with a filtration efficiency of more than 99.99%. It can withstand pressure of more than 3.5 Kg/cm^2. If any questions, please contact Haier or agencies designated by Haier for technical support.

Warning The gas purity shall be at least 99.5%. Do not use CO_2 cylinders with carts.

Connection of the main power supply

•Before connecting the main power supply, ensure that the power matches the power requirements indicated on the nameplate. The requirements of the power supply for the incubator are:

Power voltage: AC 220-240V~;

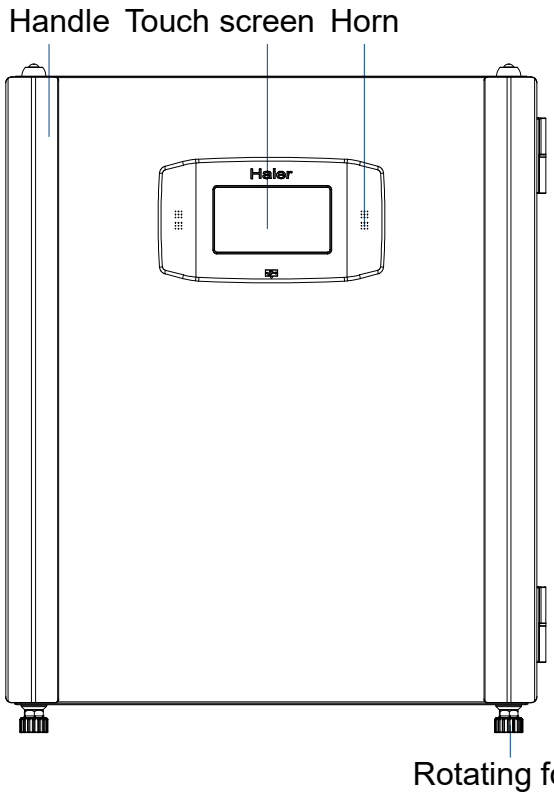
Voltage frequency: 50Hz±1Hz;

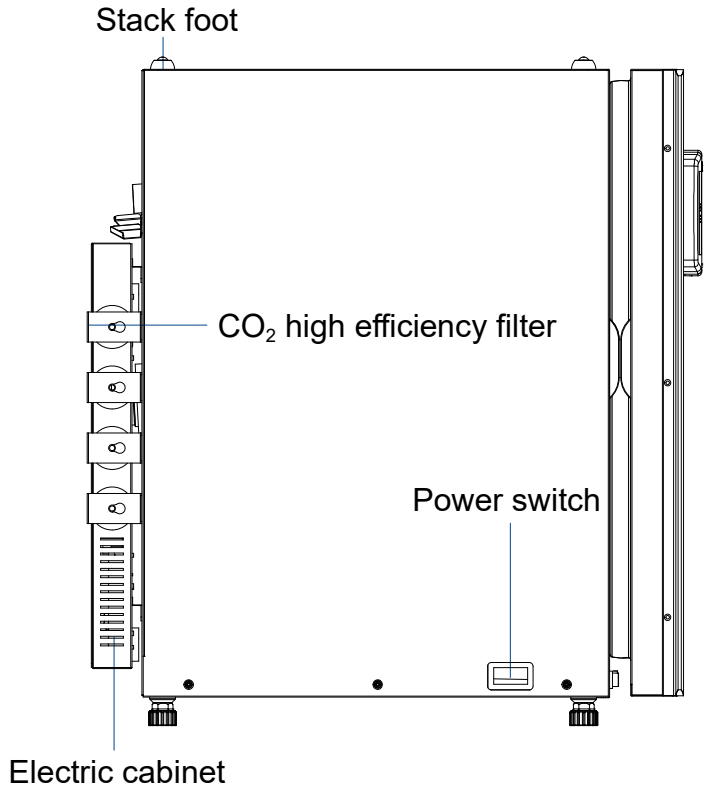
•The accessories of the incubator include a power cable for grounding. Plug the quick connector of the power cable into the lower right interface (facing the incubator) of the electric cabinet on the back of the incubator.

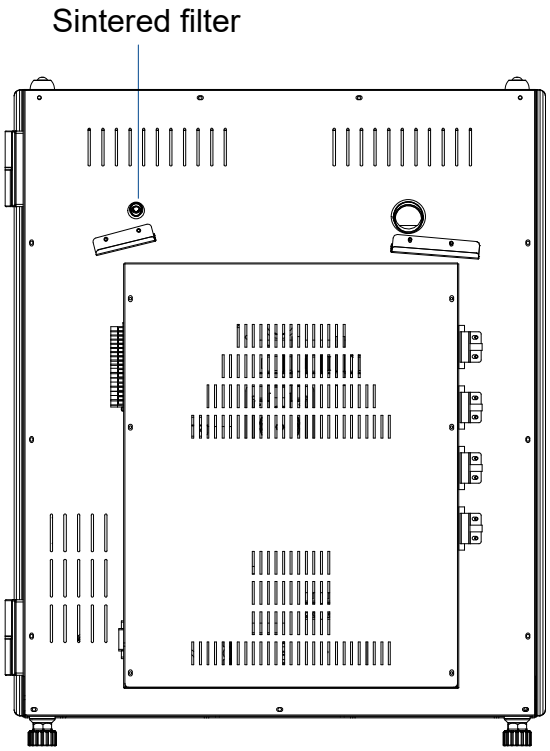
⚠Warning Make sure that the power cable is connected in place. The power cable connector has a self-locking structure. The main power supply unit shall be well grounded. Make sure that the power cable of the incubator is properly grounded after connection.

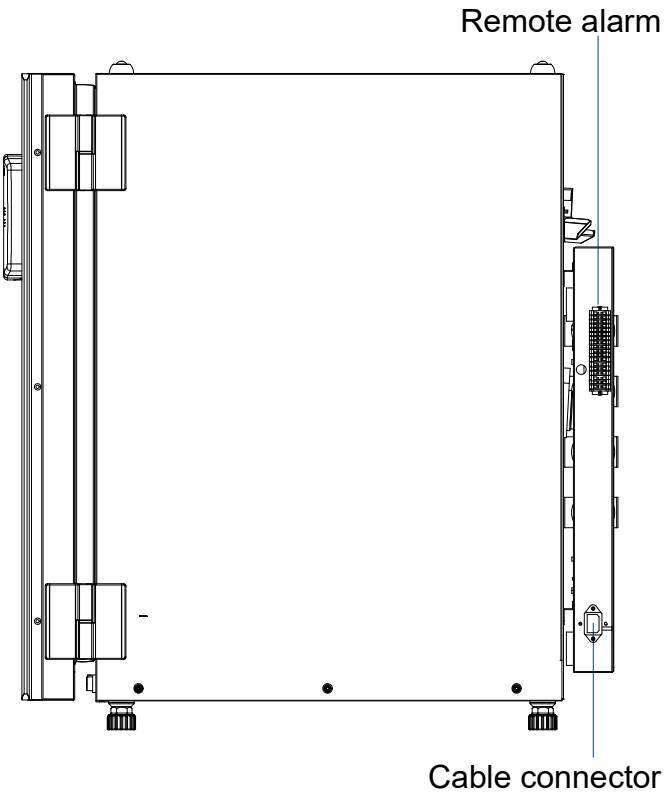
Description of Parts • Control Panel

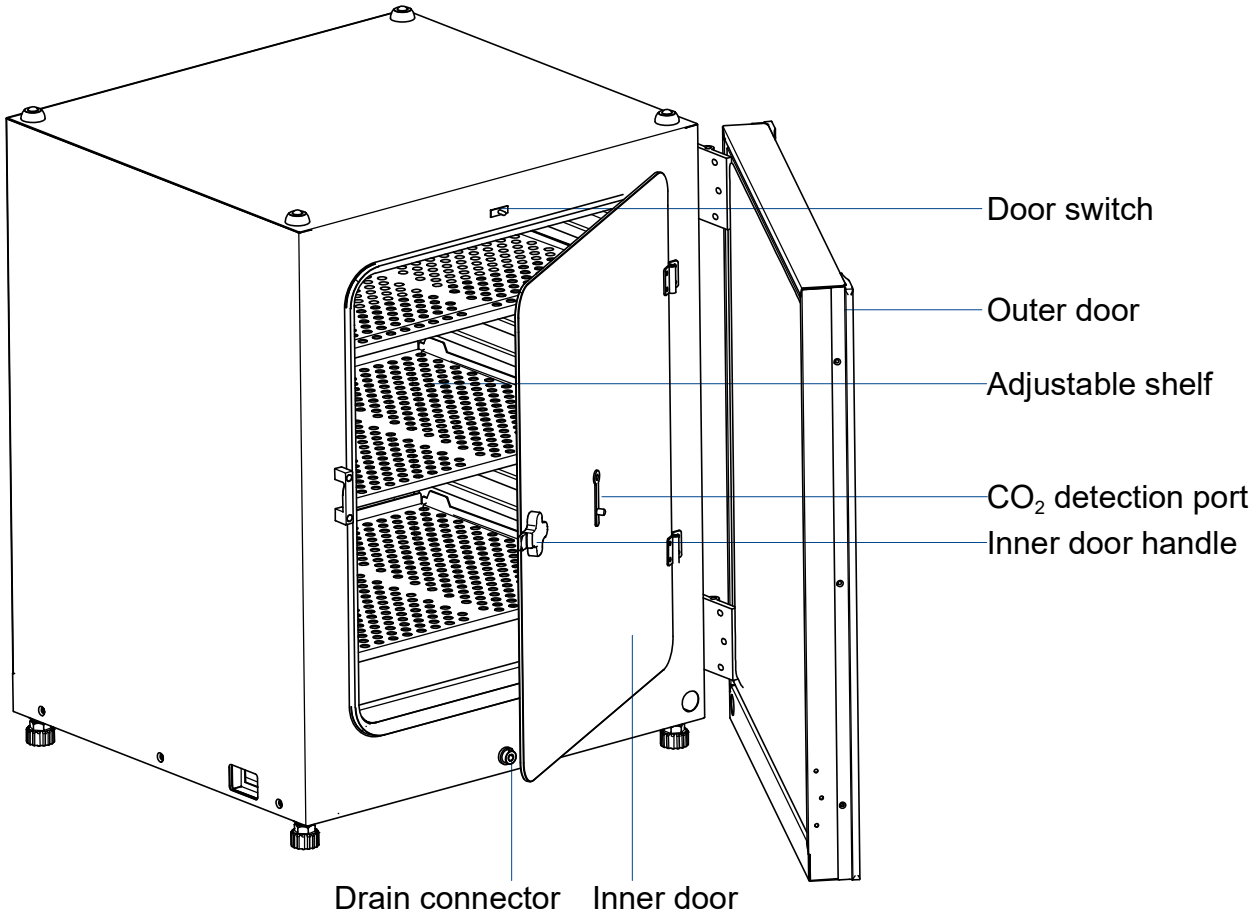
Description of Parts



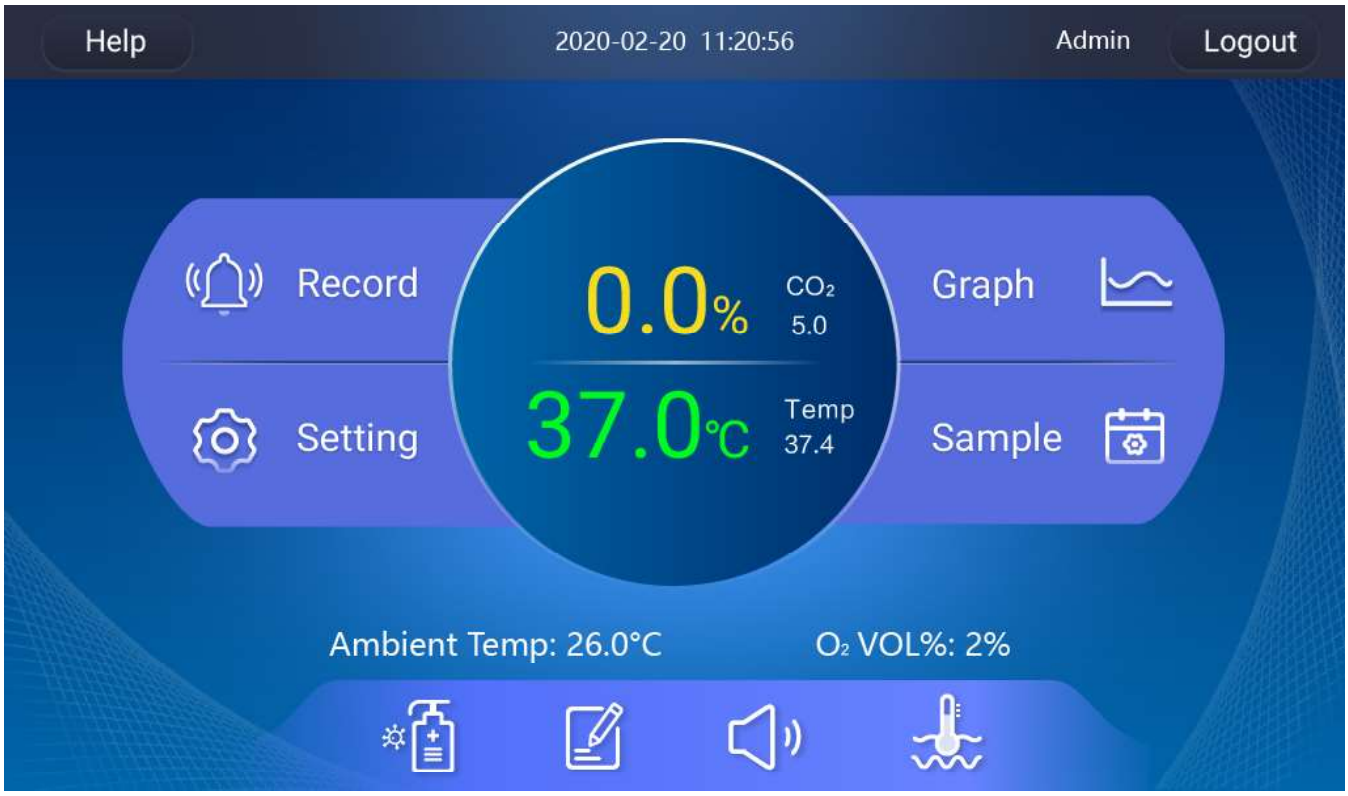








Control panel



Commissioning and application

Preparation before use

• The ambient temperature in the placement area of the incubator shall be at least 3~5 °C lower than the control temperature;

• Always keep the outer door and the glass door opened;

Use distilled water

• Inject distilled water into the reservoir (close to room temperature) and make sure the volume is lower than the maximum limit of the bottom reservoir;

• Avoid overflow during water injection;

⚠Caution Water quality requirements: In order to ensure trouble-free operation of the incubator, use sterile distilled water or equivalent water with the same quality level as sterilized and distilled water. The acceptable conductivity shall be within the range of 1~20 μs/cm. (The resistivity shall be within 50 kΩ ~ 1 megohm).

Open the pressure regulating valve on the CO2 gas storage cylinder

Before operation, confirm the output pressure of the low-pressure gauge is set properly. Open the master valve of the cylinder counterclockwise. Observe the reading of the high-pressure gauge and record the total C02 pressure in the high-pressure cylinder. Adjust the regulating screw clockwise to open the low-pressure valve. Rotate the pressure regulating screw of the low-pressure gauge clockwise to compress to open the valve. The high-pressure gas at the inlet is depressurized. The low-pressure gas flow enters the working system through the outlet. The pressure of low-pressure output gas shall be 1.0 Bar±0.2 Bar.

⚠Caution Please carefully observe or look up the instructions of the pressure reducing valve to determine the regulating direction. Adjust the low-pressure adjusting knob properly for a proper gas flow output to prevent a potential damage of the high efficiency filter.

Power on

• Connect the main power supply;

• Turn on the main power switch;

⚠Caution Presse the main power switch to ensure the power is properly connected.

Initial setting for first power-on

• Language:Select the desired display language;

• Network: Search for the Internet and connect the unit to the wireless network;

• Time:You can set the time manually or synchronize with the Internet time (if connected to the Internet);

• Temperature scale: Select the desired temperature standard °C or °F;

• Mode: Select the desired management mode. In normal mode, anyone can set and view the parameters. In the authorization mode, only the administrator can set the parameters;

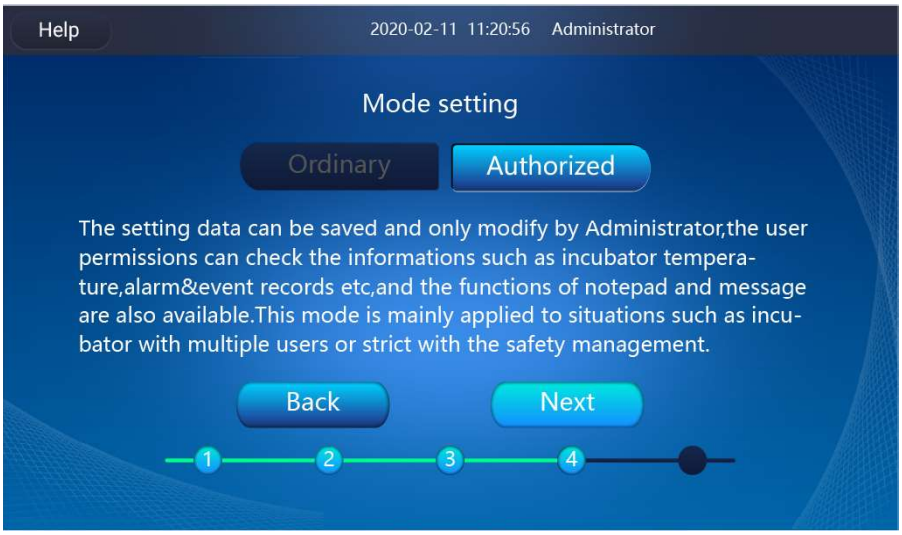
• Password: Set the administrator password for authority management; (Please keep the password in a safe place. Contact Haier for technical support if you forget the password);

⚠ Caution For all display interfaces, the highlighted portion means that it is not selected. Click on it and it will turn black, which means that it is selected.

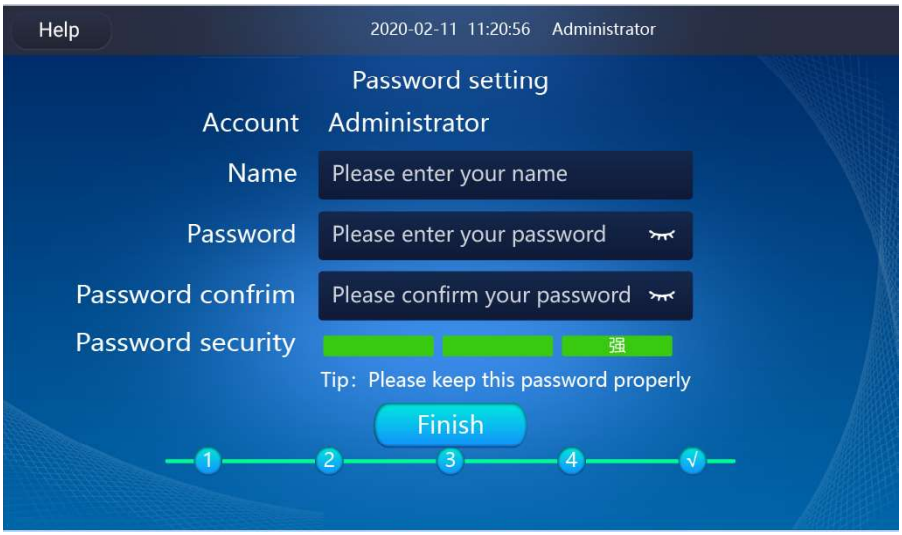
Language selection interface

Network settings interface

Time and temperature setting interface



Mode setting interface



Password setting interface

Home page

After completing the initial setup, enter the home page of the display screen.

1. Operation record: Time record and alarm record generated during operation of the incubator;

2. Operation data: Parameter and operation curve of the working chamber during operation of the incubator;

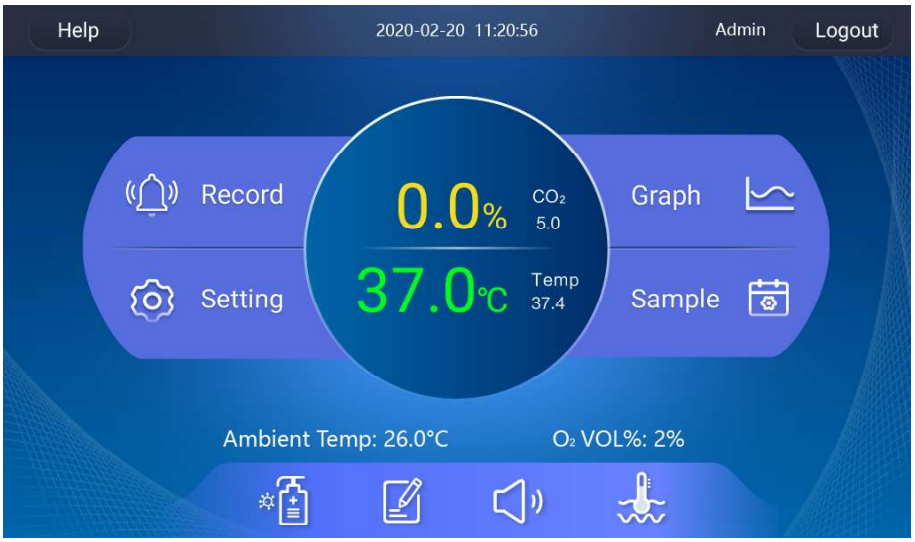
3. Setting: Basic settings of the incubator;

4. Level: Water level display of the incubator, white for normal and red for water shortage;

5. Sterilization: Click  to enter the sterilization setting;

6. Mute: Click  to clear the buzzing alarm (the buzzing alarm continues when the set time is over);

7. Message, notepad and announcement: Click  to enter the message, notepad and announcement interface.



Home page

Parameter settings

Users can set parameters in two ways:

• Directly click the display parameter on the home page to enter the corresponding parameter settings interface;

•Click the setting icon to enter the setting interface, and then select the culture condition setting to enter the corresponding parameter setting;

The default setting temperature is 37.0 °C and the CO_2 concentration is 5.0%.

Culture condition setting interface

Basic settings

Click on the home page to enter the setting interface, and you can set the language, time and alarm volume of the incubator by clicking the basic settings.

•Change language: Select the appropriate language in the drop-down menu;

•Time setting: Set the time in the drop-down menu;

•Alarm volume: In the event of an alarm, it can be used to adjust the alarm volume of the buzzer;

•Operation mode: Select normal mode or authorization mode according to your specific needs;

•Buzzing alarm delay time: In the event of a buzzing alarm, click the mute button on the home page; if the alarm source still exist when the buzzing alarm delay time is over, the buzzing alarm will continue;

•Key volume: It can be used to adjust the key volume;

•Screen brightness: It can be used to adjust the display brightness of the screen;

•Screen sleep: It is suggested to set the screen sleep time according to the service time, so as to extend the touch screen's service life;

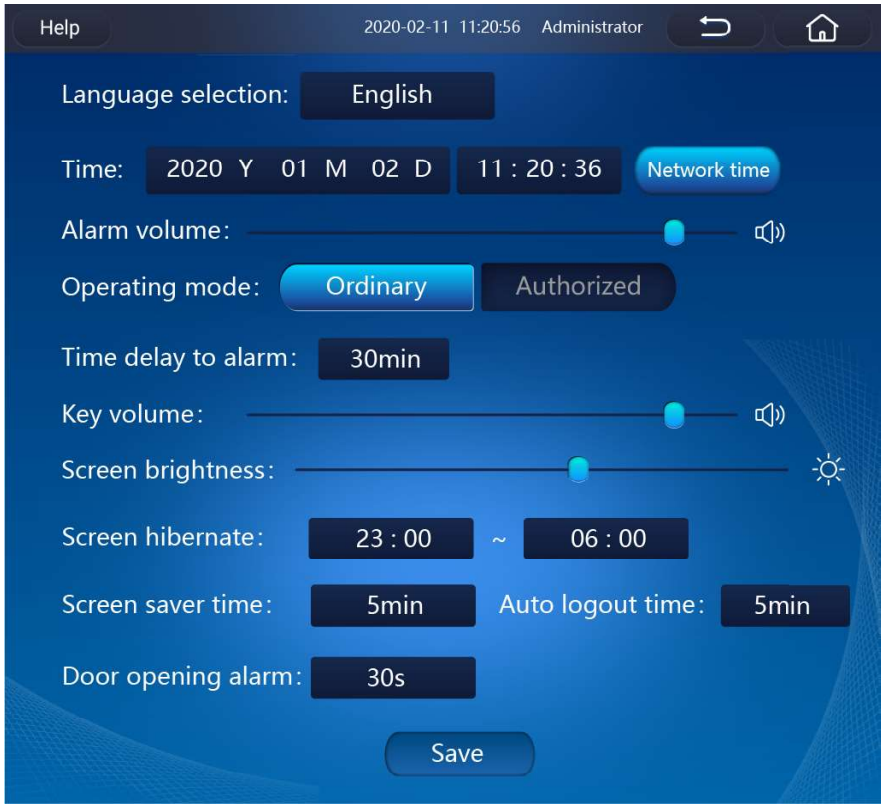
•Lock screen period: If no operations in the lock screen period, the screen will enter the sleep state.

•Door opening alarm:It can be set how long after the door is opened to alarm

⚠Caution

•All changes will take effect after being saved by clicking.

•When creating a new user, you need to enter the card number and contact information. The card number may be the user's job number or other numbers.



Message, notepad, announcement

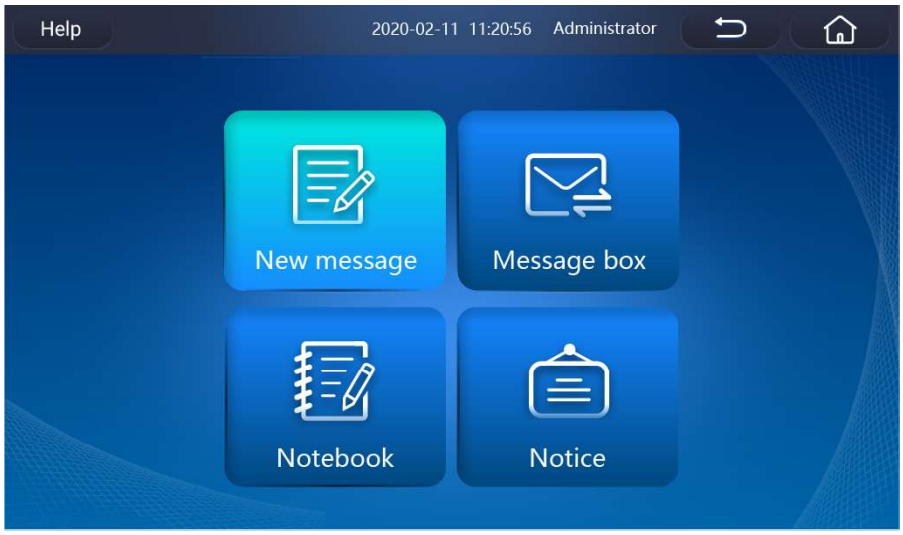
Click on the home page to enter the message, notepad and announcement interface.

•New message: Different authorized users can send messages by creating a new message;

•Message box: After the user logs in, if there are unread messages, the number of unread message will be highlighted on the home page icon, and the number of unread messages will be highlighted at upper right corner of the message box;

•Notepad: It is used for recording. In normal mode, the notepad is open for view by anyone. In authorization mode, the logged user can only see his/her own records;

•Announcement: It is used for multiple users. You can post the matters that you want to remind the other users to the home page. When clicking the screen in sleep mode, the announcement interface will be displayed first, and then you may enter the home page.



Alarm

Alarm type

Alarm type	Phenomenon	Alarm Indication	Buzzer alarm
High temperature alarm	temperature alarm Internal temperature > set temperature +0.5 °C or the set limit	Display of parameter in red	Pulse sound alarm
Low temperature alarm	Internal temperature < set temperature -0.5 °C or the set limit	Display of parameter in red	Pulse sound alarm
Over temperature alarm	Internal temperature > over temperature protection limit	Display of parameter in red	Pulse sound alarm
High concentration alarm	Internal CO_2 concentration > set concentration +0.5% or the set limit	Display of parameter in red	Pulse sound alarm
Low concentration alarm	Internal CO_2 concentration< set concentration -0.5% or the set limit	Display of parameter in red	Pulse sound alarm
Door opening alarm	The door is opened for more than 30s	Alarm flashes during the set alarm time	Giving pulse sound alarm within the set alarm time
Sensor fault	Fault of the ambient temperature sensor	Flicker alarm	Pulse sound alarm
	Fault of the temperature sensor	Flicker alarm	Pulse sound alarm
	Fault of the CO_2 concentration sensor	Flicker alarm	Pulse sound alarm

Alarm restore

This series of incubators has automatic alarm restore function:

•In the case of an alarm, press the mute button  on the main interface to stop the buzzer alarm;

•If the alarm condition still exists, the buzzer alarm will automatically restore after the buzzer alarm delay time is over.

Cleaning and sterilization

Cleaning

Some parts of the incubator are made of plastic. Solvents will dissolve plastics. Strong acid or corrosive solutions will embrittle plastics.

Do not use hydrocarbon-containing solvents, solvents with alcohol content of more than 10% alcohol, strong acids or corrosive solutions to clean plastic parts and surfaces.

Do not spray cleaning agents or other liquids onto the touch screen and the back electric cabinet of the incubator. During wiping, make sure no moisture enters the electrical components.

If any questions about the compatibility of disinfectants or cleaning agents with the equipment components or the materials in the equipment, please consult Haier or agencies designated by Haier.

1. Cleaning of the outer surface
   - Use warm water and detergent solution to thoroughly remove dirt residue and sediment;
   - Wipe the surface with a clean cloth and water;
   - Dry the surface thoroughly with a clean cloth.
2. Cleaning of the display screen
   - Clean the display screen with a dry cloth of 100% microfiber!

⚠Caution Do not spray or wipe up the display with detergent.

Disinfection and sterilization

1.Pollution control process

In the process of using, the user needs to develop a corresponding pollution control process that is compatible with the incubator in accordance with the following requirements.

- Wiping/spraying disinfection: Standard manual disinfection control procedures for the incubator and accessories;
- Dry heat sterilization procedure: The incubator can automatically operate the dry heat sterilization procedure.

2. Preparation before disinfection and sterilization
   - Take all the samples out of the working chamber and store them in an appropriate area;
   - Remove the HEPA filter (if any) from the working chamber;
   - Prepare a container with sufficient capacity for drainage;
   - Place the open end of the drain hose directly into the drain container, and insert the quick connector at the other end into the drain valve at the lower part of the incubator;
   - The reservoir will start to drain until no water flows out;
   - Wipe up any remaining water to ensure no water inside the incubator.

3.Wiping/spraying disinfection

Manual wiping / spraying disinfection can be divided into three stages:

• Pre-sterilization

Wipe up/spray disinfectant on the inner surface of the working chamber;

Disinfect the interior of the working chamber and the shelves thoroughly with disinfectant as required by the disinfectant manufacturer.

• Washing

Use warm water and detergent solution to thoroughly remove dirt residue and sediment;

Wipe the surface with a clean cloth and water;

Drain the water in the reservoir;

Dry the surfaces of the working chamber and shelves thoroughly with a clean cloth.

• Final disinfection

Wipe up or spray disinfectant the removed shelves and air duct plate according to the manufacturer's requirements;

Wipe up the surface of the shelves and air duct plate with a clean cloth;

Reinstall the shelves and air duct plate.

⚠Caution Do not spray disinfectant to the air intake (at bottom of the CO_2 sensor) of the back CO_2 concentration sensor.

⚠Warning Disinfection with alcohol!

a) The disinfectant of which the alcohol content is higher than 10% may form flammable and explosive gas mixture when mixing with air;

b) Avoid using such disinfectants in open flame or high temperature environments during disinfection;

c) Use such disinfectants in space with a good ventilation condition;

d) After completion of disinfectant reaction, wipe up the disinfected parts;

e) Follow safety regulations to avoid fire and explosion hazards.

⚠Caution Chlorine-containing disinfectant!

Chlorine-containing disinfectants will corrode stainless steel.

Use only disinfectants that will not corrode stainless steel.

⚠Warning Electric shock!

Touching current-carrying parts may lead to life-threatening electric shock.

Disconnect the incubator from the power supply before cleaning and disinfecting!

a) Shut down the incubator with the power switch;

b) Unplug the power cord to avoid accidental connections;

c) Be sure that the incubator is powered off.

Warning Health hazard!

The surface of the working chamber may be contaminated. Contact with contaminated cleaning fluid may cause infection. Disinfectants may contain hazardous substances.

Always observe the safety instructions and hygiene regulations during cleaning and disinfecting!

a) Wear safety gloves;

b) Wear safety goggles;

c) Wear masks and other oral cavity respiratory protective devices to protect your mucosa from stimulation;

d) Observe the safety instructions of the disinfectant manufacturer and the health authority.

Sterilization operation

This series of incubators is equipped with 180°C dry heat sterilization function. The sterilization method and sterilization effect comply with WS/T 67-2012 medical institution disinfection technical specifications. It can kill all microorganisms, including bacterial spores, and reach the sterility assurance level.

The whole process of sterilization can be divided into three stages: heating stage (about 2h), continuous sterilization stage (about 1.5h) and cooling stage (about 8h). Before sterilizing, reinstall the sterilized air duct plate and shelves onto the incubator, connect the power supply and turn on the power switch.

1.The user can enter the sterilization procedure in two ways:

•Directly click the sterilization icon on the main interface to enter the sterilization procedure;

•Click the setting icon to enter the setting interface, and then click the sterilization icon to enter the sterilization procedure;

Sterilization confirming interface

After entering the sterilization confirming interface, you must follow the prescribed steps to light the start icon.

a) Open the inner door of the incubator for 30s until you hear the alarm sound;

b)Remove all items in the incubator (including but not limited to samples, HEPA filters, etc.);

c) Drain the water from the reservoir and wipe up any remaining water;

d)Close all doors of the incubator and click “Start”.

⚠Caution Prior to sterilization, make sure that the samples and HEPA filter inside the incubator have been taken out, otherwise may cause high temperature damage.

⚠Warning Prior to sterilization, make sure to drain the water in the reservoir and wipe up any remaining water; otherwise, the water inside the incubator will evaporate under high temperature and then generate pressure, while high temperature moisture is harmful to human body;

⚠Caution The sterilization procedure cannot operate in the event of any of the following faults:

a) Sensor damage

b) High actual value

c) Low actual value

d) Unreasonable actual value

e) Wrong communication

f) Water detected

⚠Warning Hot surface, caution!

During high temperature sterilization, the glass door handle, glass door and lining surface of the outer door will become very hot. Do not open the doors before the internal temperature cools down to normal temperature. Wear safety gloves when contacting these surfaces during routine sterilization.

During the sterilization process, opening the inner glass door will pause the sterilization. An alarm will prompt the user to decide how to continue.

Sterilization ongoing interface

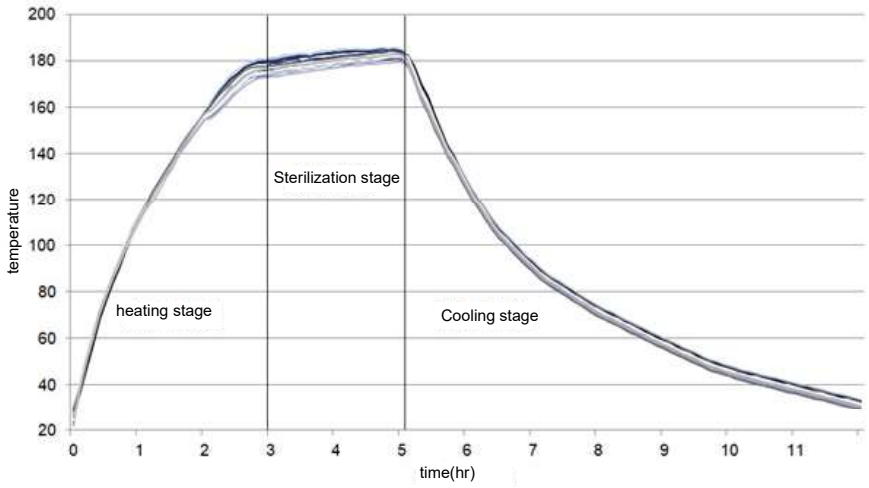
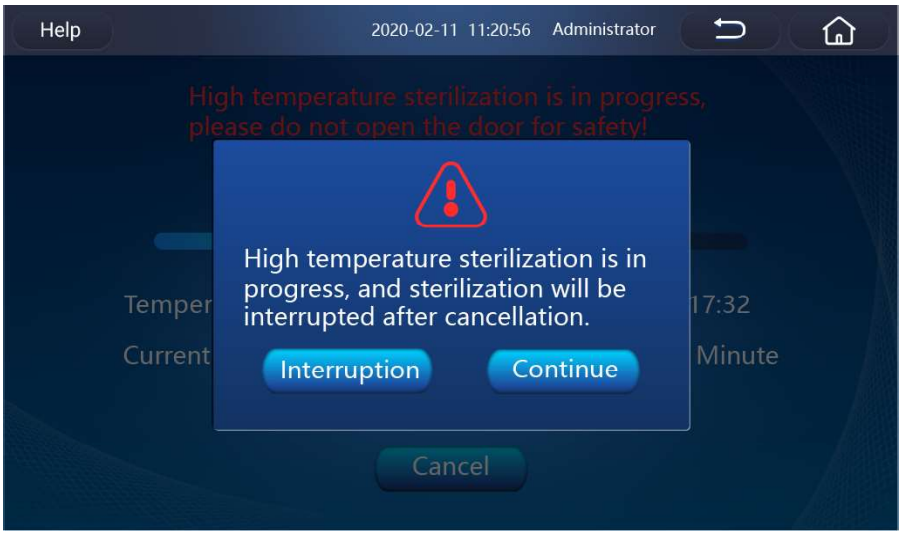


Diagram of the dry heat sterilization stage

2.Cancel sterilization

During the sterilization process, press the “Cancel” button. A cancel sterilization dialog box will appear. When clicking “confirm to stop”, it will return to the “Settings” interface. The sterilization stop warning dialog box will pop up. When clicking the “Continue Sterilization”, it will return to the sterilization interface.



Sterilization cancel interface

• Sterilization pause

a) Door opening and loss of power cancel the process of sterilization. If the door is closed or the power is recovered, a dialog window for sterilization appears on the screen to prompt the user for action to abort the process or to continue. The temperature displayed in the dialog window is the real time temperature in the incubator.

b) An alarm will also sound along with the sterilization pause warning dialog box. Click any position on the screen, the alarm will be canceled while the sterilization stops warning dialog box stays. Once the incubator resumes to the set temperature, the sterilization pause warning dialog box will automatically be canceled.

Sterilization stop interface

3.Sterilization finished

When the temperature in the incubator is decreased to the set temperature, it will display that sterilization is finished. The user needs to manually press “Finish” to end the sterilization operation, and then it will back to the main interface.

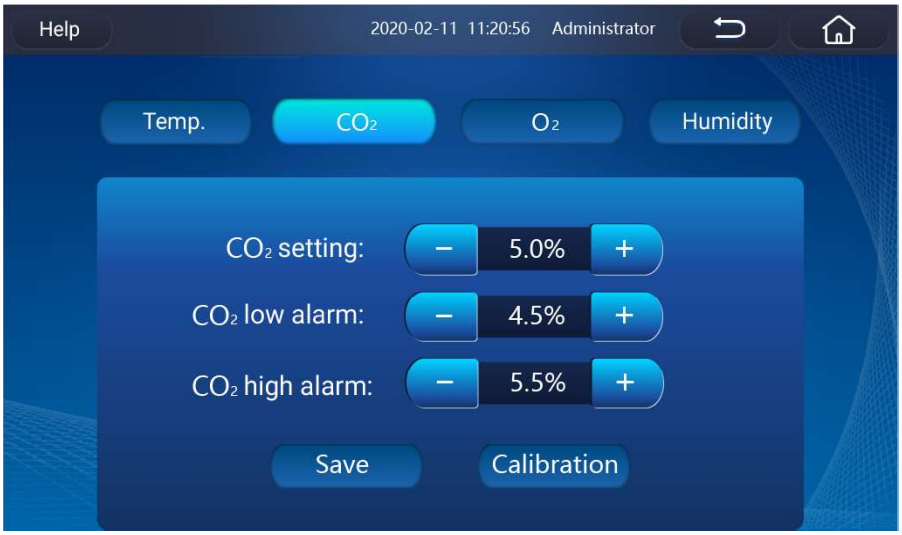
After finishing sterilization, operate by following the steps below:

- Open the outer door and inner door of the incubator;
- Refill with water;
- Install the HEPA filter (if any);
- Close all doors.

Sterilization completion interface

CO_2 concentration calibration

This series of incubators use a state-of-art infrared (IR) sensor rated at high temperature of 190°C. You can calibrate the sensor by entering the CO_2 concentration in the setting interface and click parameter calibration.



CO_2 concentration setting interface

Parameter calibration can be classified as:

1.Air calibration

Ensure good ventilation before calibration - low CO_2 concentration is required. Ensure the maximum ventilation volume of the indoor ventilation system or open the windows.Open the incubator door and wait for ten minutes. Click the air calibration button.

⚠Caution Keep a minimum count of people in the room as each person will increase the CO_2 concentration. If there are several incubators in the room, it is recommended to use nitrogen for air calibration. You can purchase a standard nitrogen and calibration kits from Haier or agencies designated by Haier.

⚠Warning If the display screen shows that the CO_2 concentration is greater than 0.5% after venting or opening the window for ten minutes, turn off all CO_2 gas supply devices in the room, and perform air calibration again. If the display screen shows that the CO_2 concentration is still greater than 0.5%, use nitrogen for air calibration. You can purchase standard nitrogen and calibration kits from Haier or agencies designated by Haier.

2.Numerical calibration

•Third-party CO_2 concentration detection instrument.

Place the third-party detector probe at the center of the incubator;

Close all doors of the incubator and set the CO_2 concentration value. Ensure the tightness of the entire incubator, including the cord hole on the back.

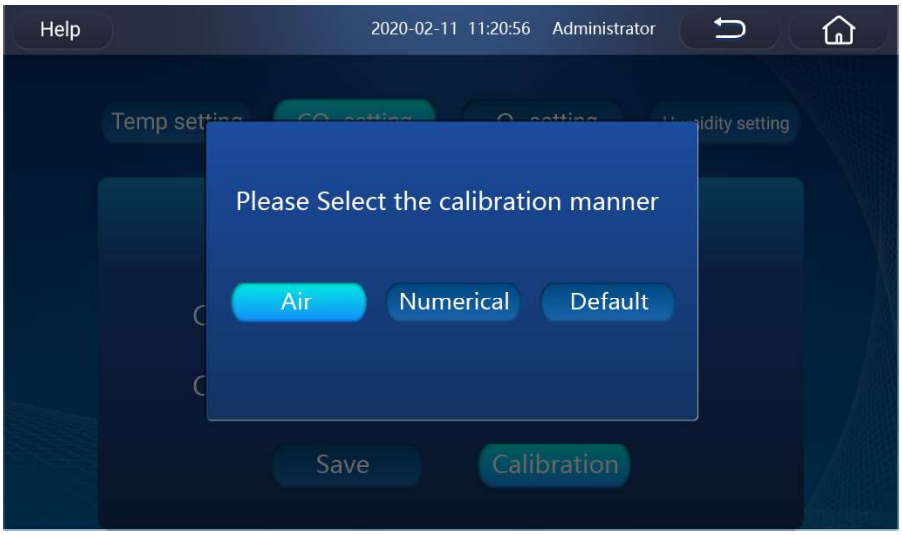
After achieving stable operation, directly input the value displayed on the third-party detector into the numerical calibration for saving.

•Standard gas calibration

Calibrate with the standard concentration CO_2 gas calibration kit supplied by the Haier or agencies designated by Haier. Input the standard concentration input directly for saving. Please refer to the kit instructions for the operation process.

3.Restore default

Restore the factory settings of the CO_2 sensor.



Calibration interface

Periodic maintenance

The expected service life of this series of incubators is 10 years. Please follow the periodic maintenance recommendations below within the expected service life:

•Conduct a routine inspection on the incubator once a year to ensure the operation accuracy and safety of the incubator. Each set of incubator has gone through a strict factory commissioning and inspection process to ensure high-precision culture environment parameters. If you want to keep the incubator operate at the highest accuracy, please contact Haier's engineer;

•The users need to complete the following inspections once a week:

a)Check the water level of the reservoir and replenish it if necessary; there is a low water level alarm display on the screen;

b)Check if the air supply input pressure is adjusted to 1.0Bar ±0.2Bar;

•Regularly replace the high-efficiency filter at the CO_2 inlet (the recommended replacement period is 12 months).

⚠Warning Be sure to cut off the gas supply before replacing the high efficiency filter at the air inlet. After the replacement, check the connection conditions, including whether the hose is inserted in place and whether the clamp is tightened, to ensure that there is no air leakage.

• Regularly replace the HEPA filter (if any), and recommended replacement period is 6 months. The user can determine the replacement period according to the actual situation;

• During normal use, please check the vent line for air leakage at regular intervals if the gas consumption is large. If any problem, please inform Haier or agencies designated by Haier for maintenance and replacement;

• During normal use, please check the water level of the reservoir at regular intervals and add or replace distilled water in time. If any water leakage or water seepage of the reservoir is found, please inform Haier or agencies designated by Haier for maintenance and replacement;

• During routine maintenance and repair, only Haier or agencies designated by Haier is allowed to inspect or provide the parts for maintenance of the incubator;

• Before informing the maintenance engineer, please clean and disinfect the incubator first;

• Haier reserves the right to update and improve incubator designs.

Q&A

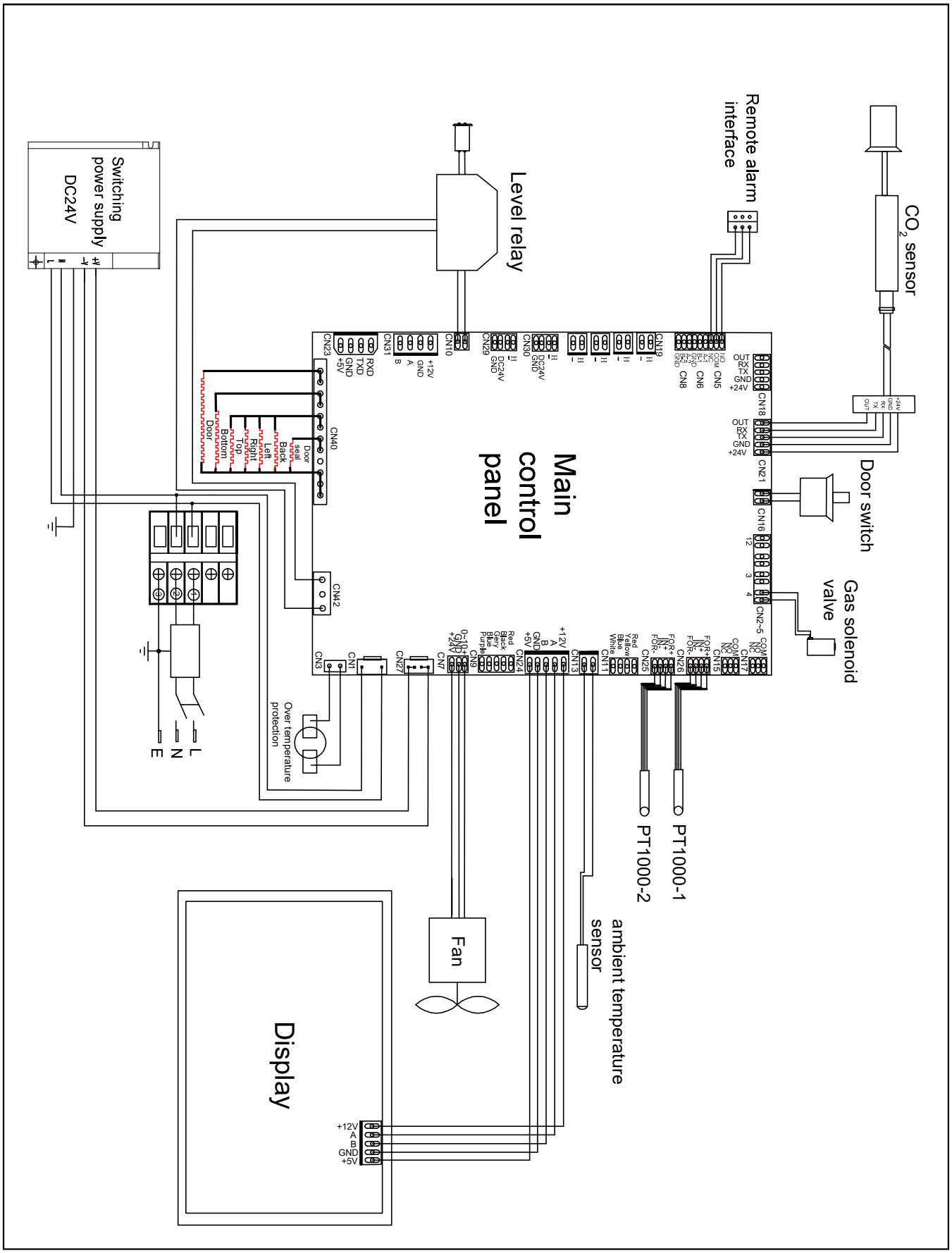
Any questions during use? Suspect that the incubator has fault? Please check here first. This chapter provides answers to various possible faults and solutions.

If the problem is still not solved after operation, please call for Haier after-sales service.

Do not disassemble the incubator by yourself.

Fault	Troubleshooting
The incubator does not work	The power switch is ON and the cable is plugged in place
	Are the plug and the socket poorly connected
	Is the input power available
The incubator does not heat	Check the settings
The incubator does not intake air	Check if the air supply is connected
	Check if the pressure relief valve is opened
	Check the settings
Large amount of condensed water on the glass door	Check if the outer door is closed

Circuit diagram



Specification • Packing List

Specification

Classification	Name	HCP-80	HCP-168	HCP-258
Structure	Volume（L）	80	170	258
	Internal material	304 stainless steel		
	External material	Powder coated zinc plate		
	External interface	35mm diameter		
Dimension	Product dimension (Width × Depth × Height) mm	625x684x735	714x812x887	794x867x985
	Dimension of the working chamber (Width × Depth × Height) mm	400×420×490	490×560×650	570×610×745
Shelf	Shelf dimension (width × depth) mm	380×300	473×434	550×484
	Quantity: standard / maximum	3/7	3/11	3/13
	Structure	Perforated,adjustable		
Temperature parameter	Temperature control range (°C)	Ambient temperature +3~55		
	Temperature fluctuation (°C)	±0.1		
	Temperature uniformity (°C)	±0.3		
	Type of temperature sensor	PT1000		
CO_2 parameter	CO_2 control range	0~20%		
	CO_2 control error	0.1%		
	Type of CO_2 sensor	IR		
Humidity	Humidity control range	> 90%rh		
Noise		45 dB(A)	47 dB(A)	49 dB(A)
Electrical parameter	Power supply	220-240V~/50Hz		
	Power (W)	900	1400	1600
Expectedservicelife/Productiondate		10 years /Refer to the product barcode		

Note: The sterilization power is the maximum rated power; product parameters due to improvements are subject to changes without prior notice.

Packing List

Name	HCP-80	HCP-168	HCP-258
Shelf	3	3	3
Power cord	1	1	1
Drain pipe + drain connector	1	1	1
Intake pipe	1	1	1
Intake pipe joint	1	1	1
Intake pipe clamp	2	2	2
User manual	1	1	1
Plastic bag	1	1	1

Certificate of Quality

Checker:

Qingdao Haier Biomedical Co.,Ltd.
Address: Haier Industrial Park, Economic Technology Development Zone, Qingdao P.R. China
Web:www.haierbiomedical.com
Revision Date:06/2021
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