本用户手册包含仪器功能和操作过程等，为了确保正确使用仪器，在操作仪器前请仔细阅读手册。请妥善保存手册，以便碰到问题时快速阅读。

This user manual includes the functions and operating procedures of the instrument. To ensure correct use of the instrument, please read the manual carefully before operating the instrument. Please keep the manual properly for quick reading when encountering problems.

开箱检查 Unpacking inspection

用户第一次打开仪器包装箱时，请对照装箱单检查仪器和配件，若发现仪器或配件错误，配件不齐或是不正常，请与销售商或生产商联系。

When the user first opens the instrument packaging box, please check the instrument and accessories against the packing list. If any errors, incomplete or abnormal parts are found, please contact the seller or manufacturer.

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前言 Preface

- 使用须知 Instructions for use.

为了您的安全，本使用说明书中有“电击危险”、“重要内容”等符号提醒您于搬运、安装、运行时，检查仪器安全防范事项，请您配合使仪器使用更加安全。

For your safety, symbols such as "electric shock hazard" and "important content" in this user manual remind you to check the safety precautions of the instrument during transportation, installation, and operation. Please cooperate to make the instrument safer to use.

 电击危险 **Electric shock**	错误使用时，可能造成人身伤亡。 **When used incorrectly, it may cause personal injury or death.**

 重要内容 **Important content**

- 请勿自行拆装更改本仪器装配件和电路。
- **Do not disassemble or modify the assembly parts and circuits of this instrument by yourself.**
- 切勿让本机遭雨淋或受潮，严防水汽侵入机件，以避免失火或电击危险。
- **Do not let this machine be exposed to rain or moisture, and strictly prevent water vapor from entering the components to avoid fire or electric shock hazards.**
- 为更好地保护仪器，建议电源输入端加装断路器。
- **To better protect the instrument, it is recommended to install a circuit breaker at the power input end.**
- 错误使用时，可能造成仪器损坏、功能异常等。
- **When used incorrectly, it may cause damage to the instrument, abnormal functionality, etc.**

安全指引 Safety guidelines

使用环境 Usage environment

 重要内容 Important content
◆ 本仪器正常工作温度范围 5～35℃，湿度范围为 50～80%，过高或过低湿度将严重影响本仪器的电气安全性能。 **The normal operating temperature range of the instrument is 5~35 ℃, and the humidity range is 50~80%. Too high or too low humidity will seriously affect the Electrical safety performance of the instrument.**
◆ 仪器侧面和背面有散热孔部位应留有足够空间且防尘良好，将本仪器远离暖气设备和避免阳光直射。 **There should be enough space left on the side and back of the instrument with heat dissipation holes and good dust prevention. Keep the instrument away from heating equipment and avoid direct sunlight.**
◆ 仪器应避免强磁场和电气火化干扰，附近不应有启动频繁的电机、恒温电热箱等。 **Instruments should avoid strong magnetic fields and electrical ignition interference, and there should be no frequently started motors, constant temperature electric heating boxes, etc. in the vicinity.**
◆ 周围无高浓度粉尘或腐蚀性气体、物质。 **There is no high concentration of dust or corrosive gases or substances around.**

◆ 周围无强烈气流，当周围空气需强流动时，气流不应直接吹到浴槽表面上。 **There is no strong airflow around, and when the surrounding air needs to flow strongly, the airflow should not directly blow onto the surface of the bath.**
◆ 使用与工作温度范围相适应的液体介质，如水、乙醇水溶液或无水乙醇、硅油等都应洁净,无颗粒现象。 **The use of liquid media suitable for the working temperature range, such as water, ethanol aqueous solution, anhydrous ethanol, silicone oil, etc., should be clean and free from particle phenomena.**
◆ 冷凝器出风口位置必须保持通风良好，无物体阻碍空气流通，前后距离在500㎜以上，左右距离在300㎜为宜。 **The position of the condenser outlet must be well ventilated, no objects hinder the air flow, the distance between the front and back is more than 500mm, and the distance between the left and right is 300mm.**

重要内容 Important content

- 电源电压必须与产品铭牌上的电源规格相同。

  The power voltage must be the same as the power specification on the product nameplate.

- 为使仪器可靠工作，防止触电危险，应有良好的接地系统，并配用与电源插头相匹配的插座。

  In order to make the instrument work reliably and prevent electric shock, there should be a good earthing system and a socket matching the power plug.

- 液槽注液后严禁随意搬运仪器或使仪器倾斜，以避免工作介质侵入机件造成危险。

  After the liquid tank is filled with liquid, it is strictly prohibited to move the instrument or tilt it at will to avoid the intrusion of working medium into the machine components, which may cause danger.

仪器使用 Instrumentation

 **电击危险 Electric shock hazard**

- 请从仪器背面连接电源线，用手拿插头插拔电源插头，严禁拖拉电线。严格防止高温、老鼠等损坏电线。

  Please connect the power cord from the back of the instrument and use your hand to plug and unplug the power cord. It is strictly prohibited to drag or pull the wire. Strictly prevent damage to wires due to high temperatures, mice, etc.

- 为避免触电，切勿擅自打开仪器之外壳。

  To avoid electric shock, do not open the instrument casing without authorization.

- 切勿让本机遭雨淋或受潮，严防水汽侵入机件，以避免失火或电击危险。

  Do not let this machine be exposed to rain or moisture, and strictly prevent water vapor from entering the components to avoid the risk of fire or electric shock.

- 倘若水或其它物体意外进入机身内部，请立即关闭电源，并设法待水挥发干或取出异物后再通电使用。

  If water or other objects accidentally enter the interior of the body, please immediately turn off the power and try to wait for the water to evaporate or remove foreign objects before using it.

清洁维护 Cleaning and maintenance

 重要内容 Important content
◆ 清洁前将本机电源拔离供电插座。请用柔软的干布抹拭面板及机身的其它部位。清除污物可用柔软的洁布沾些去污粉或洗洁精，抹净后再用干布加以抹干。小心防止水滴侵入机件或开关、插座等处。 **Before cleaning, unplug the power supply of the machine from the power socket. Please use a soft dry cloth to wipe the panel and other parts of the body. To remove dirt, a soft cleaning cloth can be dipped in detergent or detergent, and then wiped clean with a dry cloth. Be careful to prevent water droplets from entering parts, switches, sockets, etc.**
◆ 请慎防针、钉、硬币、螺丝、螺母等导电体跌入仪器孔口；避免水汽等侵入机件，以防仪器故障。 **Please be careful not to let conductive materials such as needles, nails, coins, screws, nuts fall into the instrument hole; Avoid water vapor and other intrusion into the machine components to prevent instrument failure.**
◆ 禁止强酸、强碱类物品或液体接触仪器。 **Prohibit strong acids, strong alkalis or liquids from coming into contact with the instrument.**

◆ 不要自行拆修本仪器。除更换熔丝管和制冷系统充氟外，本机内部并没有一般用户可自行拆修的部件。发生故障时应由专业技术人员支持进行维修。

Do not disassemble or repair this instrument yourself. Except for replacing the fuse tube and filling the refrigeration system with fluorine, there are no components inside this machine that ordinary users can disassemble and repair on their own. When a malfunction occurs, it should be repaired with the support of professional technical personnel.

安装和操作说明
Installation and operating instructions

仪器安装 Instrument installation

拆卸说明 Disassembly instructions

小心拆卸各部件及将个别附件放在一起，请保留包装箱和所有包装用材料、吸塑等，以备以后再度装运时使用。

Carefully disassemble each component and place individual accessories together. Please keep the packaging box and all packaging materials, blisters, etc. for future shipment.

重要内容 Important content

- 严禁将仪器倒置或使仪器倾斜超过 30 度，违章操作可能导致仪器的严重损坏。

  It is strictly prohibited to invert or tilt the instrument more than 30 degrees, as unauthorized operation may cause serious damage to the instrument.

- 切勿让本机遭雨淋或受潮，严防水汽侵入机件，以避免失火或电击危险。

  Do not let this machine be exposed to rain or moisture, and strictly prevent water vapor from entering the components to avoid the risk of fire or electric shock.

- 为避免触电，切勿擅自打开仪器之外壳。本仪器中并没有一般用户可自行拆修的部件，因此，除专业修理者外，切勿擅自打开本机之外壳摸索其内部。发生故障时必须请专业技术人员维修。

  To avoid electric shock, do not open the instrument casing without authorization. There are no components in this instrument that can be disassembled and repaired by ordinary users. Therefore, except for professional repairers, do not open the outer shell of this machine to explore its interior without authorization. When a malfunction occurs, it must be repaired by professional technical personnel.

仪器安放 Instrument placement

选择一个既利于操作，又符合仪器工作要求的空间。仪器前面和背面有散热孔部位应留有足够的空间使通风良好。电源电压、电流必须与产品铭牌上的电源规格相同，应有良好的接地系统，电源插座规格与仪器电源插头匹配。

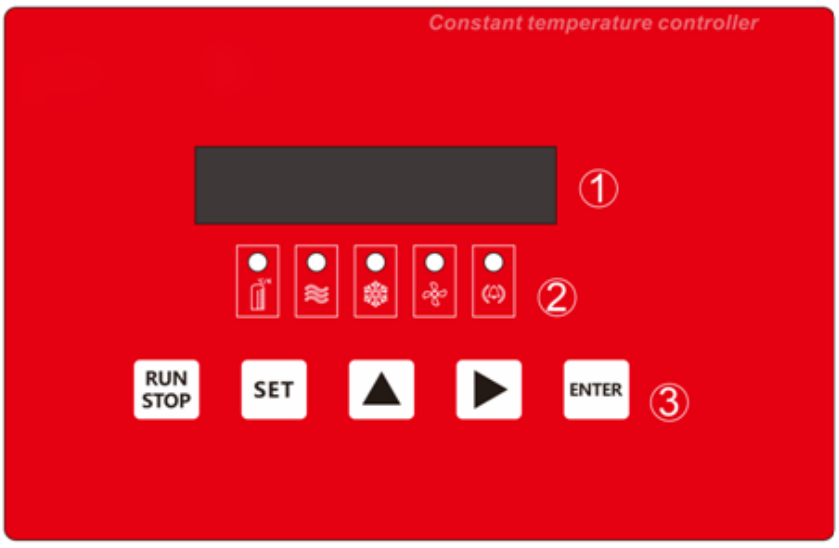
Choose a space that is both convenient for operation and meets the

requirements of instrument work. Sufficient space should be left in the areas with heat dissipation holes on the front and back of the instrument to ensure good ventilation. The power supply voltage and current must be the same as the power supply specification on the product nameplate. There should be a good earthing system. The power socket specification should match the instrument power plug.

电击危险 **Electric shock hazard**
◆ 为使仪器可靠工作，防止触电危险，请使用接地线。 **To ensure the reliable operation of the instrument and prevent the risk of electric shock, please use a grounding wire.**

控制器操作说明
Controller operation instructions

控制显示面板 Control Display Panel



控制显示面板 Control Display Panel

① 温度、工作参数显示器 Temperature and working

parameter display

② 状态显示器 Status display

③ 键盘 keyboard

温度及工作参数显示

Temperature and working parameter display

显示温度时，其中第一位用于显示一、1、2、3，如果输入的温度范围超出了规定的量程范围，按确认键时会出提示声。这时请重新输入一个正确的温度值，然后确认退出。

When displaying temperature, the first digit is used to display -, 1, 2, and 3. If the input temperature range exceeds the specified range, a prompt will sound when pressing the confirm button. At this point, please re-enter a correct temperature value and confirm to exit.

系统参数设置 System parameter settings

在显示当前温度状态长按“SET”键 2 秒，输入密码 6789，即可进入设定系统参数设置菜单。短按“SET”键可在 C2～C10 间切换，短按“ENTER”键即可进入对应参数的修改界面。修改好按“ENTER”键退回上级菜单。长按“SET”键 2 秒保存参数并退回主界面。

Press and hold the "SET" button for 2 seconds while displaying the current temperature status, and enter the password 6789 to enter the system parameter setting menu. Short press the "SET" key to switch between C2 and C10, and short press the "ENTER" key to enter the corresponding parameter modification interface. After modification, press the "ENTER" key to return to the previous menu. Long press the "SET" button for 2 seconds to save the parameters and return to the main interface.

在显示当前温度状态长按“SET”键 2 秒，输入密码 6668，即可进入到 C1 菜单，短按“ENTER”键即可进入对应参数的修改界面。修改好按“ENTER”键退回上级菜单。长按“SET”键 2 秒保存参数并退回主界面。

Press and hold the "SET" button for 2 seconds while displaying the current

temperature status, enter the password 6668, and enter the C1 menu. Short press the "ENTER" button to enter the corresponding parameter modification interface. After modification, press the "ENTER" key to return to the previous menu. Long press the "SET" button for 2 seconds to save the parameters and return to the main interface.

在显示当前温度状态长按“SET”键 2 秒，输入密码 6669，即可进入到 C11～C13 菜单，同时按住  键即可进入对应参数的修改界面。修改好按“ENTER”键退回上级菜单。长按“SET”键 2 秒保存参数并退回主界面。

Press and hold the "SET" button for 2 seconds while displaying the current temperature status, enter the password 6669, and enter the C11~C13 menus. At the same time, press and hold the up and right keys to enter the corresponding parameter modification interface. After modification, press the "ENTER" key to return to the previous menu. Long press the "SET" button for 2 seconds to save the parameters and return to the main interface.

注：C9 需要同时按住  才可以进入参数设置，C9 按  键之后自动执行第一个点恒温过程，恒温后输入校正值。

Note: C9 needs to press and hold the up and right keys simultaneously to enter parameter settings. After pressing the enter key, C9 automatically executes the first point constant temperature process, and after constant temperature, enters the correction value.

1、 **加热设备，恒温设备，C1 默认为 P0；**

Heating equipment, constant temperature equipment, C1 defaults to P0;

2、 **单冷却设备，C1 默认为 P1，此时系统菜单中无 C4,C9,C11 和 C12；**

Single cooling equipment, C1 defaults to P1, and there are no C4, C9, C11, and C12 in the system menu at this time;

1)“C1”设置系统的工作模式 **Set the working mode of the system with 'C1'**

工作模式为冷热模式 P0 和单冷却模式 P1，加热设备，恒温设备默认为 P0，单冷却设备默认为 P1；

The working modes are cold and hot mode P0 and single cooling mode P1, with heating equipment and constant temperature equipment defaulting to P0 and single cooling equipment defaulting to P1;

2) 冷热模式中 In hot and cold mode

“C2”设置压缩机的启停值，默认是启用状态

C2 "sets the start stop value of the compressor, which is enabled by default

P1 为启用；P1 is enabled;

P0 为禁用；P0 is disabled;

单冷却模式中 In single cooling mode

“C2”设置压缩机开启温度点，默认是 1 度，即目标值+1 度开启压缩机，最大可设置 10 度；

C2 "sets the starting temperature point of the compressor, which defaults to 1 degree, i.e. the target value+1 degree to start the compressor, with a maximum setting of 10 degrees;

3) 冷热模式中 In hot and cold mode

“C3”设置压缩机恒温参与启停值（COT），超过该温度的恒温，压缩机禁止运行，默认30度，设置范围（0℃～35℃）；

“C3 "sets the constant temperature participation start stop value (COT) of the compressor. If the constant temperature exceeds this temperature, the compressor is prohibited from running, with a default of 30 degrees Celsius and a setting range of 0 ℃ to 35 ℃;

单冷却模式中 In single cooling mode

“C3”设置压缩机关闭温度点，默认是 1 度，即目标值-1 度关闭压缩机，最大可设置 10 度；

C3 "sets the compressor shutdown temperature point, with a default

value of 1 degree, which is the target value of -1 degree. The compressor can be shut down with a maximum setting of 10 degrees;

4) **“C4” 设置超温报警和超温停机功能。默认温度为5度；**

C4 "sets the overtemperature alarm and overtemperature shutdown functions. The default temperature is 5 degrees;

P0 为禁用、P1 和P2为启用，默认P1模式

P0 is disabled, P1 and P2 are enabled, default P1 mode

P0表示设备在恒温状态下，当前温度与设定温度的差超过该值，设备不会做任何报警和停机保护；

P0 indicates that when the device is in a constant temperature state and the difference between the current temperature and the set temperature exceeds this value, the device will not provide any alarm or shutdown protection;

P1表示设备在恒温状态下，当前温度与设定温度的差超过该值，并持续5分钟，会提供报警提示，但不做停机处理；

P1 indicates that when the device is in a constant temperature state, if the difference between the current temperature and the set temperature exceeds this value and lasts for 5 minutes, an alarm prompt will be provided, but no shutdown will be performed;

P2表示设备在恒温状态下，当前温度与设定温度的差超过该值，并持续5分钟，会提供报警提示，并做停机处理；

P2 indicates that when the device is in a constant temperature state, if the difference between the current temperature and the set temperature exceeds this value and lasts for 5 minutes, an alarm prompt will be provided and the device will be shut down;

（单冷却模式没有C4功能）

(Single cooling mode does not have C4 function)

5）“C5”设置主机最高限温 C5 "sets the maximum temperature limit of the host

冷热模式中 In hot and cold mode

设定温度不能超过该温度值，或者实际温度超过该温度值+5度，都会蜂鸣报警显示错误代码，机器处于待机报警显示错误代码状态，按确认键可消音，处理后，需要重新上电运行，不同版本默认温度不同，根据不同版本做系统查看。

If the set temperature cannot exceed the temperature value, or if the actual temperature exceeds the temperature value by+5 degrees, an alarm will sound and an error code will be displayed. The machine is in a standby alarm display error code state, and pressing the confirm button can silence it. After processing, it needs to be powered on and run again. The default temperature is different for different versions, and the system will be checked according to different versions.

单冷却模式中In single cooling mode

设定温度不能超过该温度值，或者实际温度超过该温度值+5度，都会蜂鸣报警显示错误代码，机器处于待机报警显示错误代码状态，按确认键可消音，处理后，需要重新上电运行，默认50℃，最高可调节到100℃。

If the set temperature cannot exceed the temperature value, or if the actual temperature exceeds the temperature value by+5 degrees, a beep alarm will display an error code. The machine is in a standby alarm display error code state, and pressing the confirm button can silence it. After processing, it needs to be powered on again for operation. The default temperature is 50 ℃, and the maximum temperature can be adjusted to 100 ℃.

6）“C6” 设置主机最低限温 C6 "sets the minimum temperature limit of the host

设定温度不能超过该温度值，或者实际温度超过该温度值5度，都会蜂鸣报警显示错误代码，机器处于待机报警显示错误代码状态，按确认键可消音，处理后，需要重新上电运行，默认-40度；

If the set temperature cannot exceed the temperature value, or if the

actual temperature exceeds the temperature value by 5 degrees, an alarm will sound and an error code will be displayed. The machine is in a standby alarm display error code state, and pressing the confirm button can silence it. After processing, it needs to be powered on again for operation, with a default of -40 degrees;

7）**“C7”显示精度设置 C7 Display Precision Settings**

设置显示温度的小数点位数，0.1 与 0.01 两种；

Set the decimal places for displaying temperature, with two options: 0.1 and 0.01;

8） **“C8”设置传感器温度偏移量 Set sensor temperature offset for 'C8'**

当显示屏显示的温度偏离实际温度较远时，使用本功能校正显示温度。假定显示温度为 30.00，用二等以上玻璃温度计测得的实际温度为 29.50，则显示温度偏高 0.5 度。修改“C8”参数为-0.50 即可。如果显示温度偏高，输入负值，如果显示温度偏低，输入正值。确认数值正确以后，按“ENTER”键退回上级菜单

When the temperature displayed on the display screen deviates significantly from the actual temperature, use this function to correct the displayed temperature. Assuming the displayed temperature is 30.00 and the actual temperature measured with a second class or higher glass thermometer is 29.50, the displayed temperature is 0.5 degrees higher. Modify the "C8" parameter to -0.50. If the display shows a high temperature, enter a negative value. If the display shows a low temperature, enter a positive value. After confirming the correct value, press the "ENTER" key to return to the higher-level menu

提醒（在设置长按  切换数字变换顺序）

Reminder (long press and hold the up button to switch the number transformation sequence in the settings)

9) **“C9”9点温度校准 “C9 ”9-point temperature calibration**

冷热模式中 In hot and cold mode

同时按住  键进入校准模式

Press and hold the up and right keys simultaneously to enter calibration mode

校准点为10 度到90 到共9 个点

Calibration points range from 10 degrees to 90 degrees, with a total of 9 points

校准时自动恒温到对应的点温度，稳定后等待20分钟自动切换到输入温度界面，屏上数字闪烁。输入完正确温度后按“ENTER”键进入下一点

输入完第 9 个点后按“ENTER”键执行校准并保存数据。

During calibration, the temperature is automatically kept constant to the corresponding point temperature. After stabilizing, wait for 20 minutes to automatically switch to the input temperature interface, and the number on the screen flashes. After entering the correct temperature, press the "ENTER" key to enter the next point

After entering the 9th point, press the "ENTER" key to perform calibration and save the data.

10) **“C10”恢复出厂设置 Restore factory settings for 'C10'**

在C10界面下，同时按住  键设备恢复出厂设置，系统自动清除之前设置所有温度限制和保护，恢复到出厂默认参数；

Under the C10 interface, press and hold the up and right keys simultaneously to restore the device to its factory settings. The system automatically clears all temperature limits and protections previously set, and returns to the factory default parameters;

11）“C11”压缩机高温启动阀值（COHT）

High temperature start-up threshold (COHT) for "C11" compressor

冷热模式中 In hot and cold mode

在C11界面下，短按“ENTER”键可以设置压缩机的启动阀值，不同版本默认温度不同，根据不同版本做系统查看；

In the C11 interface, short press the "ENTER" key to set the starting threshold of the compressor. The default temperature varies for different versions, and the system can be checked according to different versions;

12）“C12” 压缩机高温超温启动阀值（OTCOT）

High temperature and overtemperature starting threshold (OTCOT) for "C12" compressor

冷热模式中In hot and cold mode

在C12界面下，短按“ENTER”键可以设置压缩机高温超温启动阀值，默认5度；

In the C12 interface, short press the "ENTER" key to set the threshold for compressor high-temperature and overtemperature startup, which defaults to 5 degrees;

满足下列调节开启压缩机运行

Satisfy the following adjustments to start the compressor operation

A、压缩机恒温运行启停值（COT）＜目标温度值≤高温启动阀值（COHT）；

B、当前温度值≥目标温度值+高温超温启动阀值（OTCOT）；

C、当前温度值≤高温启动阀值（COHT）

A. Compressor constant temperature operation start stop value (COT) ＜ target temperature value ≤ high temperature start threshold (C0HT);

B. The current temperature value is greater than or equal to the target temperature value+the threshold value for high-temperature over

temperature startup (OTCOT);

C. Current temperature value ≤ High temperature startup threshold (COHT)

13）“C13” 设置开机自动运行功能（默认关闭F0）

C13 "sets the startup automatic operation function (F0 is turned off by default)

在C13界面下，短按“ENTER”键可以设置开机自动运行功能，默认F0。

In the C13 interface, short press the "ENTER" key to set the automatic startup function, which defaults to F0.

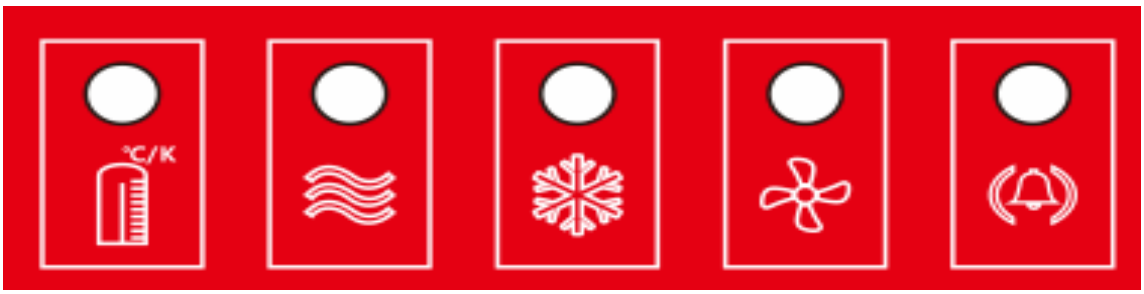
F1为使能开机自动运行功能

F1 enables the automatic operation function upon startup

F0为静止开机自动运行功能

F0 is a static start automatic operation function

工作状态指示 Work status indication



运行 Run　　加热 Heating　制冷 Refrigeration　循环 loop　　报警 Alarm

运行：当设备参数设定后，启动运行时，该指示灯亮。

Run: When the device parameters are set and the operation is started, this indicator light will be on.

加热：需要加热时，加热指示灯点亮，恒温时，加热指示等闪烁表示调节加热。

Heating: When heating is needed, the heating indicator light is on, and when the temperature is constant, the heating indicator flashes to indicate

adjustment of heating.

制冷：在开启循环的情况下，延时约 1 至 3 分钟指示灯亮，启动压缩机工作。

Refrigeration: In the case of opening the cycle, the delay of about 1 to 3 minutes, the indicator light, start the compressor work.

循环：当设备运行时，循环泵指示灯亮，液槽循环泵开始工作。此时允许仪器作制冷运行。

Loop: When the equipment is running, the indicator light of the circulation pump lights up and the liquid tank circulation pump starts working. At this point, the instrument is allowed to perform refrigeration operation.

报警：当设备运行中出现报警提示，需要及时排除报警故障，按 ENTER 消音处理故障，故障处理后，重新上电启动设备，故障代码详见错误代码报警说明（说明书最后面）。

Alarm: When an alarm prompt appears during the operation of the equipment, it is necessary to promptly eliminate the alarm fault, press ENTER to silence the fault, and after the fault is resolved, power on the equipment again to start it. The fault code is detailed in the error code alarm description (at the end of the manual).

参数设定和调节 Parameter setting and adjustment

操作键盘共由 5 个按键组成，其功能和操作详见列表：

The operation keyboard consists of 5 buttons, and their functions and operations are detailed in the list:

【开始/停止】	【设置】	【向上/向下】	【向右】	【确定】
【Start/Stop】	【SET】	【Up/Down】	【Right】	【Enter】

按键 KEY	功能 FUNCTION	操作 OPERATION	备注 REMARKS
RUN STOP	开 始 / 停 止 Start/Stop	按住按键不放超过 2 秒钟。 Press and hold the button for more than 2 seconds.	设备开始运行，同时循环功能启动。 The device starts running while the loop function is activated.
SET	设定工作温度 Set operating temperature	轻触按键 Tap the button	轻触按键，显示界面会转换到设置温度界面，此时可以通过 ▲ ▶ 向上和向右按钮，对温度进行设置，设置好温度，按 ENTER 键返回主界面。 Gently touch the button and the display interface will switch to the temperature setting interface. At this time, you can set the temperature using the "Up" and "Right" buttons. After setting the temperature, press the "Enter" button to return to the main interface.

设置温度示例 Example of setting temperature

譬如设备默认 20.00，需要设置 40.00 度，可以通过  调节到 2 的位置，把 2 设置成 4，可以得到 40.00；

For example, if the device defaults to 20.00 degrees and needs to be set to 40.00 degrees, you can adjust it to the position of 2 by pressing the "right button" and set 2 to 4 to obtain 40.00 degrees;

譬如设备默认 20.00，需要设置-20.00 度，可以通过  调节到 2 的位置，长按  键，向上按钮会变成向下按钮，把 2 设置成-2，可以得到-20.00；

备注：长按  可以变换调节的顺序，默认  可以调节 0-9，长按切换后，可以变成 9-0 的输入。

For example, if the device defaults to 20.00 degrees and needs to be set to -20.00 degrees, it can be adjusted to the position of 2 by pressing the "right button". Long press the "up button" and the up button will turn into a down button. Setting 2 to -2 will result in -20.00 degrees;

Note: Long press and hold the "Up" button to change the order of adjustment. By default, the "Up" button can adjust 0-9. Long press and hold to switch to 9-0 input.

SET	系统参数设定 System parameter settings	按住按键不放超过 2 秒钟。Press and hold the button for more than 2 seconds.	当长按 SET 超过 2 秒钟，输入 6789，进入到系统菜单, 此时可以对 C2/C3/C4/C5/C6/C7/C8/C9/C10 等参数进行设置，参数含义参考温度及工作参数显示。 When pressing and holding "SET" for more than 2 seconds, enter 6789 to enter the system menu. At this time, you can adjust the Set parameters such as C2/C3/C4/C5/C6/C7/C8/C9/C10, and refer to temperature and working parameter display for parameter meanings.
SET	系统参数设定 System parameter settings	按住按键不放超过 2 秒钟。Press and hold the button for more than 2 seconds.	当长按 SET 超过 2 秒钟，输入 6668，进入到系统菜单, 此时可以对 C1 参数进行设置，参数含义参考温度及工作参数显示。 When pressing and holding "SET" for more than 2 seconds, enter 6668 to enter the system menu. At this time, the C1 parameters can be set, and the parameter meanings refer to the temperature and working parameter display.

SET	系统参数设定 System parameter settings	按住按键不放超过 2 秒钟。Press and hold the button for more than 2 seconds.	当长按 SET 超过 2 秒钟，输入 6669，进入到系统菜单,此时可以对 C11/C12/C13 参数进行设置，参数含义参考温度及工作参数显示。 When pressing and holding "SET" for more than 2 seconds, enter 6669 to enter the system menu. At this time, the C11/C12/C13 parameters can be set, and the meaning of the parameters can refer to the display of temperature and working parameters.
▲	改变数值大小 Change the value size	默认向上，长按可向下 Default up, long press to go down	向上/向下按钮，默认 0-9 输入，当长按 ▲ 键超过 3 秒，会变换成 9-0 的输入。 Up/Down button, default 0-9 input. When pressing and holding the "Up" button for more than 3 seconds, it will change to 9-0 input
▶	改变光标位置 Change cursor position	轻触按键 Tap the button	

	恢复出厂设置 Restore factory settings		在显示当前温度状态长按SET超过 2 秒钟，将进入系统参数界面，继续轻触SET按键，调节至 C10，同时按住▲ ▶超过 3 秒，控制板会发出蜂鸣声，控制器恢复出厂设置。 Restore factory settings. When the current temperature status is displayed, press and hold the "SET key" for more than 2 seconds to enter the system parameter interface. Continue to lightly touch the "SET key" button and adjust to C10. At the same time, press and hold the "up key and right keyboard" for more than 3 seconds. The control board will emit a beep, and the controller will return to factory settings.

恒温控制 Constant temperature control

开机前 Before starting the machine

1).将仪器背部的出液口用适当口径的硅橡胶管或其他管子与外循环系统相连，注意连接紧密。注意区分循环出口接口和循环入口接口。

Connect the liquid outlet on the back of the instrument with a silicone rubber tube or other tube of appropriate caliber to the external circulation system, paying attention to tight connection. Pay attention to distinguishing between the loop outlet interface and the loop inlet interface.

2)．根据实际工作温度和恒温波动度需要，在液槽中注入适量的蒸馏水、酒精或酒精水混合液。

According to the actual working temperature and constant temperature fluctuation requirements, inject an appropriate amount of distilled water, alcohol, or a mixture of alcohol and water into the liquid tank.

3)．启动设备，用相同的工作介质不断补充到液槽中。如果外系统及管路容积较大，则适当降低液槽中的液位高度。仪器正常工作的液位必须界于槽体 1/2 或者 3/4，液位不可偏低，偏低会导致加热管干烧或制冷效果差，影响设备运行。

Start the equipment and continuously replenish it with the same working medium into the liquid tank. If the volume of the external system and pipeline is large, appropriately reduce the liquid level in the tank. The liquid level for normal operation of the instrument must be within 1/2 or 3/4 of the tank body. The liquid level should not be too low, as a low level may cause dry burning of the heating tube or poor cooling effect, affecting the operation of the equipment.

重要内容 Important content

- 请选择合适的液位工作。

  Please select the appropriate liquid level for operation

- 注液后，严禁随意移动仪器或使仪器倾斜，以防止介质侵入机件造成危险。

  After liquid injection, it is strictly prohibited to move or tilt the instrument arbitrarily to prevent the medium from invading the machine and causing danger.

- 在 8～95℃温度范围，使用蒸馏水或洁净的自来水作介质比较理想，在低于 8℃使用时，可以采用一定比例的酒精水溶液，或者加入适量的抗冻剂。

  In the temperature range of 8-95 ℃, using distilled water or clean tap water as the medium is ideal. When used below 8 ℃, a certain proportion of alcohol water solution can be used, or an appropriate amount of antifreeze can be added.

- 启动仪器以后，请立即检查液槽中的液流情况，如果外循环流量很小，或液槽中看不到液体流动，可能是循环管路中存在空气或水路损耗严重所致，循环管路中存在空气需要排除循环管路中的空气后再启动仪器，因为水路损耗严重可以通过在出口增加旁路的形式完成水槽内部循环。

  After starting the instrument, please immediately check the liquid flow situation in the liquid tank. If the external circulation flow rate is very small or liquid flow is not visible in the liquid tank, it may be due to the presence of air or severe water loss in the circulation pipeline. Air in the circulation pipeline needs to be removed before starting the instrument, as severe water loss can be achieved by adding a bypass at the outlet to complete the internal circulation of the water tank.

外循环恒温 External circulation constant temperature

外循环接口请接入相应的位置，请注意管口径的合理选配。

Please connect the external circulation interface to the corresponding position and pay attention to the reasonable selection of pipe diameter.

显示温度校正 Display temperature correction

设备带有温度校准功能，对应系统参数 C8

The device has a temperature calibration function, corresponding to system parameter C8

“C8”设置传感器温度偏移量 当显示屏显示的温度偏离实际温度较远时，使用本功能校正显示温度。假定显示温度为 30.00，用二等以上玻璃温度计测得的实际温度为 29.50，则显示温度偏高 0.5 度。修改“C8”参数为-0.50 即可。

When the temperature displayed on the display screen deviates significantly from the actual temperature, use this function to correct the displayed temperature by setting the sensor temperature offset for "C8". Assuming the displayed temperature is 30.00 and the actual temperature measured with a second class or higher glass thermometer is 29.50, the displayed temperature is 0.5 degrees higher. Modify the "C8" parameter to -0.50.

如果显示温度偏高，输入负值，如果显示温度偏低，输入正值。 确认数值正确以后，按“ENTER”键退回上级菜单

If the display shows a high temperature, enter a negative value. If the display shows a low temperature, enter a positive value. After confirming the correct value, press the "ENTER" key to return to the previous menu

重要内容 Important content

- **实行温度校正以前，必须使仪器在 50%左右负荷下处于恒温状态，并将玻璃温度计置于恒温箱中保持足够时间，然后正确读取玻璃温度计的示值。因为在升温或降温过程中，循环系统中温度的均匀性明显比在恒温状态时的差，这时读取的温度计示值没有代表性。**

  Before implementing temperature correction, the instrument must be kept in a constant temperature state at around 50% load, and the glass thermometer must be placed in a constant temperature box for sufficient time, and then the reading of the glass thermometer must be correctly read. Because during the heating or cooling process, the uniformity of temperature in the circulating system is significantly worse than in the constant temperature state, the thermometer reading at this time is not representative.

停机 Shutdown

1). 尽可能将仪器温度回复到接近环境温度。

Try to restore the instrument temperature as close to the ambient temperature as possible.

2). 按压 RUN STOP 键超过 2 秒钟，关闭循环泵和压缩机，切断所有输出。

Press the "RUN/STOP" button for more than 2 seconds to turn off the circulating pump and compressor, and cut off all outputs.

错误报警代码说明
Error alarm code description

1、 Err 00 ： 无错误 No errors

2、 Err 11 ： ADC 初始化失败 ADC initialization failed

3、 Err 12 ： ADC 数据异常 ADC data abnormality

4、 Err 13 ： 温度传感器 Temperature sensor

5、 Err 31 ： 测温电路 Temperature measurement circuit

6、 Err 32 ： 测温电路 Temperature measurement circuit

7、 Err 41 ： 液位偏低报警 Low liquid level alarm

8、 Err 42 ： 制冷系统高压过高报警 Refrigeration system high pressure alarm

9、 Err 43 ： 流量过低报警 Low flow alarm

10、Err 62 ： 温度过低 Temperature too low

11、Err 63 ： 温度过高 Temperature too high

12、Err 71 ： 通信错误 Communication error

出现报警后按“ENTER”消音，待故障处理后，设备需要重新上电才可以清楚报警

After an alarm occurs, press "ENTER" to silence the sound. After the fault is resolved, the equipment needs to be powered on again to clear the alarm

保养与维护 Maintenance and upkeep

1．定期清理仪器内胆脏物，保持仪器清洁干净。

Regularly clean the internal dirt of the instrument and keep it clean.

2．定期检查零件固定螺丝是否松动，松动的螺丝将其锁紧。

Regularly check whether the fixing screws of the parts are loose, and lock them tightly with loose screws.

3. 设备在操作和运行中，如遇问题，请查看说明书处理，如不能处理应该联系当地经销商或厂家处理；

If there are any problems with the equipment during operation and operation, please refer to the manual for handling. If it cannot be handled, please contact your local dealer or manufacturer for assistance;