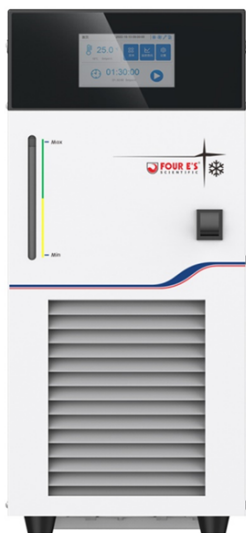




Operating Instructions 使用说明书



Recirculating Chiller

冷水机

CH800

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Please read the operating instructions in full before starting up and follow the safety instructions.
The appearance and specifications are subject to change without notice.

WARNING SIGNS



DANGER

Indicates an extremely hazardous situation, which, if not avoided, will result in death, serious injury.



WARNING

Indicates a potentially hazardous situation, which, if not avoided, can result in death, serious injury.



CAUTION

Indicates a potentially hazardous situation, which, if not avoided, can result in injury.



NOTICE

Indicates practices which, if not avoided, can result in equipment damage.

1. SAFETY INSTRUCTIONS

General Information:

- Please read the operating instructions carefully before use and follow the safety instructions.
- Keep the operating instructions in a place where it can be accessed by users.
- Ensure that only trained staff can work with the device.
- Follow the safety instructions, guidelines, occupational health, safety and accident prevention regulations.
- Set up the device in a spacious area on an even, stable, clean non-slip, dry and fireproof surface.
- Do not operate the device in explosive atmospheres, or with hazardous substances.
- Protect the device and accessories from bumping and impacting.
- Check the device and accessories for damage before each use. Do not use damaged components.
- Safe operation is only guaranteed with the accessories described in the "Accessories" section.
- The device must only be operated with the original power cable.
- The socket for the power cable must be easily accessible.
- Socket must be grounded (protective ground contact).
- The voltage stated on device label must match the supply voltage.
- The device can only be disconnected from the power supply by pulling out the power plug or the connector plug.
- Disconnect the power plug before attaching or changing any accessories.
- Disconnect the power plug before cleaning, maintenance and transportation of the unit.
- The device must only be opened by trained specialists. The device must be unplugged from the power supply before opening. Some parts inside the device may still cause electrical discharge for some time after unplugging from the power supply.



Coverings or parts that are removable must be put back on the device again to ensure safe operation, for example to keep foreign objects and liquids, etc. from getting into the device.

- The device may only be used as prescribed and as described in these operating instructions. This includes operation by trained personnel.
- When using critical or hazardous materials in your processes, it is recommended to use additional appropriate measures to ensure safety in the experiment. For example, users can implement comprehensive monitoring equipment.
- Process pathogenic material only in closed vessels under a suitable fume hood. Please contact supplier for technical support if you have any question.



If the power switch is not within reach when device is operating, an EMERGENCY STOP switch that can be easily accessed must be installed in the work area.

- The circulating chiller refrigerates and circulates fluid according to specified parameters. There are potential hazards due to high and low temperatures and general electrical hazards while using the device. The user safety cannot be ensured only with design requirements of the device. Other hazards may arise, e.g., by the breakage of the container and reaction with the carrier fluid. It is not possible to consider all eventualities. They remain largely subject to the judgment and responsibility of the operator. For this reason, it become necessary for user to take other precautionary safety measures.
- Use suitable hoses for connection.
- Secure hoses and tubes against slippage and avoid kinks.
- Check hoses, tubes and bath at regular intervals for possible material fatigue (cracks/leaks).
- When device is used for external circulation, extra precaution must be taken for cold fluid leakage due to damaged hose.

**DANGER**

Do not start up the device if:

- It is damaged or leaking
- Cable (not only supply cable) is damaged.
- After a power failure during operation, the device may recover the previous operating mode.
- Transport the device with care.
- Do not transport or empty the bath while it is still cold. Check the temperature of the fluid when emptying the bath.
- Always empty the bath before moving the device.

**NOTICE**

Always empty the bath if the unit is unused for long time.

Fluids:**CAUTION**

Only use the fluids, which fulfill the requirements for safety, health and device compatibility. Be aware of the chemical hazards that may be associated with the bath fluid used. Observe all safety warning for the fluids.

- Depending on the bath fluid used and the type of operation, toxic or combustible vapors can arise. Ensure suitable ventilation.
- Do not use any fluid which may cause dangerous reactions during processing.
- Only use recommended bath fluid. Only use non-acid and non-corroding fluid.

**CAUTION**

Never operate the device without sufficient fluid! Check the fluid level detection at a regular basis.

- Continuous monitoring of the filling level of the bath fluid is required.
- To ensure a sufficient fluid circulation, the bath fluid should be loaded to exceed the yellow line of the filling level indicator. (Recommended fluid volume is 4 to 4.5L)
- Untreated tap water is not recommended. It is recommended to

use distilled water or high purity water (ion ex-changers) and add 0.1g soda (sodium carbonate Na_2CO_3) /liter, to reduce corrosive properties.



Don't use following fluids

- Untreated tap water
- Acids or bases
- Solutions with halides: chlorides, fluorides, bromides, iodides or sulfur
- Bleach (Sodium Hypochlorite)
- Solution with chromates or chromium salts
- Glycerine
- Ferrous water

2.Application Scenarios

• Application :

Used for refrigerating and circulating fluids.

Intended Use: Benchtop device.

Range of use (Indoor environments only) :

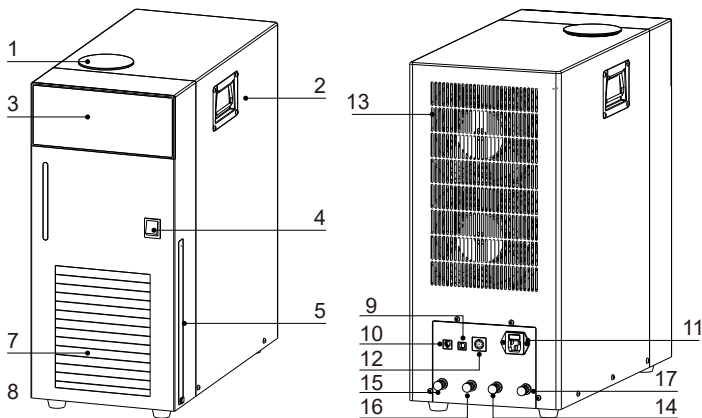
- Laboratory
 - College
 - Pharmaceutical
 - Medical/Research institutions
- ### • The device can be used in any areas except:
- Residential areas
- ### • The safety of the user cannot be guaranteed:
- If the device is operated with accessories that are not supplied or recommended by supplier.
 - If the device is operated improperly or in contrary to the supplier's specifications.
 - If the device or the printed circuit board are modified by third parties.

3. Unpacking

- Unpacking :
 - Unpack the device carefully.
 - Any damage should be notified immediately and send damaged note to the shipping agent.
- Packing list :

Item	QTY
CH800 Chiller (Recirculating Chiller)	1
Power cable	1
Inlet & Outlet hose with insulated pipe (inner diameter $\phi 10\text{mm} \times 1.5\text{m}$)	2
Overflow hose (inner diameter $\phi 10\text{mm} \times 1.0\text{m}$)	1
Drain hose (inner diameter $\phi 10\text{mm} \times 1.0\text{m}$) + 1 stopper (outer diameter $\phi 10\text{mm}$)	1
Plastic pipe clamp	6
User manual	1

4. Device Setup



1	Filling lid	10	RS485 interface
2	Handle	11	Power socket
3	Touch screen	12	External Temperature sensor interface
4	Power switch	13	Air outlet
5	Venting grid cover	14	Overflow
6	Filling level indicator	15	Pump connector (OUT)
7	Venting grid	16	Pump connector (IN)
8	Legs	17	Drain
9	USB interface		

5. Preparations

• Setup

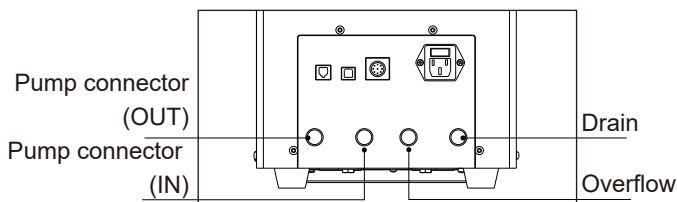
- Place the unit on an even, stable, clean, nonslip, dry and fireproof surface.
- Keep at least 20 cm of open space on the front and rear side.
- The place for installation should be large enough and provide sufficient air ventilation to ensure the room does not warm up excessively because of the heat from device radiates to the environment.
- Do not set up the device in the immediate vicinity of heat sources and do not expose to sun light.
- The chiller motor and electronics produce intrinsic heat that is dissipated via the venting grid! Never cover the venting grid!
- Connect the tubing
- Remove the stoppers from the pump connection IN and OUT, overflow and drain.
- Connect hoses to the pump connection IN and OUT and secure the hoses with suitable clamps. The other end of the hose should be connected to the device that needs to be cooled.

- Connect a hose to the “Overflow” port and secure it with clamp. Overflowing fluid should be directed into a vessel via the hose.
- Connect a hose to the “Drain” port and secure it with clamp. Draining fluid should be directed into a vessel via the hose.



NOTICE

When the external system is not necessary, please seal the pump connection IN and OUT with silicone stoppers.



Filling and draining :

- Filling: Open the filling opening lid to fill 4 to 4.5L fluid to the bath and put the lid back.
- Draining: To drain the fluid from the bath, remove the stopper from the drain hose and put the hose in a vessel.
- Connect a hose to the “Overflow” port to discharge excessive fluid to a vessel. The vessel should be placed lower than the overflow port.



NOTICE

Tap water may be unsuitable for operation because the calcium carbonate content may cause calcification. High purity water (from ion exchangers) and distilled or bi-distilled water are unsuitable for operation due to

corrosive properties of these media. High purity water and distillates are suitable as a medium after adding 0.1g soda (Na_2CO_3 , sodium carbonate) per liter of water.



NOTICE

The temperature limit values are adjustable in accordance with the refrigerant used.



NOTICE

Accidental power failure during operation, please wait for 5 minutes before restart.



NOTICE

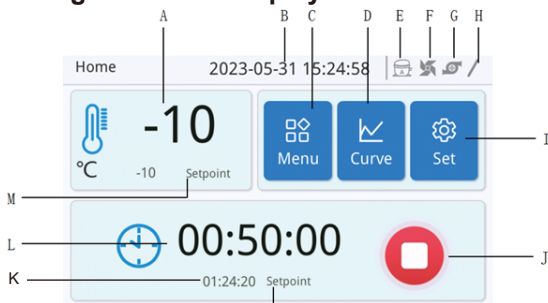
Preparing suitable bath fluids is required when the working temperature is set under 4°C.

Bath Fluid	Proportion	Minimum Temp. (freezing point)	Recommended Temp. Settings	Volume
Ethylene Glycol (Antifrogen® N)*	5:5 (fluid: water)	-32~-35°C	-10~-20°C	4-4.5L (mixture)
	4:6 (fluid: water)	-22~-25°C	-5~-10°C	4-4.5L (mixture)
	3:7 (fluid: water)	-12~-15°C	0~-5°C	4-4.5L (mixture)
	2:8 (fluid: water)	-2~-5°C	5~0°C	4-4.5L (mixture)
Water	/	4~0°C	Room Temp. ~ 5°C	4-4.5L

*Note: Recommended ratio for Antifrogen® N at different temperature settings

Ethylene glycol solution is not suitable for direct operation and needs to be mixed with distilled water or deionized water in a proper scale.

6. Operating Panel and Display



No.	Designation	Function
A	Bath temperature	Read the actual bath temperature
B	Time	Read the current time
C	"Menu" icon	Press it to display menu option
D	"Temperature curve" icon	Press it to display the bath temperature curve
E	Compressor	"Blue": working; "Gray": not working
F	Cooling fan	"Blue": working; "Gray": not working
G	Pump	"Blue": working; "Gray": not working
H	Temperature sensor	"Blue": external temperature sensor "Gray": internal temperature sensor
I	"Set" icon	Press it to display the operation settings options
J	"On/Off" icon	Switch on/off the chiller
K	"Timer Setpoint"	Press it to set the time: 0-30h
L	Timer display	Displays the remaining working time
M	"Temp Setpoint"	Set the temperature: -20°C~ room temperature

Before starting up, make sure the voltage specified on the device label matches the available supply voltage.

The power socket used must be grounded (protective earthing).

If above conditions are met, the device is ready for operation after connecting the power.

If these conditions are not met, safe operation is not guaranteed, and the device could be damaged.

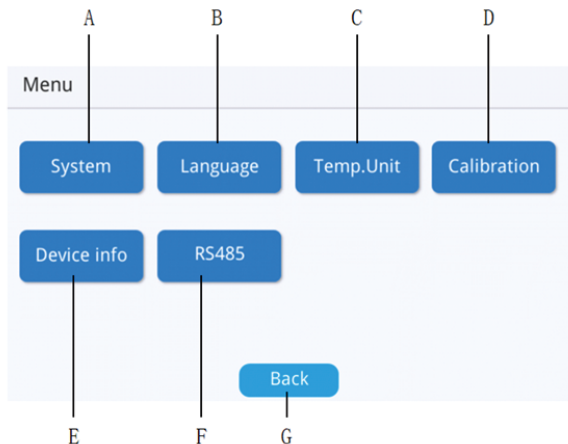
Observe the ambient conditions (temperature, humidity, etc.) listed under “Technical Parameters”.

Power on

1. Switch on the power switch.
2. Then the device enters standby status and is ready for operation.
3. Press “Temp Setpoint” to set the temperature.
4. Press “Timer Setpoint” to set the time.
5. Make sure all settings are correct, press “On/Off” icon to start the device.

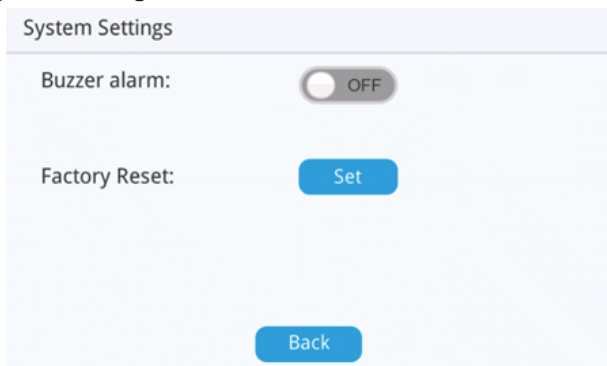
7. Menu Settings

• Menu



No.	Designation	Function
A	"System" button	Press it: Switch on/off audio alarm and reset to factory settings
B	"Language" button	Press it: select Chinese or English
C	"Temp. Unit" button	Press it: select temperature unit and adjust screen brightness
D	"Calibration" button	Press it: calibrate the internal temperature sensor
E	"Device info" button	Press it: check software version and serial number
F	"RS485" button	Press it: set the parameter of RS485 interface
G	"Back" button	Press it: back to the home screen

• System Setting



- **Language Settings**

Language

☒ 简体中文 ☐ English

[Cancel](#) [Save](#)

- **Temperature Unit and Screen Brightness**

Temp.Unit

Temperature unit ☒ °C ☐ °F

Screen brightness 50 100

[Back](#)

• Temperature Calibration

1. In the home screen, set the temperature value at 0°C. When it stabilizes to 0°C, use an external temperature probe to measure the actual temperature of the fluid, and input the measured temperature value to the “Calibrated Temp.” box.
2. In the home screen, set the temperature value at -15°C. When it stabilizes to -15°C, use an external temperature probe to measure the actual temperature of the fluid, and input the measured temperature value to the “Calibrated Temp.” box.
3. Then click “Calibrate” to perform the settings.

Calibration

Setpoint	Set Temp.	Current Temp.	Calibrated Temp.	Confirm
Point 1	0	0	0	Yes
Point 2	-15	-15	-15	Yes

• Device Information

Device Information	
Software version	Ver2.0
Firmware version	Ver2.0
Model Number	CH800

Back

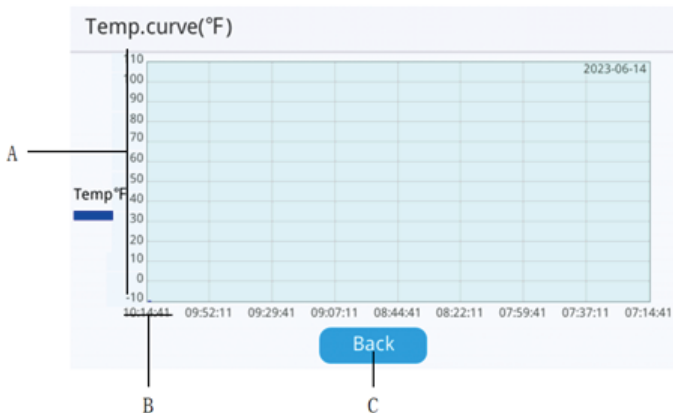
• RS485 Interface

RS485 Interface	
Baud rate	115200 ▼
RS485 address	0001
Check bit	None ▼
Data bit	8 ▼
Stop bit	1 ▼

Cancel Save

8. Temperature Curve Screen

- Temperature curve :



No.	Designation	Remarks
A	Temp. value	Read the temperature
B	Time value	Read the time
C	"Back" button	Back to the Home Screen

9. Operation Settings

• Operation Settings:

Operation Settings

A

Sensor

☒ Internal ☐ External

B

Pump

☒ ON ☐ OFF

C

Timer

☒ ON ☐ OFF

D

Back

No.	Designation	Remarks
A	"Sensor" setting	Select Internal/External temperature sensor
B	"Pump" setting	Switch on/off the pump
C	"Timer" setting	Switch on/off to set the time
D	"Back" button	Back to the home screen

10. Maintenance and Cleaning

To avoid contamination, it is essential to change the bath fluid regularly. If water is used for bath fluid, we recommend adding water bath protective agent. The protective agent stops the growth of algae, bacteria and other microorganisms to ensure the bath fluid can be used for long time. To keep the full cooling performance, the dust filter of the cooler must be checked regularly and cleaned if necessary.

- Switch off the device and disconnect power cable.
- Detach the venting grid cover.
- Take out the dust filter.
- Clean the dust filter with a vacuum cleaner or wash it in the water and dry it before assembly.



NOTICE

Don't clean the compressor surface with sharp/hard objects.

Cleaning

- Disconnect the power prior to cleaning.
- Use only washing agents which have been approved by supplier to clean the device: water containing surfactant or isopropyl alcohol.
- Wear protective gloves while cleaning the device.
- Electrical devices may not be placed in the cleansing agent while cleaning.
- Do not allow moisture to get into the device when cleaning.
- If use a different cleaning or decontamination method that is not recommended by the supplier, the user must check with the supplier that this method does not damage the device.

Repair

- Please send in device for repair only after it has been cleaned and is free from any materials which may pose a health hazard.
- For repair, please return the device in its original packaging. If the original packaging is missing, please use suitable packaging for transportation.

11.Error Codes

Any malfunctions during operation will be identified by an error message on the display.

Proceed as follows in such cases:

1. Switch off the device
2. Restart the device

Error message	Probable Cause	Suggested Action
Calibration error	Entered the wrong calibration temperature value	Check the parameters and re-enter
Internal temperature sensor fault	Damaged sensor or loose wires	Contact customer service department
External temperature sensor fault	Damaged sensor or loose wires	Check if the external temperature sensor is plugged properly into the device.
Fluid temperature is too high	Fluid temperature is higher than 40°C	Switch the device off and let the fluid cool down
Over current	Damaged compressor	Power off the device, wait for 10 minutes, and restart the device.

If the actions described above fails to resolve the fault or another error message is displayed, then contact customer service department.

12. Technical Parameters

Operating voltage		VAC	AC100~120V/AC200~240V
Frequency		Hz	50Hz/60Hz
Max. input power		W	750
Working temperature range		°C	-20°C ~ room temperature (25°C)
Temperature stability		K	±0.3
Temperature control		°C	PID
Temperature measurement, absolute accuracy		K	±0.5
Temperature setting		/	Touch screen
Temperature setting resolution		K	0.1
Temperature display		/	Touch screen
Temperature display resolution		K	0.1
Cooling capacity	+20°C	W	750
	+10°C		650
	0°C		500
	-10°C		400
	-20°C		200
Refrigerant		/	R290
Max. Pump pressure		bar	1.0
Max. pump flow rate		l/min	22
Bath volume		L	5.0L(Max. 5.3L)
Fluid maximum viscosity		mm2/s	50
Interface		/	USB; RS485
Permitted ambient temperature		°C	+5~+35°C
Permitted ambient humidity		%	80
Dimension (W x D x H)		mm	235*468*535mm
Weight		kg	35



Refrigerant must be disposed of in accordance with local and national regulations. The technical parameter is subject to change without notice!

13.Warranty

We guarantee that our scientific instruments adhere to the most rigorous engineering and quality standards. This instrument is warranted to be free from defects in materials and workmanship under normal use and service, for a period of 24 months from the date of dispatch. The warranty is extended only to the original purchaser. For claims under the warranty, please contact your local supplier. After the warranty period expires, the manufacturer retains the right to invoice the cost price for the repair or maintenance of a faulty device, along with any associated service fees.

Scope of Warranty

The following conditions are not covered under the warranty.

- Faults or damage caused by negligence, improper installation, improper operation, or failure to use and maintain the machine in accordance with the instructions in this operating manual.
- Issues caused by unauthorized disassembly or modification.

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请仔细阅读说明书并在说明书的操作指导下安全使用本仪器。
外形和性能指标如有变动，概不另行通知。

警示符号说明



危险表示会产生直接伤害的情况，如果不加以避免将导致死亡或严重人身伤害。



警告表示会产生潜在伤害的情况，如果不加以避免将导致死亡或严重人身伤害。



小心表示会产生潜在伤害的情况，如果不加以避免将导致人身伤害。



注意提示实际应用，如果不加以避免将导致仪器受损。

1. 安全说明

一般信息:

- 操作仪器前请认真阅读本使用说明并遵守安全操作规范。
- 请将本使用说明放置于使用者方便查阅的地方。
- 确保只有受过相关训练的人员才能操作本仪器。
- 请遵守安全规范、人身安全和事故防止等相关规范。
- 将仪器放置于宽敞、平坦、平稳、清洁、防滑、干燥、防火的台面。
- 请勿在易爆的环境操作使用本仪器，请勿使用本仪器处理危险的介质。
- 确保仪器和配件免受挤压和碰撞。
- 使用前请检查仪器和配件并确保无损，请勿使用损毁的仪器和配件。
- 只有使用“配件”列表中的配件才可确保安全操作。
- 仪器只能使用原装电源线。
- 电源插座必须易于操作。
- 电源插座必须接地保护。
- 输入电压必须与仪器铭牌上标示的电压一致。
- 只有拔下仪器电源插头才能完全切断电源。
- 安装、更换配件和零部件时必须首先断开电源。
- 清洁维护或者移动仪器时必须首先断开电源。
- 即使在维修时，也只有经过专门培训的专业人员才能打开仪器。打开仪器前，请拔下电源。仪器拔下电源后内部某些带电部件可能仍处于带电状态。



注意

为确保安全操作，塞盖或者其他可从仪器上移走的零部件须重新安装到位。这可防止例如液体、外部物体等进入仪器。

- 仪器只能按照使用说明中的规定和指引使用，包括只有经过专业培训人员才能操作本仪器。
- 在处理危险的或者有害的物料时，建议额外采取一些合适的措施确保实验的安全性，例如操作人员可以使用一些防火、防爆的措施或者全面的监控设备。

- 处理病原体介质时，请使用密闭容器并在合适的通风橱中进行。如有其他问题，请联系我司人员。



如果仪器的安装或放置场所无法确保电源关闭开关可被随时关闭，必须在工作区域安装操作便利的紧急关闭开关。

- 实验室循环水浴可根据特定的参数对介质冷却及循环，涉及低温以及由于仪器的电能输入引起其他危险。用户的安全不能简单的通过仪器的设计得到完全的保障。根据控温介质的种类，可能出现进一步的危险，例如超过或者低于某一特定的温度阈值，或者由于容器的破裂或者由于与冷却介质的反应。我们无法预料所有可能发生的危险。其他一些事故很大程度上受操作者的判断影响，用户应负责。因此，用户有必要采取其他的安全措施。
- 通风不良可能导致形成爆炸性混合物。仅在通风良好的地方使用该设备。
- 使用合适的软管连接。
- 软管安装时避免打滑和扭结。
- 定期检查连接管和浴槽以防材料老化(破裂和渗漏)。
- 当设备被用于外部循环时，必须采取额外的预防措施，防止由于软管的损坏导致冷却介质泄漏。



当仪器出现下列情况时，请勿启动仪器

- 损坏或渗漏
- 线缆(不仅仅是电源线)损坏。
- 操作中，电源故障恢复供电时，该仪器会保存上次设定温度。
- 运输仪器时要小心。
- 不要在仪器处于低温状态时运输或清空浴槽。将冷却液排出仪器时请检查浴槽中冷却液的温度。
- 移动仪器前请排空浴槽。



仪器长时间放置不用时，请排空浴槽。

冷却液:



仅使用满足安全、健康和仪器需要的冷却液。请注意使用的冷却液可伴有化学危害，遵守冷却液的所有安全警告。

- 根据所使用的冷却液和操作的类型，可能出现有毒或易燃蒸汽；确保相匹配的排风。
- 请勿使用任何在操作过程中有可能造成危险反应的冷却液。
- 只能使用推荐的冷却液。只能使用非酸性和非腐蚀性冷却液。



当仪器中冷却液不足时请勿操作！定期检查液位。

- 持续监测浴槽中所需的液位。
- 为了达到充足的循环，冷却液应加到液位视窗标示黄色以上（建议加冷却液4.0-4.5L）。
- 未经处理的自来水不推荐使用。建议使用蒸馏水或高纯度的水(经离子交换)并加0.1克碳酸钠(碳酸钠 Na_2CO_3 的)/升，以降低腐蚀性。



请勿使用以下介质：

- 未经处理的自来水
- 酸或碱类液体
- 卤化物的溶液：氯化物，氟化物，溴化物，碘化物或硫
- 漂白水(次氯酸钠)
- 铬酸盐或铬盐的溶液
- 甘油
- 亚铁水

2.应用场景

- 应用：

使用冷水机 (CH800)用于液体的冷却和循环。

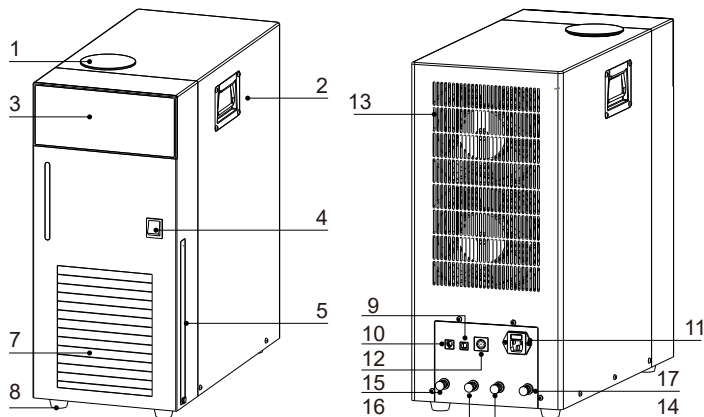
设计用途: 台面仪器

- 使用区域(仅可用于室内):
 - 实验室 - 医疗/科研机构
 - 制药 - 大学
- 仪器可用于下列之外的所有区域:
 - 居民区;
 - 直接连接于低压供电网络同时提供居民供电区。
- 出现下列情况时我们将无法确保使用者的安全:
 - 如果使用了非厂家提供或推荐的选配件;
 - 如果仪器操作有误或者违反了厂家的操作规范;
 - 如果仪器或者电路板被第三方非法修改。

3.开箱

- 开箱:
 - 请小心拆除包装并检查仪器;
 - 如果发现任何破损, 请填写破损报告并立即通知货运公司。
- 交货清单:
 - CH800冷水机 (冷却循环器)
 - 电源线
 - 进出水软管内径 $\varnothing 10\text{mm} \times 1.5\text{m}$ 带保温管(2根)
 - 溢流软管内径 $\varnothing 10\text{mm} \times 1.0\text{m}$ (1根)
 - 排水软管内径 $\varnothing 10\text{mm} \times 1.0\text{m}$ (1根, 带一个外径 $\varnothing 10\text{mm}$ 堵头)
 - 塑料管卡箍 (6个)
 - 说明书、合格证、保修卡

4.仪器构造



1	加液盖	10	RS485端口
2	拉手	11	电源插座
3	触摸显示屏	12	外部温度传感器接口
4	电源开关	13	出风口
5	滤网窗口	14	溢流接口(Overflow)
6	液位视窗	15	冷却液接口(OUT)
7	进风口	16	冷却液接口(IN)
8	机脚	17	排液接口(Drain)
9	USB端口		

5.准备工作

• 安装:

- 仪器放置在平坦、稳定、清洁、防滑、干燥和防火的台面。
- 仪器前后请保持至少20 cm的间距。
- 仪器安放场所必须足够大并可提供足够的通风，从而不会因仪器发热引起周边温度的升高。
- 不可将仪器放置于热源附近，也不可将仪器暴露在阳光下。
- 制冷仪器的马达以及电子元器件本身所发出的热量通过进、出通风口散热！请勿覆盖和堵塞进、出风口。

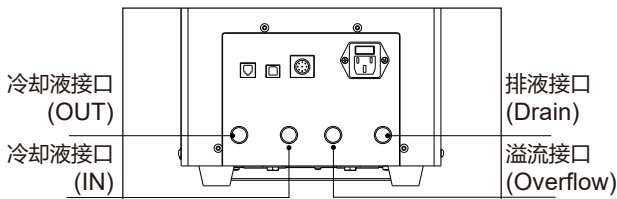
• 连接软管系统:

- 将仪器冷却液接口 (IN)、冷却液接口 (OUT)、溢流接口 (Overflow) 排液接口 (Drain) 处的硅胶堵头取下。
- 将进、出水软管内径 $\varnothing 10\text{mm} \times 1.5\text{m}$ 带保温管(2根)连接到冷水机的冷却液接口 (IN)、冷却液接口 (OUT)，然后用配件“塑料管卡箍”将进、出水软管与冷水机的冷却液接口固定，另一端连接到需要冷却设备的进、出水接口；
- 将溢流软管内径 $\varnothing 10\text{mm} \times 1.0\text{m}$ (1根)连接到冷水机的溢流接口，然后用配件“塑料管卡箍”将溢流软管与冷水机的溢流接口固定，另一端放置在盛水容器里；
- 将排液软管内径 $\varnothing 10\text{mm} \times 1.0\text{m}$ (1根，带一个外径 $\varnothing 10\text{mm}$ 堵头)连接到冷水机的排水接口，然后用配件“塑料管卡箍”排水将软管与冷水机的排水接口固定，另一端放置在盛液容器里；



注意

如果不需要外部系统时，请将冷却液接口(IN)和冷却液接口 (OUT)用硅胶堵头封住。



加冷却液和排空：

- 加冷却液：将冷水机加液盖取下，加入4.0-4.5L冷却液，并把加液盖盖好。
- 排空：将放在容器里排液管一端的堵头取下来，把软管放置在盛液容器里，排空冷却液后。
- 通过连接于溢流口(Overflow)接口的软管可将多余的液体导入合适的容器。容器的位置应该低于溢流口 (Overflow)的位置。

自来水不适合于实验，因为碳酸钙含量可能会导致钙化。由于具有腐蚀性，高纯度的水(经离子交换)和蒸馏水或重蒸水不适合于操作。高纯度的水和馏出水每升加入0.1克苏打（碳酸氢钠 NaHCO_3 ）可作为冷却液使用。



注意



注意

操作温度范围限制根据所选冷却液可调。



注意

机器在正常工作过程中意外断电，需等待5分钟后才能重新启动机器。



注意

当工作温度设置在4°C以下时需要添加对应配比的冷却液。

冷却液	比例	最低温度 (冰点)	推荐设置温度	用量
乙二醇 (Antifrogen N)	5:5(5成冷却液、5成水)	-32°C~-35°C	-10~-20°C	4-4.5L (混合液)
	4:6(4成冷却液、6成水)	-22°C~-25°C	-5~-10°C	4-4.5L (混合液)
	3:7(3成冷却液、7成水)	-12°C~-15°C	0~-5°C	4-4.5L (混合液)
	2:8(2成冷却液、8成水)	-2°C~-5°C	5~0°C	4-4.5L (混合液)
水	/	4~0°C	室温 ~ 5°C	4-4.5L

***注：数据来源Antifrogen N；乙二醇原液不能直接使用，需要配兑蒸馏水或去离子水后使用**

6.操作界面和显示屏



序号	名称	功能
A	浴槽内部温度显示	实时显示温度值
B	时间显示	实时显示时间
C	“菜单” 按键	按下该键：显示菜单选项
D	“温度曲线” 按键	按下该按键：实时显示浴槽的温度曲线
E	压缩机状态显示	“蓝色” 表示压缩机工作中； “灰色” 表示压缩机没有工作
F	散热风扇状态显示	“蓝色” 表示散热风扇工作中； “灰色” 表示散热风扇没有工作
G	水泵状态显示	“蓝色” 表示水泵工作中；“灰色” 表示水泵没有工作
H	温度传感器状态显示	“蓝色” 表示选用内置温度传感器； “灰色” 表示选用外部温度传感器
I	“设置” 按键	按下该键：显示设置选项
J	“启动/关闭” 按键	启动/关闭按键
K	“定时设定” 按键	指示按键，可进入定时设定：0-30小时
L	定时显示	设定时间后，显示剩余工作时间
M	“温度设定” 按键	设置工作状态下需要达到的温度值：-20℃~ 室温

开机前请检查电源电压是否与仪器铭牌上要求电压一致。

电源插座必须接地保护。

如果符合上述条件，插上电源即可开启仪器进行操作。

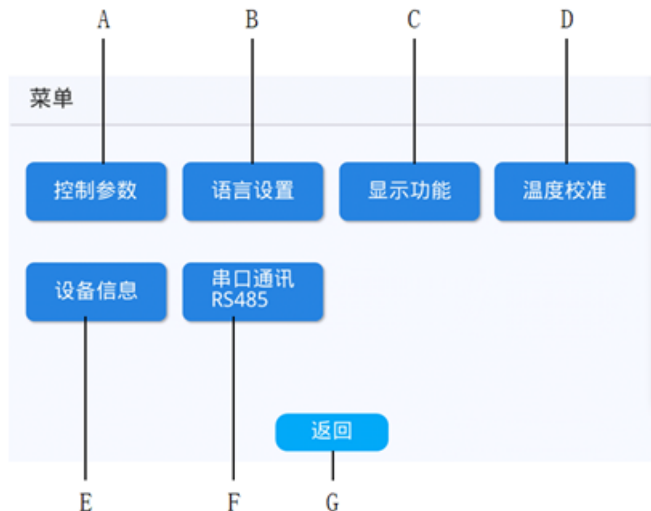
如果上述条件未能满足，将无法保证安全操作，有可能导致仪器损坏。

注意“技术参数”中所列的周边条件。

启动

1. 打开仪器电源开关，触摸屏亮起。
2. 仪器准备就绪，进入待机状态。
3. 按下“温度设定”按键改温度设置。
4. 按下“定时设定”按键改时间设定。
5. 确认好设定参数无误后，按下“启动/关闭”按键。仪器进入工作状态。

7. 菜单界面



序号	名称	功能
A	“控制参数” 按键	按下该键; 可以进行蜂鸣器的开启/关闭及还原出厂设置
B	“语言设置” 按键	按下该键; 可以进行中英文选择
C	“显示功能” 按键	按下该键; 可以进行温度单位选择及屏幕亮度调节
D	“温度校准” 按键	按下该键; 可以对内置温度传感器进行校验
E	“设备信息” 按键	按下该键; 可以查询到软件版本及仪器序列号
F	“串口通讯RS485” 按键	按下该键; 可以进行RS485串口的参数设置
G	“返回” 按键	按下该键; 退回到主界面

• 控制参数界面



• 语言设置界面

语言设置

☒ 简体中文 ☐ English

取消 保存

• 显示功能界面

显示功能

温度单位 ☒ 摄氏度°C ☐ 华氏度°F

屏幕亮度 50 100

返回

• 温度校准界面

1. 主界面设定温度为 0°C ，待温度稳定到 0°C ，用一个测温仪器测量冷却液的实际温度，并将实际温度数值输入到校准值对应的框内；按下“确定”按键。
2. 主界面设定温度为 -15°C ，待温度稳定到 -15°C ，用一个测温仪器测量冷却液的实际温度，并将实际温度数值输入到校准值对应的框内；按下“确定”按键。
3. 完成上两步骤操作后，按下“校准”按键，完成校准设定。

温度校准

校准点数	设定值($^{\circ}\text{C}$)	当前值($^{\circ}\text{C}$)	校准值($^{\circ}\text{C}$)	确定项
校准点一	0	0	0	确定
校准点二	-15	-15	-15	确定

返回

校准

• 设备信息界面

设备信息	
软件版本	Ver2.0
主机固件版本	Ver2.0
产品型号	CH800

返回

• 串口通讯RS485界面

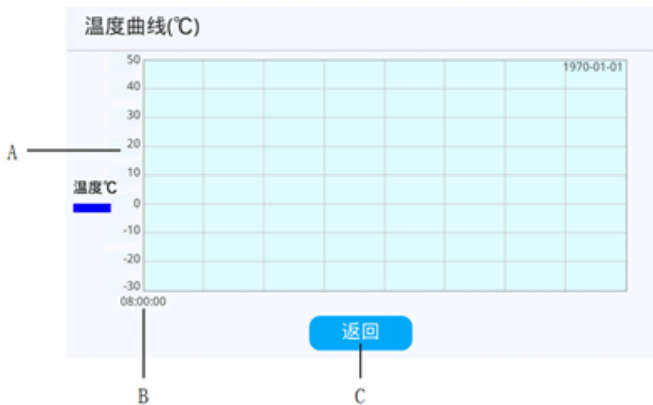
串口通讯(RS485)	
波特率	115200 ▼
通讯地址	0001
校验位	None ▼
串口通讯数据位	8 ▼
停止位:	1 ▼

取消

确定

8. 温度曲线界面

• 温度曲线界面结构



序号	名称	功能
A	温度刻度值	实时显示温度的变化曲线
B	时间刻度值	实时滚动时间刻度
C	“返回” 按键	按下该键；退回到主界面

9.设置界面

• 设置界面结构



序号	名称	功能
A	“温度探头” 设置	可选用内置温度传感器或选用外部温度传感器
B	“循环水泵” 设置	设置循环水泵开启/关闭
C	“定时功能” 设置	设置定时功能开启/关闭
D	“返回” 按键	按下该键；退回到主界面

10. 清洁维护

为避免污染，请定期检查并更换冷却液。如果水用于作为冷却液，我们建议添加水浴槽保护液。可以阻止藻类、细菌和其他微生物的生长。水浴槽保护液可确保冷却液可长时间使用。为了保持足够的冷却功能，定期清洁冷却器的滤网。

- 关闭仪器并断开电源。
- 卸下滤网窗口。
- 取出防尘滤网。
- 拿用真空吸尘器清除冷凝器滤网灰尘或者用水清洗滤网，安装前请将滤网晾干。



请勿使用硬物触碰热压缩机的表面。

清洁

- 清洁仪器须断开电源。
- 清洁仪器时仅可使用本公司认可的清洁液：含活性剂的水溶剂和异丙醇。
- 清洁仪器时请佩戴防护手套。
- 清洁时，请勿将电子设备放置于清洁剂中。
- 清洁时，请勿让潮气进入仪器。
- 当采用其他非本公司推荐的方法清洁时，请先向我们确认清洁方法不会损坏仪器。

维修

- 在送检您的仪器之前，请先清洁并确保仪器内无任何对人健康有害的物料残留。
- 如需维修服务，请使用原包装箱妥善包装后将仪器寄回。如原包装不存在时请采用合适的包装。

11.错误提示

故障时，屏幕提示错误信息。此时，按照以下步骤处理：

- 1.关闭仪器开关，
- 2.重新开启仪器

错误描述	原因	解决方案
校验错误	输入的校准温度值错误	重新确认参数值，并输入
内部温度传感器故障	传感器损坏、线路松动	联系售后部门
外部温度传感器故障	传感器损坏、线路松	检查外部测温传感器和主机间的连接插头是否插
当前显示温度异常， 无法开启制冷	电路损坏、线路松动	联系售后部门
工作电流过大	压缩机异常、损坏	关闭仪器静置10分钟后 再尝试重新开启

如果上述措施无法排除故障或者出现其他错误信息请采取下列措施：

- 联系售后部门；
- 附简短故障说明，将仪器送返维修。

12.技术参数

12.技术参数

操作电压		VAC	AC100-120V/AC200-240V
频率		Hz	50Hz/60Hz
最大输入功率		W	750
工作温度范围		°C	-20~室温 (25°C)
温度稳定性		K	±0.3
温度控制		°C	PID
测温(绝对)准确度		K	±0.5
温度设置		/	按键
温度设置精度		K	0.1
温度显示		/	触摸屏
温度显示精度		K	0.1
制冷量	+20°C	W	750
	+10°C		650
	0°C		500
	-10°C		400
	-20°C		200
制冷剂		/	R290
最大水泵泵压		bar	1.0
最大泵流量		l/min	22
浴槽容量		l	5.0L (最大储液量为5.3L)
冷却液最大粘度		mm ² /s	50
接口		/	USB; RS485
允许工作环境温度		°C	+5~+35
允许相对湿度		%	80
尺寸(W x D x H)		mm	235 X 468 X 535mm
重量		kg	35



制冷剂必须根据国家和地方的相关规定加以处理。
技术参数若有变更，恕不另行通知！

13. 保修

根据公司保修规定本机保修2年。保修期内如果有任何问题请联络您的供货商，您也可以将仪器附发票和故障说明直接发至我们公司，经我方事先确认后运费由贵方承担。保修不包括零件的自然磨损，也不适用于由于过失、不当操作或者未按操作说明书使用和维护引起的损坏。

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