



Operating Instructions 使用说明书



High-speed Micro Centrifuge

高速微量离心机

CF221

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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.

1. Declaration of Conformity

We declare under our sole responsibility that this product is in compliance with the regulations:

2014/35/EU, 2006/42/EC, 2014/30/EU, 2011/65/EU, EN 61010-1, EN 61010-2-010, EN 61010-2-051, EN 61326-1, EN 60529, EN ISO 12100.

2. Safety Instructions

General Information

- Please read the operating instructions completely before using the device.
- 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.

Explanation of Symbols



This symbol indicates prohibited operational actions.



This symbol indicates important mandatory actions to follow.

- ❗ • Prior to usage, please strictly follow the operating steps mentioned in this manual. Failure to do so may damage the device.
- Only trained staff can operate or repair this device.
- Position the device on a secure and steady work surface to prevent any potential harm to the device or personal injury.
- Prior to usage, ensure that the power supply voltage matches the specified requirement indicated on the device nameplate. Neglecting to do so could lead to fire or electric shock.
- The device uses a three-pin plug and the third pin is a ground pin. Don't remove the grounding prong of the power cord and ensure that the power plug is securely connected to the socket to avoid the risk of fire.
- In the event of a gas leak, such as inflammable or explosive gas, close the gas valve, open doors and windows for ventilation, and do not plug or unplug electrical appliances, as this could potentially cause explosions and fires.
- When unplugging the centrifuge plug from the power socket, grasp the plug head instead of pulling the cord. Pulling the cord directly with your hand may result in electric shock or a short circuit, leading to a fire.
- If the device is not working properly, please disconnect the power. Operating the device under abnormal conditions may cause electric shock, leading to a fire.

- Ensure the device is disconnected to the power supply before starting repairs or maintenance to prevent electric shock or personal injury.
- Ensure that no suspended particles from the centrifuge and its surroundings are inhaled during maintenance and cleaning, as this could potentially pose health hazards.
- Disconnect the power supply if the device won't be used for an extended period of time to prevent the power cord from aging.
- The disposal of scrapped centrifuges should be carried out by certified personnel.
- When restarting the centrifuge after a power outage, it is important to check the settings of the centrifuge. Changes in settings could potentially affect the results.
- Be careful when transporting the device to avoid any personal injury or causing damage to the device.
- The device should be used in the open environment of a well-ventilated laboratory or a fume hood.



- Don't place the centrifuge in damp or near water sources, as it may result in electric shock.
- Don't pour water directly onto the centrifuge, as it may cause electric shock or short circuits.
- Don't touch any electrical components of the centrifuge, such as power plug, or any switches with wet hands, as it may cause electric shock.

- ⊘ Users are prohibited from disassembling, repairing, or modifying the centrifuge themselves, as improper operation may lead to fires or injuries.
- Don't place flammable, explosive, or volatile substances in the centrifuge, and refrain from using flammable aerosols near the centrifuge to avoid explosions or fires.
- Don't insert metal objects such as nails or wires into any holes or gaps of the centrifuge or into any exhaust vents used for internal air circulation, as contact between these objects and moving parts may cause electric shock or injury.

Disclaimer

The following situations may affect the normal use of the equipment. We shall not responsible for any property loss or personal injury caused by below situations:

- Don't follow the operating instructions
- Use of the equipment for purposes other than specified in this manual
- Use of accessories and consumables not recommended by the manufacturer
- Maintenance or repair of the equipment by uncertified personnel
- Unauthorized modification of the equipment by the user

3. Operating Instructions



Danger! Explosion hazard!

- Don't operate this equipment indoors where there is a risk of explosion.
- Don't use this equipment to centrifuge explosive or highly reactive substances.
- Don't use this equipment to process materials that produce explosive gases.



Warning!

Electric shock due to damaged equipment or power cord.

- Before starting the equipment, ensure that both the equipment and power cord are undamaged.
- Only start the equipment that has been correctly installed or repaired.
- In hazardous situations, disconnect the equipment from the power supply. Remove the power plug from the equipment or power socket.



Warning!

Hazards due to damaged accessories!

- Ensure all accessories are in good condition.
- Check if the accessories are damaged before use. If yes, replace the accessories.
- Don't use the accessories that exceed the service life.



Caution! Hazards due to incorrect accessories!

- Using accessories that aren't recommended by the manufacturer may affect the safety, normal function and accuracy of the equipment. Damages caused by improper accessories is not covered by the warranty.



Device damage caused by contacting liquid

- Turn off the device.
- Disconnect the power supply.
- Carefully clean the equipment and its components according to the cleaning and maintenance instructions mentioned in this manual.



Condensation can lead to damage of electrical components

- When transporting the equipment from a cooler environment to a warmer one, condensation may form on the chamber wall. Please wait for at least 4 hours before reboot the equipment.
- The equipment should be placed in a location where the power supply can be easily disconnected.
- Colliding with or moving the device while it is running may cause damage. Severe damage to the centrifuge or rotor may occur if the rotor collides with the chamber wall.



Rotor and rotor lid are not secured properly

- Tighten the rotor and the rotor lid before running.
- Improper securing of the rotor and rotor lid may cause abnormal noise in the centrifuge. Press this  button immediately to stop the device.



The tubes are asymmetrically loaded

- To ensure symmetric loading, tubes that are arranged opposite each other must be of the same type and contain the same sample quantity.
- To make sure that tubes are symmetrically loaded, we recommend using electronic scale to measure the filled sample tubes.



Rotor Overload

- When the device reaches the maximum speed and maximum loading capacity, the density of the sample tubes must not exceed 1.2g/ml.



The rotor lid is corroded by chemical substances.

- If the rotor lid comes into contact with organic solvents, clean it immediately.
- Regularly inspect the rotor lid for damages or cracks.
- If there are cracks or it turns milky white, replace it immediately.



The rotor is damaged by corrosive chemicals.

- The stability of the rotor may be affected by corrosive chemicals.

- Avoid contacting corrosive chemicals, including strong alkalis, strong acids, solutions containing mercury, copper, and other heavy metal ions, organic halides, concentrated hydrochloric acid solutions, and phenols.
- If the rotor is contaminated with corrosive chemicals, clean it immediately with a neutral detergent and pay attention to clean the grooves of the rotor.



Rotor falls off due to improper operation.

- Always use both hands to carry the rotor when removing or placing it to prevent it from falling off.



Damaged tubes.

- Don't use damaged tubes for centrifugation as it may damage to the device and the sample. Visually inspect all centrifuge tubes for damage before use.



The tube lid is open.

- Unclosed tube lids may break during centrifugation, causing damage to the rotor and centrifuge. Please make sure that all tube lids are closed before running.



Organic solvents can damage plastic centrifuge tubes.

- Using organic solvents (such as phenol) can weaken the strength of plastic centrifuge tubes, potentially causing damage to the tubes.

4. Unpacking

Unpack the package carefully and examine the contents for potential damages that may have occurred during transit. If you observe discernible damage, please promptly contact your local seller for assistance. In the event of any discernible damage to the device, refrain from connecting the device to a power source to avoid any potential risks or further harm.

Packing List:

Name	Quantity
Centrifuge	1
Power cord	1
Emergency lid release pin	1
Wrench	1
User manual	1
Warranty card	1
Certificate	1

5. Product Introduction

Product overview

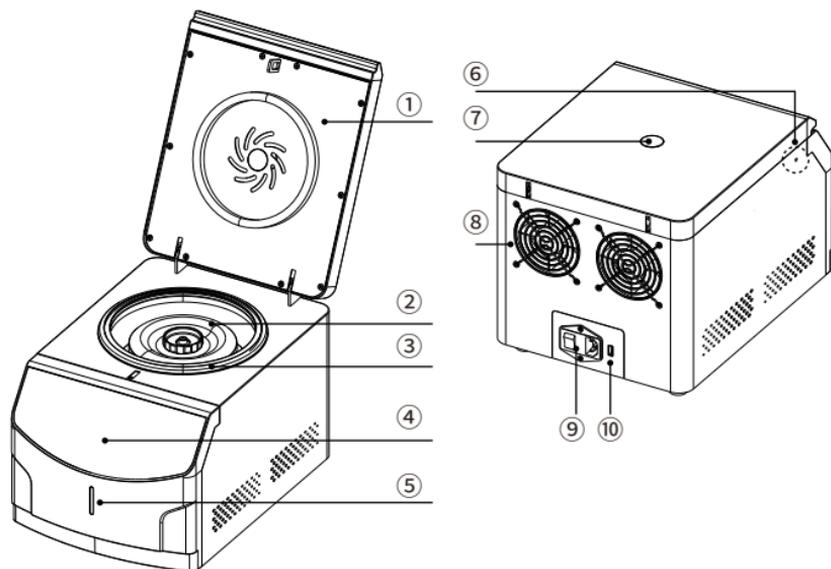
CF221 High-speed Micro Centrifuge is a versatile laboratory instrument designed for rapid separation and extraction of components from mixtures of liquids and solids. By utilizing centrifugal force, it effectively separates particles based on their density, enabling efficient sample processing in various fields, including life sciences, biology, medical research, pharmaceuticals, geology, agriculture, forestry, petrochemicals, light industry, and

metal particles analysis, etc.

Features

- Maximum centrifugal force (RCF) reaches up to 21,200xg
- Large TFT touchscreen with an intuitive user interface for easy operation
- Motor-driven lock lid design enhances safety, enabling easy lid closure with gentle pressure
- Silent operation promotes a safe, stress-free environment
- Multiple protection function, over speed protection, system protection and lid locking protection
- Remarkable versatility with 4 different rotors: 24x1.5/2.0mL tubes, 12x5mL tubes, 8x4x0.2mL PCR strips/tubes (for 4x0.2mL PCR strips or 32x0.2mL PCR tubes)
- The rotor chamber is made of fully enclosed steel structure, ensuring safe centrifugation

Product structure



①	Lid	⑥	Emergency lid release hole
②	Rotor chamber	⑦	View port
③	Sealing ring	⑧	Fan
④	Operation panel and display	⑨	Power switch
⑤	Indicator	⑩	USB interface

6. Specifications

Model	CF221
Max. Speed (rpm)	15,000
Max. RCF (xg)	21,200
Speed accuracy	±10rpm
Time setting range	1s~99min59sec or continuous run function
Noise	< 58dB(A)
Power supply	AC110V/220V 50-60Hz
Wattage	230W
Weight	17.5kg
Dimension (L*W*H)	382*266*256.8

Note: The appearance and technical parameters of the device are subject to change without notice.

Model No.	Rotor Capacity
CF221-01 (Standard)	24x1.5 / 2.0ml tubes
CF221-03 (Optional)	12x5ml tubes
CF221-04 (Optional)	4x8x0.2ml PCR strips/tubes

7. Installation Requirements

Installation Environment

To ensure that the device can meet the normal operation and optimal performance, please abide by the following requirements:

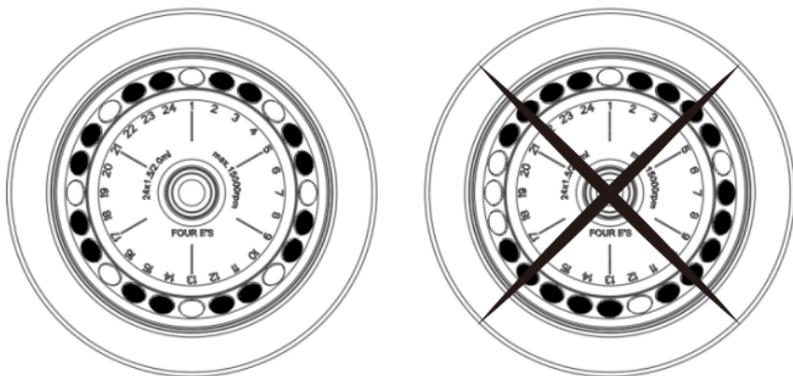
- Indoor use only
- Ambient temperature: 5~35°C
- Avoid strong vibrations, high temperatures, and direct sunlight in the vicinity.

- Avoid mechanical shaking or vibration.
- Position the device on an secure and stable work platform in an area free from corrosive gases, smoke, direct sunlight, excessive air currents, or strong magnetic field disruptions.
- After installation, the four rubber feet of the device should bear even force.
- The distance between the back and side of the device and the wall should not be less than 30cm to ensure well ventilation.
- Do not twist or compress the power cord.
- Prior to usage, check the working voltage. In areas with unstable voltage, consider using a voltage stabilizer suitable for motor loads to ensure a stable voltage within the normal input range required by the machine:
110V/220V \pm 10%.
- The device must be grounded properly to avoid electrical shock hazards. The device uses a three-pin plug, and the third pin is a ground pin. Only use earth/grounded sockets with a protective earth (PE) conductor.

8. Instructions for the Rotor and Tubes

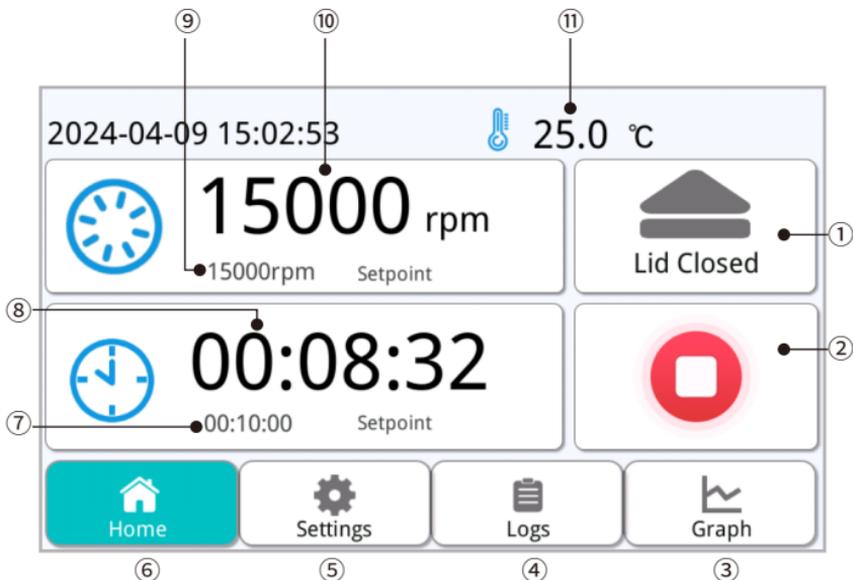
- Insert the rotor to the motor shaft. Ensure the rotor is in position and connected to the shaft. Tighten the locking nut firmly by turning it clockwise with the wrench. Ensure the rotor is firmly secured on to the motor shaft without any slackness or movement. You can remove the rotor by turning the locking nut counterclockwise using the wrench.

- Attach and tighten the rotor lid.
- Insert tubes opposite each other in pairs into the rotor bores. To ensure symmetric loading, tubes that are arranged opposite each other must be of the same type and contain the same sample quantity. To minimize weight differences between filled sample tubes, we recommend balancing. This will reduce wear on the drive and also reduce operating noise.



9.Operation Settings

Operation Panel



①	Open/close the lid
②	Start/Stop program
③	Check the operation graph
④	Check the operation logs
⑤	Click to the settings menu
⑥	Back the the home screen
⑦	Set centrifugation time
⑧	Display the remaining centrifugation time
⑨	Set the speed
⑩	Display the real-time speed
⑪	Display the real-time temperature

Speed setting

Speed Setting

 5000_{rpm} 

300  15000

Set the speed of centrifugation and adjust it by pressing “+/-” icons (increment is 100rpm) or use slide function for faster adjustment. The speed range is 300-15000rpm.

Time Setting

Time Setting

H	M	S	Range	
98	08	58	30s-99h59m59s	
99	09	59		
<u>00</u>	:	<u>10</u>	:	<u>00</u>
01	11	01		
02	12	02		

Slide up and down to set the centrifugation time.

System Settings

System

Conversion

Device info

System settings

Brightness 50  100

Ramp rate

Up(1-3)  3  Down(1-3)  3 

Language 简体中文 English

Home **Settings** **Logs** **Graph**

System

Conversion

Device info

System settings

RPM/RCF Speed (rpm) RCF(xg)

Temp. unit °C °F

Home **Settings** **Logs** **Graph**

- Brightness: slide left or right to adjust the brightness.
- Continuous cooling: switch on and close the lid to start continuous cooling automatically.
- Three adjustable speed levels: speed can be accelerated from 0 to 15000rpm or decelerated from 15000rpm to 0 at three speed levels. When setting 1st, 2nd, 3rd speed level, the acceleration and deceleration time is 60s, 40s, 15s respectively.
- Language: Chinese or English
- RPM/RCF: speed or RCF
- Temp. Unit: °C or °F

Program Settings



Delete

Logs

No.	Status	Time	Description
1		2024-01-30 10:54:00	The device is on.


Home


Settings


Logs


Graph

New: Click “New” button to create a new program

Select: Choose a program to run (e.g. No.2) , then click “Select” button

Delete: Choose a program to delete (e.g. No.2) ,then click

“Delete” button

Edit: Select a program to edit (e.g. No.2), then click “Edit” button

10.Troubleshooting

Error messages

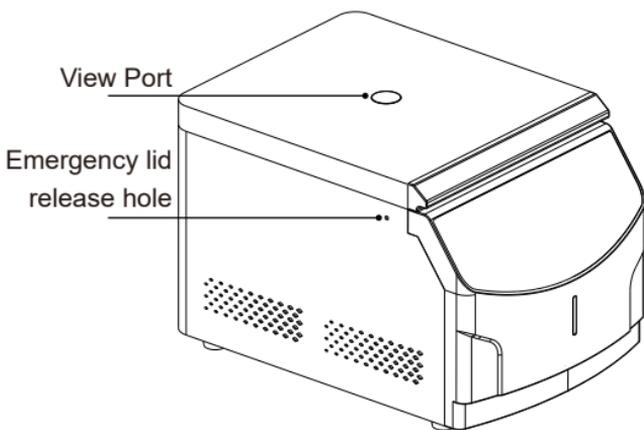
Problem	Cause	Solution
No display	No power connection	Check the power connection
	Damaged power socket	Replace the power socket
	Damaged power switch	Replace the power switch
	Others	Contact distributor or supplier
Centrifuge lid can't be opened.	The rotor is still running.	Wait for the rotor to stop.
	Power outage	1. Check the power supply 2. Activate the emergency lid release.
Loud noise during operation	The rotor is not loaded properly.	Switch off the device and tighten the rotor nut and rotor lid
	The tubes are asymmetrically loaded.	Switch off the device and load the tubes symmetrically.
Temperature display doesn't match the actual temperature.	Damaged temperature sensor.	Contact distributor or manufacturer
Shows “High Rotor Temperature. Device stopped automatically.”	The ambient temperature is too high.	The ambient temperature should be less than 35°C.
	No refrigerant or PCB fault.	Contact distributor or manufacturer

Note: In case of any error messages are not shown in above list, please contact your local distributor or manufacturer.

Emergency lid release

During power outage, the centrifuge lid cannot be opened using the “Open lid” button on the operation panel. In that case, the lid can be opened by the emergency lid release.

- Ensure the rotor is not running through the view port.
- Disconnect the device from the power supply.
- Insert the emergency lid release pin or a thin screwdriver into the emergency lid release hole and push it, then the lid will open automatically.



11. Maintenance and Cleaning

- Switch off the device and disconnect it from the power supply before starting cleaning or disinfection.
- Do not allow any liquids to penetrate the inside of the housing.
- When the centrifuge is not in use for an extended period, remove the rotor and apply rust inhibitor onto the rotor base (or drive shaft) to prevent rust. This ensures proper coordination

between the rotor base and rotor for balanced operation. To prevent rust, consider placing desiccants inside the centrifuge chamber to absorb moisture when needed.

- During use, the rotor may be contaminated due to damaged centrifuge tubes, overfilling, or improper sealing. After use, remove the rotor from the shaft, clean it promptly, and apply a protective agent. To prevent corrosion and associated risks, monitor sample volume and seal integrity, regularly inspect the seal ring for damage, and replace it promptly if aging or broken occurs to prevent leaks.
- Remove the rotor and clean it using a soft cloth soaked with diluted alcohol.
- Clean any dust deposits using a brush, but not a wire brush.
- Thoroughly clean the rotor and rotor chamber, and check the rotor for wear, damage and corrosion.
- Only use cleaning agents and disinfectants with pH between 6 and 8.
- If the device has been contaminated by aggressive chemicals, clean immediately using a mild cleaning agent.
- Do not exceed temperature of 121°C or a time of more than 20min. while autoclaving.
- Replace the seals of rotors after 50 autoclaving cycles. (Seal PN: 3.4.603440007)

12. 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。

1. 符合性声明

我公司自行负责声明本产品符合：

2014/35/EU, 2006/42/EC, 2014/30/EU 和 2011/65/EU 指令，
并符合以下标准或标准性文档：

EN 61010-1,

EN 61010-2-010,

EN 61010-2-051,

EN 61326-1,

EN 60529 和 EN ISO 12100.

2. 安全说明

一般信息

- 操作仪器前请认真阅读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。

符号说明



表示必须禁止的行为或操作



表示必须遵守的行为或操作



- 首次使用本产品请仔细阅读说明书，如果不按本说明书规定的方法来使用设备，则有可能造成设备损坏。
- 只有专业的技术人员或售后维修人员才能安装维护离心机，否则可能会导致触电或火灾。
- 务必将离心机稳固地安放于坚实水平的操作台面上。如果固定不牢固或安放场所不恰当，将导致离心机翻倒或人员受伤。
- 请使用离心机铭牌上标明的专用电源。否则有可能引起火灾或触电。
- 本离心机电源线配有三线（接地）插头。符合10A的标准三线（接地）插座。在任何情况下，切勿切除或拆除电源线的接地插脚。务必保证电源插头和插座插紧，牢固可靠，否则可能导致火灾。
- 如有易燃易爆气体泄漏时，需关闭气体阀门，打开门窗，通风排气，不要插、拔离心机电源插头，否则有可能引起爆炸和火灾；
- 从电源座拔下离心机插头时，应手握电源头而不要去拉电源头的导线。如果用手去拉导线则有可能引起触电或因短路而引发火灾；
- 如果离心机运行不正常，则请拔下电源插头。在不正常状态下继续运行有可能引起触电造成火灾；
- 在对离心机进行任何维修或维护之前，务必断开离心机电源，以防触电或人员受伤；
- 确保在维修保养时不会吸入离心机内部及周围的药物或悬浮粒。否则有可能对健康带来危害；
- 如离心机长时间不使用时，应拔下电源插头，以防电源线因老化导致触电、漏电造成火灾；
- 离心机报废处置由相应人员进行。
- 在停电或者关闭电源后重新启动离心机时，需要检查离心机的设置情况。设置的改变可能会导致结果的变化；
- 搬运离心机时，应注意不要被离心机绊倒，以防离心机受损或人员受伤；

- 离心机周围应无障碍物，保持通风通畅；



- 不得将离心机安放于潮湿的场所或易遭受喷水的地方，否则会因绝缘程度降低而引起触电；
- 不得将水直接倾倒在离心机上，否则会引起触电或短路；
- 不要将装有水的容器或重物放到离心机上，如果物品掉落，则可能引起人员受伤而流出的水则会使绝缘程度降低引起漏电或触电；
- 不可用湿手接触离心机诸如电源插头之类的任何电气零件或任何开关，否则可能引起触电；
- 用户不得自行拆卸·修理或改装离心机。否则有可能会因操作不当引起火灾或人员受伤；
- 不得在离心机中放置易燃、易爆的危险品或易挥发的物品，也不可在离心机附近使用可燃性喷雾剂。否则会有可能引发爆炸或火灾；
- 不得将诸如铁钉或铁丝之类的金属物件插入离心机的任何孔口和间隙或用于内部空气循环的任何排气口，否则会因为上述物件与运动部件接触而造成触电或受伤；

免责声明

以下情况可能影响设备的使用，由此产生的财产损失，人员伤亡由设备使用方承担：

- 不按操作手册操作设备
- 未按规定用途使用设备
- 与非本公司推荐的配件和耗材一起使用
- 由未经本公司授权的人员维护或维修设备
- 未经授权用户自行更改设备

3. 操作说明



危险！有爆炸危险

- 不得在有爆炸危险物质的室内运行此设备。
- 不得用此设备离心爆炸性物质或者高活性物质。
- 不得用此设备处理会产生爆气体的物质。



警告！设备或电源线坏导致触电

- 启动设备前确保设备和电源线没有损坏。
- 只可启动正确安装或维修的设备。
- 危险情况下切断设备电源。从设备或电源座上拔下电源头。



警告！机械损坏的配件造成受伤危险

- 避免所有配件受到机械损坏。
- 每次使用前检查配件是否损坏。如损坏，请更换配件。



小心！错误的配件导致安全隐患

- 使用非本公司维修的配件可能会影响设备的安全性正常功能和精确度。由于使用不当的配件引起的损坏不在本公司的质保范围内。



不慎泼出的液体导致设备损坏

- 及时关闭设备。
- 切断电源。
- 根据操作说明中关于清洁和消毒的提示仔细清洁设备机器配件。



冷凝水会导致电气部件损坏

- 将设备从一个较冷的环境中运输到温暖的环境后，设备内部可能会形成冷凝水。放好设备后，至少等待4小时再连接设备电源。



- 设备应放置在易于断开电源的位置使用。



- 碰撞或移动正在运行的设备会造成损坏。若转子碰撞离心机腔壁，会造成离心机或转子严重损坏。因此，在设备运行期间，切勿移动或碰撞设备。



转子和转子盖固定不当造成受伤危险

- 拧紧转子和转子盖后才可进行离心分离。
- 转子和转子盖未正确固定会导致离心机出现异响，立即按下  键，结束离心分离。



转子不对称装载可能会造成受伤危险

- 在转子中对称装载相同的离心管。
- 使用电子秤称出所使用的离心管的重量，检查装载是否对称。



转子过载可能造成受伤危险

- 转速最大且容量或装载量最大时，要离心分离的试剂的密度不得超过 1.2g/mL。



受到过化学性损坏的转子盖可能会造成受伤危险

- 如果转子盖接触了有机溶剂，请立即清洗。
- 定期检查转子盖是否受损，是否产生裂缝。
- 如果转子盖出现裂缝或变成乳白色，请立即更换。



腐蚀性化学物质会损坏转子

- 转子的稳定性可能会受到腐蚀性化学物质的影响。
- 避免转子接触到腐蚀性化学物质，主要包括强弱碱、强酸、含有汞、铜和其它重金属离子的溶液、有机卤化物、浓盐酸溶液和苯酚。
- 如果转子被腐蚀性化学物质污染，请立即用中性洗涤剂清洗。着重清洗转子凹槽处。



操作不当可能会导致转子掉落

- 取放转子时必须始终双手托握转子以防掉落。



离心管超载可能会造成受伤危险

- 注意离心机的负载极限。
- 根据需要达到的相对离心力，选择使用制造商规定的离心管。



离心管损坏可能会造成危险

- 如果离心管损坏，不得继续使用。否则可能造成设备和配件的损坏以及样品的损失。
- 使用前请目视检查所有离心管是否有损坏。



未盖上离心管盖会造成危险

- 打开的离心管盖可能在离心过程中断裂，从而损坏转子和离心机。因而开始离心前请仔细盖上所有离心管盖。



有机溶剂会损坏塑料离心管

- 使用有机溶剂（如苯酚）会降低塑料离心管的强度，离心管可能因此受损。

4. 开箱检查

请小心打开包装并检查仪器是否破损，如发现任何破损，请填写破损报告并立即通知当地代理商和货运公司。

装箱清单：

序号	配件名称	数量	序号	配件名称	数量
1	产品主机	1	5	说明书	1
2	电源线	1	6	保修卡	1
3	开门针	1	7	合格证	1
4	内六角扳手	1			

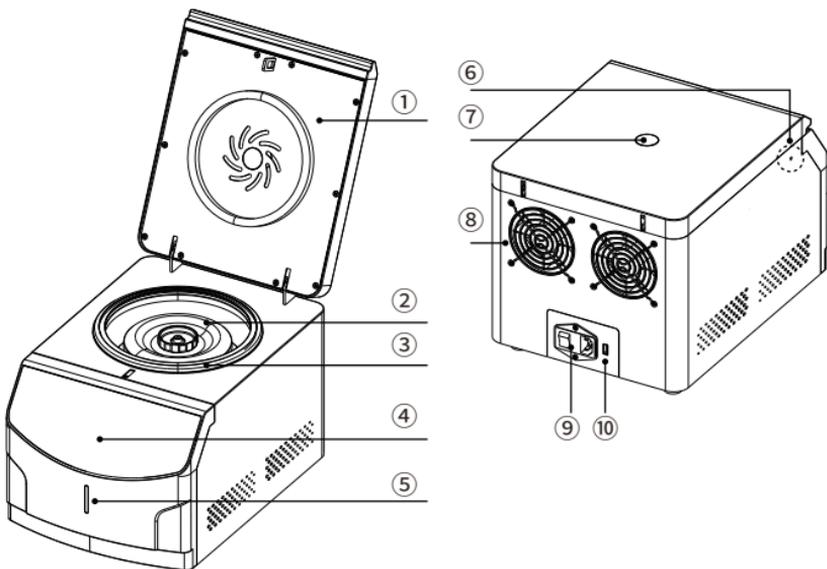
5. 产品介绍

产品用途及适用范围

CF221全称高速微量离心机，是利用离心力，分离液体与固体颗粒或液体与液体的混合物中各组分的机械。常用于微量样品快速分离提取，在生命科学，生物学，医学研究，制药，地质，农林，石化，轻工及金属颗粒等领域有广泛地应用。

产品特点

- 优异的离心加速度，最高可达21,200xg
- TFT彩屏显示，界面直观易读，实现简便的操作
- 电机门锁吸附设计，轻轻一按即可关闭离心机盖
- 适配四种不同的转子，最大程度地提高实验的灵活性
- 具有多种保护功能：超速保护、系统保护、门盖保护等
- 离心腔采用全封闭内钢结构，保障离心安全
- 整机振动小，静音运行性能，打造安全、轻松的工作环境



① 门盖	⑥ 紧急解锁孔
② 离心腔	⑦ 观察窗
③ 密封圈	⑧ 排风扇
④ 操作显示屏	⑨ 电源开关
⑤ 指示灯	⑩ 电源插座

6. 主要技术参数

产品名称	CF221
最高转速 (rpm)	15,000
最大离心力 (xg)	21,200
转速精度	±10rpm
定时范围	1s~99min59sec或连续运转
整机噪音	< 65dB(A)
电源	AC110V/220V 50-60Hz
整机功率	230W
重量	17.5kg
外形尺寸 (长*宽*高)	382*266*256.8

注：本公司注重科技创新，产品参数如有变更，恕不另行通知。

转子参数

转子型号	转子容量
CF221-01(标配)	24x1.5 / 2.0ml
CF221-03(选配)	12x5ml
CF221-04(选配)	8x4x0.2ml PCR排管

7. 安装要求

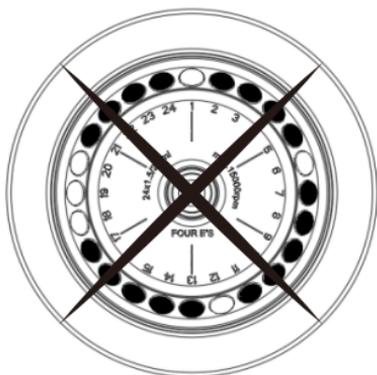
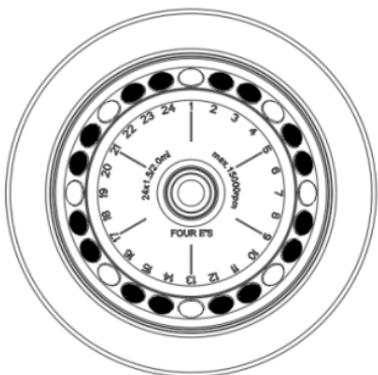
安装环境

为了使离心机正常运行并获得最佳性能水平，离心机安装场所应符合下列条件：

- 仅限室内使用。
- 环境温度：5~35°C。
- 周围不能有较强振动源，高温，避免阳光直射。
- 避免机械摇摆或振动。
- 安装在平稳坚实的水平台面上。
- 室内空气不能含有导电尘埃，腐蚀性气体。
- 安装到位后，本机底板的四个橡胶脚应均匀受力。
- 机器背面及侧面离墙壁的安装距离不得小于30CM，以以确保仪器放置间距合理。
- 不要使电源线扭曲或受压。
- 使用前请检查工作电压，电压不稳定地区应考虑使用适合电动机负载的稳压器稳压。以保证正常输入机器要求的稳定电压：110V/220V±10%。
- 电源必须要有独立保护接地线，禁止用零线代替保护接地线。
- 如果电源插座装有接地线，使用前检查接地是否良好。
- 如果插座未装有接地线，则务必由专业的工程技术人员安装上接地线。

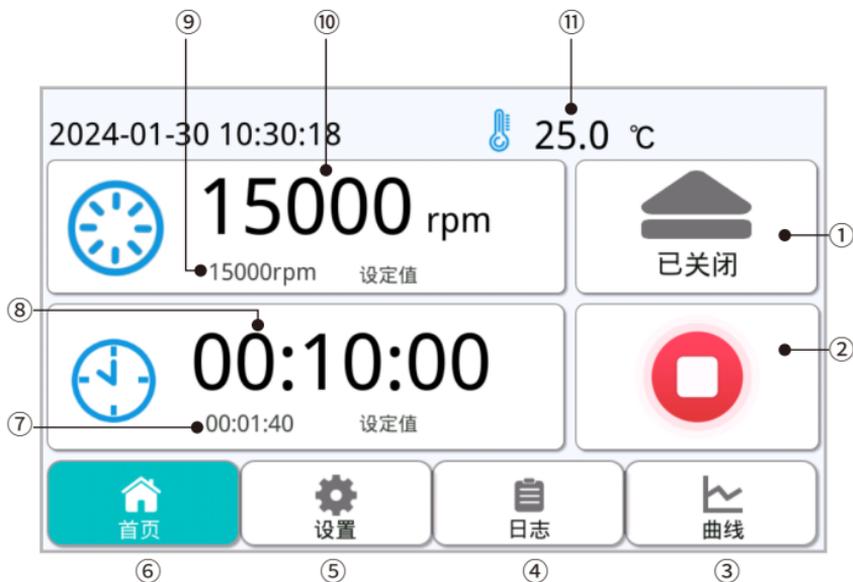
8. 转子安装与拆除

- 将转子竖直穿入电机轴，一只手按住转子，用内六角扳手将转子锁紧螺母顺时针拧紧。拧紧后转子与电机轴不能有任何松动或者相对滑动；如需拆除转子，逆时针松动锁紧螺母，即可取下转子。
- 装上转子盖并拧紧；
- 离心管必须成对的装在转子孔内，为保证装载对称，相对两侧的离心管型号和填充量必须相同。为缩小装有样品的离心管间的重量差异，建议用一台秤均衡重量。这样可以保护驱动装置，降低噪音。



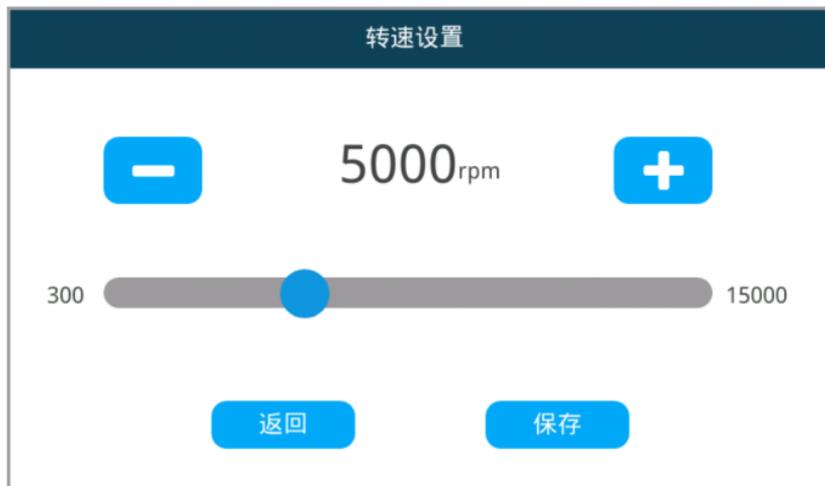
9.操作指南

功能界面



①	打开门上盖	⑦	离心时间设定
②	程序启动/停止按键	⑧	离心剩余时间显示
③	查看工作曲线	⑨	离心转速设定
④	查看工作日志	⑩	实时转速显示
⑤	进入设置菜单	⑪	实时温度显示
⑥	返回主界面		

转速设置



点击左右侧“-”“+”符号按钮，可实现转速加减，每次点击调节量为100rpm，拖动调节滑块，可实现快速调整，转速设定范围300-15000rpm.

时间设置

时间设置

时	分	秒	范围	
98	08	58	30s-99h59m59s	
99	09	59		
<u>00</u>	:	<u>10</u>	:	<u>00</u>
01	11	01		
02	12	02		

[返回](#) [保存](#)

上下滑动可设置离心时间。

系统设置

系统设置

系统

屏幕背光 50  100

电机加减速速度

加速度(1-3)  3  减速度(1-3)  3 

语言设置 简体中文 English

[首页](#) [设置](#) [日志](#) [曲线](#)



- 屏幕背光：左右滑动可调节屏幕亮度；
- 电机加减速速度：三种加减速可调节，1、2、3档加减速时间分别为60s、40s、15s；
- 语言设置：中文、英文；
- 电机转速单位：可选转速或者离心力；
- 温度单位：可设置摄氏度或者华氏度；
- 设备信息：可通过此处查看机器硬件和软件的版本号；

10. 故障分析与处理

错误信息

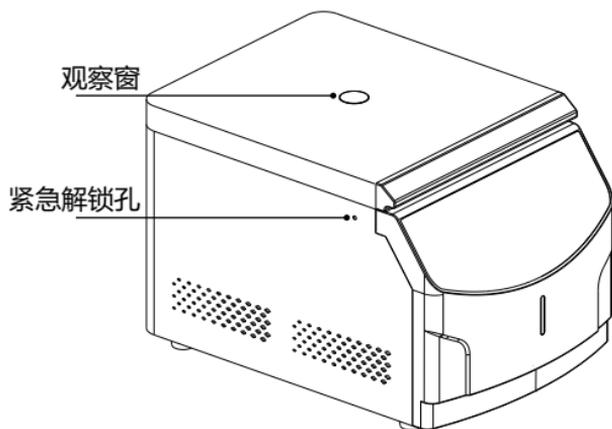
序号	故障	原因分析	解决方案
1	显示屏不亮	未通电	检查电源并接通
		电源损坏	更换电源
		开关损坏	更换开关
		其它	与供应商或厂家联系
2	离心机上盖打不开	转子还在转动	等待离心机停止工作
		停电	1、检查电源； 2、操作紧急解锁装置
3	运行噪音大	转子安装不正确	停止离心机，检查转子及转子盖是否锁紧；
		离心管放置不对称	停止离心机，将离心管对称放置。
4	温度显示与实际严重不符	传感器损坏	与供应商或厂家联系
5	提示信息“转子腔内温度过高，离心机停止工作”	离心机使用环境温度过高	使用环境温度不高于35°C
		内胆不制冷	与供应商或厂家联系

提示：如出现的错误信息不在列表中，请联系供应商或厂家。

紧急解锁机构

设备断电时，无法正常通过电机驱动打开上盖。在紧急情况下，可通过紧急解锁结构打开离心机。

- 从观察窗确认转子已停止转动；
- 拔掉电源插头；
- 用开门针或细的螺丝刀插入紧急解锁孔，轻轻用力推动，上盖会自动打开。



11. 清洁与维护

- 在开始清洁或消毒工作前，关闭设备并断开电源；
- 不要让任何液体进入设备内部；
- 离心机长期不使用时，应将转子体取出，并在转子座（或驱动轴）上涂上防锈油，防止转子座生锈后，与转子体配合不好，影响仪器运转时的平衡效果。必要时可在离心室内放入干燥剂吸收潮气，防止转子座（或驱动轴）生锈；
- 转子在使用过程中会由于离心管有损伤、充注过满或密封不严而被污染。转子使用后应把转子从轴上取下来，及时清洗、涂保护剂（若长期放置在轴上，转子与转轴接触在压应力作用下，致使腐蚀作用加剧，这样可能发生“咬死”现象）。为了防止腐蚀及隐患的发生，在转子使用中应该注意离心管的样品充注量及密封的严密性，应经常检查密封圈是否完好。如果发生老化、破损应及时更换，避免发生漏液；
- 拆下转子，用干净的软布蘸稀释的酒精清洁；
- 对于难去除的污垢残余，可以用刷子，但不能使用钢丝刷；
- 彻底清洁后，必须检查转子有无损坏、磨损和腐蚀；
- 只能使用PH值在6-8之间的清洁剂和消毒剂；

- 如果被腐蚀性化学物质污染，立即使用中性清洁剂清洁本设备。
- 高温灭菌温度不能超过121℃,时长不超过20分钟；
- 50次高温高压灭菌后需更换气密性转子盖的密封圈
(硅胶O型圈零件号：3.4.603440007)

12. 保修

您购买的是一台符合最高工程和质量标准的原装实验室机器。根据本公司的保修规定，本机保修2年，自发货日起算。对于保修期内的索赔，请联系您当地的供应商。您也可以将仪器直接寄给我们，并附上发票和问题的描述说明。经我们事先确认，运费将由您承担。

保修不包括部件的自然磨损，也不包括因疏忽、操作不当或未按照说明书使用和维护机器而造成的故障或损坏。

我们将保留任何提升和改进仪器的权利，对于此前出售的任何仪器，我们没有进行相应修改的义务。



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