

RWD

RWD Life Science Co.,Ltd

M1324R Microcentrifuge

User Manual

A

Intellectual Property Right

The intellectual property rights of this product and its instruction manual belong to RWD Life Science Co., Ltd (hereinafter referred to as the RWD), including, but not limited to patent, trademark, copyright etc.

RWD reserves final interpretation right of this instruction manual.

RWD have the right to use the instruction as confidential information. Any individual and/or organization shall not disclose the instruction of all or part of the information by any means without RWD's written permission. Nor shall any other person or organization be allowed to obtain all or part of the information of this instruction manual by any means.

No individual and/or organization shall publish, modify, reproduce, issue, rental, adapted, and translated into other languages without RWD's written permission.



is RWD's registered trademark or mark, these trademarks and the related security mark belong to RWD's intangible property. The use of non RWD's trademark or mark in this instruction manual are only for editing purposes, without other purposes, the rights belong to their respective rights owners.

Statement

RWD reserves the right to modify the content of this manual without prior notice.

RWD reserves the right to change the technology without prior notice.

RWD reserves the right to modify the product specifications without prior notice.

RWD does not guarantee the information in any forms, including (but not limited to) the responsibility of proposing the implied merchantability and suitability for a specific purpose.

RWD in only the following conditions is considered to be responsible for the safety, reliability and performance of the instruments, i.e.:

Assembly operation, expansion, adjustment, improvements and repairs carried out by RWD authorized personnel;

Relevant electrical equipment in line with national standards;

The instrument is operated according to the instruction manual.

RWD is not responsible for the products' safety, reliability or operation status in the following conditions:

Components are disassembled, stretched or debugged;

Non RWD authorized personnel repairs or alterations to the instruments;

Product may not in accordance with the manual.

Contents

1	-Introduction	1
1.1	Overview	1
1.2	Safety	1
1.3	Comprehensive description	1
1.4	Product features	2
1.5	Environmental requirements for equipment	2
1.6	Product parameters	3
1.7	Product list	3
2	-System safety	4
2.1	Main purposes	4
2.2	Personal protection	4
2.3	Operating restrictions	4
2.4	Operating safety	4
2.5	Safety symbols	4
3	-Introduction of product structure	6
4	-Product assembling	8
5	-Operation instruction	9
5.1	Start-up	9
5.2	Rotor	11
5.3	Program call	13
5.4	Other settings	14
5.5	Continuous cooling	15
5.6	Quick precooling	15
5.7	Placement of microcentrifuge tube	16
5.8	Centrifugation	16
5.8.1	Preset time/continuous run	16
5.8.2	Short run	18
5.9	Treatment after operation	18
5.9.1	Remove rotor	18

5.9.2	Remove microcentrifuge tube	18
5.9.3	Leave the microcentrifuge open	18
6	-Alarm prompts	19
7	-Troubleshooting.....	22
8	-Maintenance	23
8.1	Considerations	23
8.2	Regular maintenance	23
8.3	Cleaning and disinfection	24
8.3.1	Clean and disinfect microcentrifuge interior	24
8.3.2	Clean and disinfect the rotor	24
8.3.3	Replacement of sealing ring.....	25
8.4	Replacement of fuses.....	25
8.5	Record keeping.....	25
8.6	Parts and materials.....	25
9	-Warranty	26

1 -Introduction

1.1 Overview

First of all, thank you for choosing the Microcentrifuge manufactured by RWD.

Before the installation and application of this product for the first time, please read all attached materials to help you use this product in a better way.

RWD Life Science Co., Ltd is committed to continually improving product features and service quality, and reserves the right to make changes to the user manual and any product mentioned herein without prior notice.

For the latest product information, please call or write us or visit our website (<http://www.rwdstco.com/>). Please contact RWD in the case of any inconsistency between actual conditions of product and the user manual, or any question or suggestion, during your application of equipment.

This user manual is applicable to the microcentrifuge produced by RWD:

- Microcentrifuge M1324R

1.2 Safety

When operating the system, please read the “**2-System Safety**” section carefully to avoid hurts to operators and damages to the equipment.

If you have any question or suggestion regarding safety, please contact RWD for after-sales support.



This equipment should be operated and managed by trained professionals!

1.3 Comprehensive description

Centrifuge is a machine used to separate components in a mixture of liquid and solid particles or liquids via a centrifugal force generated from uniform circular motion of liquid samples in the rotor driven by a motor. It is mainly used to separate solid particles from liquid in suspension or two kinds of liquids with different density and insoluble with each other in emulsion.

Microcentrifuge is mainly used to process liquid samples with a volume of or less than 1.5/2 mL and needed to be operated at low temperature. It has a speed over 10,000 r/min.

Such product is applicable to daily needs of molecular biology application in labs, such as nucleic acid kit extraction and tissue protein separation.

1.4 Product features

- Quick precooling. It only takes 8 minutes to drop from ambient temperature to 4 °C, reducing waiting time
- Stable temperature control. Even at the maximum speed, it can be stable below 4 °C to avoid sample inactivation
- Compact size
- Mechanical lock design for the microcentrifuge lid could be opened and closed easily
- Touch screen and functional keys. Quick and convenient setting and use of parameters
- Preset program to enable easy calling during operation
- Small vibration and noise during equipment running. Less interference to samples and users

1.5 Environmental requirements for equipment

Please prepare the instrument operating environment according to the conditions listed below to ensure the operability and safety of the system.

	Description
Working environment	Temperature: 5 °C ~ 40 °C
	Humidity: 15% - 75% (non-condensing)
Storage environment	Temperature: -20 °C ~ 60 °C
	Humidity: 15% - 75% (non-condensing)
	Air pressure: 50 kPa ~ 106 kPa
	Class of pollution: 2
Operating voltage	AC 220V, 50 Hz, 700W

1.6 Product parameters

Parameters	Description
Dimension	$\leq 500 \text{ mm} \times 300 \text{ mm} \times 280 \text{ mm}$
Weight	$\leq 35 \text{ kg}$
Screen size	4.3 inch
Screen pixel	800*480 px
RPM	100-15,800 rpm
RCF	1xg-23,444 xg
Centrifugation time	00:30-09:59:59, ∞
Temperature	-10 °C ~ 40 °C

1.7 Product list

Configuration	Items	Quantity	Description
Standard	Device	1	Microcentrifuge
Standard	Rotor wrench	1	Tool for fitting rotor
Standard	Power cord	1	Power connection
Standard	Waste water tank	1	For collecting condensate water
Standard	Rotor	1	M-F24QG
Standard	Sealing ring	3	Spare sealing ring

2 -System safety

2.1 Main purposes

The equipment is applicable to daily needs of molecular biology application in labs, such as nucleic acid kit extraction and tissue protein separation.

2.2 Personal protection

The equipment can only be operated and managed by trained professionals. Please carefully read the user manual and get acquainted with the operating steps before use.

2.3 Operating restrictions

- 1) It is prohibited to use the equipment in rooms with explosive substances.
- 2) It is prohibited to use the equipment for processing explosive or highly active substances.
- 3) It is prohibited to use the equipment for processing substances that can producing explosive gases.

2.4 Operating safety

Operation of the equipment should be in strict accordance with the user manual. The following general precautions should be followed during operation. Failure to follow these precautions will be considered as violation of safety standards and intended use of the equipment. RWD will not be responsible in any case your misuse of the equipment or failure to follow basic safety requirements.

2.5 Safety symbols

The user manual and the equipment may contain the following safety symbols and common signs. If you have any question or suggestion regarding safety, please contact RWD for after-sales support. Please carefully follow these instructions in order to prevent equipment damage and prolong service life of the equipment.



Risk of hand injuries

When microcentrifuge is in use, the rotor will run at high speed. Therefore, failure to follow the safety precautions and the user manual will result in risk of hand injuries.



Warning – general danger zones

When such sign appears on the equipment, the following instruction should be strictly complied with. Safety precautions on the equipment cannot be ignored.



Warning –Power supply safety

The equipment can only be started when the equipment and the power cord are not damaged and correctly connected. In case of dangerous situations, the

equipment power should be immediately cut off and the plug should be removed from the equipment or the power socket.



Hazard in flammable environment

It is prohibited to use the equipment in environment with flammable gases



Hazard of electromagnetic interference

Please operate the equipment under controlled electromagnetic environment to avoid danger from equipment faults. It is prohibited to use signal transmitters including mobile phones near the equipment. In case of faults and/or needs for maintenance, please turn off the equipment and contact RWD after-sales personnel. The equipment is designed and tested in accordance with group A of CISPR 11 for Class A devices that emit radio interference as specified in EN 61326-1/EN 55011.

Warning: Class A devices are used in industrial environments. There may be potential difficulties in ensuring EMC in other environments due to conductive and radiation harassment in use.



Radiation Hazard

When processing radioactive samples, please follow all applicable radiation safety procedures. When processing radioactive pollutants, please take appropriate disinfection and safety measures. Wear protective suit (such as particle protection mask, gloves and protective shoe covers) according to rules and regulations on processing of radioactive pollutants in your labs. Dispose radioactive pollutants based on relevant regulations.



Biological infection hazard

Samples used during intended operations of the equipment can be infectious. Therefore, it is recommended to follow the general lab regulations on infection control procedure. Refer to the *Laboratory Biosafety Manual* of WHO (1984) for information concerning decontamination media and its use, dilution and effective application scope. Please comply with all applicable safety procedures when processing infectious samples. Please take appropriate disinfection and safety precautions when processing infectious substances. Wear protective suit (such as particle protection mask, gloves and protective shoe covers) according to infection control procedures in your labs. Dispose infectious wastes based on applicable regulations.



Waste treatment

Dispose all debris, wastes and infectious and radioactive pollutants generated from operations based on application lab regulations. Disinfectants, cleaning fluids and biological wastes must be disposed according to special waste disposal regulations! Reagents must be disposed according to MSDSs of their manufacturers.

3 -Introduction of product structure

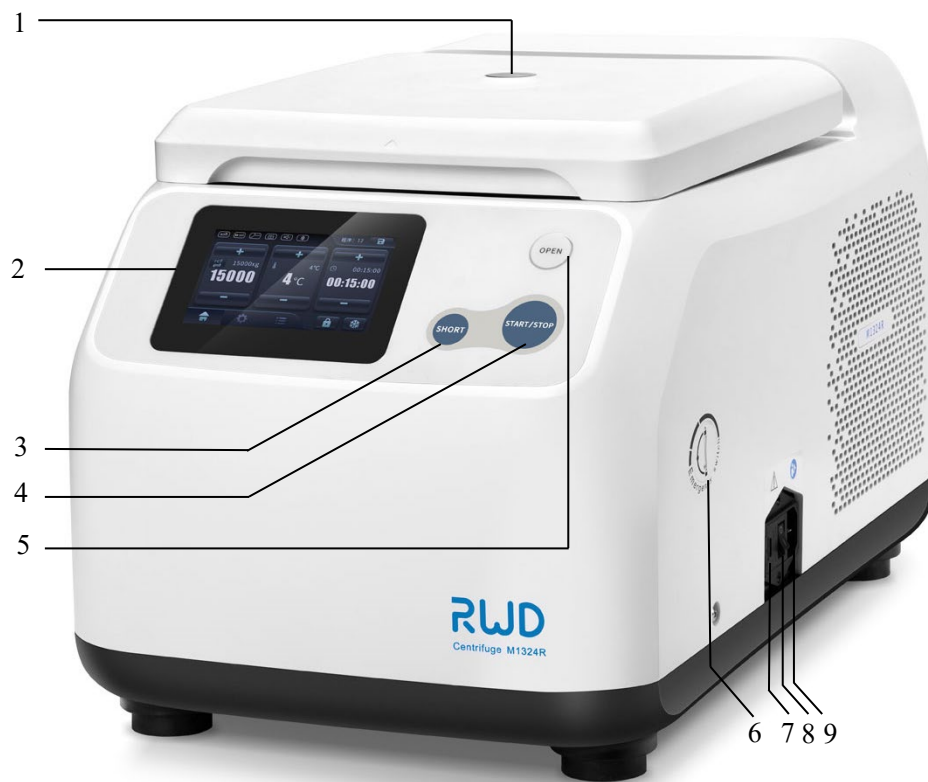


Fig. 3-1



Fig. 3-2

S/N	Part name	Description
1	Sight glass	The transparent device at the top. It is convenient to observe the motion state of the rotor
2	Display screen	Display the user interface
3	SHORT button	Start short run
4	START/STOP button	Start/stop centrifugation run
5	OPEN button	Manually open microcentrifuge lid
6	Emergency switch	If the microcentrifuge lid fails to be opened manually after centrifugation, loosen the emergency switch with a wrench to force the lid open
7	Fuse holder	For installing/replacing fuse
8	Power On/Off	Turn on/off the instrument
9	Power inlet	Connect the power supply
10	USB port	Software upgrading port (voltage: 5V)
11	Waste water tank	Collect condensate water

4 -Product assembling

Note: Please start the centrifuge 4 hours after the assembly is completed.

1) Unpack first and take out the device and fittings.

Note: lift the main body of the instrument under the cooperation of two persons together by placing both hands at the bottom of microcentrifuge.

- 2) Place the microcentrifuge on an appropriate bench and remove the plastic packing.
- 3) Wait until the equipment temperature rises to the ambient temperature and ensure all power supplies meet equipment requirements.
- 4) Connect the microcentrifuge to the power supply and turn on the power switch. Wait for the display screen to light up and the microcentrifuge lid to open automatically.
- 5) Loosen the rotor nuts counterclockwise with rotor wrench, take out the protective styrofoam bag of the rotor and put the rotor back.

Type of Rotor	Description	Setting Range
M-F24G	Volume: 24×1.5/2.0mL air tightness	Max.rpm: 15,800rpm Max.rcf: 23,444xg
M-F24	Volume: 24×1.5/2.0mL	Max.rpm: 15800rpm Max.rcf: 23444xg
M-F4PCR	Volume: 4 × PCR 8-Tube Strips	Max.rpm: 15,800rpm Max.rcf: 20,653xg
M-F18Kit	Volume: 18 × spin column or 1.5/2.0 mL centrifuge tube	Max.rpm: 15,800rpm Max.rcf: 20,095xg
M-F24QG	Air tightness quick lock Volume: 24×1.5/2.0mL	Max.rpm: 15,800rpm Max.rcf: 23,444xg
M-F24Q	Non-airtightness quick lock Volume: 24×1.5/2.0mL	Max.rpm: 15,800rpm Max.rcf: 23,444xg
M-F50QG	Air tightness quick lock Volume: 10×5.0 mL	Max.rpm: 15,800rpm Max.rcf: 23,444xg

5 -Operation instruction

Operating procedures:

- 1) Firstly set parameters such as target centrifugal speed, time of centrifugation, acceleration mode, ATset mode and target temperature as needed or directly call preset program before start of experiments;
- 2) Turn on quick precooling;
- 3) After the microcentrifuge reaches the set temperature, loosen the microcentrifuge lid, put in the microcentrifuge tubes and start centrifugation;
- 4) After centrifugation, open the equipment and take out the microcentrifuge tubes from the rotor;
- 5) Leave the microcentrifuge open, turn off the power and wait until the condensate water inside evaporates.

Note: If the instrument is very noisy during centrifugation, please end centrifugation and check whether the samples are placed symmetrically and the solution is balanced.

Note: It is recommended not to operate the instrument in an unbalanced state. Long-term running in this state will cause damage to the motor of instrument.

5.1 Start-up

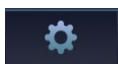
Press the power button to start the equipment for the first time to enter the home page.

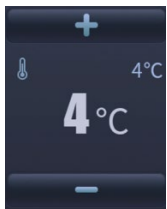
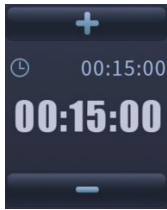
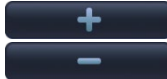
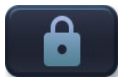
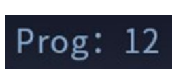
Figure 5-1 is used for example only, the actual parameters on the home page are subject to the instrument display



Fig. 5-1

Meanings of icons

Type	Icons	Description
Status icon		The icon shows that Soft mode has been enabled. At this time, the rotor accelerates and decelerates gently. This icon will disappear when corresponding function is disabled. The value displayed on this icon means 9 gear up and 8 gear down. For details please refer to section 5.8.1
		ATset mode: indicates the time when centrifugation timing starts  indicates that centrifugation timing starts when operation starts  indicates that centrifugation timing restarts when 95% of the set relative centrifugal force or speed is reached
		 indicates that the highest rotor speed is the target speed during short run  indicates that the set speed is the target speed during short run
	 =Sound  =Sleep  =Auto-open  = continuous cooling	
		Click to enter [System Settings] page
		Click to enter [Program] page
		15000xg shows target centrifugal force; 15000 shows real-time centrifugal force. Click  to switch it to  , namely to corresponding speed display

Parameter setup icon		 shows target temperature  shows real-time temperature
		 shows past centrifugal time  shows target centrifugal duration
		Click “+” or “-” to increase or decrease setting values
		Save key. Click to enter [Save Program] page
		Click once to start [Quick Precooling] and click again to end [Quick Precooling] or wait for the rotor cavity temperature to reach target temperature to automatically end quick precooling
		Parameter lock key. Enable/Disable parameter lock function. This function is mainly used to lock homepage parameters to prevent changes
		Shows the name of the currently calling program

5.2 Rotor

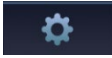
Click [System Settings] icon  to enter the page show as figure 5-2



Fig. 5-2

Click the rotor type as shown “M-F24G” to enter the rotor page, the rotor Max. rcf, Max. rpm, volume, cycles, etc. is as shown in Figure 5-3.



Fig. 5-3

Click  /  to view different rotors.

Click the rotor to be selected and click  to confirm it.

Note: Before selecting the rotor, please make sure that corresponding rotor have been installed.

When the cycles reaches 95% or more of the upper limit, the cycles is highlighted in yellow, as "99999" in Figure 5-3.

Click  to clear the cycles of used rotor.

When the rotor reaches the service life, the prompt of rotor replacement will pop up, shown as figure 5-4

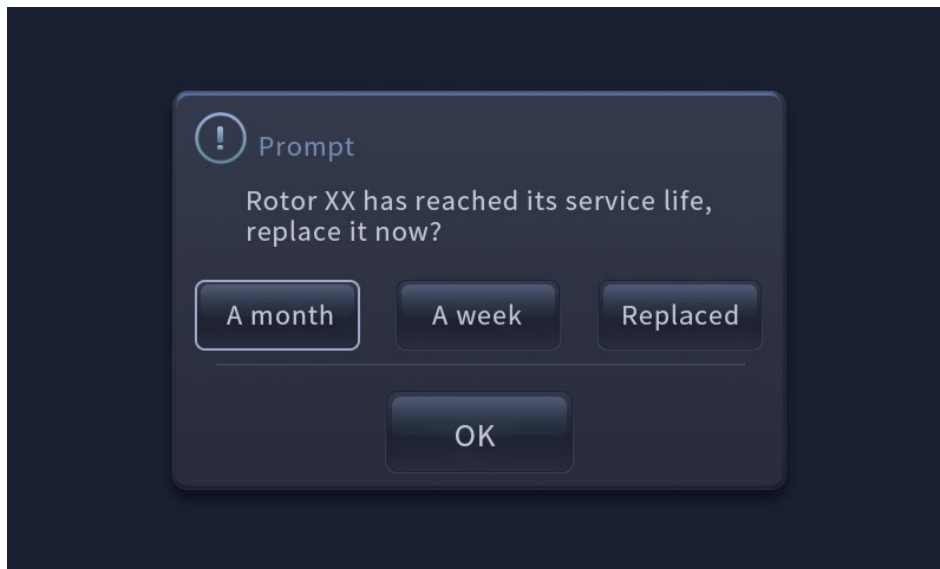


Fig. 5-4

5.3 Program call

Click the icon  on the home page to enter the program page. Here you could preset program which is convenient to call.

Click “+” to add a new program. Click to select one of the programs, for example select "Program: 3" in the picture, click the icon  to delete the program as prompted. Click  to go to the parameter setting page to edit the program, or click the icon  to confirm calling the program.

Click the icon  in the lower right corner to lock/unlock the currently selected program

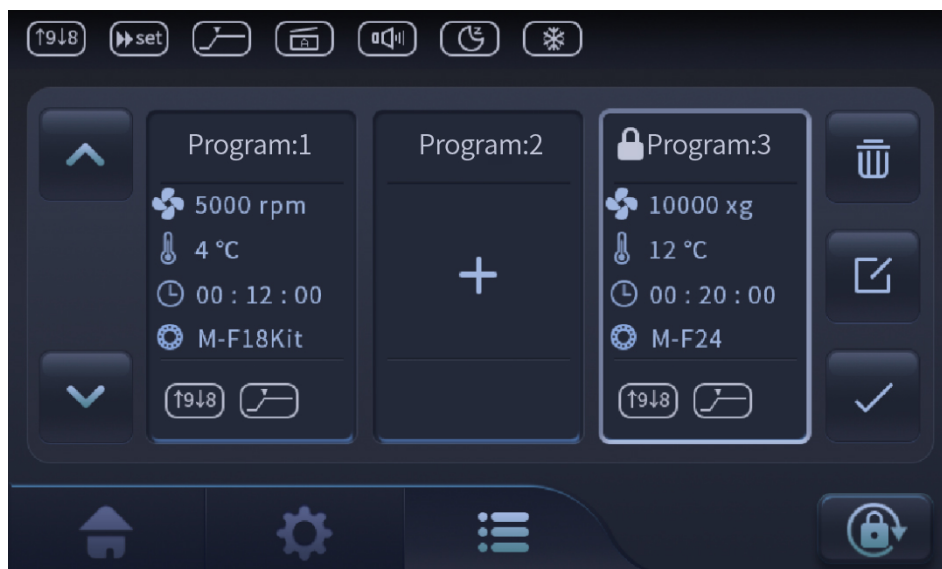


Fig. 5-5

5.4 Other settings

Click  or  to enter the previous or next page in the System Settings page and click to enable other system functions, such as Sleep, Sound, Auto-open or continuous Cooling or click to switch between Chinese and English on the system language page.

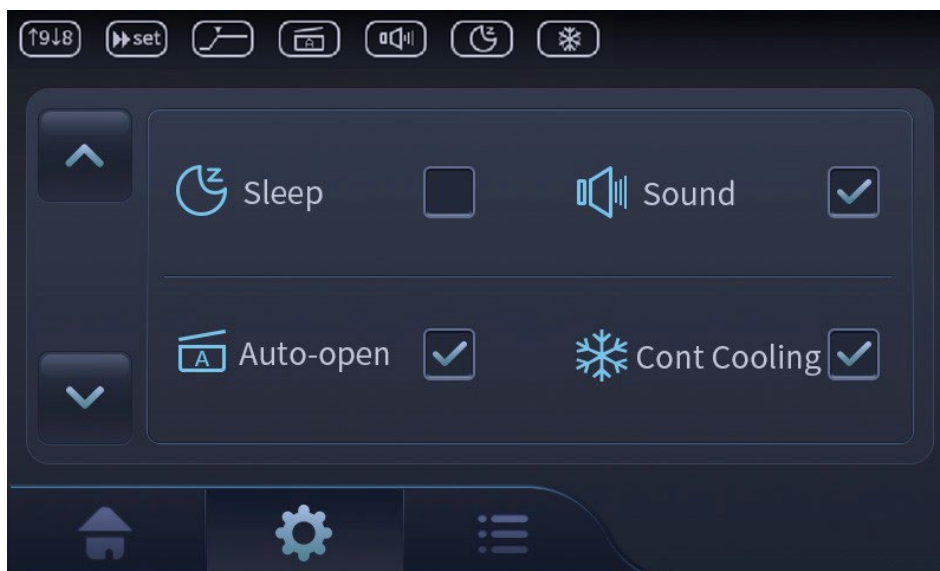


Fig. 5-6

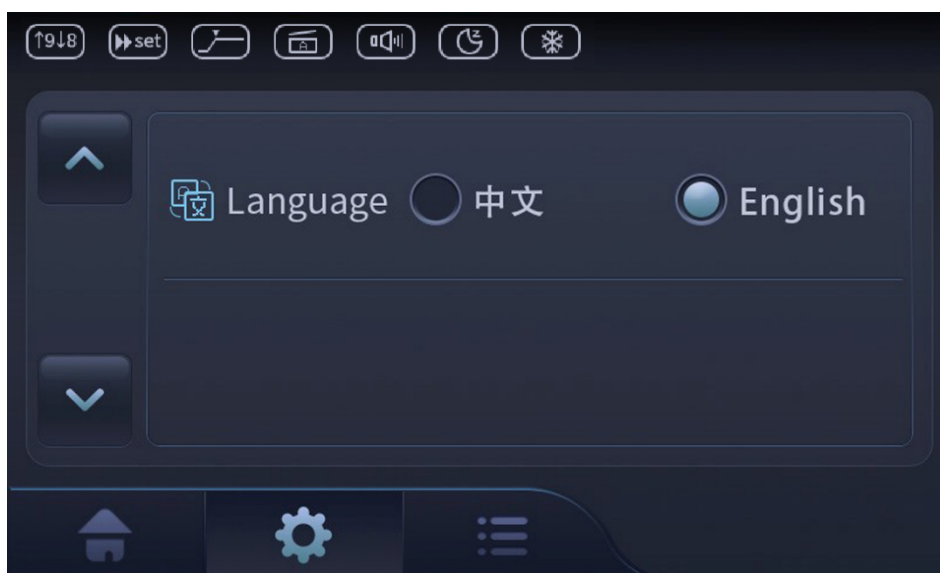


Fig. 5-7

5.5 Continuous cooling

When select [Continuous Cooling], the temperature of rotor cavity can be kept at set temperature if the following four preconditions are met when the rotor stops moving.

- 1) The microcentrifuge is started.
- 2) The microcentrifuge lid is closed.
- 3) The set temperature is lower than ambient temperature.
- 4) The microcentrifuge is not in sleep mode.

When [Continuous Cooling] is not checked, the equipment will keep cooling for 8 hours and then cooling shuts off automatically and sleep mode begins.

During continuous cooling, the set temperature will be shown on the screen. Whatever the set temperature is, the rotor cavity temperature will not be lower than 4 °C in order to avoid freezing of rotor cavity and the samples as well as forming of more condensate inside the equipment. Because the rotor is still at such time, temperature adjustment becomes slower.

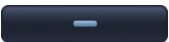
If you need to end cooling, please manually open the microcentrifuge lid.

5.6 Quick precooling

Click  to start quick precooling. Precooling icon  will be displayed at the real-time temperature key during precooling:



Fig. 5-8

Click   to adjust precooling temperature. When the set precooling temperature is reached, the cooling stops and the system gives off

intermittent prompt tone to inform operators that the precooling is completed.

Click  / [START/STOP] button to stop precooling early.

5.7 Placement of microcentrifuge tube

Vertically remove the rotor, loosen the rotor cover, put in the microcentrifuge tube, restore the rotor to its original position vertically and tighten the rotor nuts clockwise with rotor wrench until the rotor is firmly fastened (nuts must be tightened firmly). Close the microcentrifuge lid.

Note: Don't put your hands between the microcentrifuge and the lid when opening and closing the microcentrifuge lid.

5.8 Centrifugation

5.8.1 Preset time/continuous run

Click any parameters module (RPM/RCF, Temp or Time) on the home page to enter the following parameters setting page.



Fig. 5-9

- 1) Click  to shift to . Click the parameter input box to pop up the numeric keyboard for RCF/RPM, Temperature and time settings.

Note: the setting range of RCF/RPM will be various that depending on the rotor be chosen.

2) Acceleration mode

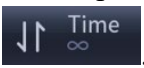
During centrifugation, two acceleration modes can be chose, one of which is to accelerate to the set RPM/RCF in the general fast mode, i.e. non-soft mode, or to accelerate to the set RPM/RCF in the soft mode. As shown in Figure 5-9, if check  and click , the soft mode is enabled.

Click the icon  to enter the page as shown in Figure 5-10. At this time, the rotor accelerates and decelerates in a soft way. There are 9 gear of acceleration/deceleration to choose from.

(Acc / Dec) = Acceleration/ Deceleration



Fig. 5-10

Preset time and continuous run modes are identical in above parameter setup, except that for continuous run, ∞ could be selected by click . Manually click the [START/STOP] button to end the centrifugation process is required when start continuous run.

3) Atset mode

When  is selected, centrifugation timing restarts when 95% of the set RPM/RCF is reached; if “Soft” is selected, it automatically changes to 95% timing mode. □

When  is selected, means that centrifugation timing starts as soon as operation starts.

After parameter setting, click [START/STOP] button to start centrifugation. When

reaching the target centrifugation time, the operation stops automatically. Click [START/STOP] button to stop preset time run early before the target time is reached.

5.8.2 Short run

Press [SHORT] button on the panel of the centrifugation to start short run but end it by releasing the button.

“Short” centrifugation has no Soft mode but accelerates to the target RPM or Max.rpm in non-soft mode.

After the rotor selection is completed on the page shown in Figure 5-2, the mode of “Short” centrifugation can be selected, that is, when clicks "SHORT" to start centrifugation, the system will perform “Short” in the mode of "set" or "Max".

Rotor cannot be selected during centrifugation.

5.9 Treatment after operation

5.9.1 Remove rotor

When the microcentrifuge lid opens, rotate the rotor nuts counterclockwise with rotor wrench to loosen the rotor and vertically take out the rotor.

5.9.2 Remove microcentrifuge tube

Remove the microcentrifuge tube.

5.9.3 Leave the microcentrifuge open

Leave the microcentrifuge open and turn off the power. Wait until the condensate inside to evaporate.

6 -Alarm prompts

ErrCode	Alarm prompts	Solutions
001	“Lid abnormality! Restart the device!”	1) Restart the device; 2) If the fault remains, please contact the after-sales personnel.
002	“Component abnormality! Contact the after-sales personnel!”	Please contact the after-sales personnel.
003	“Lid cannot be unlocked! Restart the device!”	1) Restart the device; 2) If the fault remains, please contact the after-sales personnel.
004	“Communication abnormality! Restart the device!”	1) Restart the device; 2) If the fault remains, please contact the after-sales personnel.
005	“IPM abnormality! Restart the device!”	1) Restart the device; 2) If the fault remains, please contact the after-sales personnel.
006	“Hall sensor abnormality! Wait until the rotor stops and then restart the device!”	1) Restart the device; 2) If the fault remains, please contact the after-sales personnel.
007	“Refrigeration abnormality! Restart the device!”	1) Restart the device; 2) If the fault remains, please contact the after-sales personnel.
008	“Refrigeration failure! Contact the after-sales personnel!”	1) Restart the device; 2) If the fault remains, please contact the after-sales personnel.
009	“Voltage abnormality! Check whether the Voltage is range between 220V-230V!”	Check whether the Voltage is range between 220V-230V.

010	“Drive hot! Turn off the power supply and wait until the device is cool!”	1) Turn off the equipment for 20 min before restarting; 2) If the fault remains, please contact the after-sales personnel.
101	“Speed abnormality! Check whether the rotor or tube is abnormal!”	1) Check whether the rotor or tube is abnormal; 2) If the fault remains, please contact the after-sales personnel.
102 / 204	“Device is unbalanced! Check whether the samples and rotor are abnormal!”	1) Check whether the sample is placed symmetrically; 2) Check whether the rotor is installed correctly; 3) Restart the device; 4) If the fault remains, please contact the after-sales personnel.
103	“Brake failure! Contact the after-sales personnel!”	Restart the device.
104	“Compressor hot! Open the Lid and wait for an hour until the device is cool!”	1) Open the Lid and wait for an hour until the device is cool; 2) If the fault remains, please contact the after-sales service.
105	“Chamber hot! Open the Lid and wait for an hour until the device is cool!”	1) Open the Lid and wait for an hour until the device is cool; 2) If the fault remains, please contact the after-sales service.
106	“Rotor not screwed up! Check whether the rotor is abnormal!”	1) Check whether the rotor is abnormal; 2) If the fault remains, please contact the after-sales service.
107	“Lid cannot be locked! Reopen and close the lid!”	1) Reopen and close the lid; 2) Restart the device; 3) If the fault remains, please contact the after-sales personnel.
108	“Sensor failure! Contact the after-sales personnel!”	Contact the after-sales personnel.

201	“Cooling fan failure!”	1) Contact the after-sales personnel; 2) When the fan is damaged, do not use the functions relating to refrigeration
202	“Motor fan failure!”	1) Restart the device; 2) If the fault remains, please contact the after-sales personnel.
203	“Condenser hot!”	Turn off the equipment and wait for one hour before restarting.
205	“Please pull the lid!”	Pull the lid manually.

7 -Troubleshooting

Problem	Possible cause	Solution
The lid cannot be opened.	1) The rotor hasn't stopped rotating.	1) Wait for the rotor to stop.
	2) Power failure	1) Check the microcentrifuge fuse. 2) Check the fuse of the lab. 3) Press emergency switch of the lid
Unable to start the microcentrifuge	1) The lid is not closed	1) Close the lid
The microcentrifuge shakes during starting	1) The rotor is loaded asymmetrically	1) Shut down the microcentrifuge and load the rotor symmetrically 2) Restart the microcentrifuge
Even though Short button is pressed, the microcentrifuge brakes during short run.	1) Short button is quickly released for more than two times	1) Short button must be kept pressing during short run.
The temperature value displayed flickers during centrifugation or quick precooling	1) Difference from the set temperature	1) Check setup 2) Check whether air flow at the ventilation opening is unobstructed 3) Let the ice melt or turn off the microcentrifuge for it to cool

8 -Maintenance

8.1 Considerations

- 1) Don't let any liquid enter the equipment in order to prevent electric shock.
- 2) It is prohibited to spray to clean/disinfect on the casing.
- 3) The power can only be turned on when interior and exterior of the equipment are completely dry.
- 4) Before each use, please check air tightness of the rotor cover and the microcentrifuge tube; the rotor cover and the microcentrifuge tube must be clean and undamaged.
- 5) High-temperature disinfection temperature should not exceed 121 °C for no more than 20 min. After disinfection, please apply a thin layer of journal grease onto the rotor cover screw thread.
- 6) Please don't close the lid when storing the rotor cover or the microcentrifuge tube.
- 7) It is prohibited to use any corrosive chemicals on the equipment and its fittings, such as strong and weak base, strong acid, acetone, formaldehyde, halogenated hydroxide or phenol.
- 8) When polluted by corrosive chemicals, the equipment should be cleaned immediately with neutral cleaner.
- 9) Don't disinfect the equipment with UV, β , γ ray or other HERs. Avoid storing the equipment in areas with strong ultraviolet radiation.

8.2 Regular maintenance

- 1) Please shut down the microcentrifuge and unplug the power supply before maintenance.
- 2) Regularly empty and clean the waste water tank.
- 3) Clean surfaces of the equipment and its fittings with contact to operators' skin with gentle cleanser at least once every week.
- 4) If the equipment is used to process samples with biological hazards, please regularly remove and clean the rotor and disinfect it at 120 °C. Clean the rotor with ethyl alcohol or ethyl alcohol-containing disinfectant.

Note: If rotors with non-detachable sealing ring, which cannot be disinfected for more than 50 times and should be replaced when they have been disinfected for 50 times.

- 5) Brush away dust at ventilation opening of the microcentrifuge once every half a year.
- 6) Glass tubes may be broken inside the rotor cavity when used. If glass tubes breaks, please completely clean glass pieces and chips on the rotor, the rotor cavity and its fittings, and replace the sealing ring with a new one.

8.3 Cleaning and disinfection

8.3.1 Clean and disinfect microcentrifuge interior

- 1) Open the lid. Turn off the power and unplug.
- 2) Loosen the rotor nuts counterclockwise with rotor wrench to remove the rotor.
- 3) Clean and disinfect all contactable surfaces of the equipment (including the power cord) with a piece of soft cloth and recommended cleanser.
- 4) Completely rinse the rotor cavity with clean water.
- 5) Apply glycerin or talcum powder onto dry rubber seals to prevent rubber rupture. It is prohibited to apply grease on other parts of the equipment, such as the lid lock, the motor shaft or the rotor cone.
- 6) Clean the motor shaft with a dry and dust-free soft cloth.
- 7) Check whether the equipment is corroded or damaged.
- 8) Please leave the lid open when not in use.
- 9) Reconnect the power only when the equipment is completely dry.

8.3.2 Clean and disinfect the rotor

- 1) Check whether the rotor and its fittings are corroded or damaged. Do not use them if they are damaged.
- 2) Clean and disinfect the rotor and its fittings with recommended cleanser.
- 3) Completely rinse the rotor and its fittings with distilled water.
- 4) Leave the rotor and its fittings on a cloth for air drying.
- 5) Put completely dry rotor back into the cavity.
- 6) If the rotor is not used, leave its cover open.

8.3.3 Replacement of sealing ring

Note: Do not pull the sealing ring forcibly when replacing it. Keep the sealing ring flat with no curl, otherwise the sealing performance and service life may be affected. Install the sealing ring in normal condition by following figure 8-1

Seal ring normal state: smooth and flat

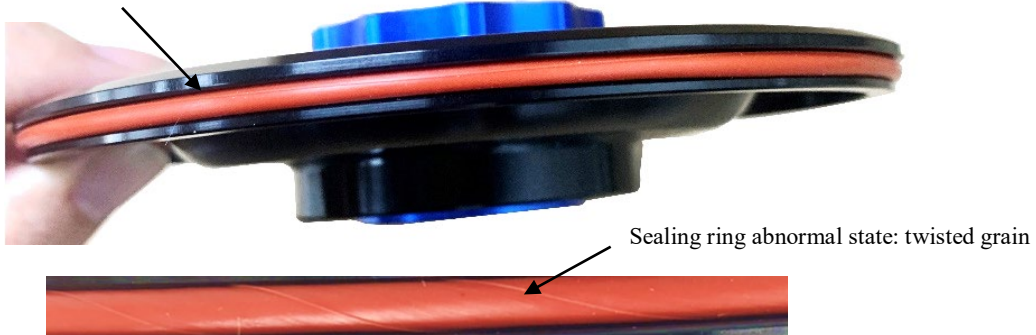


Fig. 8-1

8.4 Replacement of fuses

See *3-Introduction of product structure and buttons* for positions of fuses. Firstly, unplug the power, directly pull out the fuse holder. Both fuses can be removed and replaced.

8.5 Record keeping

It is recommended that the maintenance process should be recorded and kept after maintenance, including time, location, maintenance procedures, etc. for future reference.

8.6 Parts and materials

If you find that some parts or materials should be replaced during maintenance, please contact RWD for after-sales support.

9 -Warranty

The warranty period of this equipment starts from the delivery date. During the warranty period, if the equipment cannot be used normally due to problems such as material and process defects, the Company should be responsible for providing after-sales services such as equipment maintenance and parts replacement.

Any damage caused by improper or over-range use is not covered by the warranty. If repair or replacement of parts is required, relevant costs will be borne by the user.

When the equipment to be reworked arrives, if it has been dismantled without authorization from RWD, the Company will not provide after-sales services such as warranty, free maintenance and parts replacement.

The warranty statement (including its restrictions) is exclusively issued by RWD and covers all other warranties.

The service life of equipment: 5 years



RWD Life Science

Web: www.rwdstco.com

Add: 850 New Burton Road, Suite 201, Dover, DE 19904,
Kent, Delaware, USA

Add: 19/20F, Building 9A, Vanke Cloud City III, Liuxin 4 Street, Nanshan
District, Shenzhen 518000, Guangdong, P.R. China

Tel: +001-858-900-6602 +86-755-86111286

After-sales personnel: +86-755-86111281

After-sales E-mail: service@rwdstco.com

