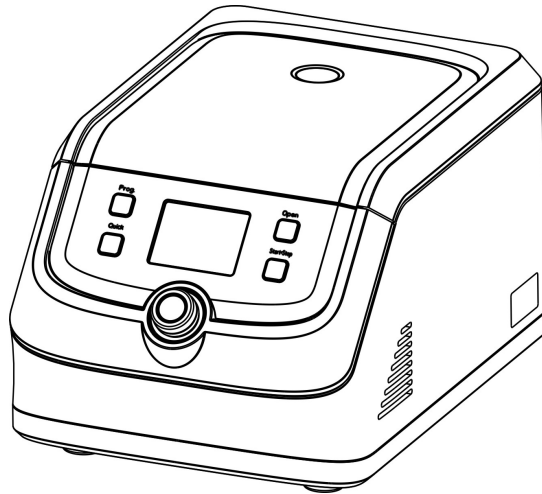


User Manual

Version 1.0

GEN-iCEN24/ GEN-iCEN24R High Speed(Refrigerated) Centrifuge



Thanks for purchasing High Speed(Refrigerated)Centrifuge.

This Manual for users contains function and operation of the Instrument. In order to use the instrument properly, please read this manual carefully before using the Instrument. Keep it for later use when you meet with difficulties.

Opening Check

Please check the Instrument and Appendix with the packing list when you first open the instrument packing case. If you find there is anything missing or incorrect with the Instrument and the Appendix, do contact the distributor.

Safety Warnings and Guidelines

1. Important operation information of the security:

Read the instruction manual carefully before operation.








NOTICE!

Operation before reading the Manual is forbidden. Read the guidelines and directions below and carry out the countermeasure according to them.

2. Warning signs and hazard icons

➤ Hazard symbols

	Bio-hazard		Electrical shock
	Danger		Caution, Crush
	Caution		

➤ Hazard Level

DANGER	Will lead to severe injuries or death
WARNING	May lead to severe injuries or death
CAUTION	May lead to light to moderate injuries
NOTICE	May lead to material damage

3. Safety precautions

Please abide by the following basic safety precautions before operation, maintenance and repair this instrument. If not, dangerous may occur and it's service life may be affected.



- Please read related regulations before handling infectious liquid and pathogenic bacteria. Be attention that must be wear gloves when operating, otherwise, it may cause serious healthy problems even endanger safety of life.



- Make sure the power cord is working without damage, Chang the power cord with same specification if necessary.
- Do not operate the instruments when removing the housing, unless the authorized service staff from vendor.



Please pay attention to your hand when closing the lid/cover, in case of getting hurt.



Please make sure that the power supply voltage is in consistent with the instrument required, and ensure that the rated load of power socket is not less than requirements of the instruments.



Power should be shut off when centrifuge stop working, the socket should be unplugged if not use the instrument for long time. Please open the lid and let moisture in centrifugal cavity evaporated (only for GEN-iCEN24R).



Risks for incorrect operation of centrifuge:
Knock or move is forbidden during the instrument running, or else, the rotor may hit the centrifuge cavity which can destroy the instrument, even hurt the operator seriously.



Risks for incorrect operation of tubes:

- The adapter must fit the rotor, to load with same type (weight, volume, density and material) tubes.
- Pay attention to tube manufacturer's requirements about quality loading limits.
- Damaged tubes are forbidden to use.



WARNING!

Risks for incorrect operation of rotors:

- The max material density is 1.2g/ml, operator should know the max loading of each hole (adapter, tube, centrifugal material) to prevent overloading.
- The instrument can produce a lot of noise when rotor covers not closely cooperated, stop it immediately by this time.
- Keep it away from aggressive chemicals, if polluted, clean up immediately with neutral detergent.



NOTICE!

Please disconnect the power supply and contact with experienced repairman or distributor under the following circumstances:

- Liquid spattered in internal instrument.
- Instruments go through with rain or water.
- Instruments don't work properly, especially with any strange sound or smell.
- Instruments dropped or enclosure damaged.
- Screws of rotor come loose.
- Functions of the instrument changed obviously.

4 Maintenance

If there are smutches on the centrifuge, clean it by soft cloth stained with cleaning cream.

Aluminum rotor should be sterilized 3-5min under 134-138℃ temperature with high pressure after using a period of time.

i

- Tubes must be taken out when the centrifuge in high temperature and high pressure sterilization, in case the tube deformation.
- The service life of accessories essentially depends on the high pressure sterilization and the use of frequency, if the structure or color was changed, please replace it immediately.
- Check whether there are cracks or damages on the rotor after sterilization, if yes, please replace it immediately.

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Chapter 1 Introduction

1.1. The normal Operating conditions

Ambient Temperature: 5℃-40℃ (GEN-iCEN24), 10℃ ~ 30℃ (GEN-iCEN24R)
Relative humidity: ≤ 80%

1.2. The basic parameters and performance

Model	GEN-iCEN24		GEN-iCEN24R
Power supply	100V-120V/200V-240V 50-60Hz		
Timer	01s-99min59s (short spin available)		
Max. capacity	24x1.5ml/2.0ml	4xPCR Strips	12x5ml
Max. Rotor radius	85mm	68mm	85mm
RCF (in steps of 100 xg)	100-21400xg	100-17100xg	100-21400xg
Speed (in steps of 100 rpm)	500-15000rpm		
Max.Centrifugal medium density	1.2g/ml		
Acceleration and deceleration time (Soft off)	≤15s		
Acceleration and deceleration time (Soft on)	45s		
Time down from ambient temperature to 4°C(At the highest speed running)	—	≤20min	
Temperature range	—	-10°C to +40°C(Keep the highest speed at 4°C)	
Noise level	62dBA	60dBA	
Max. Power/Rated Power	1000W/250W	500W	
Dimensions(L×W×H)	(240x340x230) mm	(300W×500X320) mm	
N.W (Rotor included)	13kg	30kg	

Chapter 2 Operating Instructions

2.1 Structure description

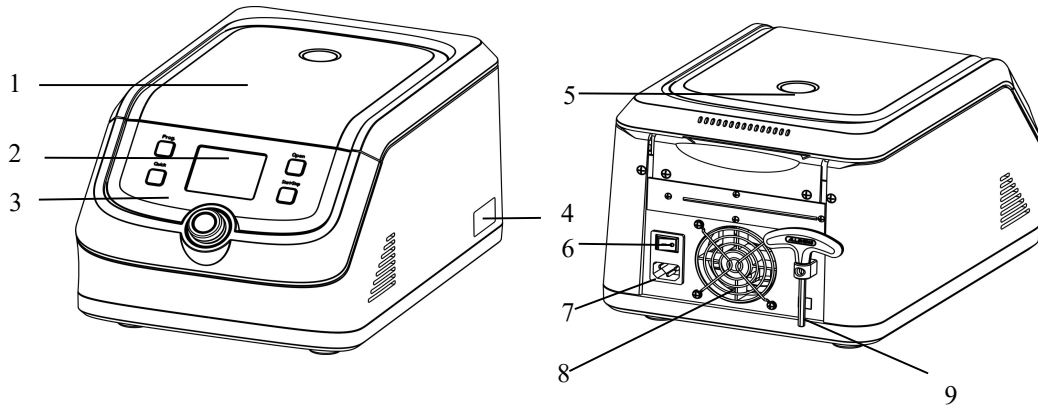


Fig1: GEN-iCEN24 High speed centrifuge

1. Lid	2. Display Screen
3. Display panel	4. Label
5. Window	6. Power switch
7. Power socket	8. Fan
9. USB input port	

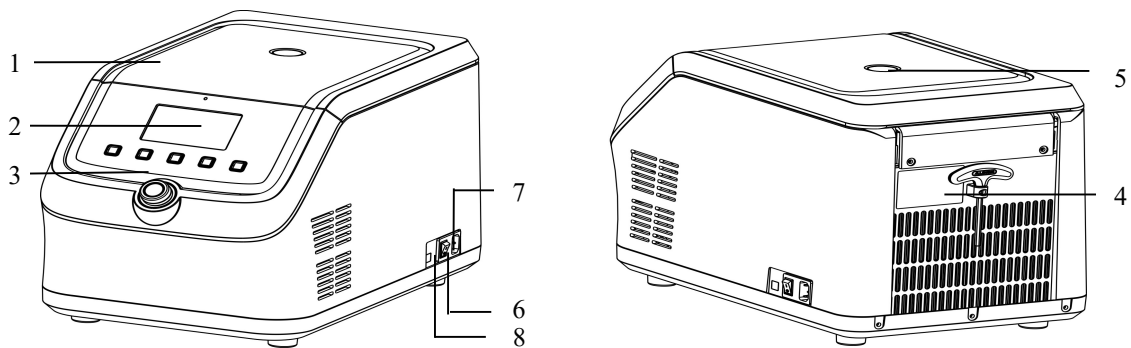
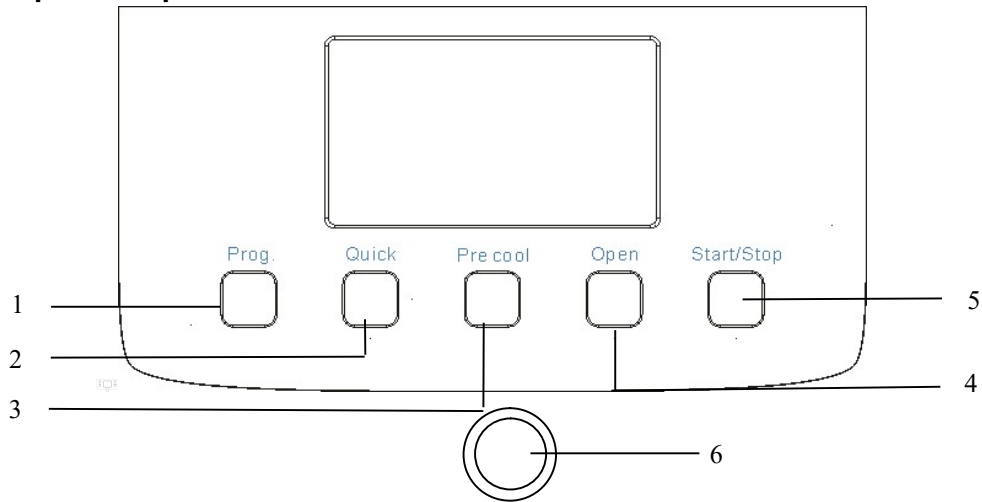


Fig2: GEN-iCEN24R High speed centrifuge

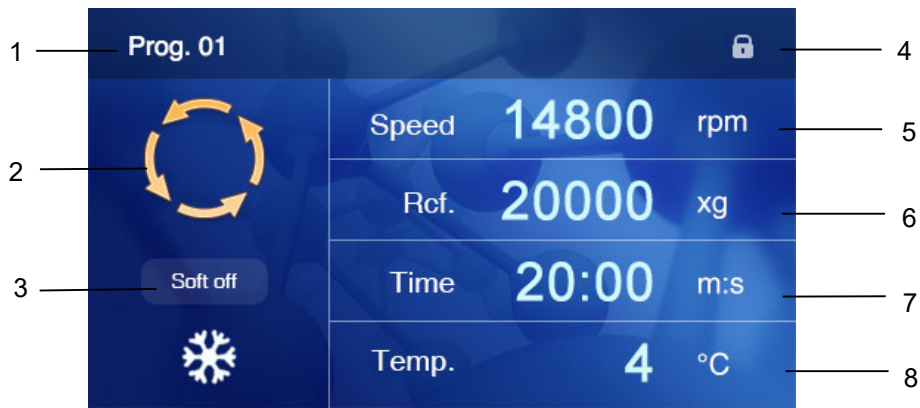
1. Lid	2. Display Screen
3. Display panel	4. Label
5. Window	6. Power switch
7. Power socket	8. USB input port

2.2 Operation panel



1. Program selection	2. Quick centrifugal
3. Pre cooling (Only for GEN-iCEN24R)	4. Lid (Open/Close)
5. Start/Stop	6. Speed setting, centrifugal force setting, time setting, temperature setting(only for GEN-iCEN24), Soft on/off

2.3 Display interface



Display screen for GEN-iCEN24R.

Screen for GEN-iCEN24 is similar with GEN-iCEN24R, just do not have "Temp."

1. Program name	2. Motor running state
3. Soft on/off	4. Lock
5. Speed	6. Relative Centrifugal force(RCF)
7. Time	8. Temperature(only for GEN-iCEN24R)

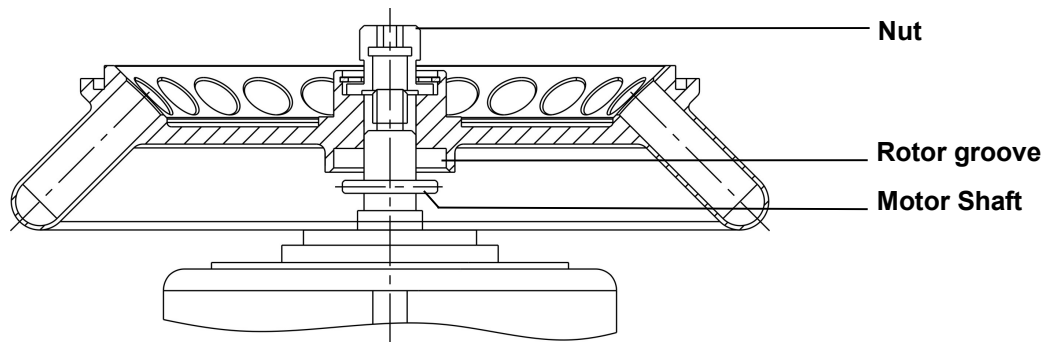
Chapter 3 Operation Guide

3.1 Installation and removal of rotor and transparent lid

Insert the rotor onto motor shaft and then press and hold it, tight the rotor nut clockwise by Allen wrench. Please make sure no bobbing up and down or any loose phenomenon after rotor and motor shaft fixed.

Hold the rotor, tight the transparent nut and rotor nut clockwise.

For rotor removal, use the opposite methods as installation.



- i** ➤ Rotor groove must be alignment to motor shaft, then tighten the rotor !
- The transparent cover must be removed before taking off the rotor !

3.2 Parameter setting

3.2.1 Program

Program is used to save or loading some repeated used functions and can save 10 (from 01 to 10) different programs, all they can be operated by pressing “Prog.” , eg.: choose 01 program, stay 3s, then it will exit and save automatically. For more details, please see 2.2 introduction. Press “Prog.” , choose program, then press “Start/Stop” to start the centrifuge.

3.2.2 Speed, Centrifugal force, Time, Temperature(only for GEN-iCEN24) ,Soft boot setup

Press the knob, rotate it, to set the speed; press and rotate the knob again, to set the centrifugal force; similarly, time(second), time(minute) ,temperature(only for GEN-iCEN24R), soft on/off also can be set.

When setting, stay 3s, it will exit and save automatically

- i** ➤ There is a direct ratio relationship between speed and centrifugal force, formula as below:

$$Rcf=1118 \times 10^{-5} \times n^2 \times r$$

Note: n: rotate speed, unit: rpm, $r_{max} = 8.5cm$

3.3 Centrifuging with time preset

3.1 Close the power switch, press “Open”, check whether the rotor completely fixed tightly.

3.2 Hold the rotor, clockwise rotate the lid nut, remove the transparent lid.

3.3 Put in the tubes evenly, close the transparent lid, then press “Start/Stop”, the centrifuge will run, press “Start/Stop” again, it will stop running.

When the instrument run to the set speed, time displays countdown, it will stop automatically when time runs out of and the lock will also open automatically.

3.4 During the process of running, you can also set speed and time, the instrument will run according to the new settings

- i**
- **Before each centrifugal, must check whether the rotor nut is completely tight!**
 - **The transparent lid must be closed!**
 - **Tubes must be placed symmetrically!**
 - **After GEN-iCEN24R end run, the lid will not open automatically, need to press the “Open” key.**

3.4 Short-spin centrifugation

Press “Quick”, the rotor will run at the highest speed, release the button, it will stop running.

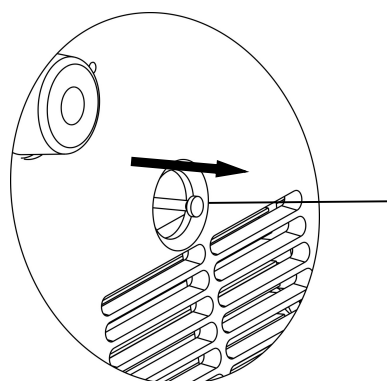
In the process of slowing down to stop, you can press “Quick” button, and re-start the centrifuge.

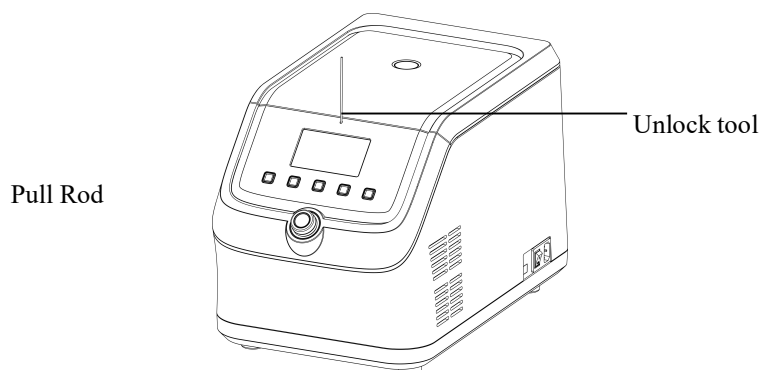
3.5 Lid emergency release

When there's power failure, the lid can't be opened, to unplug the power cord first.

GEN-iCEN24: Turn over the centrifuge, find the pull rod, pull down it then the lid will open. (see as fig.1)

iCen4R: Use unlock tool inserted into the holes in the front panel, to press the electromagnetic lock to open the lid. (see as fig.2)





3.6 Refrigeration (Only for GEN-iCEN24R)

3.6.1 Run with the lid closed

In any case, the instrument will run to the set temperature when the lid closed. After reach to this temperature, the temperature in the tank will be constant as set.

3.6.2 Pre Cooling

Press “Pre Cool”, the instrument will cooling to 4°C, and the display shows the real-time temperature. Time display — : —, Speed run to 9000rpm. After reach to 4°C, the motor will stop, the buzzer will ring 3 times, the temperature in the centrifugal cavity will be constant at 4°C.

During this process, if press the “Start/Stop”, the pre cooling will be stopped, and the temperature of the centrifugal cavity will be constant at the set temperature.

3.6.3 Run/Stop

Set the parameters, then press “Start/Stop”, the instrument start running, then it will be stopped automatically once reach the set speed and temperature. It can also be stopped by pressing “Start/Stop” in the process of running.

i The lid must be opened to moisture the evaporation after finished centrifuge every time!

Centrifuge when moving to a new position, in order to keep the refrigerant compressor stability, must be placed 1 hour first before running. And in the process of handling, the instrument must stand upright.

Chapter 4 Failure Analysis and Troubleshooting

Item	Symptom/message	Possible Causes	Solutions
1	No display	No power connection	Check the power and make sure it connects well
		Fuse failure	Replace the fuse
		Switch damaged	Replace the switch
		Others	Contact distributor
2	Temp. display variation from the nominal value (Only for GEN-iCEN24R)	Temperature sensor damaged	Contact distributor
3	Lid can't be opened	Power off	Power on
		Rotor is still spinning	Stop run.
		Lid lock damaged	Start the emergency switch
		Others	Contact distributor
4	Device shakes when centrifugal	Rotor not loaded well	Re-install the rotor
		Tubes unevenly loaded	Reload it evenly
5	E501	Lid opened during running.	Close the lid, press any key to cancel the error after stop completely
6	E502	Lock sensor damaged	Contact distributor
7	E503	Press to start with lid open.	Close the lid, run it again.
8	E101	Motor over-speed	Contact distributor
9	E104	Motor stalling	Contact distributor
10	E001 (Only for GEN-iCEN24R)	The compressor unit and the temperature sensor overheat.	Open the lid and disconnect power supply, restart it after 20min.
			The environment temp. is too high, move it to a new place of 10℃-30℃.
11	E005 (Only for GEN-iCEN24R)	Temp. sensor open circuit	Contact distributor

12	E006 (Only for GEN-iCEN24R)	Temp. sensor short circuit	Contact distributor
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Appendix:Wiring Diagram

(Just for your reference)

