



Low Speed Table Centrifuge

2-6C

Operation Instructions (V1.0)

Please read this manual carefully before use

Hunan Kecheng Instrument Equipment Co.,Ltd

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I、Features and use

2-6C is a low speed desktop centrifuge controlled by microcomputer. The characteristics of the instrument are as follows:

- 1、 The microcomputer control system of the whole machine is driven by large-torque variable-frequency motor, which can raise and lower the speed faster, run more smoothly and quietly.。
- 2、 Intelligent rotor automatic identification system can prevent personnel from incorrect operation , ensure personal and machine safety during operation.
- 3、 HD 5-inch LCD screen can synchronously display the setting and operating parameters, which is easy to operate.
- 4、 Up to 99 programs are stored in large capacity, and 5 sets of daily program modes are directly called in the operation interface.
- 5、 RCF and speed separately and switching free,automatically calculate RCF.
- 6、 Up to 10 level acceleration/ deceleration with Linear drive,and can be set according to different sample properties to ensure the best separation effect of samples.
- 7、 It is equipped with a special button for instantaneous centrifugation. Press and hold to centrifuge according to the required speed, and press and hold for continuous centrifugation, which is convenient and fast.
- 8、 The fuselage adopts a three-layer special anti-collision protection structure, and adds special noise reduction technology to accurately protect

the safety of the machine and personnel.

9、 The body adopts high-quality all-steel structure, and the centrifugal chamber is made of stainless steel and treated with environmental protection anti-corrosion coating, which is corrosion resistant, acid and alkali resistant.

10、 The door cover adopts electromagnetic induction protection and high-intensity anti-collision double-door lock electronic traction protection structure, with higher safety.

11、 It is equipped with multiple protection functions such as overspeed, unbalance, door cover protection, overcurrent, rotor fault, etc. to ensure personal and machine safety.

12、 Food grade silicone integrated seal ring, beautiful and durable, high temperature resistant, anti-aging, corrosion resistant, and not deformed and cracked.

3、 Scope of application:

2-6 low-speed desktop centrifuge is widely used in the separation and purification of clinical medicine, medical inspection, biochemical analysis, genetic engineering, immunology and other fields. It is the necessary equipment for centrifugation of scientific research institutions at all levels and colleges and universities.

II、Working Principle

Centrifuge uses the principle of centrifugal sedimentation to separate, concentrate or purify cells (particles) with different densities in the solution under the action of centrifugal force.

Place the centrifuge tube containing the same amount of test solution symmetrically in the test tube hole of the rotor. After starting the instrument, the relative centrifugal force (RCF) generated by the motor driving the rotor to rotate at high speed will separate the cells (particles) with different densities in the test solution. The relative centrifugal force depends on the horizontal distance from the position of the sample to the axis, namely, the rotation radius r and the rotation speed n . The calculation formula is as follows:

$$RCF = 1.118 \times 10^{-5} n^2 r \times g$$

n -----Speed (rpm /min)

r -----Radius of rotation (cm)

The time T_s required for particle separation and precipitation in the mixed solution is calculated by the following formula::

$$T_s = \frac{27.4 \times (\text{Log}_e R_{\max} - \text{Log}_e R_{\min}) \mu}{n^2 r^2 (\sigma - \rho)} \quad F$$

The formula is as follows:

R_{\max} -----Rotation radius of the test solution farthest from the axis

R_{\min} -----Rotation radius of test solution nearest to the axis

ρ -----Density of mixture (g/cm³)

μ -----Viscosity of mixture (poise)

n-----Speed (rpm /min)

r-----Particle radius (cm)

σ -----Particle density (g/cm³)

III、 Technical parameters of centrifuge

Max Speed:	6000r/min
Max Capacity:	4×100ml
Max RCF:	4338×g
Revolutions/min:	±10r/min
Timer:	1~99min
Time control accuracy:	±1S
Temp Range:	±1°C
Noise:	≤62dB
Voltage:	AC 220V±10% 50Hz 10A
Dimensions:	500mm×330mm×360mm (L×W×H)
Net Weight:	58Kg

IV、 Note

1. In order to ensure safety and centrifugal effect, the instrument must be placed on a firm, shockproof and horizontal platform, and ensure that the four machine feet are evenly stressed.

2. Before using the centrifuge, take out the foreign matters in the centrifugal chamber; Check whether the rotor body is correctly installed on the rotor base to ensure good connection. The screws connecting the rotor and the motor shaft must be tightened.

3. The setting shall be strictly in accordance with the allowable speed of the rotor, and it is strictly prohibited to exceed the maximum speed specified by the rotor design.

4. It is strictly forbidden to use the rotor in an unbalanced way. The centrifugal tube must be placed symmetrically and cannot be operated in single tubes. The solution in the tube must be uniform to ensure balanced operation.

5. It is forbidden to run at high speed without rotor.

6. When taking out the rotor, use the Allen wrench provided with the machine to loosen the nut and then pull the rotor upwards. It is strictly forbidden to pull the nut up by hand before it is fully withdrawn, so as to avoid damaging the flexible support of the motor.

It is strictly forbidden to pull up directly by hand after loosening the screw to avoid damaging the flexible support of the motor.

7. Before use, check the rotor and centrifugal pipe for cracks, corrosion marks and aging. If any, replace it immediately. It is forbidden to use the cracked or corroded rotor.

8. Check whether the external power supply meets the requirements and whether the instrument is reliably grounded.

9. The centrifuge shall not be moved during operation and the door cover shall not be opened. Do not open the door cover when the motor and rotor are not completely stopped.

11. After the instrument or rotor has been out of service for three months, it must be operated for 10min at low speed before it can be operated at the maximum

speed of the rotor.

12、 Do not mix rotors of other units to prevent damage to the instrument and personal safety.

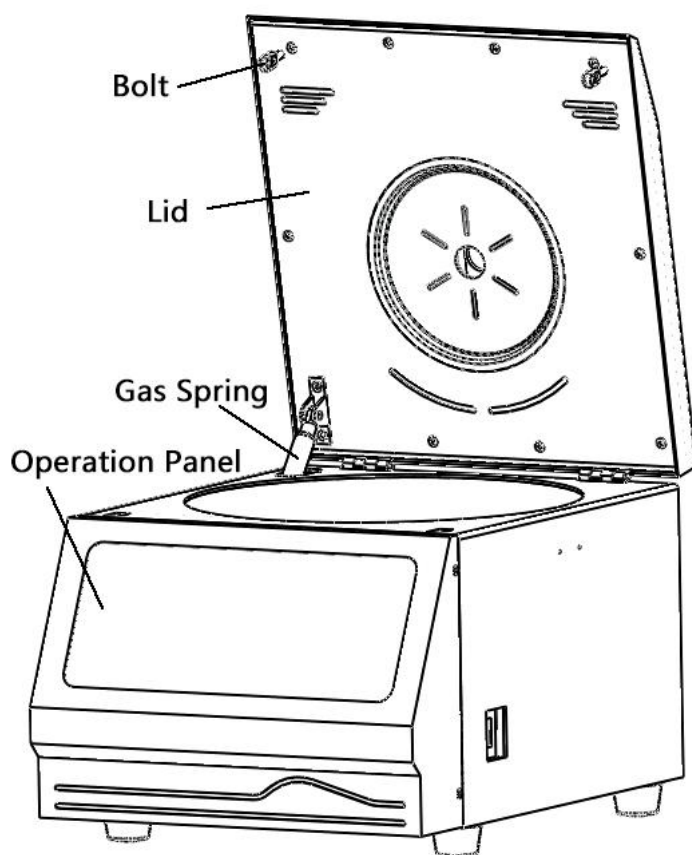
13. Do not place a container containing liquid on the instrument. If the container is overturned, the liquid may enter the centrifuge and rust its mechanical or electrical parts.

14. After separation, clean the instrument in time, turn off the power switch of the instrument and unplug the power plug.

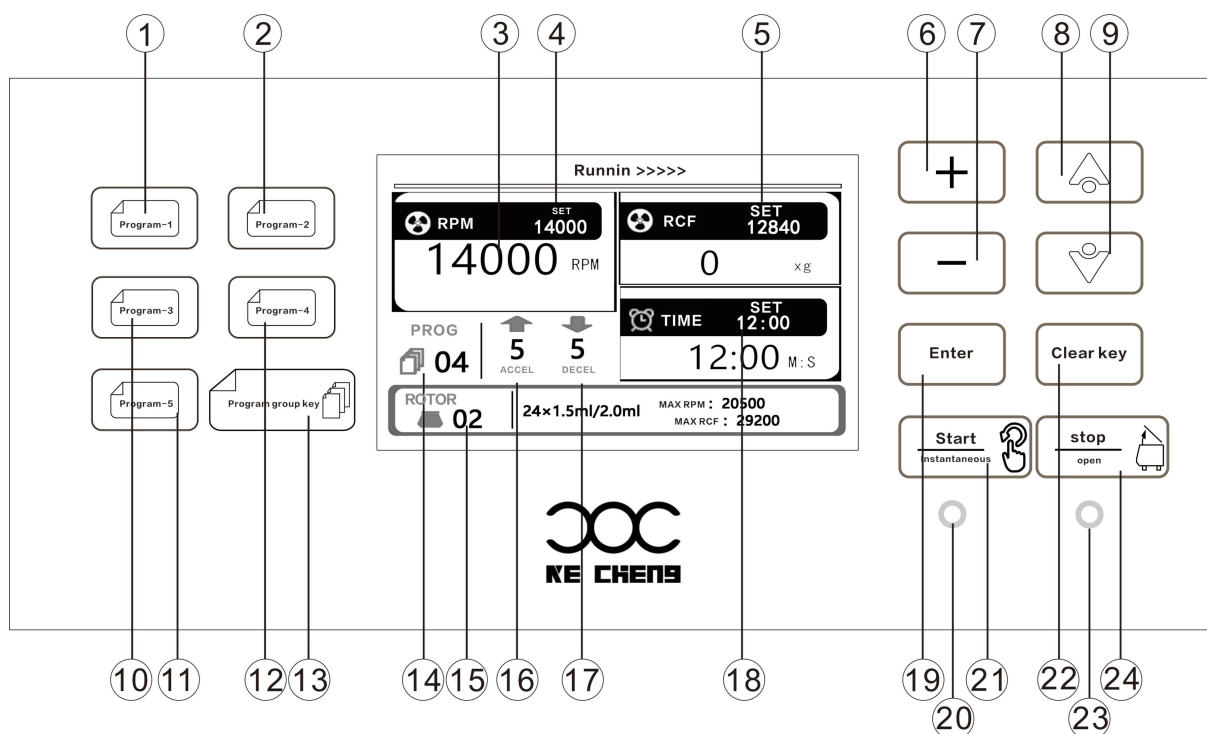
V、 Appearance and structure of the host

1、 Overall appearance

(The picture is for reference only, subject to the actual model)



2、 Operation panel



1. Program-1 2. program-2 3. actual speed value 4.,speed setting 5.centrifugal force setting 6, increase key 7, decrease key 8, up key 9, down key 10, program 3 11, program-5 12, program-4 13, program group key 14, program group key 15, rotor setting 16, acceleration gear 17, deceleration gear 18, time setting 19, confirmation key 20, operation indicator 21, start/instant key 22, clear key 23 Stop indicator 24, stop/open key

VI、 Operating Procedures:

- (1) . Place the centrifuge on the platform, visually balance it, and gently shake it by hand to check whether the centrifuge is placed stably.
- (2) . After confirming that the placement is stable, turn on the power supply, press the power switch, and then press the "Stop/Open" key to open the door cover.
- (3) . Open the door cover, gently place the selected rotor on the motor shaft, screw in the screw to tightly connect the rotor and the motor shaft (note that the action should be gentle and careful to avoid large shaking left and right and pulling up and down to avoid damage to the flexible support of the motor), then put the hanging cup or adapter with test tube on the rotor, and then rotate the rotor body slightly after the completion, the rotor should rotate flexibly, and the hanging cup (adapter) should tilt freely on the rotor, No blocking and rubbing.
- (4) . Put the centrifuge tube containing the same amount of test solution into the rotor suspension cup (test tube) symmetrically to ensure the balanced

operation of the rotor.

(5) . Close the door cover and check whether it is locked properly (lift the door cover gently and forcefully after closing, and the door cover will not open. If the door cover is not closed properly, press "Start", and the "Time Display Window" window will display "E3").

(6) . Set rotor number, speed, time and other operating parameters.

1. When the parameter needs to be adjusted, move the cursor to the corresponding option on the display screen through the "Up" or "Down" key, adjust it to the required condition with the "+" or "-" key, and press the "OK" key to confirm and save the parameter. The adjustable parameters include "program group", "speed", "time", "rotor", "acceleration", "deceleration" and "centrifugal force".

2. In the shutdown state, the "Program 1"~"Program 5" keys are used to quickly call the corresponding program group parameters. The "Program" key moves the shortcut cursor to the program group position.

3. The program group and rotor number cannot be changed during the operation of the instrument. Only "speed", "time", "acceleration", "deceleration" and "centrifugal force" can be modified during the operation.

4. When the status of the centrifuge is "stop" or "time is up", press the "start" key to run the indicator light on, the speed starts to rise until it stabilizes at the set value, the speed display window is the actual speed of the rotor, the temperature displayed in the temperature window is the actual temperature in the centrifuge chamber, and the time of the time display window is decreasing.

5. When the time returns to 0 or the "Stop" key is pressed, the buzzer will give

an alarm, the stop indicator will flash, the rotation speed will start to drop, and when the speed drops to 0 r/min, it means that the machine has stopped, the stop indicator will always be on, and the buzzer will give an alarm (press any key to clear the alarm). At this time, the door cover of the centrifuge chamber can be opened and the centrifuge sample can be taken out.

6. When the speed displays "0", the "door open key" opens the door electrically.

7. When there are different centrifugal demands, different parameters can be saved through program group parameters. When the cursor moves to the "program group" parameter through the "up" or "down" key, the "+" or "-" key adjusts the program group, and sets the rotor, speed, acceleration, deceleration, etc. under the current program group, then press the confirmation key to save the parameter to the current program group. By analogy, you can set up to 99 different program groups. When you need to call the saved parameters, you only need to call the corresponding program group. When selecting the parameters corresponding to "program" with the "up" or "down" key, use the "+" or "-" key to adjust it to the program to be used. The system supports a total of 10 gears from 0 to 9, with 0 being the fastest and 9 being the slowest. When the angle rotor or horizontal rotor with large volume is used, the slower gear can be selected, and other gears can be selected.

(7) Finally, carefully check the parameters on the screen and the parameters to be set. After confirmation, press the "Start" key to start the instrument and enter operation.

(8) When the running time counts down to "0", the centrifuge will automatically stop and the buzzer will beep. When the speed is 0, press the "Stop/Open" key to open the door cover. Press the "Stop/Open" key in case of emergency during operation, and the buzzer will not ring when the centrifuge stops running.

Note: Don't open the door frequently. The recommended interval is 10 seconds to avoid damage to components.

(9) Open the door cover and carefully take out the centrifuge tube to complete the whole separation process.

(10) Turn off the power switch and cut off the power supply of the centrifuge.

VII、 Troubles & Solutions

Troubles	Cause	Solution
Not display when the power is turned on	Not voltage	Check voltage
Not display when the power is turned on	fusing of metal	Check & replace
	Cable connection loose	Check & adjust
Large vibration	Tube No Symmetrically placed	Check & adjust
	Tube broken	Check & replace
	rotor not tightened	Check & adjust
	Partial damage to shock	Check & replace
Display 0000 , Start no running	The circuit board or transformer is damaged	replace
	The control system connector is loose	Re-tighten
	Key damage	replace
	Motor damage or leakage	replace
Can running, but can't up the speed, has strange sound or rare delicacy	Control system or motor fault	Manufacturers maintenance
Actual speed is different from the set or displayed speed, out of control or unstable	Control system fault	manufacturers maintenance
The temperature can't meet the set low temperature requirements	Without precooling or insufficient precooling	Full precooling
	Compressor damaged	Check & replace
	The solenoid valve is damaged	Check & replace
	Insufficient refrigerant	Add refrigerant

This machine is equipped with error display window. When the machine fails, the "information window" will display the following characters with the following meanings::

E1	Imbalance
E2	Over speed
E3	Door open
E4	Lid exception
E5	Temperature sensor error
E6	Over temperature
E7	Locked motor
E8	Communication error
E9	System error
EA	Low voltage
EB	Over current protection
EC	Motor fault (Hall state error)
ED	Brake resistance

VIII、 Unpacking inspection and install

1、 Unpacking inspection

1.1 Before receiving the instrument, carefully check whether there is transportation damage. If yes, please refuse to receive the goods, inform the company in writing and take photos of the damaged machine.

1.2 Check whether the goods are consistent with the order list. If not, please contact Hunan Kecheng Instrument and Equipment Co., Ltd.

1.3 Remove the package and take out the articles in the centrifugal chamber.

2、 Install

2.1 Installation site requirements

- a) . The installation position should select a solid concrete platform to prevent the impact of external vibration on the machine; The room is dry and clean, avoiding direct sunlight.
- b) . There should be independent ground wire in the room to ensure power safety.

2.2 Installation of host

- a) Install the host machine on a solid table top to ensure that the four feet contact the table top.
- b) The clearance between the host and the wall should be greater than 16cm to ensure good ventilation.
- c) The power supply is 220V 50Hz 10A, the wire sectional area is not less than 2 mm², the socket capacity is not less than 18A, and the protective grounding wire must be firmly connected.

IX、 Maintenance

1. Please dry the centrifuge chamber with a clean soft cloth after use.

Dirt from rotor and centrifugal pipe.

2. Regularly check the rotor and centrifugal pipe for cracks.
3. When the instrument needs to be out of service for more than one month, please take the rotor out of the centrifuge chamber, apply a thin layer of grease

to the center hole of the rotor and the centrifuge spindle, and keep the rotor in a dry place.

X、Warranty

1、Centrifuge hosts are guaranteed for 2 years. In case of non-human damage to the product, the company will provide free maintenance service within 2 years from the date of purchase. In case of man-made damage or failure beyond the two-year warranty period within 2 years, the company will charge a certain cost for maintenance.

2. Our company will not be responsible for any of the following situations when supporting various rotors:

Use above the maximum rotor speed;

The rotor is scratched and bruised;

The rotor is seriously corroded by acid and alkali;

Repair by unauthorized professional personnel.

3. Without the permission of the company, unauthorized professionals are not allowed to open the machine; All maintenance and adjustment must be carried out by professional personnel according to the maintenance manual.

4. The company will not be responsible for the maintenance and adjustment of unauthorized personnel!

XI、 Certificate of Conformity

2-6C

Low Speed Table Centrifuge

Certificate of Conformity

Max Speed: 6000r/min

Max RCF: 4338×g

Factory code : KC20211103017

This product has passed the inspection and is allowed to leave the factory.

Hunan Kecheng Instrument Equipment Co.,Ltd

QC: _____

Jan,12th,2023

XII、 Packing List**Packing List**

NO.	Product Name	Specification and code	Quantity	Note
ONE	Low Speed Table Centrifuge	2-6C	1UNIT	
TWO	Accessories and accompanying tools			
1	Special tools	inner hexagon spanner	1PCS	
2	Power cord		1PCS	
3	Angle rotor	12×15ml/conical bottom	1SET	
4				
5				
10				
THREE	Attached documents			
1	Operation instructions		1PCS	This book
2	Certificate		1PCS	This book
3	Packing list		1PCS	This book

Packing QC_____

Hunan Kecheng Instrument Equipment Co.,Ltd**Jan,12th,2023**

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