



High Speed Refrigerated Centrifuge

Model YR0114-1

Instruction Manual

Thank you very much for purchasing our Kalstein's High Speed Refrigerated Centrifuge Model YR0114-1

Please read the "Operating Instructions" and "Warranty" before operating this unit to assure proper operation. After reading these documents, be sure to store them securely together with the "Warranty" at a hand place for future reference.



Warning: Before operating the unit, be sure to read carefully and fully understand important warnings in the operating instructions.



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CONTENTS

FOREWORD.....	3
SAFETY TIPS.....	3
WARNING SIGNAL.....	3
I、USE.....	4
II、TECHNICAL PARAMETER.....	4
III、WORKING PRINCIPLE.....	4
1、DIMENSION.....	4
2、CONTROLLING PANEL.....	4
3、KEY FUNCTION.....	4
4、DRIVING SYSTEM.....	7
5、REFRIGERATION SYSTEM.....	7
6、ELECTICAL APPARATUS.....	7
7、SAFETY PROCTION.....	7
IV、INSTALLMENT AND DEBUGGING.....	8
1、INSTALLATION REQUIREMENT.....	8
2、POWER REQUIREMENT.....	9
3、INSTALLMENT AND DEBUGGING.....	9
V、OPERATION.....	15
1、OPEN LID.....	15
2、SAFETY ATTENTIONS.....	15
3、OPERATION.....	16
VI、MAINTENANCE.....	- 16 -
1、CHAMBER.....	17
2、ROTOR.....	17
3、CONTROL CABINET AND WORKING TABLE.....	17
VII、WARRANTY.....	17
VIII、SPECIAL ATTENTION.....	- 17 -

Foreword

For user:



Safety tips:

* Before using, please read Instruction Book carefully.

* Only technicians and authorized people could be permitted to install and operate.

* The following materials shall be prohibited in the instruction for use:

-----flammable or explosive materials

-----materials which could react chemically with sufficient vigour to cause a hazard

Warning signal:



Caution: Before use, please read Instruction book carefully!



Caution: High-voltage Danger!



Caution: Do not lift by the front plate!



I 、 Use

YR0114-1 (High Speed Refrigerated Centrifuge) is mainly used in the field of molecular biology, genetic engineering, pharmaceutical product, etc. It is Microcomputer control, frequency control of motor.

II 、 Technical Parameter

Max SPEED	22000r/min
Max Capacity	600mlx6
Max RCF	52000×g
Temperature Range	-20 ~+40°C
Timer Ranger	0~99h 59min
Time Accuracy	±1s
Speed Accuracy	± 50r/min
Temperature Accuracy	±1°C
Noise	≤70db(A)
Power supply	220V 50Hz 30A
Ambient Temperature	0 ~35°C relative humidity≤ 85 %
Dimension	710× 840× 1200mm
Weight	260 kg

III 、 Working Principle

1 、 Dimension refer to Table 1

2、 Controlling panel refer to Table 2

3、 Key function:

Rotor: Rotor number (Table 3)

Speed: Set the speed from the range of 0 to the max speed of rotor.

Time: Time setting

Temp: Temperature setting

Acc: Acceleration level (Level 1~9, 1 is the fastest, 9 is the slowest)

Dec.: Deceleration level (Level 1~9, 1 is the fastest, 9 is the slowest)

Enter: Confirm

Start: Start spinning

Stop: Stop spinning/ Lid open

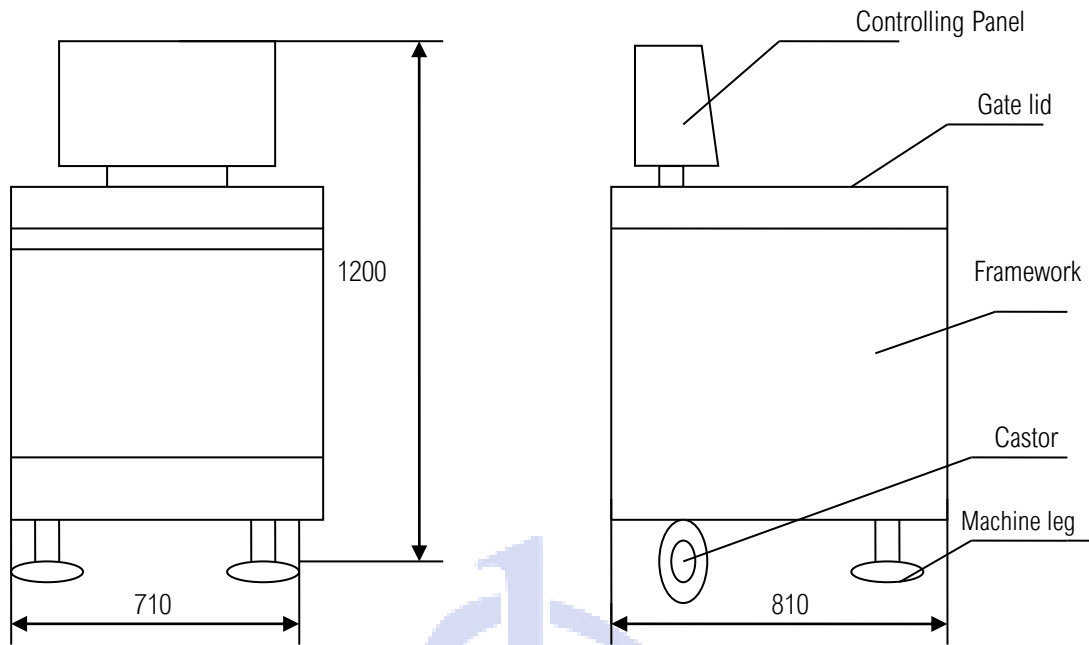


Table 1

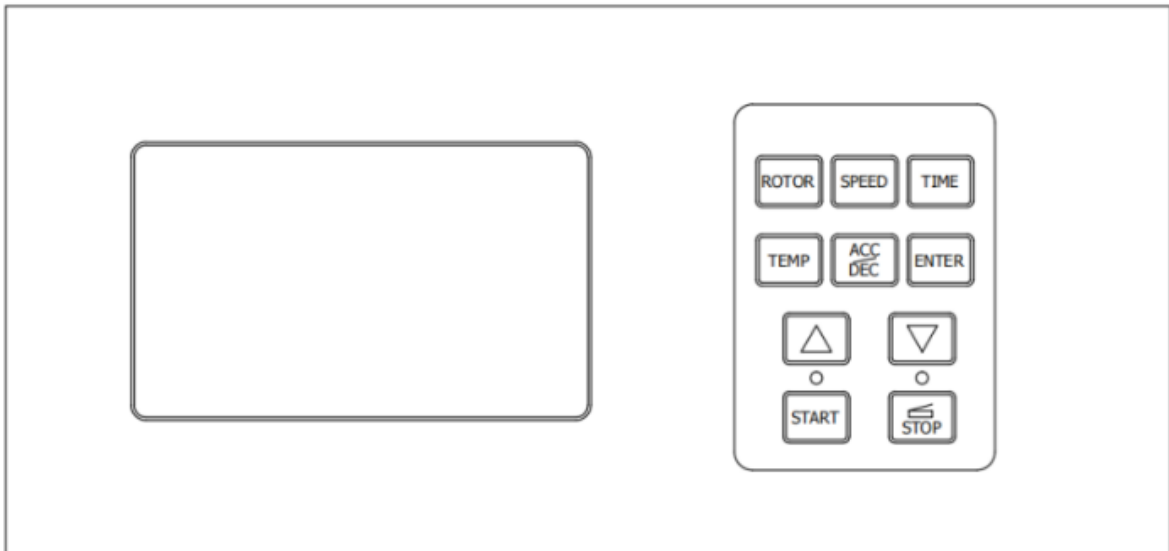
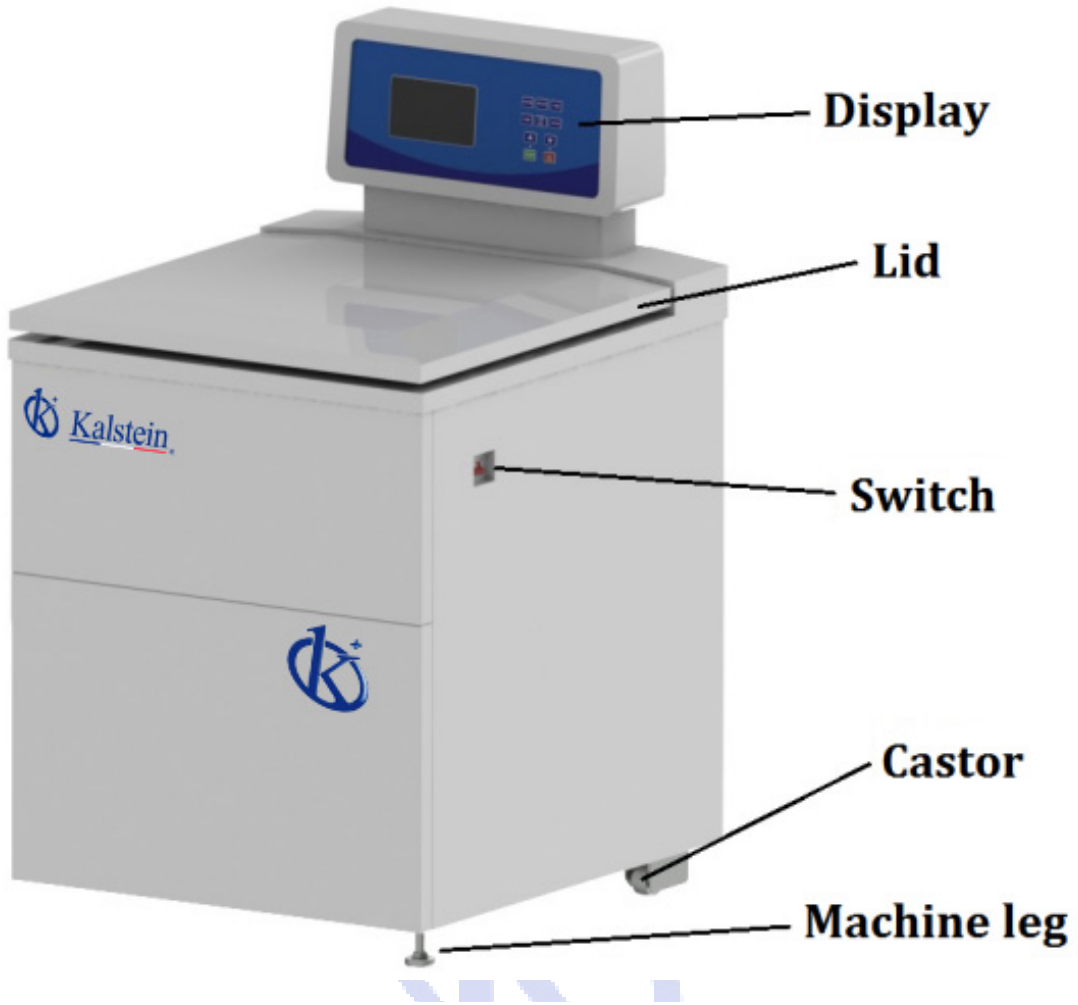


Table 2



Rotor Number	Rotor capacity	Max Speed	Max RCF
No.1 Angle rotor	1.5/2.2mlx36	22000 rpm	52000 xg
	5/10mlx16	22000 rpm	52000 xg
No.2 Angle rotor	20mlx12	16500 rpm	31100 xg
No.3 Angle rotor	10mlx18	21000 rpm	50400 xg
No.4 Angle rotor	50mlx8	18000 rpm	35047 xg
No.5 Angle rotor	70mlx6	15000 rpm	25700 xg
No.6 Swing rotor	750mlx4	5000 rpm	5470 xg
No.7 Swing rotor	50mlx4	5000 rpm	4390 xg
	50mlx8	5000 rpm	4390 xg
	15mlx32	5000 rpm	4390 xg
No.9 Angle rotor	300mlx6	11000 rpm	19650 xg
No.10 Angle rotor	500mlx6	9000 rpm	14400 xg
No.11 Angle rotor	50mlx6	20000 rpm	43000 xg
No.12 Angle rotor	100mlx8	14000 rpm	26952 xg
No.13 Angle rotor	250mlx6	12000 rpm	22470 xg
No.14 Angle rotor	15mlx32	16000 rpm	30940 xg
No.17 Angle rotor	600mlx6	7000 rpm	9100 xg
No.19 Swing rotor	10mlx96	5000 rpm	4390 xg
	15mlx72	5000 rpm	4390 xg
	50mlx20	5000 rpm	4390 xg
No.20 Microplate rotor	8x96 well	4000 rpm	2236 xg
No.8 Continuous flow rotor	1000 ml	14000 rpm	21500 xg
No.18 Continuous flow rotor	3000 ml	8000 rpm	9500 xg

Table 3

4. Driving system

The machine is indirectly driven by AC variable frequency motor in a large torque, it has a special vibration damping mechanism, which greatly reduces vibration and noise.

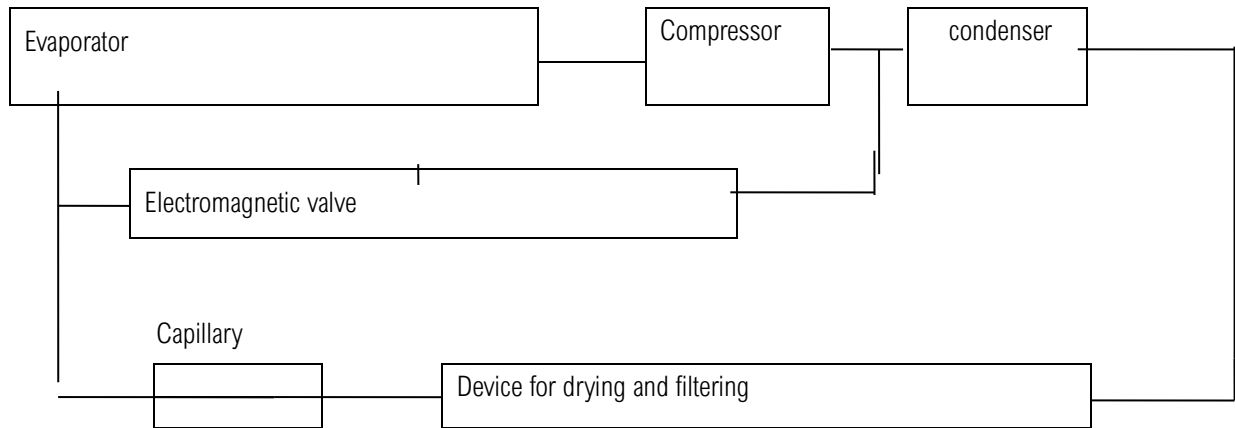
5. Refrigeration system refer to Table 4

It employs imported high-powered refrigerated compressor. The refrigeration effect is perfect.

Electromagnetic valve can control heating to ensure the accuracy of temperature.



Table 4



6、Element of Electrical Apparatus Refer to Table 5

The system use 8089 single chip microcomputer UCP, Temperature and time can be automatically controlled. In addition, the setting of speed, temperature and time can be changed in the course of running.

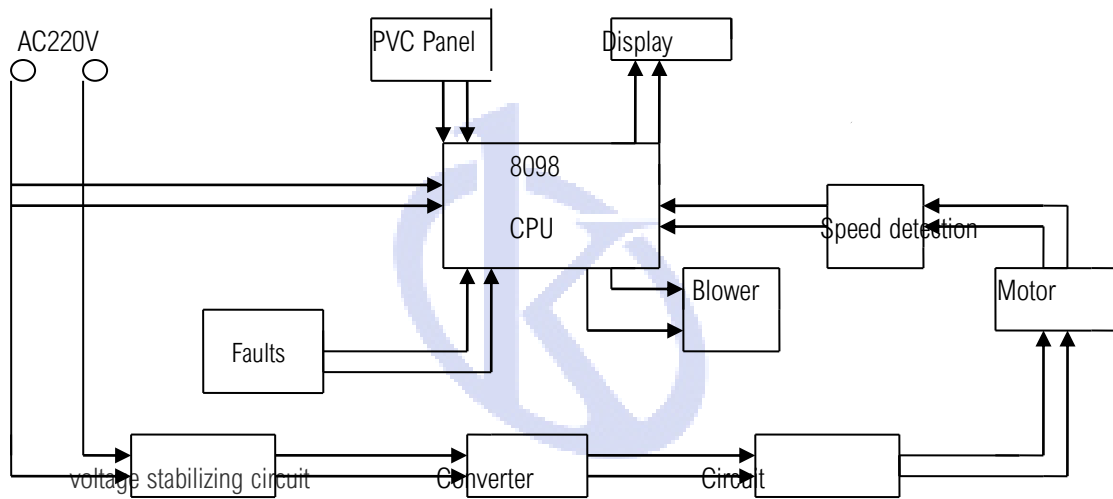


Table 5

7、Safety Protection

- | | | |
|-------------------|--------------------|------------------|
| 1) 、 Imbalance | 2) 、 Over heat | 3) 、 Temperature |
| 4) 、 Transmission | 5) 、 Lid | 6) 、 Over speed |
| 7) 、 System | 8) 、 Wrong setting | 9) 、 Converter |

a、Imbalance protection: In course of running, shake arising from imbalance comes to a certain degree, the system can automatically stop and show error number “1”

b、Over temperature protection: When temperature sensor is destroyed or temperature controlling system breaks down, the system can automatically stop and show error number “2”



- c、 **Temperature protection:** If compressor system comes to fault, the system show error number “3”
- d、 **Transmission protection:** the system can automatically stop and show error number “4”
- e、 **Lid safety protection:** If the gate isn't closed well, the goods can't work. When you open the gate in the course of running, the system will doesn't work and show fault number “5”.
- f、 **Over-speed protection:** When the speed you set exceeds the maximum speed of the rotor, the goods can't work. Or in the course of running, if the actual speed is 500r/min than the setting, the machine won't work and show error number “6”
- g、 **System protection:** when the whole system has a fault, and show “error”
- h、 **Wrong setting:** When stop, the real speed is 300 r/min more than real speed, start key isn't available, and show error number “8”.
- i、 **Frequency converter protection** : press START, the motor doesn't work or the system automatically stop in the course of running ,display error number “9”

IV、 Installment and Debugging

1、 Installation Requirement;

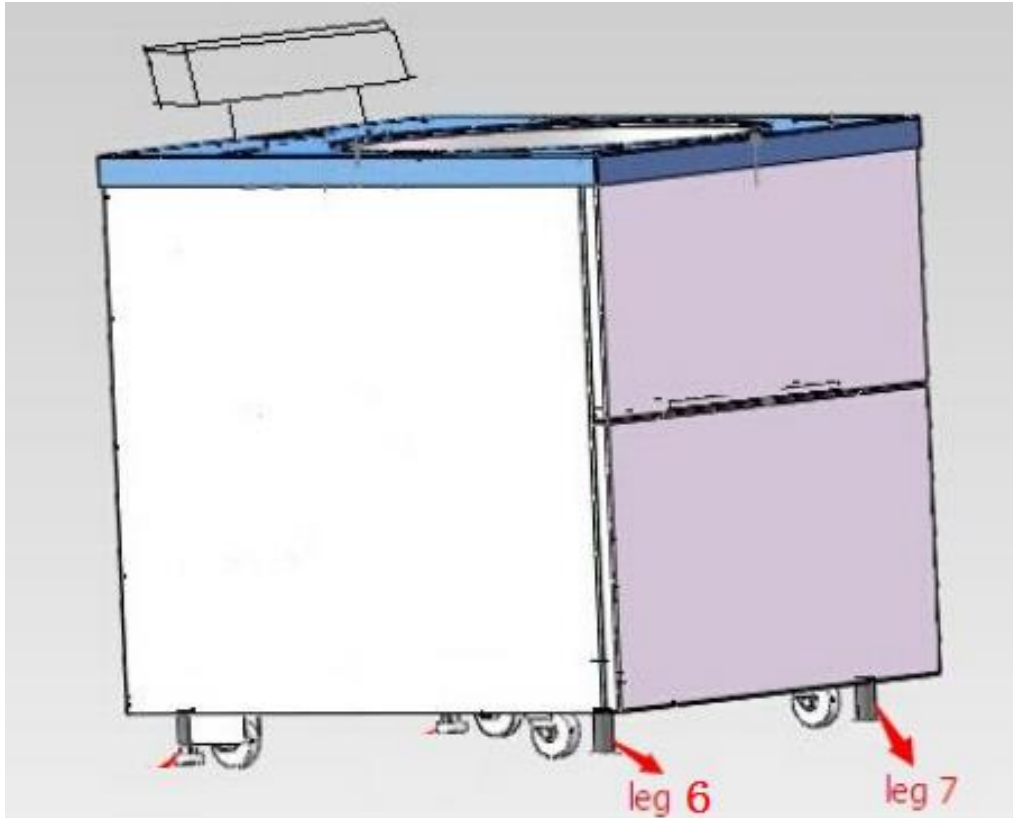
- 1) The table shall be stability.;
- 2) There isn't vibration source nearby;
- 3) Room temperature shouldn't exceed 35°C to ensure the best effect. (Don't start the machine if the temperature exceeds 38°C);
- 4) The back of machine shall be 30cm from the wall for aeration.

2、 Power Requirement

AC 220V±10% 30A 50Hz independent earth wire

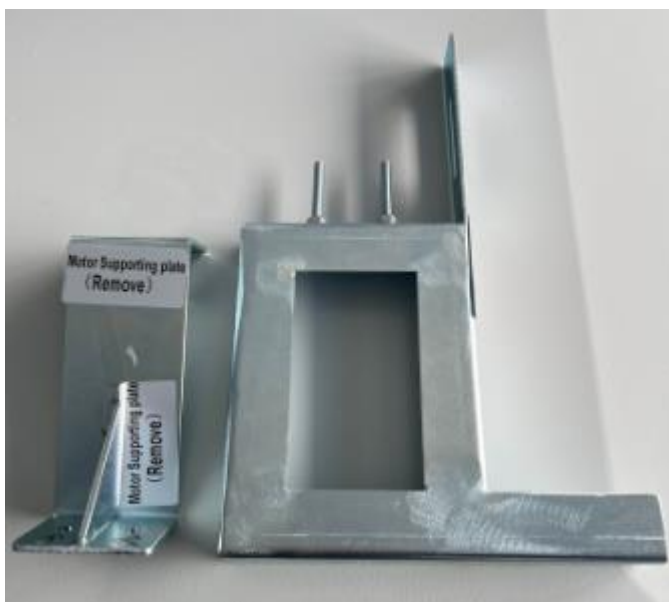
3、 Installment and Debugging

a. Installment



c). After you place the machine to its right position, please find the screws we marked with the figure of 6 and 7 (it is machine feet). Please rotate the two screws in clockwise direction, until the feet touch the floor. Then the castor can't work, the machine will stand on the floor, please make sure it stands steadily.

d) In order for a safe transit, the motor may have a vibration in transit, which may cause problems of big noise or other issues, we try to fix the motor by a supporting plate. Please remove the supporting plate. Try as follows:



2 Supports



Kindly note the supporting plate has two ends, it can connect the motor to the metal base plates. There are 2 screw at each end, please remove the 4 screws(in yellow circle) and take the supporting plate away.

** It is necessary to remove the supporting plate (See the picture above). The supporting plate is only used to keep a safe transit. It affects the motor working in the course of operation.

e) Install the front plate by tighten the screws 1 and 2.

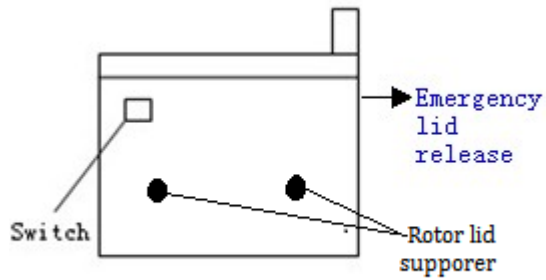
Debugging

By confirming the machine is well installed, please find the switch, which is on the right side of machine, switch the machine on.

1. Open the lid

This model has electronic lock. Press OPEN DOOR key for 3 seconds to open the lid automatically.

If there is no power, there is an emergency lid release at the rear plate. Pull the line, the lid will open by manual.



* Kindly note you can place the rotor lid on the rotor lid supporter.

2. Horizontal test

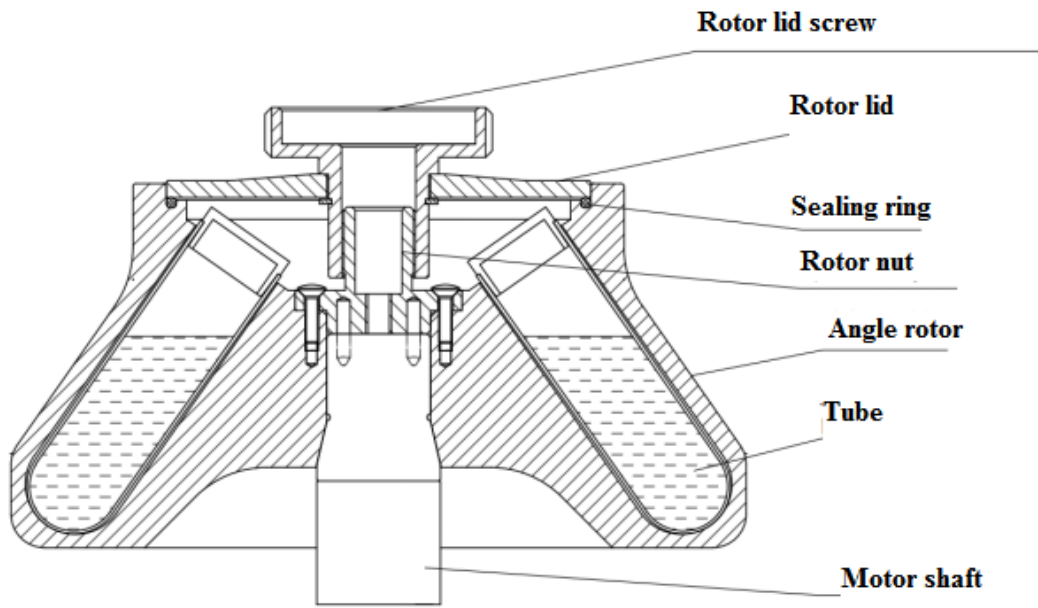
Kindly note we pack a yellow gradienter in the carton of spare parts. Please open the lid of machine, and place gradienter on the motor shaft.



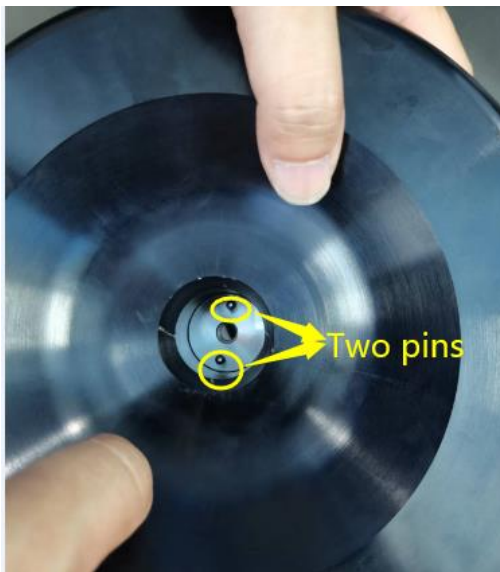
Make sure that the bubble stays at the center of gradienter. It means the machine stand horizontally. It benefits for rotor spin.

If not, please adjust the leg 6/7 of the machine. (Picture I)

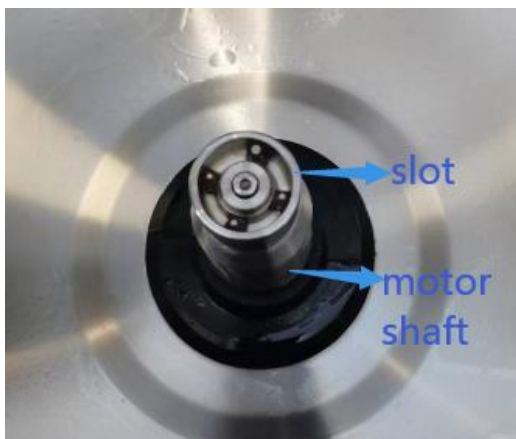
3. Rotor Assemble



There are 2 pins at the bottom of the rotor.



There is slots at the top of motor shaft.





Please try to insert the two pins of rotor to the slots which we marked in yellow or orange slot. See the follows:



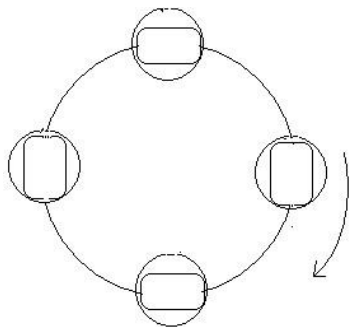
You will find that the rotor snaps to the motor shaft (There is a sharp sound). Then the rotor is well connected.



Please don't shake the rotor by your hand, it may bend the motor shaft.

* Place the tube into the rotor symmetrically. Kindly note the weight difference of each tube (with load) should be less than 1g.

* In order to avoid the liquid spill out of tube in the course of spin, we suggest you to fill the tube with the liquid up to 80% of its max volume.

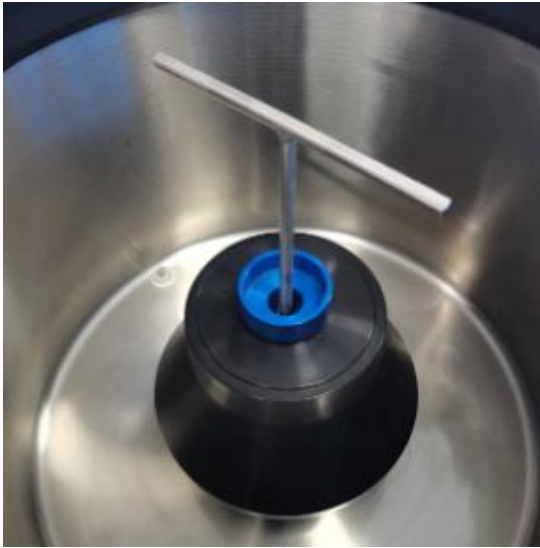


4. Rotor removal

* When you remove the rotor, please find the T-Shape tool we pack together with the goods.



T-shape tool



Insert the T-shape tool into the center of rotor lid, please rotate the T-shape tool until you can lift up the rotor by T-Shape tool.

V、 Operation

1、 Open the lid

This model has electronic lock. Press STOP key for 3 seconds to open the lid automatically.



2、 Safety attentions

Because centrifuge is running with a high speed, even a small mistake can damage centrifuge.

Please read Instruction carefully, and pay more attention to the follows:

- 1) Prohibit setting the speed higher than the max speed.
- 2) No permit of running, if the tubes are imbalanced.
- 3) Rightly put the rotor on the Rotor holder.
- 4) Before using, please check if there are cracks and corrosion with the tube and rotor, no using the rotor of cracks and corrosion.
- 5) Don't open the gate lid in the running.
- 6) If you don't adjust horizontal, don't use it.
- 7) Check if the external power supply comes to standard.

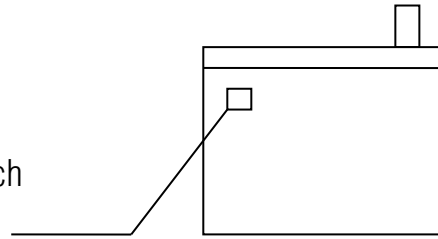
3、 Operation



1) on confirming the above attentions are all right, then switch on,(refer to Table VII),the compressor is running.

Table 7

switch



2) Parameter setting

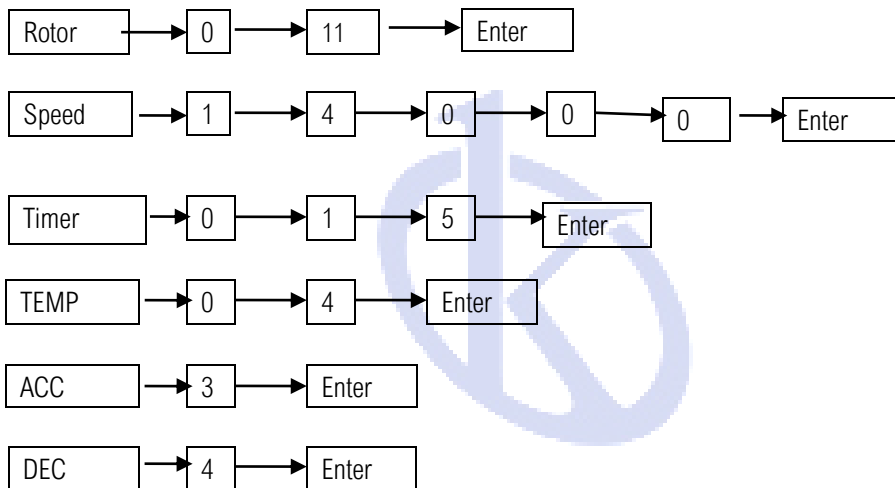
* ACC/Dec: Level 1~9, 1 is the fastest, 9 is the slowest

* Please check the Rotor number of the rotor you use on Table 3

For example Angle rotor 50mlx6:

Rotor	Speed	Time	TEMP	ACC/DEC
11	14000	15 min	4°C	3/4

Procedure as follows: :



At last, it will show as follows:

11	14000	015	4	3
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Press Enter button. Then Start the machine, it will work.

Press Stop key, the speed will decrease. The lid will open when the speed reduce to 0.

3) Data changes

Speed, time, temperature and rate can be changed in the running, but the rotor number can't be changed.



VI、 Maintenance

Firstly turn off the power before maintenance.

1、 Chamber

Remove the rotor after spinning, then clean and dry the chamber with a cotton cloth. , No non-neutral cleaning agents for the chamber.

2、 Rotor

Before rotor installment, put vaseline or lubricating oil on the rotor holder. Please note that the rotor holder can't be damaged.

After the rotor is removed from the chamber, it should be promptly cleaned with a neutral washing solution, dried with a dry cotton cloth, and stored in a dry and ventilated place.

No non-neutral cleaning agents for the chamber.

3、 Control cabinet and working table

Control cabinet and working table should keep clean.

Rotor, tube and other tools shouldn't be put on the panel in case of scratch. Control cabinet and working table can use soft cloth and neutral Cleaner to keep paint from crashed off. Don't use strongly corrosion disinfectant fluid to disinfect (for example 84)

VII、 Warranty

On the premise of correct operation and maintenance, the warranty is guaranteed for one year from the date of delivery.

VIII、 Special attention

This model has electronic lock. When the power is off, the lid can't open. In that case, please note at the back of this machine, there is a white string, pull it back, and then you will hear a sound, the lid will open.



Emergency lid release

