

Bechtop High Speed Micro refrigerated Microcentrifuge

The Use and Maintenance Manual

Thanks for using SHUKE Centrifuge.

Please read this carefully before installing, using or mending this instrument, in order to play the best performance and security

CATALOGUE

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1.Cautions

Security and Cautions based on the description of the safe operation of centrifuge requirements. Please read it carefully before the installation, operation, maintenance and repairs . Understand the security and the matters needing attention and the right operation, This will help you to avoid the operating personnel injuries and the use of centrifuge damage performance.

1.1 Installation and maintenance

- The machine centrifugal indoor may have placed the rotor accessories packaging. It must be sure to open the door cover and take it out.
- During maintenance process, anywhere need to remove the cover may lead to electric shock and human injury. Be sure to shut down all the power supply button before the machine maintenance , and the power cord plug from the socket of has been plucked; Maintenance work needed by professional personnel.
- Replace its component must be has been proved to meet the requirements of the centrifuge.

1.2 Electric protection

- To avoid the electric shock , The centrifuge using the three core type plug, must have the ground with three core socket connection.
- Make sure the Wall socket and ground wire is connected, Power supply voltage must be determined with this centrifuge corresponds with the use of voltage.
- DO NOT use three holes become two hole expansion power adapter.
- DO NOT use two line of the expansion socket or Use no ground the multi-purpose power adapter.
- DO NOT put the filled with liquid containers on the machine or Close to the local machine.the liquid will go inside the machine and damage electrical or mechanical components if carelessly overturned container.

1.3 Fire protection.

- Please use the same type specification overload insurance fuse. This machine use the type specification for the fuse is BGXP $\phi 5 \times 20$ 250V 5A.
- The centrifuge is not for separation has characteristics of inflammable and explosive material design .DO NOT do operation on this kind of material , Neither dressed up these substances in machines or will such material in all the surrounding distance

30cm range..

1.4 Operation security

- Please use our company for the design of this centrifuge rotor and accessories.
- Please make sure the centrifugal indoor has to clean up, without sundry before starting it.
- Please make sure the screw inside the centrifugal rotor has tightened before starting it.
- Please don't make it to the rotor speed more than the maximum speed limit during the working.
- Please don't force centrifuge slow or stop the rotor with your hand.
- When the centrifuge not stop rotating rotor, please don't lift and move it.
- Please don't open the door cover during the operation.
- During the operation it must remain other objects 30cm away. Please don't work in that range, except in the commissioning. DO NOT reach anything into the centrifuge when it work.
- Strictly no turned idling! Otherwise easy cause spring chuck cracking.

1.5 Chemical and biological security



- The conventional operation may include all kinds of solution and test samples, They will be the pathogenic, poisonous or radioactive substances which material can not use this centrifuge operating, Unless has taken necessary protective measures.
- Please pay attention to the instruction of the liquid in the original containers before the operation.
- Holding the liquid must be careful because they are contagious.
- During the operation ,it must be strictly obey the the provisions and way of the laboratory.
- The destruction of all waste solution must comply with the safety and environment protection requirements.

When you ask our service man to come to ,you must to clean your centrifuge very carefully-----it's your duty.

2.Codes and Meanings

Chart 1

No.	CODE	GB No.	MEANING
-----	------	--------	---------

1	~	4706.1	AC
2		5465.2	CONNECT(TOTAL POWER)
3	o	5465.2	BROKE(TOTAL POWER)
4		4728.2	GROUNDING
5		4793	CAUTION!

3.Product instruction

3.1 Product use and application scope

Tabletop high speed refrigerated centrifuge (hereinafter referred to as the machine), is widely used in biological physical and biological medicine and health, agriculture science and environmental protection scientific research units and production department, is the ideal instruments and equipment in the colleges and universities, research institutes, blood center, biological pharmaceutical enterprise .

3.2 Product features

The machine adopts computer control, touch panel, digital display, electronic locks, brushless dc motor drive and other advanced technology, speed PMW control method,9 programs can be stored, 9levels and deceleration can be adjusted. Its features:

- (1) Due to the unique of shock absorber, the anti-vibration effect is good.
- (2) The speed control adopt PID way, high precision. can choose different raising and lowering speed time, Brushless dc motor make sure the machine working peacefully, to meet the requirements of the laboratory, it's no need to change carbon brush ,and no dust pollution.
- (3) Automatic calculation RCF value; Have the point start function (short-term centrifugal);
- (4) Electronic locks security protection function; When the door does not cover well, the centrifuge can't work.

3.3 Product name and the classification

desktop high speed refrigerated centrifuge, the highest speed 15000 r/min.

According to the classification of medical devices catalogue belongs to medical laboratory equipment management category 1st kind of instruments.

According to shock protection with the protection measures of grounding belongs to

class 1 common equipment.

According to the structure belongs to desktop refrigerated centrifuge.

According to rotating speed,belongs to high-speed centrifuge .

3.4 Working principle

Using the centrifuge spins the powerful rotor produce centrifugal force, Accelerate the settlement of particles in the liquid, make the samples of different subsidence coefficient and different density of the substance separate , concrete and pure.

4.Main technical parameters

4.1 Host performance parameters.

The highest speed: 15000 r/min

The biggest centrifugal force: 21630 x g

The most quantity: 24 x 1.5 ml

Speed control precision: ± 10 r/min

Temperature range:-10°C~35°C

Temperature precision: ± 1 °C

Time control scope: 1-999min59s

Power: AC220V frequency 50 Hz 15 A

Noise:<55 dB(A)

Overall size: 400 mm * 285 mm * 285 mm

Weight: 19 Kg

4.2 Rotor parameters.

Rotor Technical Data:

Rotor	Capacity	Max Speed	Max RCF
NO.1 Fixed-angle Rotor	24x1.5/2.2ml	15000rpm	21630xg
NO. 2 Fixed-angle Rotor	4x8x0.2ml	15000rpm	21630xg
NO. 3 Fixed-angle Rotor	12x5ml	15000rpm	18270xg

5.Installation and commissioning

5.1 Remove package(done by users)

You should inspect the appearance when you got the machine. There should not be a severe impact, lying down in the process of transportation, packing boxes appearance shall be in good condition,If anything like that happened you should let us know as soon as possible.

First dismantled the package on the cover , Take out the rotor and accessories, then the host, Finally packing boxes and packing should be deal with properly so as not to cause environmental pollution.

5.2 Installation requirements(done by users)

(1) Environment requirements

This machine should be installed in the interior, installed on the rigid , solid mesa. Without conductive dust in the air, no corrosive or destroy the insulation of the gas, and no strong vibration sources nearby , avoid direct sunlight.

(2) Space requirements

This machine should be installed on the back of the distance from wall not less than 30 cm, in order to ensure requirements of the air cooling, the temperature should not be more than 35 °C to ensure the best performance.

(3) Power supply requirements

This machine used power of single-phase ~ 220 V, frequency 50 Hz, 5 A. Power supply must have independent ground connection. It is strictly prohibited to use zero line instead of ground connection. If you have questions, please contact your dealer or local power supply bureau.

As security measures, this centrifuge is equipped with three core single-phase plug, ensure good ground connection. If you can't plugged into the plug sockets, please contact electrician change your original power socket and not let single phase three core security role plug failure. Please ensure that centrifuge ground connection is good.

(4) Installation requirements

When the machine on the point, this bottom four rubber of machine should be uniform feet force, or to increase the cushion block (done by users) to readjust to requirements.

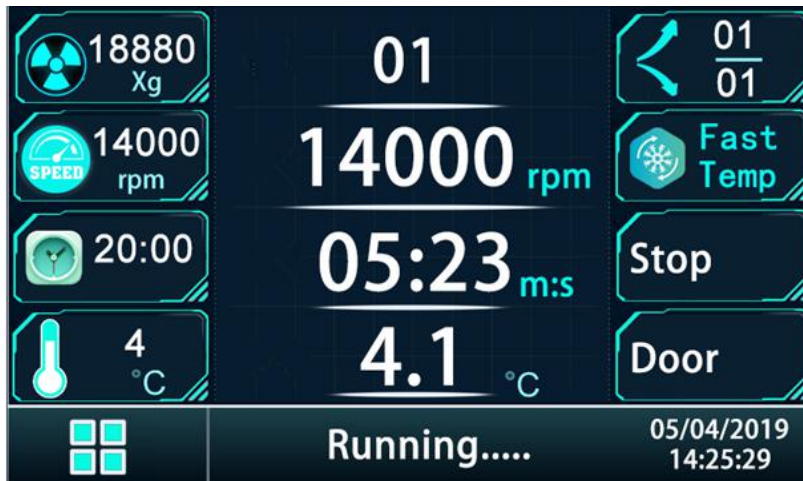
5.3 Commissioning requirements.


WARNING: DO NOT start the machine when it is not clean up inside,or you will damage it!

According to the provisions of article 6 operating instructions, first of all ,choose low speed running, and gradually increased to the highest speed operation. If there is no exception, the commissioning is successful.


5.4 Instrument panel description


This machine adopts touch screen operation (as shown in the figure)




Rotor setting... Click rotor display area  to enter the rotor selection interface to directly select the required rotor No. and automatically return to the main interface.

Speed setting... Click to enter RPM/ RCF  setting interface, and click rpm or rcf window, directly input RPM/ RCF. click OK to confirm, click OK.Key to return to the main interface

Time setting... Click to enter timing setting interface  Can set up hour, minute, second

Temperature setting... Click to enter temperature setting interface 

Directly input temperature which you want. Temperature range: -10°C - 40°C

Acce/Decce setting... Click to enter Acce/deece setting interface 

Separately set acce/deece. Range:1-9. 1 is the fastest.

Fast Temp... Click fast Temp interface . When the user needs to precooling the rotating head, press this key to make the compressor cool at full speed. Meanwhile, the rotor will run at 6000rpm, quickly reach the set temperature and shut down automatically

Run/stop... Click RUN/STOP,  press this button to run/stop machine

Door... Click . When standby, press this button to open the door

Function Menu... Click function menu.  In the function interface, program

groups can be set and called; previous operation records (before power failure) can be viewed; error messages can be viewed; operation curves can be viewed; additional

functions such as system time can be set.

6. Use and operation

6.1 Rotor installation

Install the rotating head vertically on the motor shaft (pay attention to the slot at the tail to align with the motor drive pin), install the lock nut, tighten it with a wrench, and cover the rotor cover. Press the "fasttemp" key after setting all energy numbers to make the rotor and centrifugal chamber reach the set temperature quickly. When the set temperature is reached, it will automatically stop and prompt. Open the door cover, install the sample back cover and the door cover, press the run key to start the machine running and speed up (at the same time, the icon will change to stop), and after reaching the set speed, start the countdown. (please make sure that each tube is loaded symmetrically and balanced before the machine is running)

6.2 Stop

During the machine running process, when the time comes back to decrease, centrifugal machine will slow down according to parameters. As the rotor completely stop working, you can open the door cover when heard the alarm. If you want to stop the running machine, press the "stop" button, the machine will stop according to the above procedures.

When the machine is in error, you can clear it by click the "stop-open the door" key.

6.3 Open the door cover.

Close the door: the machine will automatically lock the door cover after the door cover is flat.

Open the door: press the "door" key to unlock the machine and push the door cover upward.

There is a small hole on the left side of the machine for emergency door opening in case of power failure or door lock failure. When it is necessary to open the door in an emergency, use the Allen wrench attached with the machine, insert it vertically and rotate it in a counterclockwise direction to open and open the door cover. It can't be used to open the door at ordinary times.

In order to convenience of the user, this machine can store 12 centrifugal program.

DO NOT use rotors overspeed. The user should be responsible for the loss, which is caused by overspeeding. (The solution in the tube should be 75% of the tube nominal capacity.)

The users should be discharge the rotor when they need to replace it, loose the lock nut with hexagonal wrenches, then get out of the rotor. check attach photo. To avoid

overspeeding,Relative rotor number should be set again when the rotor need to be replaced everytime.Reset the speed again.

DO NOT lift up or move the centrifuge when it is working.

DO NOT open the lid when the rotor is rotating.

6.4 Troubleshooting

Chart 3

normal fault code	probable causes	solutions
E1 Unbalance	-----	-----
E2 Overspeed	Overspeed protection: wrong rotor number setting or uncontrolled protection of strong current plate	
E3 Door	When press "start" key, the door cover is not closed properly. The microswitch for door cover detection is not installed in place or damaged.	Close the door
E4 Door	Door is opened during operation	Close the door
E5 Temp.	Abnormal temperature of centrifugal chamber	Check temperature probe
E6 Rotor	-----	-----
E7 No speed	No speed of motor,unreliable speed measurement,or the speed sensor is damaged	Inspection and replacement
	The motor is not running, and the motor rotor is locked.	Replace motor
	Loose wiring or damage of strong current plate	Inspection and replacement
E8 communication	Damaged drive plate or cable	Inspection and replacement
E9 Drive	Damaged drive plate	Inspection and replacement
E10 Over current	Speeding up too fast	Adjusting acce.
E10 Over voltage	Too fast deceleration or car killing resistance damage	Inspection and replacement

7. Repair and maintenance

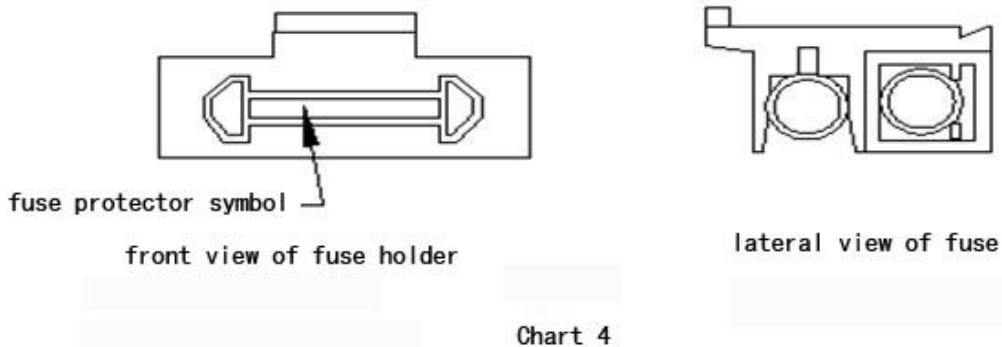
7.1 Take the rotor out from centrifugal chamber, clean it with neutral cleaning mixtrue, dry it with a clean cloth , prevent chemical corrosion,put it in a dry and ventilated place, Do not use non-neutral detergent to clean rotor. The center hole of rotor should have a little grease for protection.

7.2 The rotor installed and take out should be lightly, take out the rotor vertical, to avoid the rotor drop and damage the drive shaft of the rotor.

7.3 You should clean chamber if you do not use the centrifuge for a long time, drying and taking out the rotor to grease on the drive shaft of the rotor for protection.

7.4 Fuse replacement

- (1) Turn off the power,disconnect the plug between the wire and external power supply,then the plug between the wire and centrifuge.
- (2) There is a fuse holder below the power socket on the back side of the centrifuge(chart 4),with a fuse symbolic identification.find the V-groove of the fuse holder(chart 5);use a straight screwdriver to insert this groove,and pull out the fuse holder.
- (3) Take out the damaged fuse protector and discard it,take out the standby fuse protector from the holder and install it.the fuse protector specification of this centrifuge is BGXP BGXP $\phi 5 \times 500$, 250V, 10A.
- (4) Insert the fuse holder into the power socket.



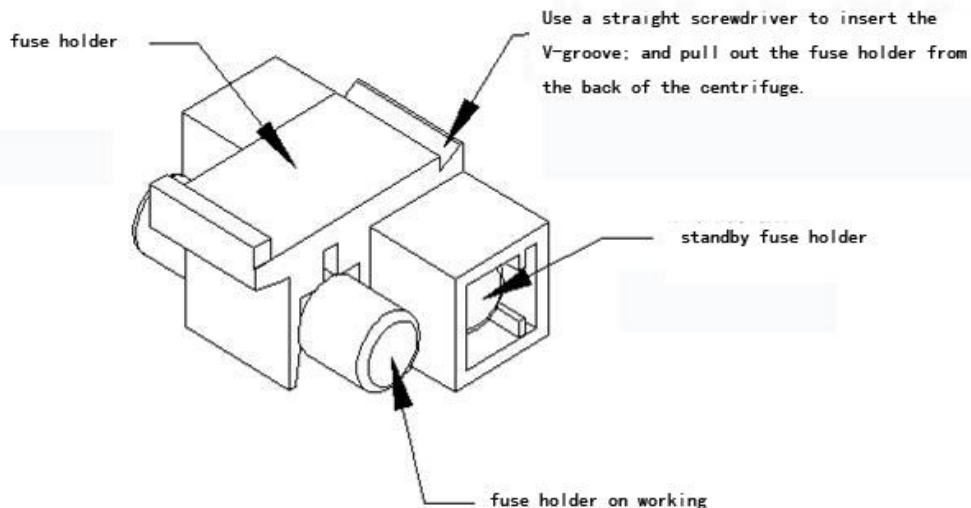


Chart 5

8. Transportation and storage

8.1 Transportation

Long distance transportation, it must use wooden or paper packing boxes .and the centrifuge should be cover with dust mask, and fill up with damping materials all around the machine, it is strictly prohibited of collision, rolling and dipping in the rain or snow in the process of the transportation.

Movement indoor can do directly, but also should avoid big shock, collision, convert.

8.2 Storage

The centrifuge don't use for a long time , should open the door cover, stored in ventilation, dry, clean room and the site should without corrosive substances and inflammable and explosive material.

Due to the technology constantly updated, if there is something different with the manual, please contact our company.

Warranty regulations

All the products of our company, the buyers get two year warranty from the day they bought, We will take all cost because of quality defects during the guarantee period. Out of the warranty period, the users will charge the cost by themselves.

Any of the following conditions is not free maintenance range

- Failures which caused by incorrect installation, operation or maintenance
- Failures which caused by trying to dismantle, change the relevant components parameters

- Failures which caused by using rotors and accessories not designed for this centrifuge
- Failures which caused by force majeure, such as war, natural disaster, etc.

In order to make people understand our product, and provide better service for customers, please pay attention:

Please keep the warranty card and maintenance record.

**Bechtop High Speed Micro refrigerated
Microcentrifuge**

Certificate of compliance

Product Name: Bechtop high Speed refrigerated microcentrifuge

Factory Number:

This product is permitted to leave the factory after inspection.

Inspector: _____

Date: _____

Product warranty card

(maintained by this card within the warranty period.)

Product Name	Bechtop high Speed refrigerated Microcentrifuge		
Model	TGL-2150	Product number	
Date of production		Purchase date	
Name of user and Department(stamped)			
Address:		Contact:	
Tel:	Fax:	E-mail:	
Comments and Suggestions to our products:			

Packing List

Serial number	Name		Quantity	Unit	Remarks
1	centrifuge mainframe		1	set	
2	optional rotors				
3					
4					
5					
6	attachment tools	special spanner	1	set	
7		power line	1	set	
8					
9					
10	attachment documents	instruction manual	1	piece	
11		certificate of compliance	1	piece	
12		product warranty card	1	piece	
13		packing list	1	piece	
14					
15					
16					
17					

Packing person: _____

Date: _____