# Operation Manual

BBRC-101

## Blood Bank Refrigerated Centrifuge

Thank you for Choosing Biolab products. Please read the “Operating Instructions” and “Warranty” before operating this unit to assure proper operation.

## Safety Notices

We appreciate your business with our Centrifuge Instrument. In order to avoid any potential accident happening. Please operate centrifuges according to the following safety protocol.

1. Unplug the main power cord, when performing maintenance or when centrifuge is expected not being used for a long period of time.
2. Load the rotor with samples arranged symmetrically. Opposing tubes must be of equal weight. If necessary, use “water blank “tubes to balance sample tubes of unequal weigh. Do not conclude that tubes are balanced by sight over volume. Use the pan balance provided in the centrifuge room for balancing tubes in rotors for the centrifuge.
3. Never exceed the maximum speed posted for the rotor!
4. Never use the rotor that appears damaged (e.g. O-rings missing, scratched, corroded, and cracked).

Thanks for using our instrument! For your fast and sincerely service please read the manual carefully when you use the machine.

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# 01 Summary

Blood Bank Refrigerated Centrifuge BBRC-101. Ideal for Medical, Life Sciences, and Agricultural Sciences fields and so on. This machine can match different rotor types and many kinds of volumes, which support kinds of Laboratory tests and Small batch preparation and separating blood bag requirements. Its Max speed is 5000r/min, Max. RCF is 4730×g, Max. volume 4×800ml. BBRC-101 has fast cooling down function, and use brushless frequent motor drive, microprocessor control system, soft control touch panel, digital display run parameters, adjustable acceleration & deceleration, and auto-electric lid interlock with alarm for a combined safe protection system. We assure you of “stable function, Quiet noise, Simple operation, Convenient using ”!

# 02 Main specification and technical parameters

| | |
|---|---|
| Max. Speed | 5000 r/min |
| Max. Volume | 4×800ml |
| Max. RCF | 4730×g |
| Temperature range | -20℃ ~ 40℃ |
| Timer | 99h 59min |
| Temperature Accuracy | ±1℃ |
| Speed Accuracy | ±50 r/min |
| Noise | ≤ 62dB(A) |
| Power supply | 220V /110v  50Hz/60Hz |
| Dimension | 700mm×715mm×420mm |

# 03 Available rotors

| Rotor No. | Rotor Type | Max speed (rpm) | Max Volume(ml) | Max RCF (g) |
|---|---|---|---|---|
| No.30671 | Swing out rotor | 4000 | 4x800ml | 3450 |
| No.30696 | Swing out rotor | 4000 | 4x500ml | 3380 |
| No.31377 | | | | |
| | swing out rotor | 5000 | 4x50ml | 4730 |
| | | | 4x100ml | |
| | | 4000 | 8x100ml | 3020 |
| | | | 8x50ml | 3200 |
| | | | 24x15ml | 3200 |
| | | | 32x15ml | 3200 |
| | | 4000 | 96x5ml vacuum tube | 2480 |
| | | | 160x5ml vacuum tube | 2480 |
| No.31377 | swing out rotor | 4000 | 32x10ml vacuum tube | 2790 |
| | | | 32x7ml vacuum tube adapter | |
| | | | 32x5ml vacuum tube adapter | |
| | | | 48x10ml vacuum tube | 2880 |
| | | | 48x7ml vacuum tube | 2760 |
| | | | 48x5ml vacuum tube | 2480 |
| | | | 72x10ml vacuum tube | 3140 |
| | | | 96x7ml vacuum tube | 3140 |
| | | | 160x7ml vacuum tube | 3140 |

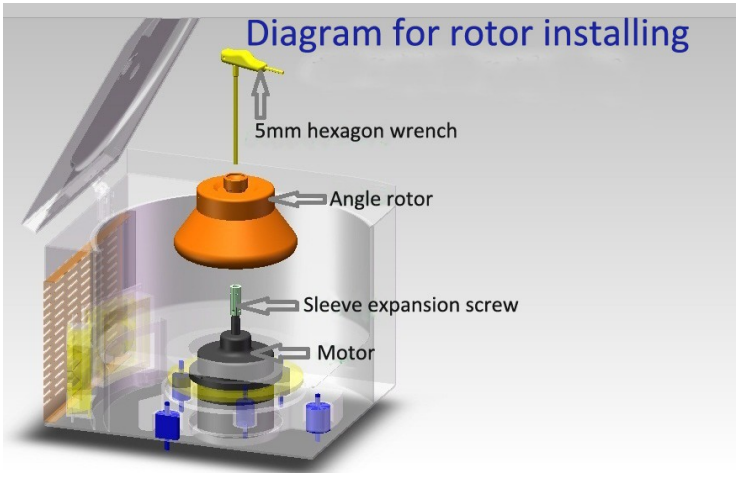
| | | | | |
|---|---|---|---|---|
| No.31376 | Micro plate rotor | 4000 | 2x3x48 well | 2300 |
| No.31494 | | | 4x4x96 well | 2840 |
| No.30638 | Angle Rotor | 5000 | 6x15ml | 2540 |
| No.30607 | Angle Rotor | 5000 | 12x15ml | 3080 |
| No.30639 | Angle Rotor | 5000 | 24x15ml | 3500 |
| No.30640 | Angle Rotor | 5000 | 4x50ml | 2520 |
| No.30611 | Angle Rotor | 5000 | 6x50ml | 2850 |
| No.30641 | Angle Rotor | 5000 | 12x50ml | 3860 |
| No.30613 | Angle Rotor | 5000 | 4x100ml | 2630 |
| No.30614 | Angle Rotor | 5000 | 6x100ml | 3130 |
| No.30642 | Angle Rotor | 4000 | 12x100ml | 2970 |

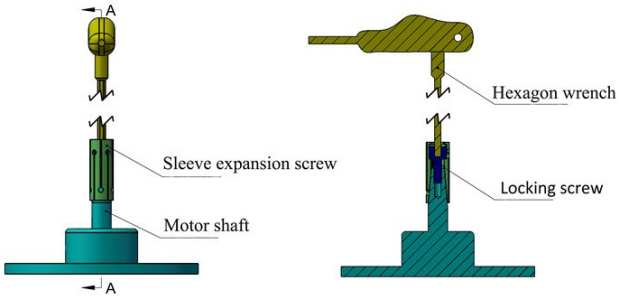
# 04 Unpacking

Please check whether there are serious damages on the package as soon as you received the centrifuge, if so, please contact us directly, if not, please unpacking the package, take out the instruction manual, checking the components and accessories according the packing list in the instruction manual. If you found something missing, please tell us.

# 05 Installation

1.The centrifuge should be installed on a stable working table, let its four rubber feet touch the even surface of the table. And then insert one head of the power plug into the socket which mounted on the rear of the centrifuge. Insert another head of the plug into the power supply socket. (Attention: the power supply socket must be connected with the earth in case of electric shocks).
2.Installation of the rotor:(Pay attention to this part carefully)

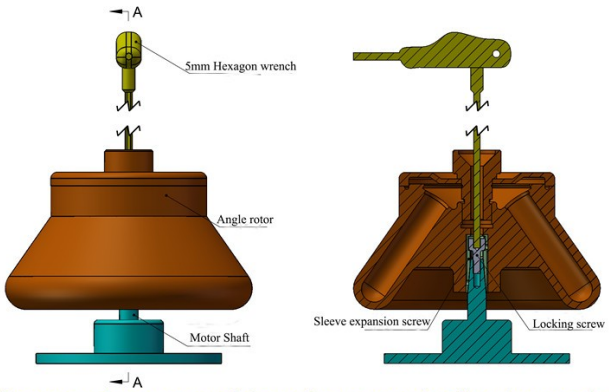



No.1 Please make sure the sleeve expension screw is very loose before putting into rotor.

No.2 If the rotor is fully installed down to the shaft,move up and down the rotor you could hear "bang bang " sound.

Diagram of angle rotor and the motor parts




Do remember,we can tighten the rotor only after the rotor is installed fully down to the shaft.

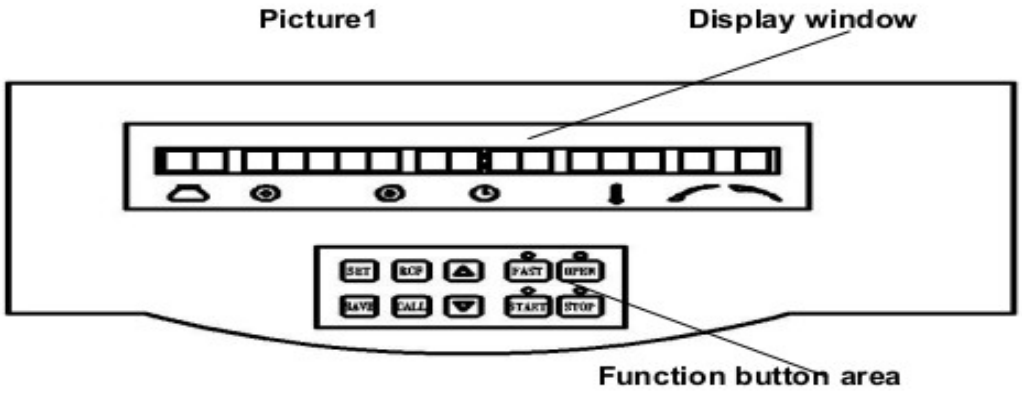
Rotating sleeve expension screw  with the wrench from closewise with 1-2 circles,then put the rotor. Check the sleeve expension screw to make sure it is very loose before putting into rotor. That is because only when the sleeve expension screw is very loose, the rotor can be fully installed down to the shaft which is correctly installed. If the rotor is installed fully: move the rotor up and down from the shaft, you could hear “bang bang...” sound. If you find the sleeve expension screw is tight and the rotor can not be installed down fully, rotating with the wrench from anticlosewise 3-4 circles to loose the screw and move the rotor up and down to check, if you can hear”bang bang”,it is correct, if not, continue to loose the screw till the rotor can be fully installed down to the shaft. Only after the rotor is fully installed down to the shaft, then you can tighten the rotor.

# 06 Operation

1. Checking whether the rotor is installed correctly, if not, install the rotor correctly at first.
2. Prepare the tubes; put the test liquids into the tubes, checking whether they are in the same level with your eyes.
3. Load tubes on the tube rack symmetrically; otherwise it will be resulted in severe vibration in the process of centrifugal.
4. Close the lid, make sure it is locked
5. Set parameters

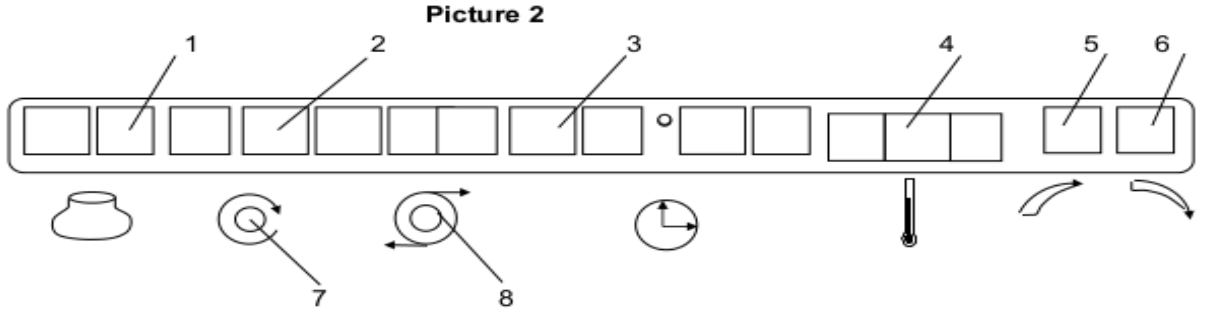
The time and speed will be showing on the panel, switches and buttons as the following figure:

Picture1




1). Display Window content ( as Picture 2 shown )

Picture 2




1. rotor no. 2. Speed 3. Time 4. Temperature 5. Acceleration 6. Deceleration

7—Speed indicator light 8—RCF indicator light

1. Rotor No. window
It will show the last 2 digits of “Rotor No.”!
2. Speed window
It shows 3 kinds of contents. One is speed; the second is relative centrifugal force (RCF); the third is display operation programs.
3. Timer window
It displays 2 kinds of contents: 1.Time; 2. Fault.

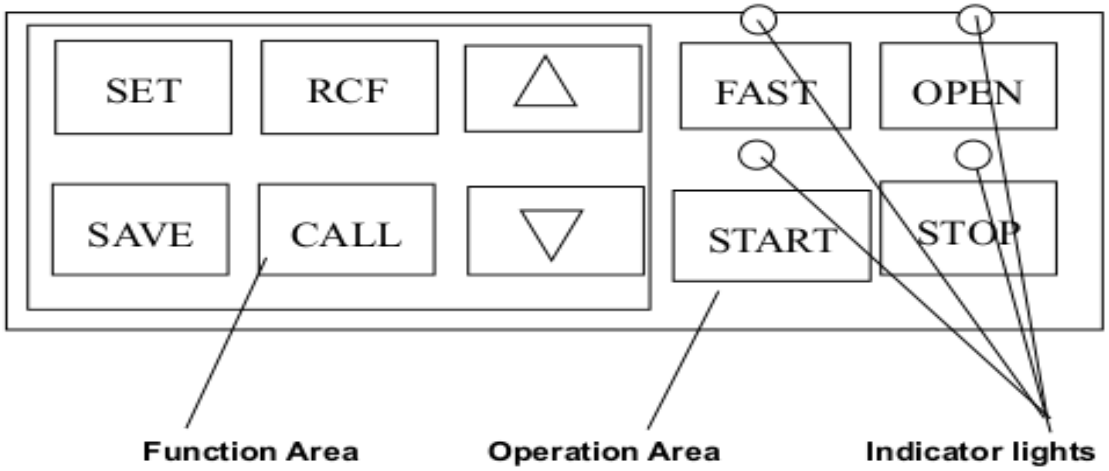
Fault codes are as the following form shown.

| Fault | lid (not close well ) | Drive (fault) | Voltage instability | Temperature transmitter | Generate receive error | Over-speed | Imbalance |
|---|---|---|---|---|---|---|---|
| code | E-1 | E-2 | E-4 | E-5 | E-6 | E-8 | E-9 |

4. temperature
It shows the temperature value.
5. acceleration and deceleration
It shows 10 kinds of speed NO. In one numeral, the time spends on accelerating and decelerating is between 2-10minutes. The bigger of the numeral in showing, the shortest of the time spends on accelerating and decelerating

2). Functions button Area：

Picture 3



(a) Set button
You can set the “Rotors number”, “speed”,”Temperature”, “speed acceleration” and “speed deceleration” transferable with this button and the “△””▽” button. For example: Push the “set” button for two times when the centrifuge is in shut down status, the “speed” display will flash, then you can set speed use the “▽””△”button. The speed will flash two times to be confirmed automatically (in the process of flash, don’t push any button) you can set all the parameters like this way.

( b ) △button and▽button
Push the△button and hold on, the figure will become bigger and bigger, click the△button, the figure will become bigger one by one.
Push the▽button and hold on , the figure will become smaller and smaller, click▽button, the figure will become smaller one by one.

( c ) ”RCF” button,set the RCF.
Note: Press “RCF” button, the speed window will show RCF. Press the “RCF” button the second time,it will be back to show Speed. The RCF value comes with a dot to show, while speed value doesn’t,for example,3450g the window will show 3450., at the same time, the RCF light is a red light; 4000rpm, the window will show 4000,at the same time, the speed light is a green light.

( d ) ”Save”button,save the program,10 programs can be stored.How to set and save programs: Press “call” button,the speed window will show P0 or P1…P9,press △button and▽button to change from P0-P9.Now we set Program 0,when it shows P0,press “set” button,to set speed,rotor No.,time,temperature,acceleration/deceleration according to the above way. When you finish,press “save” button two times to save the program you set.

( e ) ”Call”button,call the program stored. press △button and▽button to change from P0-P9.
how to calculate the centrifugal time: The calculation of the centrifugal time is in direct ratio with the RCF while in inverse ratio with the density of the liquids. The centrifugal time depends on the maximum RCF and minimum radius; the long bucket will inevitably result in long centrifugal time. The centrifugal time is hard to calculate, it is mainly depending on the experiment.

3 ) Operation Area Functions:

( a ) start
Press the “start” button, the green light beside the “start” button will on, the centrifuge will start to work according the parameters you set. Centrifugal chamber temperature by cold hot in turn way in establishment temperature +/- 2℃ In scope automatic control temperature. The time parameter starts the countdown.

( b ) stop
It will cut off the electricity automatically in the process of operation when the centrifugal time is 0, the red light will on , it will decelerating according the parameters you set, when you hear the buzz sound the rotors will stop, you can open the cover now. If you want to stop the machine, you should press the “stop” button, the machine will stop according the above procedure.

( c ) open the cover
You can open the cover till the “i”open light on .

(d) Power off
Press the down side of the switch button, now the panel is cut off, but the whole machine is not power off, if you stop using the machine, you should take out the plug from the power supply socket.

# 07 Other Functions

1. Over-speed protection: if the speed set by the operator exceed the max.speed of the rotor, it can’t work when you press the “ start” button, you will see “E-8” in the break down window; What is more, if the speed is out of control and exceeds the Max.speed of the rotor , the machine will stop automatically and the “E TEMP Window” will show E-8 code.

2. Memory function: When all the parameters are set, they will be memorized by the machine. And the centrifuge will run as per these parameters you set last time when you restart the machine.

# 08 Other Safety Precautions

1.Centrifuge tubes should be replaced periodically, never use tubes with cracking.
2.You should care for the overflowed harmful substance when open the rotor lid or clean the centrifugal chamber.
3. When the rotors damaged you can only move the centrifuge for 30(cm), make sure no dangerous subjects within 30 (cm) around the centrifuge.
4.The operator can’t lean on the centrifuge when it is in operation, non-worker can’t stay around the centrifuge.
5. When the centrifuge is broken down, forbid the non-professionals to repair it. You need to invite the professional maintenance person or send back to our factory. Before repairing, please unplug the main power cord, so the centrifuge can cut off all the power supply.
6.In order to protect the safety of operator, cannot allow to open the lid when the instrument running. Instrument itself is also with this kind of protection function, that is to say, when speed is over the max speed with 100rpm, the lid switch will cut off the power automatically. When operator press the OPEN key wrongly, the lid is no response, in order to protect centrifuge safety, lid cannot be opened, But strictly forbid following illegal operations:

(1)When the instrument running, or in the procedure of deceleration to shut down, the speed is not decelerated to 100rpm, strictly forbid to pull down the ring in the bottom of the instrument to open the lid. Strictly forbid to enforce rotors to stop running artificially, this will cause personal injury accident
(2) Strictly forbid to close the Power switch artificially, then connect the power. At this time, centrifuge program think the speed is 0, Press open key, the lid can be opened, this can be easily misleading to stop rotor running artificially.

# 09 Maintenance

1. You should take out the rotors from the centrifugal chamber when you don’t use the machine for a long time, and then store them in the ventilation and dry place after cleaning.
2. Clean the centrifugal chamber when finished centrifugation, dismantle the central sleeve from the axle regularly, and lubricate the axle and central sleeve, in case of corrosion.
3. Keep the place which settle the centrifuge clean, make sure the freezer is not choked by dirty subjects.

# 10 Warranty Policy

1. We have one –year warranty on our all products
2. After the machine fixed, our professional technician will file it and keep track of the usage of the machine.
3. We will pay attention to the feedback of the customers within 24 hours.s
4. We won’t charge customers any money for repairing the machine in one-year warranty time.
5. We only charge for the accessories on repairing the machine beyond the one-year warranty time.
6. We have technician training class twice a year, training the technician for our distributor

# 11 Trouble-shooting service

| Trouble | Cause | Removal |
|---|---|---|
| The display window is not working when power is connected | No 220V/110V power supply | Check the power supply |
| | Fuse is broken | Check and replace fuse |
| The rotor doesn’t run when Start key is pressed | The connector to circuit board | connect it properly |
| | The power transformer is broken. | Replace the transformer |
| | The motor is powered on, but it doesn’t work. The motor is damaged. | Replace the motor |
| Abnormal vibration of the centrifuge | The tube in the rotor is not arranged symmetrically. | Check and rearrange Properly. |
| | The test tube is broken. | Check and replace the broken tube |
| | The rotor is not turned tightly. | Check |
| | The shock absorber is damaged | Replace the damaged shocking absorber |

BIOLAB SCIENTIFIC LTD.
3660 Midland Avenue, Suite 300, Toronto, Ontario M1V 0B8 Canada
Email: contact@biolabscientific.com  Tel: +1 707 533 1445
Website: www.biolabscientific.com