

Sichuan Shuke Instrument Co.Ltd.

User Manual

For

TG12

Hematocrit centrifuge

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

Our duty is at your service!

Our pursuit is satisfying you!

Our motto:

Credit based

Quality first

Safety Notices

The Operations Manual for TG-12 table top haematocrit centrifuge contains all of the information needed to install, operate, and maintenance. To prevent any potential accident, please read this *Operation Manual* carefully and operate centrifuges according to the following safety protocol.

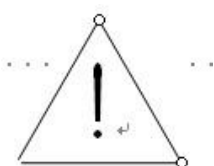
The terms danger, warning, caution and note have specific meaning in this manual.

Danger advises against certain actions or situations that could result in personal injury.

Warning advises against certain actions or situations that could result in personal injury, health risk and environment pollution.

Caution advises against actions or situations that could damage instrument, produce inaccurate data, or invalidate a procedure.

Note provides useful information regarding an operation, function, or procedure.



The signs of danger, warning and caution are placed in the left of corresponding text.

I 、 Product Introduction

TG-12 is table top haematocrit centrifuge. Max speed is 12000r/min, Max Volume is 24 capillaries, Max RCF is 15800×g.

Brushless frequency motor for model TG-12 and digital display which indicates the speed、 time.

Frame is 3 tiers protection steel jacket, and with the stainless steel chamber. Electronic lock and pneumatic spring and automatic locked cover can assure the security, The lid can not open in order to protect the operator in

operation.

Little vibration 、 low noise and beautiful design. Adopt advanced CPU control system realizing microprocessor control, it can control rotate speed, temperature and relative RCF, digital display.

The instrument has following functions:

- a. It can rotate relative RCF
- b. It can store all the parameters automatically in operation, and can use directly when startup next time.
- c. When exceeding max speed with 500r/min, it will stop automatically and protect the system.

This machine is in accord with national standard GB4793.7-2001 and international standard IEC61010-2-20: 1992.

II、 Centrifuge technical parameters

Main technical parameters for TG-12

Table 1

Maximum speed	12000 r/min
Maximum capacity	24pcs capillary
Maximum RCF	15800×g
Timer	0-99min
Noise	≤55dB (A)
Power	AC230V 50Hz 2A
Dimensions	355mm×270mm×205mm
Net weight	14kg

III、 Matched rotors

TG-12 centrifuge for haematocrit blood can be used to determine the specific product value of blood cell and separate the micro-blood from

micro-solution,

Table 2 Main technical parameters for rotor

Volume ml	Max Speed (r/min)	Max RCF (×g)
24 capillary	12000	15800

IV、 Installation

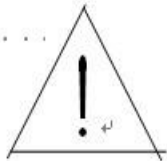
Check the package before opening the packing box. Examine the Centrifuge for any shipping damage. If any damage and discrepancy was found, please contact our service representative

1、 The work table should be smooth and stable, the four feet of the centrifuge should touch the surface of the work table firmly



Warning In order to ensure safety, please keep 30cm space around the instrument, and stay out of the safety space in operation, do not store any inflammable and any other dangerous goods in the safety space.

2、 Electrical source should be 230V Single phase, with independent earth line



Caution! Error voltage or the voltage over 10% will damage the instrument. You need to check the voltage before connect the power.

3、 This instrument only can be used indoor and it is better to operate under 20°C condition. 80% maximum relative humidity for 31°C, while 50% for 40°C, and avoid placing the centrifuge under heat producer(e.g sunshine、 heating pipe and radiator)



Caution! In order to assure ventilation effect, you should

keep enough space for centrifuge devices. Overheating and poorly ventilated room will damage the instrument.

4、 Use the attached power cord



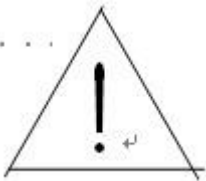
Warning

Centrifuge rear over with power socket ! , the security identity is enclosed. socket is 230V, be careful when connecting the socket.

V、 Operation

1、 Power on

Power switch is located on the right bottom corner of control panel. Turn it to “on” position, the power indicator will turn red.



Caution

Side of this power switch is posted with safety marking, ! this means the power is 200V 2A, It is dangerous voltage, beware of electric shock.

2. lid opening

There is open key on the control panel⑤,. Press "open"⑤, lock opened. push the lid upward until it open completely, Spring level will help to open the lid.

3、 Rotor installment

(1)、 Load the rotor to the central adapter located on the axle of electrical motor, Fasten the screws in the central sleeve till the rotors are installed. Use the special wrench to fasten the screws after installing the rotors in the central sleeve of the axle.

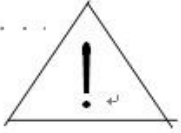


Warning

Check the rotor before loading. Never use rotors showing signs of cracking or corrosion, never use

expired rotors.

(2) Fill the tubes equally by eye (about 75% of the total volume), balance the tubes by scale.



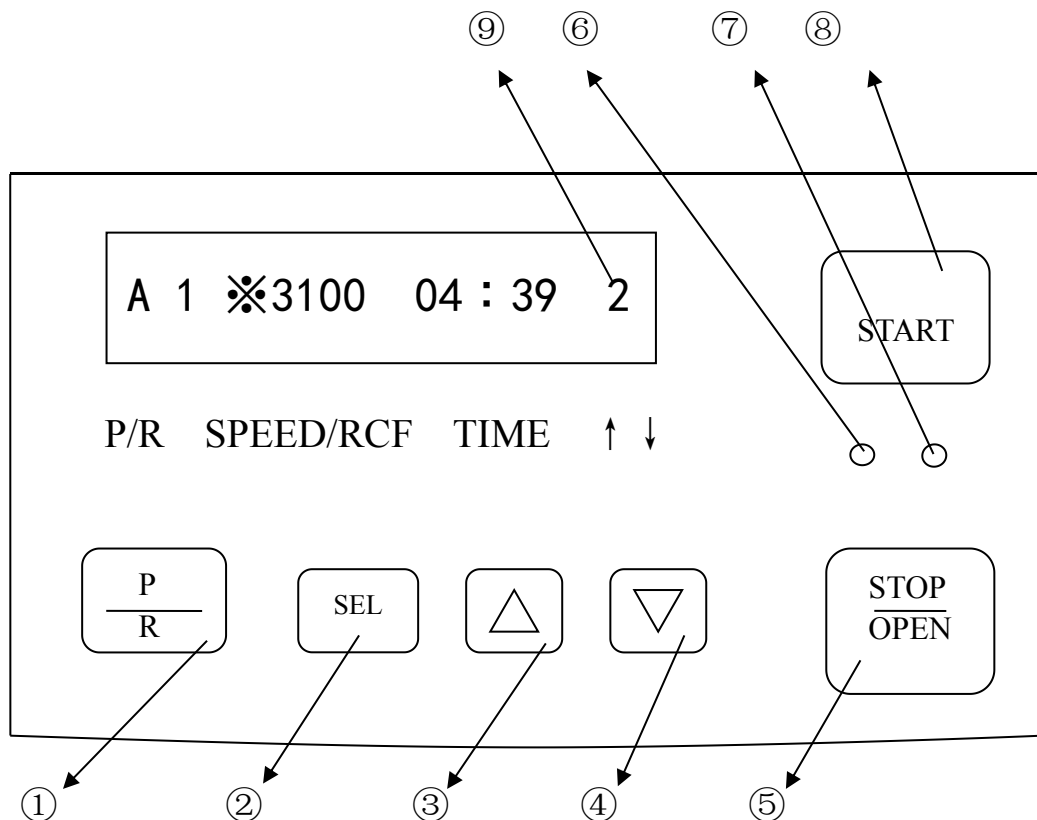
Warning The difference in weight between the tubes should not exceed 2 grams. Load the tubes symmetrically

4. Closing the lid

After the rotor has been properly loaded, close the centrifuge lid

5. Parameter setting

The time and speed will be showing on the panel, switches and buttons as shown in figure 1:



- ① RCF/RPM; ② Select the program ③ Speed/RCF up ④ Speed/RCF down
- ⑤ Stop the centrifuge/open the lid ⑥ start indicator ⑦ stop indicator
- ⑧ start the centrifuge ⑨ speed up and down

The P/R window shows the A-L2 program. It can store the memory from A to L2 these 15 programs, especially the K0-K1, L0-L1-L2 are gradient separation process

The SPEED/RCF window shows the speed and RCF value, when pressing SEL ②, the screen will display F, it's the RCF.

There are 2 functions of the Time Window. i. Display centrifugal time. When speed up to the one you setting, it displays the time in the countdown. ii Display the instrument error. For example, "ERR1" means the lid is not shut properly, and ↑↓ shows the fluctuant speed.

All kinds of break down shows in table 3:

Table 3

E1	E2	E3	E5	E6	E7	E8
Cover unclosed	Break down	Parameters setting	Sending error	Receiving error	ECC Error	Over speed

E5---- Sending error push the start button, if the rotor is in the Non stationary state, it will display E5. When the rotor recovers to stationary state, press the start button, the instrument will run normally.

E6---- Receiving error Driving Board Error

E7---- ECC Error Display panel calculation error

Parameters Description

(1) Parameters setting

Press the SEL ② repeatedly, the selecting data will flash, then you can set the speed and time by pressing the up ③ and down ④. After setting the parameters, press the start ⑧, the instrument will operate with the setting datas. When the time countdown to 00:00, the instrument will stop and open the lid automatically.

(2) Storage Program

In order to operate the instrument quickly, we made the improvement of storage function. It will store your parameters automatically and can be used directly next time. Press the button ① and the start button ⑧, the instrument will start to work according to the parameters you set.

The program is as follow:

① storage

After setting the parameters and hear the buzz sound, the screen will bright, then the parameters you set will store into A-L2 program.

② Parameters using

If you need to adopt program A, please press button ①. When it displays A, then press the button ⑧ to start the operation.

6. start

Press the “start” ⑧, the green light of the “start” button will be brighten, the instrument start to run, the speed window display speed; The time window begin to count down, 18 seconds later, the speed will rising to the setting speed . In the process of instrument operation, press SEL ②, the speed transforming display relative RCF, and then press ②, display speed.

7. 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, the instrument also will stop running.

8. open the cover

Press the “open the lock” button⑤, the lock will be unlocked, when you hear the buzz sound, pull the cover in upward direction, the gas spring will help you open the cover., then take out the sample, all the centrifugation process finished. For you safety, the cover only can be opened when the speed turn to 0 r/min, and produce the buzz sound by pressing button ⑤.

9. power off

When finishing centrifugation, pressing boat shaped switch back of the instrument is OK. If centrifuge is expected not being used for a long period of time, unplug the main power cord, so the instrument can cut off all the power supply.

VI、 other functions

1. Rotor No. setting

Caution! Every rotor has a Rotor No. Rotor No. needs to be set properly. If rotor NO setting is right, but the setting speed exceeds the rotor's Max speed, the instrument also can not start. This can ensure the right use of the instrument.

2. Memory function

When all the parameters are set, they will be memorized by the machine. The parameters in the window are what you set last time when you restart the machine

3. lid protection function

a) if the lid closing is not closing well, press start, the centrifuge can not run, speed screen shows E1. Only close the lid properly, press start, the centrifuge can run.

b) When the centrifuge is running, press open, the lid can not open. This program aims to protect the operator, not instrument error.

3. Test sample protection

When the cover is closed or the machine cuts off suddenly, and you want to take out the test tubes, then you can undo the screw which there is mark in the side of the centrifuge by wrench, the cover will open, then take out the test sample.

5. Over speed protection function

When speed controlling has error occurred in the running centrifuge, and

speed exceeded this rotor's max speed with 500r/min, the centrifuge will stop automatically and shows E8.

VII、 Other safety precautions

1. Forbidden for Artificial over speed



Danger Artificial over speed is a serious violation of operating procedures, easy to occur personal instrument accidents.

2. The service life of the rotor : the service life of the rotor is 5 years. The use of cumulative number is 3000 times, the accumulated use time is 2000 hours. One of the three conditions is reached, the duration of rotor is invalid. Prohibit to use the rotor with exceeding service life.

3. Please check the rotors if had hair line before use every time. The rotors will crack if using cracked and corrosion sign rotors.



Danger

Check rotor carefully before each operation.

Never use rotor with cracking, corrosion sign, and never use expired rotor.

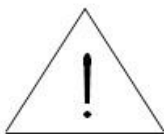


Warning

least 3 mins

When maintenance, please take off the plug, wait at open the front cover, otherwise, easy to occur electric shock.

4. Notice



Caution! The rotor head、cup、bucket and adapter needed for strict disinfection purification after separating radioactive、toxic and viral material

Table 4 Time—Temperature Condition

Absolute Pressure kpa	Steam Temperature		Minimum retention time(min)
	Temperature Rating/°C	Range/°C	
225	136.0	134-138	3
150	127.5	126-129	10
115	122.5	121-124	15
75	116.5	115-118	30
The minimum retention time means the environmental temperature			

VIII、 Error elimination

Press upper part of the boat shaped switch key, the instrument panel digital tube light is not power on, instrument can not run, please check if the safety wire is burned (safety wire is in lower right corner of the power socket behind instrument) If burned, please replace the safety wire, if not burn, take out the centrifugal chamber from bottom to top , check all the pins in the panel if loose or fall off , if they are loose or fall off, please insert the pins tightly. If the above two situations are normal, maybe the boat shaped switch is broken, change new switch button. If the fault is still cannot be ruled out, please contact the company

IX、 Maintenance

1. Caution! When do not use rotors, please remove them from the centrifuge chamber, promptly wipe clean with neutral detergent solution, stored in dry and ventilated place.

2. Caution! After centrifugation, please clean centrifugal chamber, dry water every day. Periodically take off rotor body and coating grease in spin axis to prevent rust.

3. Caution! Placing centrifuge should avoid ultraviolet, or machine and

rotor are easy to fade and spray layer is easily peeled off, if unable to avoid this, please use a cloth to block UV when using the machine.

X、Quality Guarantee

This centrifuge has been subjected to thorough testing and quality control before delivery. We promise to do as below:

1. One year warranty for this centrifuge (from date of delivery)
2. Our company after-service center will build up files in time and follow up the user's information.
3. Will reply the customer within 24 hours.
4. Customers can send the centrifuge back to our company for repair and replacement when centrifuge can not run normally in warranty, all the cost is for our company account. This warranty becomes void in case of incorrect operation, use of non-appropriate spare parts or accessories and non-authorized modification of the rotor or the centrifuge.
5. All our products will have a lifetime warranty, exceed three guarantees period, only charge nominal fee

Remark:

Regarding how to select RCF parameter

1. The principle of the centrifugation

Centrifuge will produce RCF during operation. Due to sedimentation caused by RCF make the subject dangling in the solution to form precipitation. The substance of the more proportion turned the direction of the largest radius rotor, the lighter substance is on heavier substance and let the subjects of different proportion to be separated hierarchically.

2. How to calculate the relative centrifugal force (RCF)

Centrifugation is depending on the RCF, RCF is depending on the speed and centrifugal radius, the formula of calculating the RCF as follows:

$$RCF = 11.2 \times R \times \left(\frac{N}{1000} \right)^2$$

The transfer coefficient 11.2 is a approx value, which is calculating according acceleration of gravity (1g = 9.81m/s²)

3. The confirmation of centrifugal time

Same RCF, centrifugation time is inversely proportional to centrifugal solution's proportion description. The more of the proportion, the less of the time. The less of the proportion, the more of the time.

Same solution, centrifugation time is inversely proportional to RCF. The bigger RCF, the less of the time. Contrary, the smaller RCF, the more of the time.

Same RCF, centrifugation time is related to Min centrifugal radius, longer basket(test bottles) require a longer centrifugation time.

Therefore, the separation time is difficult to calculate. Usually it is decided by the general test.

Certificate of Compliance

for

Hematocrit Centrifuge

Product Name: Hematocrit Centrifuge

Factory Number: 21050807

This product is permitted to leave the factory after inspection.

Inspector: _____

Date: _____

Product warranty card

(maintained this card within the warranty period.)

Product Name	Hematocrit Centrifuge		
Product number	21050807	Date of production	May 2021
Purchase date			
Name of user and Department(stamped)			
Address:			Contact:
Tel:	Fax:	E-mail:	
Comments and Suggestions to our products:			

Packing List

TG12 Table Top Hematocrit Centrifuge

Serial number	Name	Quantity	Unit	Remarks
1	centrifuge mainframe	1	set	
2	optional rotors adapters	24 capillary	1	set
3				
4				
5				
6	attachment tools	special spanner	1	set
7		power cord	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: _____