

TG16-W

Tabletop High Speed Micro Centrifuge


Instruction Manual

(Read the Instructions Carefully before Use)

Index.....	Page
1、 Attention for safety.....	2
1.1 Attention for installation and maintenance	2
1.2 Attention for electric system.....	2
1.3 Attention for fireproofing	2
1.4 Attention for safe operation	3
1.5 Attention for safety in chemistry and biology.....	3
2、 Symbols and meanings.....	4
3、 Product introduction	5
4、 Main technical parameters.....	6
4.1 Performance index for main machine	6
4.2 Rotor parameters	6
5、 Structure characteristics and working theory.....	6
5.1 Structure for whole machine and working theory.....	6
5.2 Drive system and imbalance protection.....	7
5.3 Electric control.....	7
5.4 Instrument panel setting.....	8
6、 Installation and adjustment.....	8
6.1 Unpacking of package.....	8
6.2 Installing requirements.....	9
6.3 Centrifuge adjustment.....	10
7、 Operation.....	10
7.1 Check the rotor and tube.....	10
7.2 Install rotor	10
7.3 Adding liquid and placing the centrifugal tube	10
7.4 Close the door lid	10
7.5 Set rotor No., speed and time	11
7.6 Start and stop centrifugation	11
7.7 Take out the centrifugal tube	11
7.8 Uninstall the rotor	12
8、 Service and maintenance	12
9、 Transportation and storage.....	14

Attached: Packing List and Qualified Certificate

1、Attention for safety

 **Attention for safety** clarifies the requirements of safe operation in the instruction manual. Please carefully read it before installation, operation, maintenance and repairing. Understanding the warning and correct operation can avoid the personal injury and the damage of centrifuge.

1.1 Attention for installation and maintenance

- The rotor accessory and package may be placed in the centrifugal chamber. You should open the door lid for checking when installing.
- In the machine maintenance process, the parts that need remove cover may cause electrical shock or personal injury. Ensure that the power has been cut off and the power line has been removed from the socket, and qualified staff manipulates it.
- The replaced part must be consistent with the requirements of this centrifuge.

1.2 Attention for electric system

- To reduce the risk of electric shock, the centrifuge adopts the plug with three points which must connect with the socket with ground lead.
- Make sure if the wall socket is connect with the ground wire. The voltage of power supply must accord with the voltage of centrifuge.
- Don't use the power adapter from three holes to two holes.
- It is forbidden to use the expanding socket with two lines or all-purpose power adaptor without ground wire.
- Don't put container with liquid on the centrifuge or around the centrifuge. If the container is knocked over, the liquid will infiltrate into centrifuge and damage the electrical or mechanical parts.

1.3 Attention for fireproofing

- Please use the overload fuse with same model and specification.
- The centrifuge is not designed for the flammable and explosive matters. You cannot make centrifugation for the matters (chloroform, acetaldehyde), and cannot put the

matters in the centrifuge or store them around centrifuge within 30cm.

1.4 Attention for safe operation

- Please use the rotor and accessories which are designed for this centrifuge
- Make sure if the centrifugal chamber is cleaned before operation.
- Make sure if the screw (nut) of the rotor in the centrifugal chamber has been screwed down.
- Not exceed its max speed of rotor during operation.
- Don't decelerate rotor speed or stop by hand.
- Don't hold or move centrifuge when rotor is rotating.
- If the glass test tube is cracked in centrifuge chamber, please carefully check and clean the gasket and centrifugal chamber because the glass fragment may have inserted into their surface.
- Don't open the door lid of centrifuge in the running status.
- The distance between centrifuge and other objects must be kept 30cm during operation. You should not stand around centrifuge within 30cm unless adjusting it. Anything is not allowed to enter into centrifuge during operation.



1.5 Attention for safety in chemistry and biology

- The routine manipulation may include all kinds of liquid and test sample which may be the disease-causing and poisonous matters. The centrifuge can not be manipulated with the matters unless you have taken the protection measures.
- Please pay attention to the liquid explanation in container before operation.
- Be careful of the infectious liquid. If not understanding the provided sample, please at least make sure that they aren't microbe. You must make further aerosol protection (the suspended speck in the air, such as smoke and fog.) for the easier disease-causing hepatitis virus(B or C), HIV, atypical mycobacteria and the fungus of physical structure.
- The infectious samples must be manipulated according to the manipulating program and method in lab for avoiding expanding disease.

- The spilt matters may produce aerosol (the suspended speck in the air, such as smoke and fog.) , so please pay attention to the warning about aerosol (the suspended speck in the air, such as smoke and fog.)
- Only use the suitable rotor and adaptor. The centrifuge can not be manipulated with disease-causing, poisonous or radioactive matters unless you have take the protection measures. When the second type of hazardous substances (according to “Laboratory Biosafety Manual” of the World Health Organization.) is manipulated, the air safety level must be monitored. The superior substances require a higher level of safe protection measurements.
- You should follow the environment security and protection requirements when destroying the discarded liquid.

Users have the responsibility to clean and sterilize centrifuge and accessory if you need maintenance service from our company.

2、Symbol and its meanings

No.	Symbol	GB No.	Meanings
1	~	4706.1	Alternating current
2		5465.2	Power on(general supply)
3	○	5465.2	Power off (general supply)
4		4728.2	Protective earthing(ground)
5		4793	Warning! (see attachment paper)

Form 1

3、Product introduction

3.1 Application and scope

TG16-W tabletop high speed micro centrifuge makes use of centrifugal settling

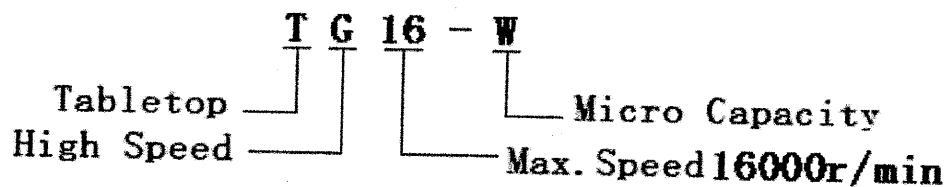
to separate, purify and condense the granule. It can be widely used in the fields of clinical medicine, biochemistry, genetic engineering and radioimmunology. It is ideal equipment for scientific research institute and hospitals.

3.2 Product feature

The centrifuge features with microprocessor control, touch panel, DC brushless motor and speed controlled by PWM.

- 1). Adopted special shock absorber for ideal effect of vibration damping and automatic balance.
- 2). Speed is controlled by PWM with the function of high accuracy. The quietly operated DC brushless motor meets the working requirements in the condition of laboratory. Furthermore there is no carbon brush replacing without carbon pollution.

3.3 Classify and Name



TG16-W tabletop high speed micro centrifuge whose Max.speed is $1650 \times 10 \text{r/min}$.

·It belongs to Class 1 of medical laboratory equipment according to the management of "The Classified Catalogue of Medical Devices".

·It belongs to Class 1 of ordinary equipment with protective grounding according to the protection against electric shock.

·It belongs to tabletop centrifuge according to the structure.

·It belongs to high speed centrifuge according to the speed.

4、Main technical parameters

4.1 Performance index for main machine

Max. Speed	16000r/min
Max. RCF	17800×g
Max. Capacity	8×5mL
Speed accuracy	±50 r/min
Time range	1 min~99min
Power supply	~110V 60Hz
Dimension	230mm×265mm×175mm
Weight	10kg

4.2 Rotor parameters

Form 2:

Rotor	Max. Speed (r/min)	Capacity (ml)	Max. RCF (×g)
No.1 (Angle)	16000	12×1.5/2.2ml 18×0.5ml	17800
No.2 (Angle)	13000	8×5ml	11400

5、Structure characteristics and working theory

5.1 Structure for whole machine and working theory

(1) The structure of whole machine (Figure 1)

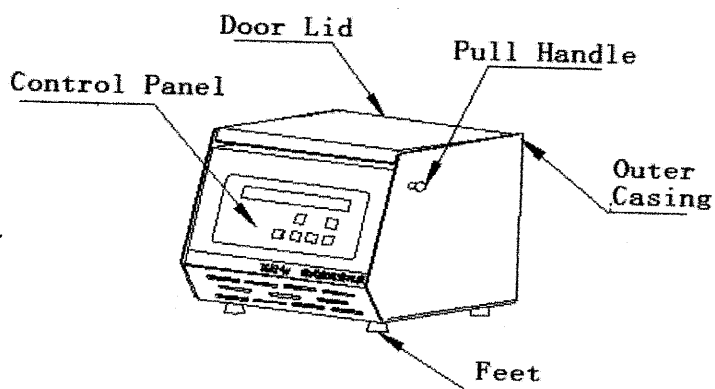


Figure 1 Mainframe Shape

The centrifuge is composed of the main machine and accessories. The main machine is composed of case, centrifugal chamber, drive system, control system and the part of manipulation display. The rotor and centrifugal tube(bottle) belong to accessory.

(2) Working Theory

Centrifuge makes use of the strong RCF that centrifuge rotates with high speed in order to accelerate the settling speed of the granule in the liquid, and separate, condense and purify the matters with different settling coefficient and density.

5.2 Drive system

Direct drive system. Adopted special shock absorber for ideal effect of vibration and noise damping.

5.3 Electric control (Figure 2)

System control is adopted 8-digit CPU, and motor drive is adopted vector control technology for stable speed and energy saving. Time is controlled automatically with multiple protective functions. High brightness LED screen displays the setting parameters and actual running parameters. During a run, you can change the speed and time freely. RCF can be shown at real time.

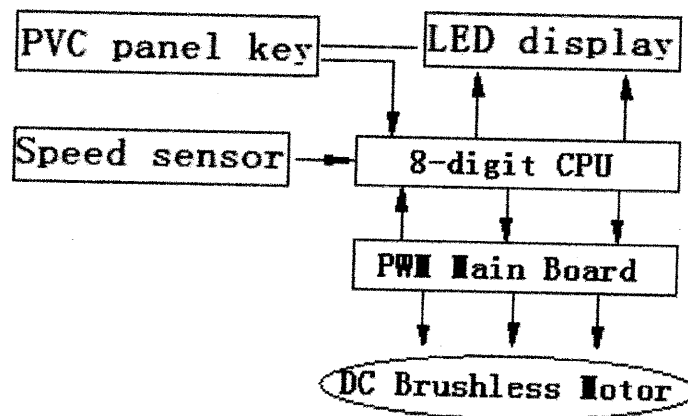


Figure 2 Electric control theory

5.4 Instrument panel setting

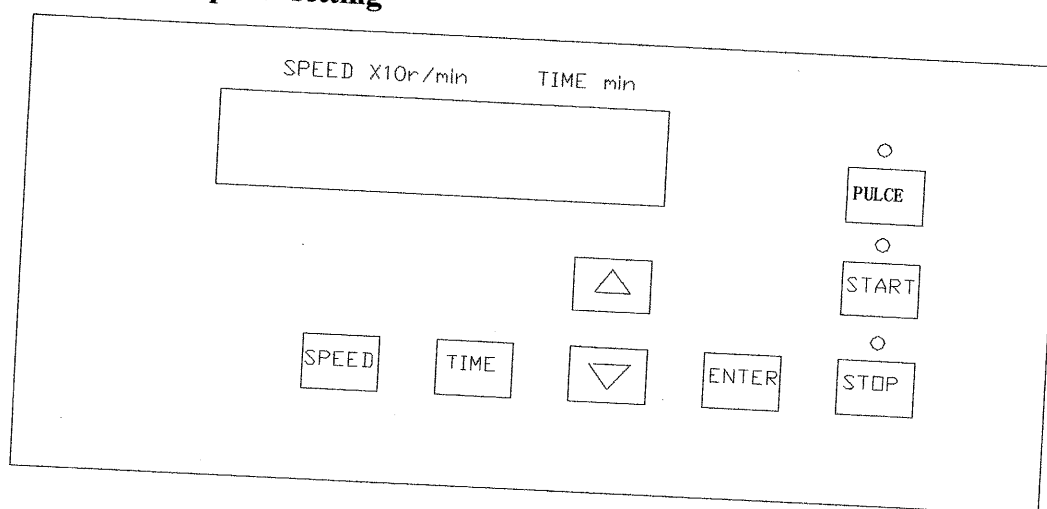


Figure 3 Instrument panel

[STOP]: Delete trouble message while operation or parameters setting; Stop centrifugation while operation.

[ENTER] : Press [ENTER] to confirm the setup working parameter value

[▲]: Increase key. Press “▲” to accelerate the setting parameter value, such as speed and time.

[▼]: Decrease key. Press “▼” to decelerate the setting parameter value, such as speed and time.

[SPEED]: Press [SPEED] to set speed, then press [ENTER] to perform.

[TIME]: Press [TIME] to set time, then press [ENTER] to perform.

[START]: Start centrifugation in stand-by mode.

[PULSE]: Shortrun key (short-time centrifugation) . Press the key and hold on while centrifuge is power on and does not run, then the centrifuge will run swiftly; Release the key, the centrifuge will stop automatically.

6、 Installation and adjustment

6.1 Unpacking of package (by user)

- User should check the appearance of packing case after receiving, and the goods should not be happened with sharp hitting and upending during delivery. Please contact with forwarding agent and inform our company immediately if occurring above accidents.
- First, remove the top door plank and take out the main machine from the package case. Then take off the plastic cover. At last, deal with the package case and the stuff properly avoiding environment pollution.

6.2 Installing requirements

(1) Environment requirements:


This centrifuge should be installed indoor with steady ground, no conducting dust, no corrosive gas, no strong shocking source and no direct sunlight.

(2) Space requirement:

The distance between centrifuge and wall should be kept 30cm at least for air circulation. The room temperature should not exceed 35℃ for best efficiency.

(3) Power requirements:

This centrifuge is adopted AC with single phase, 110V/60Hz. Power must be equipped with protecting ground wire, and it is forbidden to use null line for substitution. If you have any questions about power type, please consult your distributor or local power station.


 **Warning: The ground wire should be connected properly in case of electric shock.**

As safety measure, this centrifuge is adopted with single phase and three wires plug to make sure of grounding. If your plug can not plug in the mains jack, please contact the electrician to replace your mains jack. Make sure that the centrifuge is grounded properly.

(4) Installation requirements

Place centrifuge on a steady platform or table. Make four rubber cushions stand in balance to prevent vibration. Otherwise, add some pads to readjust the height up to the requirements (by user).

6.3 Centrifuge adjustment

 **Warning:** It is forbidden to start before the centrifuge chamber is not cleaned. Otherwise, the centrifuge may be damaged.

According to the operation steps of Chapter 7, first run with low speed, and gradually accelerate to the max. speed. If no abnormal phenomenon happens, you have succeeded in adjustment.

7、Operation

7.1 Check the rotor and tube

You should carefully check the rotor, tube or test bottle before operation. It is forbidden to use the cracked and damaged rotor, tube or test bottle. Otherwise, all damages should be borne by user.

7.2 Install rotor

Place the rotor on drive shaft and put on a spacer. Then make the lock screw into tapped hole on the top of drive shaft, tighten it with screw driver. (The rotor has been installed before delivery, and please check whether the lock screw is tightened.)

7.3 Adding liquid and placing the centrifugal tube

Put centrifugal tubes with adding liquid into the centrifugal tube of rotor and tubes should be placed symmetrically in even number. Otherwise, there will be vibration and noise because of imbalance.

7.4 Close the door lid

Press down the door lid until you hear “clicking” sound which means the door lid pin enter into the hook. Then lift the door lid by hand to check whether it is closed properly. If the door lid can not be opened, it means it is closed properly.

7.5 Set rotor No., speed and time

(1)、Speed set: Press the “**SPEED**” key (the “speed” LED point on the bottom right should be on) and then press the key “▲” or “▼” to set the desired speed for operation. (Max speed is 16500r/min) Then press [ENTER] to confirm the setting.

(2)、Time set: Press the “**TIME**” key (the “time” LED point on bottom right should be on) and then press “▲” or “▼” to set the operation time (Max. time set is 99min, count down). And press [ENTER] to confirm the setting.

△ Warning: It is forbidden to operate the rotor overspeed. Otherwise, all damages caused by overspeed should be borne by user.

7.6 Start and stop

(1)、**Start:** Press [START] to run centrifuge and the [START] indicator light is on.

You should confirm if the rotor is fixed on the drive shaft before operation and the centrifugal chamber is clean.

(2)、**Automatic stop:** When time is counted down to “0”, the centrifuge automatically slows down and stops running, and the [STOP] indicator light is on.

(3)、**Stop by manual:** In the running status (the working time isn't counted down to “0”), press [STOP] to slow down and stop running, and the [STOP] indicator light is on.

7.7 Take out the centrifugal tube

When the rotor stops rotating, press the [STOP] key to open the door lid. Then press the switch with the mark “O” to cut off the power. Open the door lid and take out the centrifugal tubes.

7.8 Uninstall the rotor

When replacing the rotor, you should uninstall the used rotor (unscrewing the bolt with screwdriver and take out the rotor after removing spacer.)

⚠ Don't hold up or move the centrifuge during operation.

⚠ Don't open the door lid when rotor is rotating.

8、Service and maintenance

8.1 Please wipe up the rotor with neutral cleaning mixture after taking out of centrifugal chamber for avoiding corrosion and then stock it at dry and ventilated place. Central hole in rotor should be smeared some lubricating oil for protection.

8.2 All action on rotor should be soft, and rotor should be taken out vertically for protecting the shaft.

8.3 Please wipe up the water in centrifugal chamber if it is leaving unused for long time. Some lubricating oil should be smeared on drive shaft for protection.

8.4 Common trouble shooting

Form 3:

Trouble	Cause	Removal
The display window is not on	No 110V power supply	Check the power supply
The rotor doesn't run when Start key is pressed	The connector to circuit board is not properly connected.	connect it properly
	Fuse is broken	Check and replace fuse
	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

8.5 Replace fuse

- (1) Cut off the power, and unplug the plug the power cord connected with the external electric supply socket. Then draw another end of the power cord connected with the centrifuge.
- (2) There is a fuse case equipped on the under part of electric outlet on instrument back. (See figure 4) There is a marking for fuse symbol, and find the V-shape slot on fuse case. (See figure 5) Pull out the fuse case with slotted point screw driver into the V-shape slot.
- (3) Take out the damaged fuse and replace it. The model of fuse of the centrifuge is BGXP 5×20 、250V 5A.
- (4) Put the fuse case into electric outlet.

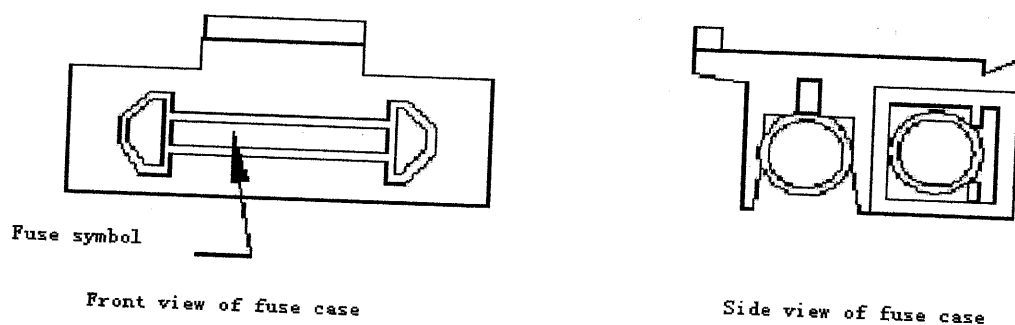


Figure 4

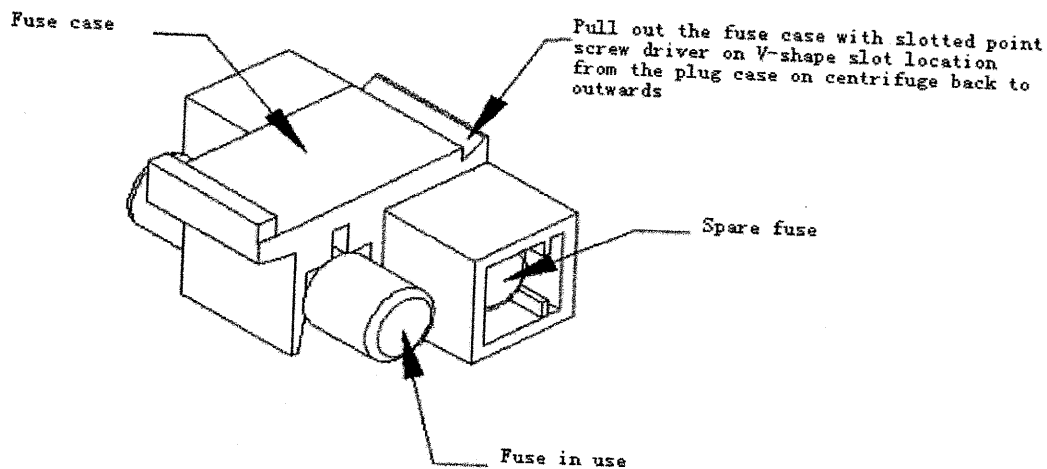


Figure 5

9、Transportation and storage

9.1 Transportation

- You should use the wooden and paper case during long-distance transportation. Put centrifuge with dust cap into the case, and fill with foam or plastic shock absorption materials. It is forbidden to be hit, inverted, rolled and soaked by rain and snow.
- You can directly move the centrifuge in room, but avoid big vibration, hitting and inversion.

9.2 Storage

- If it is leaving unused for long time, you should open the door lid and store it in ventilated, dry and clean room where there is no corrosive, flammable and explosive matters.
- As the technology continuously renews, please consult us if there is something uncomformable with this instruction manual.

Warranty

Respected customers,

Thank you for purchase of our company's products. To protect your legal rights and avoid your worries, we provide warranty service for one year with the main machines. If it is broken under warranty with inartificial reason, we will supply free maintenance service. The customer needs to pay an amount of money if the product has exceeded the warranty period. We will not supply free maintenance if any following matter is happened:

- Exceed of the warranty period or without the warranty card.
- The trouble is caused by wrong installation, operation and maintenance.
- The trouble is caused by the unauthorized uninstalling and repairing by our company.
- The trouble is caused by using the rotor not equipped with this centrifuge.
- The trouble is caused by war, natural disasters or other irresistible factors.

TG16-W Tabletop High Speed Micro Centrifuge

Packing List

No	Name	Quantity	Unit	Remark	Check
1	TG16-W Main machine	1	set		
2	Option of rotor	18x0.5ml angle rotor	1	pc	
3				pc	
4				pc	
5				pc	
6	Attached tool	Screw driver	1	pc	
7		Special tool for door opening	1	pc	
8				pc	
9				pc	
10	Attached file	Packing List	1	copy	
11		Instruction Manual	1	copy	
12		Qualified Certificate	1	copy	
13				copy	
14	Fuse BGXP ϕ 5×20		2	pc	250V 5A

Checker: _____

__Day __Month __Year

TG16-W Tabletop High Speed Micro Centrifuge

Quality Certificate

Product Name: Tabletop High Speed Micro Centrifuge

Product Model: TG16-W

Serial No.: _____

This production is tested to be qualified for delivery.

Checker: _____

__ Day __ Month __ Year