Order: 010-59822688
Toll-free: 800-990-6057 /400-810-6057
TIANGEN BIOTECH (BEIJING) CO., LTD

Ver. No.: OS220801

TGear HC15 High Speed Centrifuge User Manual



Catalog Number	Product Name
OSE-HC-01	TGear HC15 High Speed Centrifuge

For Research Use Only. Not for use in diagnostic procedures.

Contents

Chapter 1 Safety Guidelines **1**

1.1 Unpacking and Setup Precautions 1

1.2 Safety Warning and Caution Statements 1

1.3 Safe Use 2

Chapter 2 Instrument Packaging and Accessories **4**

2.1 Packing List 4

2.2 Optional Accessories 4

Chapter 3 Product Introduction **5**

3.1 Product Introduction 5

3.2 Product Features 5

3.3 Instrument Structure 5

3.4 Technical Specifications 6

Chapter 4 Operation Instructions **7**

4.1 Power On 8

4.2 Opening/Closing the Lid 8

4.3 Installing the Rotor 8

4.4 Rotor Number Setting 8

4.5 Speed/RCF Setting 9

4.6 Time Setting 9

4.7 Short Spin Function 9

4.8 Acceleration/Deceleration Setting 10

4.9 Beep Tone Setting 10

4.10 Parameter Adjustment During Operation 10

Chapter 5 Instrument Maintenance and Care **10**

5.1 Instrument Cleaning and Maintenance 10

5.1.1 Rotor Cleaning 10

5.1.2 Centrifuge Chamber Cleaning 11

5.1.3 Motor Shaft Cleaning and Maintenance 11

5.2 Instrument Troubleshooting 11

5.2.1 Emergency Lid Opening 11

5.2.2 Instrument Error Alarm Description 12

5.2.3 Fault Phenomena, Causes, and Solutions 13

Chapter 6 After-Sales Service **14**

Chapter 1 Safety Guidelines

1.1 Unpacking and Setup Precautions

When you receive the instrument and open the packaging, be sure to follow the steps below to install and debug the centrifuge. Failure to operate as required may lead to serious consequences, causing instrument damage or personal injury!!!

When moving the instrument, lift the device from both left and right sides, balancing the force. Do not shake the machine. After moving the instrument out, carefully place it gently on a suitable table.

Place the instrument upside down on the table. You will see three fixing screws at the bottom of the instrument (Figure 1). Remove these three fixing screws (Figure 2). Then turn the instrument right side up, connect to the power supply, and use the instrument normally.

Note: Be sure to remove the bottom fixing screws before connecting the instrument to power. Failure to remove the screws before running the instrument will cause irreversible damage and render the instrument unusable. Keep the removed screws properly for subsequent transportation fixation.

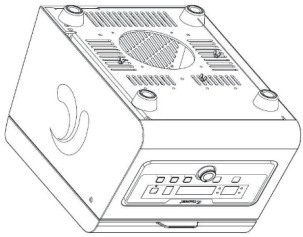

Figure 1 Bottom Fixing Screw Diagram

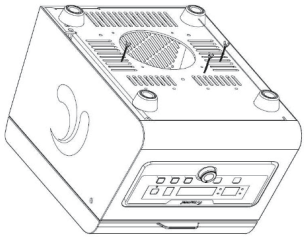

Figure 2 Bottom Screw Removal Diagram

1.2 Safety Warning and Caution Statements

Symbol	Description
	**Electrical Shock Warning:** Be sure to strictly follow the requirements of the electrical shock warning information to avoid electric shock accidents!
	**Note:** Caution statements contain particularly important information. Please read carefully. Failure to follow the instructions may cause the instrument to malfunction or even damage the instrument!
	**Protective Grounding Symbol**

1.3 Safe Use

Safety Operation Information



(1) Users must carefully read the user manual before using the TGear HC15 High Speed Centrifuge.

(2) No one is allowed to operate the instrument without reading this manual. Operating the instrument without following the instructions may cause damage to the instrument, render it unusable, or even lead to serious personal injury.

Environmental Requirements



(1) For indoor use only.

(2) Suitable ambient temperature range: 5~40°C.

(3) Suitable relative humidity range: 10~80%.

(4) Ensure the instrument is used on a level, firm, non-slip surface.

(5) This instrument has a switching power supply. Applicable voltage range: AC 220 V, Operating frequency: 50/60 Hz, current: 10 A.

(6) It is recommended to maintain a 20 cm clearance between the instrument and walls or other instruments.

(7) Do not place the instrument in damp, dusty, high-temperature, strong magnetic field, or explosive environments.

Accessory Use



(1) This instrument comes standard with one 24×1.5/2.2 ml angle rotor. Other rotors are optional accessories. Please select suitable accessories based on usage requirements.

(2) When using accessories, please use the accessories provided by our company. If you choose to use rotors from other brands, the company will not be responsible for the consequences.

(3) Different accessory rotors have different maximum centrifugal forces. After installing the rotor, the instrument automatically identifies the rotor number. Please verify that the rotor number displayed on the instrument matches the actually installed rotor, and operate within the maximum speed and maximum centrifugal force range of that rotor.

Usage Precautions



(1) Ensure the rotor is securely installed before centrifugation.

(2) Ensure samples are balanced before centrifugation.

(3) Do not open the centrifuge lid using the temporary unlocking device while the instrument is running.

(4) It is recommended to regularly clean the centrifuge rotor and chamber inner walls according to the cleaning methods in this manual to prevent instrument corrosion.

(5) Do not open the casing or disassemble instrument parts without authorization. If necessary, it must be done under the guidance of our company's professionals.

Container and Sample Precautions

(1) Do not centrifuge flammable, explosive, highly corrosive, or biohazardous samples.



(2) Do not centrifuge toxic or harmful samples. If centrifuging microbiological samples such as pathogens, please select an aerosol-tight rotor and remove the entire rotor after centrifugation before opening it in a clean bench.

(3) Ensure sample tubes are balanced during centrifugation. Imbalance can affect centrifugation results and cause danger. Long-term use without balancing can affect instrument stability.

Chapter 2 Instrument Packaging and Accessories

2.1 Packing List

After receiving the TGear HC15 High Speed Centrifuge, please check that the packaging box contains the following items:

Name	Quantity
Instrument Main Unit	1 unit
24×1.5/2.2 ml Angle Rotor	1 unit
Power Cord	1 piece
Assembly Wrench	1 piece
Lubricating Grease	1 copy / 1 portion
User Manual	1 copy / 1 portion
0.5 ml Adapter Sleeves	1 set
0.2 ml Adapter Sleeves	1 set
Warranty Card	1 copy / 1 portion
Certificate of Conformity	1 copy / 1 portion

Note: If any of the above items are missing, damaged, or incorrect, please retain the original packaging box and contact our sales personnel promptly.

2.2 Optional Accessories

Cat. No.:	Rotor No.	Specification	Max Speed (rpm)	Max RCF (×g)	Compatible Consumables
OSE-HC-A01	1	24×1.5/2.2 ml Angle Rotor	15000	20375	1.5 ml/2.2 ml Centrifuge Tubes
OSE-HC-A02	2	24×Capillary Rotor	12000	15455	Capillaries
OSE-HC-A03	3	10×5 ml Angle Rotor	13500	12920	5 ml Round Bottom PP Tubes
OSE-HC-A04	4	4×0.2 ml×8 Angle Rotor	14800	16200	0.2 ml 8-Strip Tubes
OSE-HC-A05	5	36×0.5 ml Angle Rotor	13500	13250	0.5 ml Centrifuge Tubes
OSE-HC-A06	6	8×5 ml (Conical Bottom) Angle Rotor	13500	12920	5 ml Conical Bottom PP Tubes

Chapter 3 Product Introduction

3.1 Product Introduction

TGear HC15 is a laboratory centrifuge that utilizes the centrifugal force generated by high-speed rotor rotation. It is commonly used for separating components in solid-liquid mixtures or liquid mixtures, suitable for rapid separation of micro samples. The TGear HC15 High Speed Centrifuge is easy to operate, convenient to use, and equipped with various rotors.

3.2 Product Features

- Simple and elegant appearance, convenient operation
- Maximum speed 15000 rpm, maximum RCF up to 20375×g
- Fast acceleration/deceleration, acceleration time as fast as 18 sec, deceleration time as fast as 20 sec
- 9 adjustable acceleration/deceleration gears, enabling soft braking
- Automatic rotor identification, equipped with five types of rotors
- Low centrifugation noise
- Lid automatically opens after centrifugation to prevent chamber overheating
- Large ventilation holes for excellent heat dissipation, preventing chamber overheating during prolonged centrifugation

3.3 Instrument Structure

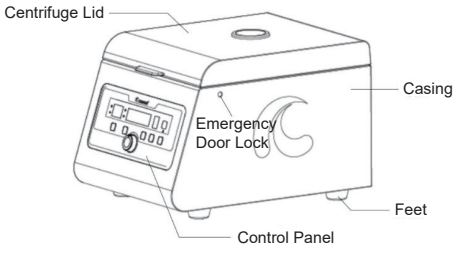

Figure 3 Instrument Front View

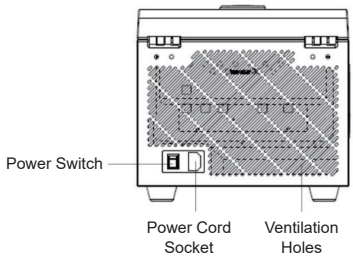

Figure 4 Instrument Rear View

Table 1 Instrument Structure Description

Name	Description
Centrifuge Lid	Centrifugation starts after closing the lid; lid automatically pops up after completion
Casing	Centrifuge sheet metal casing
Control Panel	Set operating speed, time, etc.
Emergency Door Lock	Pull the emergency door lock on the right side to open the lid when the door open key is ineffective
Feet	Support the entire instrument
Power Switch	Turn instrument ON/OFF
Power Cord Socket	Power Cord Socket
Ventilation Holes	Instrument cooling vents; do not block

3.4 Technical Specifications

Name	Parameters
Power Supply	AC 220V/50～60 Hz
Input Power	450 W
Maximum Capacity	50 ml (5 ml×10)
Speed Range [r/min.]	100~15000 / Speed increment 10 rpm
Maximum RCF	20375×g / RCF increment 10×g
Effective Centrifugation Time	1~99 min/1~99 sec; two modes selectable; accuracy ±1 sec
Drive Motor	Maintenance-free, brushless variable frequency induction motor
Rotor Automatic Identification System	Yes
Product Dimensions:	280 mm×360 mm×250 mm (L×W×H)
Shipping Dimensions:	550 mm×380 mm×355 mm (L×W×H)
Weight (without rotor)	17 kg
Noise Level at Max Speed	≤60 dB(A)
Fastest Acceleration Time	18 sec
Fastest Deceleration Time	20 sec
Interference Suppression Standards	EN 61010-1，EN 61010-2-020，EN 61326-1，EN 61010-3-2/A2

Chapter 4 Operation Instructions

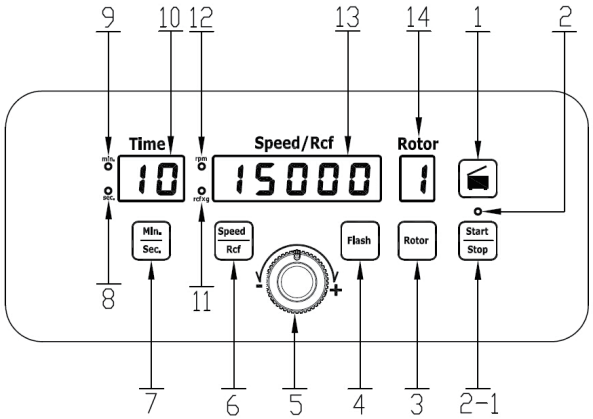

Figure 5 Instrument Panel Diagram

Table 2 Panel Key Descriptions

No.	Name	Description
1	Lid Open Key	Open the lid
2	Run Indicator Light	Red when instrument is stopped, green when running
2-1	Start/Stop	Start/stop centrifugation
3	Rotor	Manually adjust to match rotor number
4	Flash	Press and hold to start short spin
5	Knob	Adjusts speed, time, etc.
6	Speed/RCF	Switch between speed and RCF
7	Minute/Second	Switches between minute and second settings
8	Second Indicator Light	Second indicator light lights up when setting seconds
9	Minute Indicator Light	Minute indicator light lights up when setting minutes
10	Time Display Box	Displays set time
11	RCF Indicator Light	RCF indicator light lights up when RCF mode is selected
12	Speed Indicator Light	Speed indicator light lights up when speed mode is selected
13	Speed/RCF Display Box	Displays set value or actual speed
14	Rotor Number Display Box	Displays rotor number

4.1 Power On

Connect to power using the instrument's power cord. Turn on the power switch on the rear of the instrument. The instrument emits a "beep" sound, the control panel lights up, and after completing the self-check, the normal interface is displayed. Instrument startup is complete.

4.2 Opening/Closing the Lid

(1) Opening the Lid

Press the "Lid Open Key" button on the control panel. The instrument lid opens and automatically pops up. Do not place items on the centrifuge lid to avoid danger. If the instrument suddenly loses power or experiences a door opening failure, you can also pull the emergency door lock on the right side of the instrument to open the lid. The emergency door lock location is shown in Figure 3.

(2) Closing the Lid

Press down on the instrument lid. The instrument emits a "beep" prompt sound, indicating the lid is closed and the centrifugation program can be started normally.

4.3 Installing the Rotor

Align the matching centrifuge rotor (Figure 6, point A) with the slot on the motor shaft inside the centrifuge chamber (Figure 6, point B). Insert the rotor vertically, and use the simple wrench provided in the box to turn clockwise to tighten the screw cap (Figure 7).

After multiple centrifugation runs, check if the lock sleeve is secure. If loose, tighten it before running again.

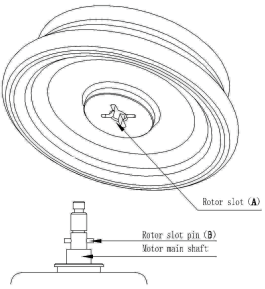

Figure 6 Rotor Installation Diagram

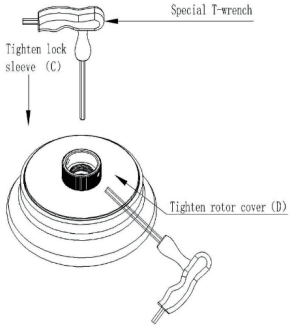

Figure 7 Rotor Tightening Diagram

4.4 Rotor Number Setting

(1) Automatic Rotor Identification

After installing the rotor on the instrument, the instrument automatically identifies each rotor model and adjusts its maximum speed and RCF according to the identified rotor number. When the number in the instrument's "Rotor" display box is followed by a "." mark, it indicates the instrument is in automatic rotor identification state.

(2) Manual Rotor Setting

If automatic identification fails or Err12 alarm occurs, press and hold the "Rotor" key for more than 5 seconds while the instrument is in standby mode. "OF" will be displayed in the "Time" display box, and "Rotor" will be displayed in the "Speed/Rcf" display box. Press down on the "Parameter Adjustment Knob" to confirm turning off the rotor automatic identification system. At this time, the number in the "Rotor" display box will not be followed by a ".", and the rotor number can be adjusted manually. When the power is restarted, the system will revert to the rotor automatic identification system. If manual input is still needed, repeat the above operation.

4.5 Speed/RCF Setting

(1) Speed Setting

The instrument defaults to speed mode upon startup. The "rpm" indicator light is constantly on. Press the "Speed/Rcf" key. The number in the "Speed/Rcf" display box flashes. Rotate the knob clockwise/counterclockwise to adjust the speed. After confirming the speed, the number will stop flashing after three flashes with no operation. Speed setting is complete.

(2) RCF Setting

Press the "Speed/Rcf" key. The number will flash. Press the "Speed/Rcf" key again. The "Rcf" indicator light turns on, indicating RCF mode. Adjust the RCF setting. Operation is the same as above.

4.6 Time Setting

The instrument has two timing modes: min and sec. The time setting range is 1~99 min/1~99 sec. The instrument defaults to "min" mode. Press the "min/sec" key. The number in the "Time" display box flashes. When the screen number flashes, the "min/sec" key can switch between min/sec modes. Switch the indicator light to the desired setting. Rotate the knob to adjust the time. After no operation, the number will stop flashing after three flashes. Time setting is complete.

4.7 Short Spin Function

The "Flash" key on the panel is the short spin key. When pressing and holding this key, the centrifuge starts, and the speed increases continuously until it reaches the maximum speed corresponding to the matched rotor. Release the key to stop centrifugation.

4.8 Acceleration/Deceleration Setting

The centrifuge has 9 adjustable acceleration/deceleration gears. The higher the gear number, the shorter the acceleration/deceleration time. Press and hold the "min/sec" key and the "Speed/Rcf" key simultaneously for 3 sec. The number in the Speed/Rcf display bar flashes showing "ACC--" and flashes, indicating entry into the acceleration gear setting state. Rotate the knob to adjust the gear. Press down vertically on the knob. The number in the upper display bar flashes showing "dEC--" and flashes, indicating entry into the deceleration gear setting state. Rotate the knob to select the desired gear. After no operation, the number will stop flashing after three flashes. Acceleration/deceleration setting is complete.

4.9 Beep Tone Setting

Press and hold the "min/sec" key and the "Speed/Rcf" key simultaneously for 3 sec. The number in the Speed/Rcf display bar flashes showing "ACC--" and flashes. Then, press down vertically on the knob key three times consecutively. The number in the Speed/Rcf display bar flashes showing "SONG1" and flashes. Rotate the parameter adjustment knob to select the beep tone type. After no operation, the number will stop flashing after three flashes. Beep tone setting is complete. SONG1-SONG4 are beep tone types, SONG5 turns off the beep tone.

4.10 Parameter Adjustment During Operation

After the machine speed stabilizes, parameters such as speed/RCF, time, and acceleration/deceleration can be modified if needed. After resetting the parameters, no manual confirmation is needed. The system automatically flashes three times to confirm the setting, and the instrument continues running according to the modified parameters.

Chapter 5 Instrument Maintenance and Care

Regularly (or based on usage) clean and maintain the centrifuge casing, inner chamber, rotor, and separation containers used. This is to prevent contaminants from remaining on them, causing corrosion to the components used and environmental pollution.

Users should follow the methods described in this manual for cleaning and decontamination to ensure no damage to the equipment. Using inappropriate cleaning agents and incorrect disinfection procedures may cause damage to the centrifuge and its internal components!

5.1 Instrument Cleaning and Maintenance

5.1.1 Rotor Cleaning

(1) Turn on the power switch and press the "Door Open Key" to open the centrifuge lid.

(2) Use the rotor removal tool provided to loosen the lock sleeve and remove the rotor (clockwise to tighten, counterclockwise to loosen). When removing the rotor, grasp it with both hands and lift it vertically upward. Do not shake it sideways.

(3) When cleaning the rotor, use a mild detergent or distilled water to dampen a sponge

or soft cloth for cleaning, then gently rinse off the detergent with distilled water. Do not spray or jet water onto the rotor, as liquid may remain in certain areas and cause corrosion. After cleaning, allow it to air dry inverted.

(4) Generally, clean the rotor once a week. If separating salt solutions or other corrosive samples, clean immediately after use. If sample splashing, soaking, or dripping onto the rotor is found during use, immediately absorb and clean the affected area locally.



1. **Do not hit the rotor with sharp objects. Prevent bumps and collisions during handling and disassembly/assembly. Prevent cracks from developing in the rotor during use due to scratches or external damage.**
2. **Regularly check the rotor assembly (especially the bottom of tube holes) for corrosion spots, grooves, or fine cracks. If any of these conditions are found, stop using the rotor and contact our company.**

5.1.2 Centrifuge Chamber Cleaning

(1) After opening the lid and removing the rotor, remember to turn off the instrument power and unplug the power cord.

(2) Use a cotton cloth moistened with distilled water and wring it out to ensure no dripping water enters the main unit. Gently wipe the chamber walls for cleaning.

5.1.3 Motor Shaft Cleaning and Maintenance

(1) After removing the rotor, clean the conical part of the motor shaft to remove dirt. This unit provides lubricating grease. Apply an appropriate amount of lubricating grease evenly to the connection area between the motor shaft and the rotor shaft hole.

(2) Do not use organic solvents, as they can break down the grease inside the motor bearing. During cleaning, prevent liquids, especially organic solvents, from contacting the motor shaft and the balls inside the bearing!

5.2 Instrument Troubleshooting

5.2.1 Emergency Lid Opening

If a sudden power outage occurs while the instrument is running normally, or if the instrument door open key malfunctions, you can use the emergency door opening device. Pull the emergency door lock to remove the rotor.

Note: If a sudden power outage occurs while the instrument is running, the instrument cannot perform braking, and the rotor will take a long time to stop. Wait for a period of time before opening the emergency door lock.

5.2.2 Instrument Error Alarm Description

Display Symbol	Abnormal Phenomenon Description	Troubleshooting Method
Erro1	Imbalance	1. Balance the sample or bucket placement, allowable imbalance ≤1.5 g. 2. Check if the imbalance protection switch leads are short-circuited and closed (should be open circuit under normal conditions). 3. Contact the manufacturer to replace parts.
Erro2	Overspeed	1. Alarm occurs when speed detected during operation exceeds the current rotor's maximum speed by 500 rpm. Usually occurs during the acceleration phase; reduce the acceleration gear.
Erro3	Lid Not Closed	1. Check if the lid signal cable is properly connected. 2. Check if the lid detection switch leads are open circuit (should be short-circuited and closed when the lid is normally closed).
Erro4	Low Voltage Fault	1. Drive board fault or mains power input voltage too low.
Erro5	Brake Overvoltage	1. Check if the brake resistor is properly connected or if the brake resistor is burnt out. 2. Reduce the deceleration gear (DEC) value.
Erro6	Overcurrent	1. Acceleration too fast under heavy load; reduce the acceleration gear (ACC) value. 2. Drive board fault or external grid power voltage too high. 3. Motor fault.
Erro7	No Speed Signal	1. Check the speed sensor cable to ensure it is properly connected. 2. Motor speed Hall sensor fault; need to replace the speed disk at the motor end.
Erro8	Communication Error	1. Check if the communication ribbon cable (10 pins grey flat cable) is properly connected. 2. Drive board fault; need to replace the drive board.
Erro9	Overvoltage	1. Ensure the external grid power supply voltage meets the machine's rated voltage.
Err12	Rotor Identification Fault	1. Rotor not installed properly. 2. Magnet at the bottom of the rotor fallen off. 3. Identification sensor fault.

5.2.3 Fault Phenomena, Causes, and Solutions

Fault Phenomenon	Fault Cause and Troubleshooting Method
No display on machine or machine suddenly loses display	1. Check if the power socket and cord are in good condition and if the power socket has power. 2. Check if the power switch has poor contact. 3. Check the fuse; if blown, replace with a spare fuse. 4. If it cannot be resolved, contact our company's service personnel.
Machine suddenly stops during operation	1. Exceeded the rotor's maximum rated speed. 2. Once the rotor speed exceeds the rotor's rated speed by 500 rpm or more, the overspeed alarm activates. In this case, you must wait until it stops before resetting the speed. 3. Exceeded the rotor's set speed. 4. When the motor overheats, the internal power is cut off, and the machine stops running. 5. If the keyboard panel has no display, check the machine's power supply system. 6. Possibly low voltage; check if the supply voltage meets specifications.
Lid cannot be opened	1. Rotor has not completely stopped; the lid should not open. 2. Check the door lock assembly. 3. Check the door lock electrical wiring. 4. Use the manual door opening method. 5. If it cannot be resolved, contact our company's service personnel.
Machine vibrates significantly	1. Rotor passing critical speed; some vibration is normal. 2. Check if the rotor is securely tightened. 3. Check the symmetry of the rotor load and the levelness of the machine. 4. Check if the rotor is properly installed. 5. Check the drive shaft. Rotate it by hand. If it does not rotate smoothly, there may be an issue with the drive shaft or motor. If it cannot be resolved, contact our company's service personnel.
After turning on the power switch, the operation panel does not light up	1. Power not connected; check the power supply. 2. PCB board and power socket fuse blown; have a professional replace the fuse. 3. If it cannot be resolved, contact our company's service personnel.
Abnormal display on operation panel	1. May be caused by grid interference; turn off the machine, wait one minute, and turn it on again. The display should return to normal.
Motor does not rotate after pressing start button	1. Electrical control circuit fault; replace the electrical control board.

Machine emits burnt smell or smoke	1. Cut off the power. 2. Check if the motor is burnt out. 3. Check if electrical components are burnt out. 4. Rotate the drive shaft by hand. If it does not rotate smoothly, contact the manufacturer's professionals.
Beyond the above fault contents	Resolve with the manufacturer's professionals.

Chapter 6 After-Sales Service

1. The warranty period for this product is 1 year. During the warranty period, if the user experiences machine failure under normal use, you can contact sales personnel, and we will provide free repair and after-sales service.
2. The following situations are not eligible for free repair, exchange, or return even within the warranty period:

(1) Failures and damage caused by natural disasters such as fire, earthquake, flood, wind, lightning, as well as abnormal voltage, environmental pollution, or chemical substance erosion.

(2) Failures or damage caused by improper use or maintenance not following the instructions in this manual.

(3) Failures or damage caused by human factors such as dropping, moving, transporting, foreign object entry, or products not manufactured by this company.

3. If the instrument's purchase date exceeds the warranty period and a failure occurs, our company is responsible for repair and will charge corresponding repair fees.

TIANGEN BIOTECH (BEIJING) CO., LTD.

Beijing Office

Production Add: Building 5, No.86, Shuangying west Road, Science and Technology Park. Changping District, Beijing, China

Office Add.: South Section, Floor 3, Building 20, Yongyou industrial Park, Yard 9, Yongfeng Road, Haidian District, Beijing

Postcode:100192 Tel.: 010-59822688

Technical Support: 010-59822661/2665 Toll Free: 800-990-6057

Fax: 010-59822788 Email: people@tiangen.com

Website: www.tiangen.com

Shanghai Office

Add.: Room 1601, Building A, No.391 Guiping Road, Xuhui District, Shanghai

Postcode: 200235 Tel.: 021-38453846

Email: sh@tiangen.com