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# Operation Manual

## ***Component R6***

Large Capacity Centrifuge

Product Model Name : \_\_\_\_\_

Date of Purchase : \_\_\_\_\_

# hanil

## **Component R6**

**Research Use Only**

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If you have any questions, contact our Technical Support Center.  
+82-2-3452-8966 / techsupport@ihanil.com

[www.ihanil.com](http://www.ihanil.com)

The appearance or specifications of the device is subject to partial change for improvement.

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# 1. General Considerations

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## 1.1 Safety

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**Follow precautions and all the safety requirements described on this user manual to prevent any damage and failure of device and loss of lives.**

1. The device should be installed on a flat surface to maintain level.
2. Check the voltage to be used, before connecting the device to the power source.
3. Only use rotors, parts, and accessories provided by Hanil Scientific Inc.  
Hanil Scientific Inc. is not responsible for damages of the device and accidents caused by using parts and accessories not recommended.
4. Do not exceed the maximum rated speed of the rotor or buckets in use.
5. Make sure to prepare necessary safety measures before using samples that are toxic or radioactive samples or pathogenic or samples or infectious blood.
6. Substances that may generate volatile or explosive vapor can not be deviced.
7. The balancing work of samples should done in advance before operation.
8. To ensure safe use of the device, do not expose the device to strong acids, strong bases, cesium, salt, or alkaline detergents.
8. If the device is contaminated by toxic or radioactive samples or infectious blood samples, remove contaminants completely and take needful actions such as ventilation or isolation of device.
9. Before operation, rotor and chamber should be dry.
10. Do not attempt to slow or stop the spinning rotor by hand.
11. Do not block vents.
12. When serving the device, be sure to remove contaminants in advance.
13. Please contact the place of purchase or Hanil Scientific Inc. for product repairs.
14. According to IEC61010-2-020 maintain a 30cm “clearance envelope” around the device while the rotor is spinning.
15. Turn the power switch off after using the device.
16. Unplug the power plug before cleaning or left unused for a long period of time.
17. Don't lean against the device

# 1. General Considerations

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## 1.2 Transport & Storage

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- The device and the accessories must only be stored in dry rooms.
- Only lift and transport the device with sufficient number of helpers.

### -Storage-

Ambient temperature 5°C~40°C

Maximum relative humidity 30%~85%

Air pressure 500~1060hpa

### -Transport-

Ambient temperature -10°C~40°C

Maximum relative humidity 10%~90%

Air pressure 500~1060hpa

## 1.3 Safety label on the Device

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Insert the rotor and tubes symmetrically.

Firmly tighten the rotor door.

Watch your fingers when close the lid.



Mark indicating danger and warning.



Mark indicating a place in danger of electric shock.



Mark indicating earth grounding

## 1.4 Electric safety

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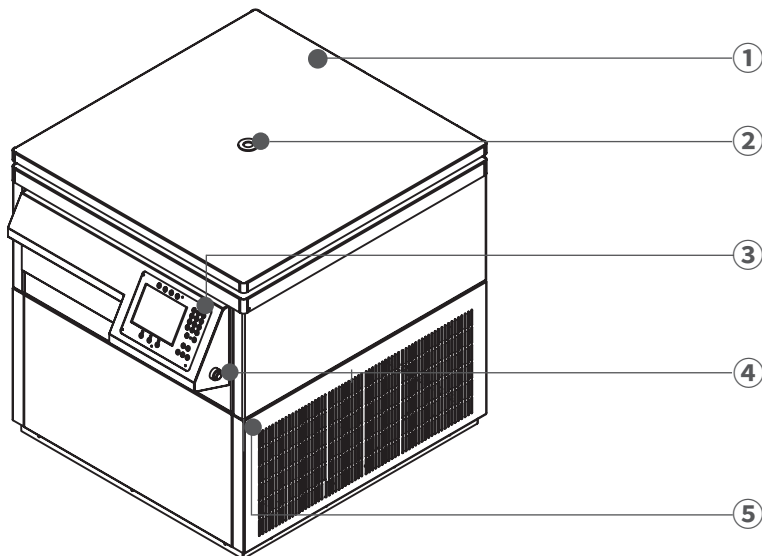
1. It is recommended that switchgear or circuit breaker and overcurrent protection devices should be installed near the device.
2. Use a power cord only provided with the device.
3. Do not use an extension cord.
4. Do not place anything on the powercable.
5. If you have the following emergencies, shut off the power supply and unplug the powercord from outlet and contact your place of purchase or Hanil Scientific Inc.
  - Unusual noises or smell from the equipment.
  - Damage or wear of a power cord.
  - Breakdown of circuit breaker, fuse or safety device.
  - If you spill liquid on the equipment.
  - If the equipment has been damaged.

## 2. Product Description

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### 2.1 Structure

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- ① Lid
- ② RPM measuring window
- ③ Control panel
- ④ Power switch key
- ⑤ Emergency Open Hole

### 2.2 Delivery package

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- Component R6
- Operating manual
- T-wrench
- Leveler tool
- Rotors & Accessories on request

## 2. Product Description

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### 2.3 Technical Specifications

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Max. RPM (Swing-out rotor)	5,000 rpm
Max. RCF (Swing-out rotor)	7,261 xg
Time	< 100 hr, continuous
Max. Capacity (Swing-out rotor)	6 x 1,000 mL
Temperature range	-20°C to 40°C
ACC/DEC steps	10/10 steps
Program memory	100
Rotor identification	Automatic
Imbalance cutoff / tracking	Yes
Noise level	< 65 dB
Dimension (W x D x H, mm)	816 x 906 x 965
Weight without rotor	355 kg
Power requirement	5.0 kVA
Power Consumption	20A
Refrigerant oil/Coolant /Refrigerant	POE ISO VG 32/404A /R134A
Power input (V, Hz)	220-240V~ 50/60Hz
Cat. No.	CP-R6

# 3. Installation

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## 3.1 Packing Inspection

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- Check packing conditions carefully, before unpacking.
- Contact Hanil Scientific Inc. immediately if damages found.
- Check the delivery for completeness.

► You can get contact details on the packing box or manual.

## 3.2 Installation

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### 3.2.1 Selecting the Location

#### **Installation on hard and flat ground.**

- Centrifuge should be installed on hard and flat place.
- If the centrifuge is installed in an inclined place, the shaft may be bent due to the weight of the rotor.

#### **Good ventilation.**

- For air circulation and safety, maintain a 30cm “clearance envelope” around the centrifuge while the rotor is spinning.



#### **Constant temperature/humidity**

- Centrifuge equipped with the sensitive electronic software which is fragile with humidity and temperature.
- Must avoid direct ray or heater and be put in the ambience of controlled temp.and air.

#### **Avoid the corrosive gas**

- Install the centrifuge in a place where corrosive gas is not generated.
- Sulfur dioxide gas and chlorine gas may cause corrosion.

#### **Leveling**

- The device should be operated on a flat surface.  
Use a leveler tool to check the device is level.



# 3. Installation

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## 3.2 Installation

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### 3.2.1 Leveling the Device

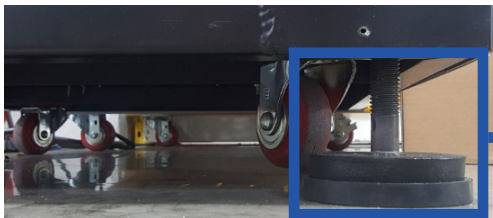


· If the device is not installed horizontally, it may cause vibration, noise or malfunction.

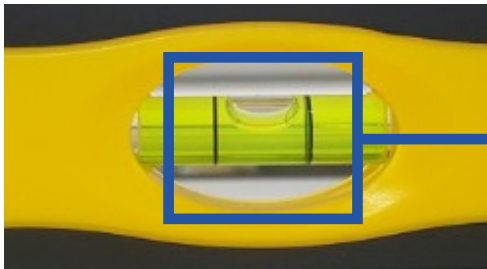
1. Place the device on a hard and flate place.
2. Put the leveler tool on the device.



2. Turn the leveling foot on the botton of the device to level the device.  
▶ Adjust the leveling foot so that the bubble in the leveler tool is at the center of the line.



Leveling Foot



Bubble in the leveler tool is at the center of the line.

# 3. Installation

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## 3.3 Power Connection

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- Connect the device to voltage sources which correspond to the electrical requirements on the label attached to the device.
- Only use a socket provided Hanil Scientific Inc.

1. You can choose a embedded socket or a movable socket
2. Switch the centrifuge on using the power switch key on the right side of the device.

## 3.4 Opening/Closing the Lid

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- If the lid is not closed, the device does not operate.

### Opening the lid

1. Press the Lid button

### Closing the lid

1. Put both hands on the lid and close it with light force.

# 3. Installation

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## 3.5 Using the Rotor

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- Do not disassemble the rotor by user.

This device does not necessarily require the rotor to be removed after use.  
Do not disassemble the rotor by the user.

# 3. Installation

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## 3.6 Loading the Blood Bags

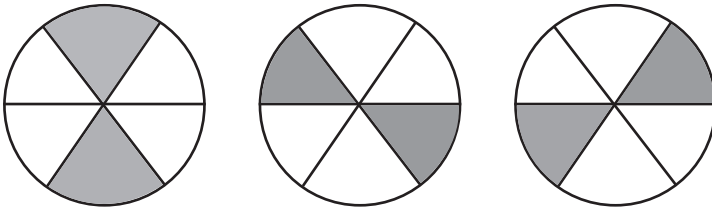
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· Only use accessories provided by Hanil Scientific Inc.

1. Load the blood bags into the adaptors with no folds at the top or corners.
2. One adaptor can be loaded up to two 450 mL blood bags.
3. Make sure the loaded blood bag adaptors opposite each other on the rotor are the same weight/volume.

[Correct Arrangement]



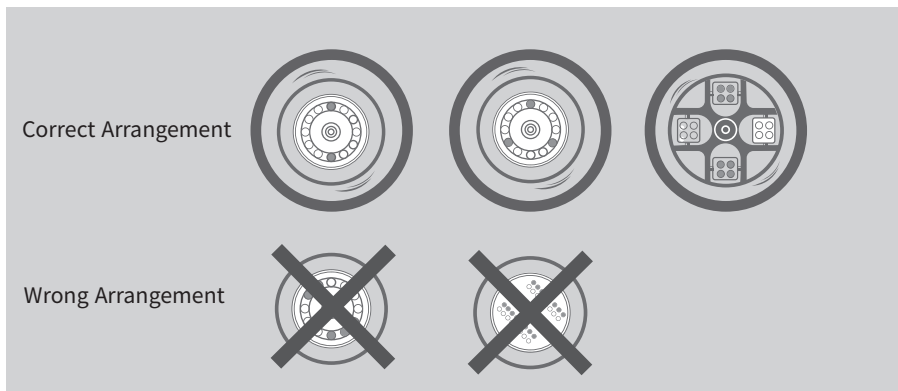
# 3. Installation

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## 3.7 Loading the Bottles

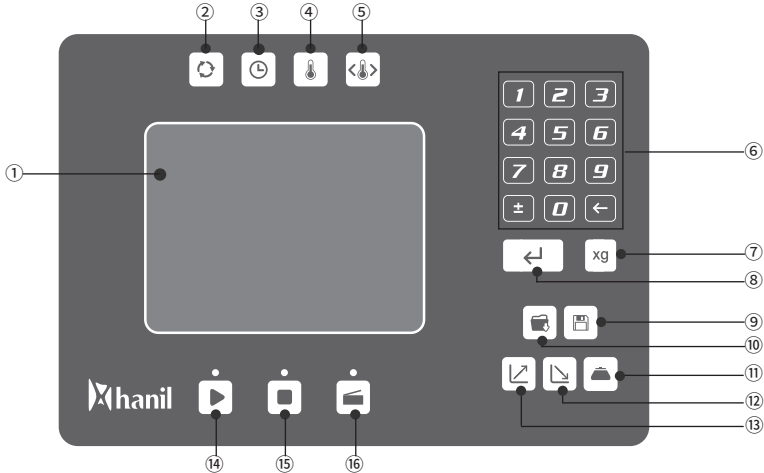
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- Always use the same type of bottles.
- Weight, Density and volume of opposing tubes must be same.
- Check symmetric loading by balancing the tubes with scales.



# 4. Operation

## 4.1 Control Panel



Button	Description
①	Display - Indicate Speed/Time/Temperature/Acc.Dec.
②	RPM - Setting the RPM
③	Time - Setting run time
④	Temp - Setting temperature
⑤	Temp Limit - Setting temperature limit range
⑥	Numeric buttons - Enter a value using the numeric buttons
⑦	XG - Setting the RCF
⑧	Enter - Setting acceleration step
⑨	Program Save - Saving a program
⑩	Program Call - Press the enter after setting the parameters
⑪	Rotor ID. - When rotor id is not identified automatically, enter the rotor ID. manually
⑫	Deceleration(DEC) - Setting deceleration step
⑬	Acceleration(ACC) - Calling up a program-
⑭	Start - Starting centrifugation
⑮	Stop - Stopping centrifugation
⑯	Lid - Openg the lid

# 4. Operation

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## 4.2 Setting Speed

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### [Setting RPM]

1. Press the Speed button once.
2. Press the numeric buttons to set the desired RPM value.
  - ▶ Up to 5,000 rpm
3. Press the Enter button.

### [Setting RCF]

1. Press the xg button.
2. Press the numeric buttons to set the desired RCF value.
  - ▶ Up to 7,261g
3. Press the Enter button.

# 4. Operation

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## 4.3 Setting Run Time

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1. Press the Time button.
2. Press the numeric buttons to set the desired run time.
  - ▶ Up to <100hr
  - ▶ Set the run time to 0 for continuous operation.  
During continuous operation, the centrifuge will continue running until you stop it manually.
3. Press the Setup/Enter button.

## 4.4 Setting Temperature

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1. Press the Temp button.
2. Press the numeric buttons to set the desired temperature.
  - ▶ -20°C ~ 40 °C
3. Press the Setup/Enter button.

## 4.5 Setting Temperature Limit

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Temperature range that stops operation when the temperature is lower or higher than the set temperature.

1. Press the Temp limit button.
2. Press the numeric buttons to set the desired temperature limit range.
  - ▶ Default value:  $\pm 30^{\circ}\text{C}$
3. Press the Setup/Enter button.



# 4. Operation

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## 4.6 Setting Acceleration/Deceleration

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1. Press the ACC or DEC button.
2. Press the numeric buttons to set the desired ACC or DEC rate.
  - ▶ ACC rate: 0~9 / DEC rate: 0~9
  - ▶ The larger the acceleration rate, the faster the acceleration speed.  
The smaller the deceleration, the slower the deceleration speed.
3. Press the Enter button.

## 4.7 Saving/Calling up a Program

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### [Saving]

1. Set the RPM(or RCF) / Run time / Accel, Decel rate / Temperature
2. Press the Program Save button.
3. Press the numeric buttons to set the desired program number.
  - ▶ Up to 0~99 :100
4. Press the Enter button.
5. When "Do you store? Y/N" message pops up, press ACC(Save,Y) or DEC(Cancel,N) button.

### [Calling up]

1. Press the Program Call button.
2. Press the numeric buttons to set the desired program number.
3. Press the Enter button.

# 4. Operation

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## 4.8 Start/Stop a Run

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### **[Start a run]**

1. Check all parameters are correct.
2. Press the Start button.

### **[Stop a run]**

1. Press the Stop button.

## 4.9 Verifying the Setting value

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During operation you can verify the setting values by pressing the 'View Setting' button.

# 5. Maintenance

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## 5.1 Care Instructions

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1. Regularly inspect the rotor chamber for check the motor shaft is normal.
2. Regularly check the rotor and accessories to be sure there is no damage.
3. Rotate the motor shaft with your hand to make sure it turns smoothly.
4. Keep dry inside the chamber after every use.
5. If any parts are contaminated with samples, clean the rotor with soft wet cloth and keep the rotor dry

## 5.2 Cleaning

---



- Before cleaning the centrifuge, be sure to switch off the device and disconnect the power cord.

### **[Outside of the device]**

1. Clean the outside of device with a soft and dry cloth.
  - ▶ If the device is contaminated, use a mild cleaning fluid to clean.
2. Do not use aggressive chemicals on the device such as alcohol, benzene, acetone or phenol.
3. Make sure do not scratch the surface of device when cleaning it.
  - ▶ Do not use a metal sponge.
  - ▶ If the device is rusted, remove it with a mild detergent and wipe it with a dry cloth.

### **[Chamber]**

1. If the rotor chamber is not dry, wipe moisture from the chamber with a dry cloth.
2. If the rotor chamber is dirty, clean it with a mild fluid to clean.

### **[Rotor]**

1. If any sample is spilt inside the rotor, clean it and dry well.

### **[Disposal]**

1. In case of product is to be disposed of, the local wastes laws and regulations are to be observed.

# 5. Maintenance

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## 5.3 Care Instructions for Refrigerated device

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### [Open the lid after centrifugation]

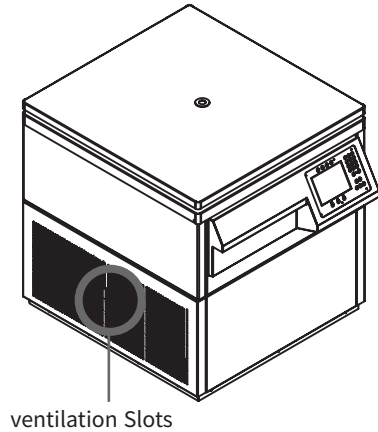
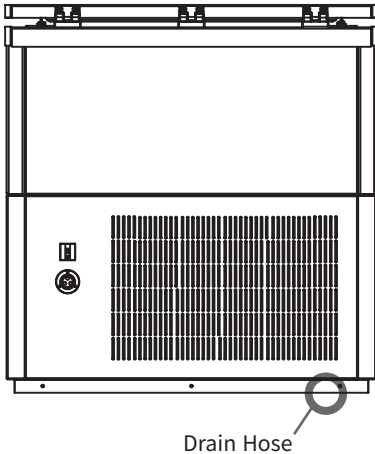
1. Wipe up the moisture in the chamber with a soft cloth.
2. Leave the centrifuge lid open after centrifugation.

### [Remove the condensation water]

1. There is a drain hose at the bottom of the device.  
Regularly check and remove the condensation water from the drain hose.

### [Remove dust]

1. Remove any dust from the ventilation slits regularly.



# 6. Troubleshooting

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## 6.1 Possible Problems

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Problems	Recommended Action
Power failure	<ul style="list-style-type: none"><li>- Check the power cord connection.</li><li>- Check the power fuse of the device.</li></ul>
Centrifugation cannot be started	<ul style="list-style-type: none"><li>- Check the lid is closed completely.</li></ul>
Lid cannot be opened	<ul style="list-style-type: none"><li>- Press the 'Lid open button'.</li><li>- Check the power connection.</li></ul>
Lid cannot be closed	<ul style="list-style-type: none"><li>- Remove the dirt on the door latch and close the lid.</li><li>- Check the lid latch is not damaged.</li></ul>
Unusual noise and vibration	<ul style="list-style-type: none"><li>- Check the device is installed on the hard and flat place</li></ul>
	<ul style="list-style-type: none"><li>- Reload the blood bags symmetrically.</li></ul>
Imbalance error message is displayed	<ul style="list-style-type: none"><li>- If there is a problem with the imbalance sensor, an imbalance error message is displayed.</li><li>- In this case, pressing the start button does not work.</li><li>- Contact Hanil techsupport.</li></ul>

# 6. Troubleshooting

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## 6.2 Error Messages

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Message	Cause
F RAM, SEEP ROM Check!	Occurs the data storage memory failure. Contact Technical Support.
Over Temperature!	Occurs the temperature is above the allowable limit. Contact Technical Support.
Doorlock Error	Occurs the lid sensor failure. Contact Technical Support.
Thermal Sensor Error	Occurs the temperature sensor failure. Contact Technical Support.
Hi Limit Temperature!	Occurs the current temperature is higher than temperature limit range. Contact Technical Support.
Low Limit Temperature!	Occurs the current temperature is lower than temperature limit range. Contact Technical Support.
Start RPM Error	Occurs when 10 RPM is not reached within 5 seconds after start. Contact Technical Support.
Low RPM Error	Occurs when the setting rpm is more than + 2%. Contact Technical Support.
Over RPM Error	Occurs when the setting rpm is more than - 2%. Contact Technical Support.
Invert Fail	Occurs when an inverter failure. Contact Technical Support.
Imbalance Error	Occurs when imbalance is detected or imbalance sensor failure. - Make sure the loaded blood bag adaptors opposite each other on the rotor are the same weight/volume - Contact Technical Support.

# 6. Troubleshooting

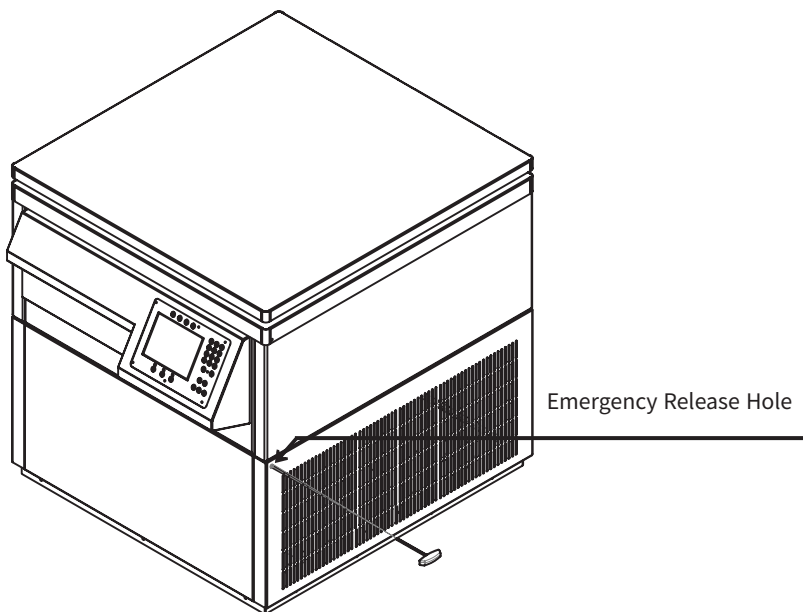
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## 6.3 Emergency Lid Open

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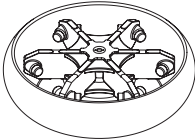
If the device lid cannot be opened, you can activate the emergency open manually.

1. Wait for rotor to stop before activating the emergency open.
2. Insert the T-wrench into the emergency open hole and press it until the lid is opened.



# 7. Rotors and Accessories

## WS1000-6



$\angle 90^\circ$   
 Max. RPM : 5,000  
 Size (W x D x H)  
 : 384 x 340 x 99 mm  
 (w/o windshield)



Bucket  
 B1000S  
 (Cap available)



Bucket  
 B1000



Cap  
 BL1000



Adaptor  
 TRB450

Bucket	Required Adaptor	Tube Capacity /Bottom type	Tube per Adaptor / Rotor	Bore (Ø x L, mm)	Max. height for tube fit (mm)	Max. RPM (rpm) Max. RCF (xg)
B1000S/ B1000	-	1,000 /Flat	1 / 6	98.5 x 143	193.7	5,000 7,261
	TRB450	450 mL blood bag	1 / 6	65.5 x 135	178.7	5,000 6,842









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