
Operation Manual

M 13

Micro Centrifuge

Date of purchase _____

Serial No. _____



Research Use Only

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Contact Us

If you have any questions, contact Hanil Scientific Inc. or place of purchase.

techsupport@ihanil.com / sales@ihanil.com

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1. General Considerations

1.1 Safety

Follow precautions and all the safety requirements described on this user manual to prevent any damages, failure of equipment and injury

1. The centrifuge should be installed on flat surface to maintain level.
Abnormal vibration is caused when the device is installed on an inclined surface.
2. Check the voltage to be used, before connecting the centrifuge 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 or accessories 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. If the centrifuge is contaminated by toxic or radioactive samples or infectious blood samples, remove contaminants completely and take needful actions such as ventilation or isolation of centrifuge.
7. Substances that may generate volatile or explosive vapor can not be centrifuged.
8. The balancing work of samples should be done in advance before operation.
9. Before operation, rotor and chamber should be dry.
10. Do not attempt to slow or stop the spinning rotor by hand.
11. Roter must be firmly tightned with a flat head screwdriver.
12. Do not block vents.
13. Do not insert foreign objects into the holes of the device.
14. Repairs must be carried out by a technologist authorized by Hanil scientific Inc.
15. According to IEC61010-2-020 maintain a 30cm“clearance envelope”around the centrifuge while the rotor is spinning.
16. Please contact the place of purchase or Hanil Scientific Inc. (techsupport@ihanil.com/sales@ihanil.com) for product repairs.
17. Turn the power switch off after using the device.
18. Unplug the power plug before cleaning or left unused for a long period of time.

1. General Considerations

1.2 Transport & Storage

Storage

Ambient temperature 5°C ~ 35°C
Maximum relative humidity 30% ~ 85%
Air pressure 500 ~ 1060 hpa

Transport

Ambient temperature -10°C ~ 40°C
Maximum relative humidity 10% ~ 90%
Air pressure 500 ~ 1060 hpa

1.3 Safety label



Risk of electric shock



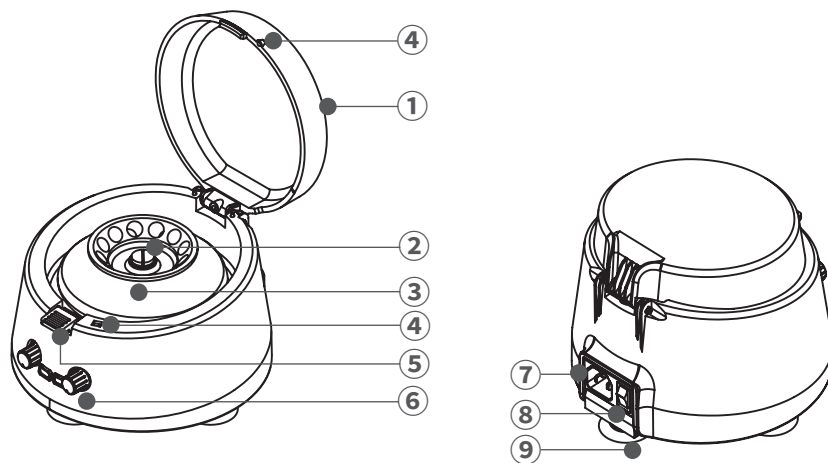
Rotation direction of the rotor.

1.4 Electric safety information

1. Use a power cord only provided with the device.
2. Use sockets with a protective earth conductor and suitable power cord.
3. If extension cord is needed, make sure it is suitable for the device.
4. Do not place anything on the power cable
5. Do not block vents.
6. If you have the following emergencies, shut off the power supply and unplug the power cord from outlet and contact your place of purchase or Hanil Scientific Inc.
 - Unusual noises or smell from the device.
 - Damage or wear of a power cord.
 - Breakdown of circuit breaker, fuse or safety device.
 - If you spill liquid on the device.
 - If centrifuge has been damaged.

2. Product Description

2.1 Appearance



- ① Lid : Lid protects samples inside the chamber, and protects rotor from breaking away when danger.
- ② Rotor locking screw : Screw connects the rotor to the motor shaft.
- ③ Rotor : Rotor holds the sample tubes.
- ④ Lid sensor : Lid sensor detects whether lid is closed.
- ⑤ Lid open button : Press the button to open lid.
- ⑥ Control Panel : Keys and knobs for operating the centrifuge.
- ⑦ Power socket : Socket is where the power cable connected.
- ⑧ Power switch : Switch allows the device to be turned on or off.
- ⑨ Absorbent rubber : Four rubber feet fix the device on the laboratory bench.

2.2 Delivery Package

- ① Standard offering
 - M 13 main body
 - Powercable(300/500V,6A)
 - Usermanual
- ② Optional products [See Page 16 (7. Rotors & Acc.)]
 - PCR tube & strip rotor
 - (A 5.0 - 6) rotor
 - (A 2.0 - 12) rotor
 - 0.5 ml tube adaptor for (A2.0 - 12 rotor)
 - 0.2 ml tube adaptor for (A2.0 - 12 rotor)

2. Product Description

2.3 Technical Specifications

Max. RPM	(A2.0 - 12) 13,500 RPM / (A0.2 - 32), (A5.0 - 6) 6,000RPM
Max. RCF	12,032 xg
Time	≤ 15 min, Pulse
Acc. time to max. speed	≤15 sec
Dec. time from max. speed	≤8 sec
Tube Capacity	1.5/2.0ml x 12
Power supply	AC110/220V, 50/60Hz
Dimension (W x D x H, mm)	189 x 202 x 129
Weight without rotor (kg)	1.5

※ This device does not provide automatic recognition of the rotor.
 So do not exceed 6,000 rpm when using the (A0.2 - 32, A5.0 - 6) rotor.

※ RCF Table

RPM	A2.0 - 12			A0.2 - 32		A5.0 - 6
	0.2mL	0.5mL	1.5/2.0mL	0.2mL Inner line	0.2 mL Outer line	5mL
3,000	443	545	594	313 ~ 443	464 ~ 560	654
5,000				870 ~ 1,231	1,289 ~ 1,556	1,817
6,000	1,773	2,191	2,377	1,253 ~ 1,773	1,857 ~ 2,241	2,616
8,000	3,151	3,877	4,226	N / A 6000RPM [Max.]		
10,000	4,924	6,058	6,603			
12,000	7,090	8,724	9,508			
13,500	8,973	11,042	12,032			

* RCF value was calculated based on the bottom of the rotor hole.

* RCF value can differ from the length of the tube inserted in the rotor.

3. Installation

3.1 Packing Inspection



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

· You can get contact details on packing box or the bottom of the manual.

3.2 Installation

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 shaft should be put exactly vertical on the horizontaliy flat ground by the leveling tool.

3. Installation

3.3 Connect Power



- Connect the device to voltage sources which correspond to the electrical requirements on the label attached to the device.
- Use sockets with a protective earth conductor and provided power cord.

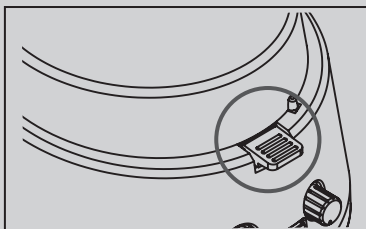
1. Connect the power cable to the power socket on the back side of the device and plug the cord into the power outlet.
2. Switch the centrifuge on using the power switch on the back side of the device.

3.4 Opening/Closing the lid

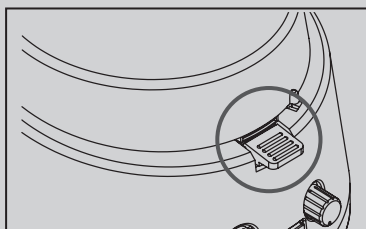
1. Press the lid button to open the lid.
▶ Closing the lid : Press the lid down until it clicks.



Press the lid down until it clicks.



(O)



(X)

When lid is not closed completely, the device does not operate.



3. Installation

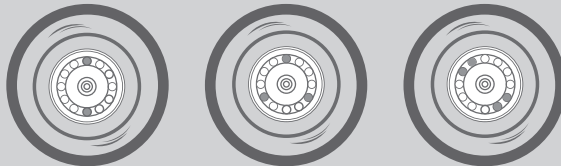
3.6 Loading tubes



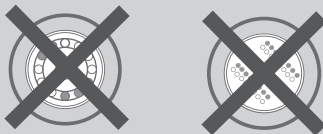
- Always use the same type of tube .
- Tubes should be loaded symmetrically .
- Do not exceed the maximum rated speed of the tube .
- Same volume and density of sample should be put on tubes .
- Check symmetric loading by balancing tubes with scales .

1. Check the inside of the rotor hole for moisture or foreign matters.
2. Tubes must be loaded symmetrically.

Correct
Arrangement

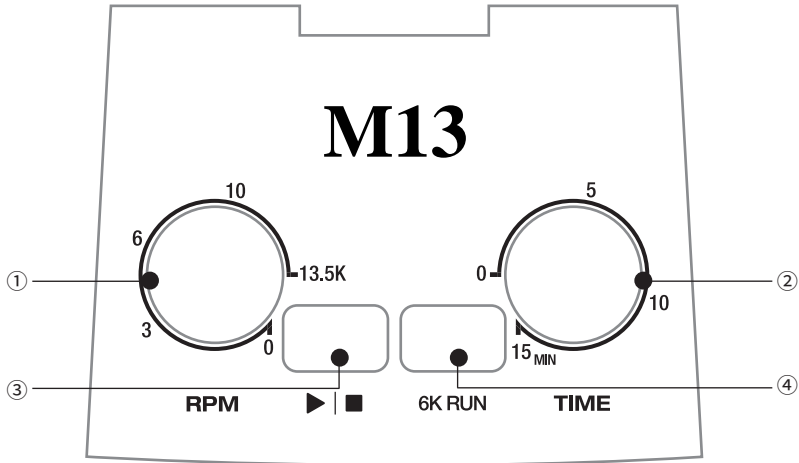


Wrong
Arrangement



4. Operation

4.1 Control Panel



Button		Description
①	RPM setting knob	Rotate clockwise or counter-clockwise to set the rpm value.
②	Time setting knob	Rotate clockwise or counter-clockwise to set the run time. (To use pulse function, set the time to '0' and press the start key.)
③	Start /Stop button	Start or stop the centrifugation.
④	6K Run button	After loading the rotor, press this button to start operation at 6,000 rpm

※ When using a A0.2 - 32(PCR strip rotor), A5.0 - 6 rotor do not exceed 6,000rpm.

5. Maintenance

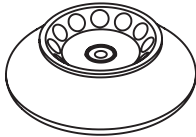
1. Regularly inspect the rotor chamber and the motor shaft.
2. Rotate the shaft with your hand to make sure it rotates smoothly.
3. Use the stopwatch to check the time setting for accuracy
4. If you find any damages, do not use the device. Contact Hanil Scientific Inc.
5. Be careful not to get any foreign substances on the sensor.
6. Check the rotor hole regularly for any foreign materials.
7. Use a damp cloth and neutral detergent to clean and disinfect the device and the rotor.

6. Troubleshooting






6.1 General Errors

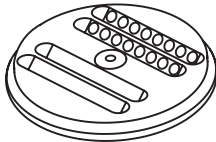
Problem	Recommended Action
Power failure	Check the power cord connection.
Error sound doesn't stop	When opening the lid, error sound activated. Press the 6K Run button to stop the error sound.
Lid cannot be opened	Press the 'Lid open button'.
Lid cannot be closed	Remove the dirt on the lid latch and close the lid again. Check the lid latch for damage.
Unusual noise and vibration	Check the device whether it is installed on the hard and flat place.
	Reload the rotor symmetrically. Reload the tubes symmetrically. Tighten the clamping of the rotor with wrench by turning clockwise

7. Rotors and Accessories





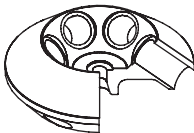
Fixed Angle Rotor, A2.0-12
 12 x 1.5/2.0 ml
 ∟ 45°
 Hole diameter (mm) : 11.5
 Max. height for tube fit (mm) : 48

Tube			
Tube capacity	0.2 ml	0.5 ml	1.5/2.0 ml
Adaptor			None
Cat. No.	TR0.2	TR0.5	-
Adaptor bore (Φx L, mm)	6 x 21	8 x 37	-
Radius (mm)	44	54	59
Max. RPM	13,500		
Max. RCF (xg)	8,965	11,003	12,032




PCR Rotor, A0.2-32
 4 x 8-tube PCR strips, 32 x 0.2 ml
 ∟ 45°
 Hole diameter (mm) : 6.5

Tube		
Tube capacity	0.2 ml	8-tube PCR strip
Radius (mm)	Inner line : 31.13 ~ 44.06 Outer line : 46.13 ~ 55.68	
Max. RPM	6,000	
Max. RCF (xg)	Inner line : 1,773 / Outer line : 2,241	



Fixed Angle Rotor, A5.0-6
 6 x 5.0 ml
 ∟ 50°
 Hole diameter (mm) : 16.5
 Max. height for tube fit (mm) : 60

Tube	
Tube capacity	5.0 mL
Radius (mm)	52
Max. RPM	6,000
Max. RCF (xg)	2,616

MEMO



RECYCLABLE



Doc.No. : UM-M13(E)(Rev.0)