

INSTRUCTION MANUAL
CAT. 72359-06 6-Place Table Top Centrifuge



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IMPORTANT SAFETY GUIDELINES

The safety statements presented in this chapter refer to the basic safety information that the operator of the centrifuge shall pay attention to and abide by. There are additional safety statements in other chapters or sections, which may be the same as or similar to the following, or specific to the operations.

- ⚠ WARNING:** Indicates a potential hazard situation or unsafe practice that, if not avoided, could result in death or serious personal injury.
- ⚠ CAUTION:** Indicates a potential hazard or unsafe practice that, if not avoided, could result in minor or moderate personal injury.
- ⚠ NOTICE:** Indicates a potential hazard or unsafe practice that, if not avoided, could result in product/ property damage.

- ⚠WARNING:** For the safety of both the operator and service personnel, take care when handling substances that are known to be toxic, radioactive or contaminated with pathogenic microorganisms when using this centrifuge. In the event that materials of a higher risk group are being used, more than one level of protection must be provided. The use of flammable or explosive materials as well as those materials which have a vigorous chemical reaction is prohibited.
- ⚠WARNING:** For your safety and the durability of your machine, never transport or store centrifuge with tube holders inside machine.
- ⚠WARNING:** If components are damaged or missing, contact Electron Microscopy Sciences immediately. **DO NOT** use substitute parts.
- ⚠WARNING:** Electron Microscopy Sciences assumes no responsibility for any damage or injury caused by improper installation or use of this product.

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SUPPLIED EQUIPMENT

The following items come standard with each centrifuge:

Equipment supplied	Quantity	Description
	1	Rotor, six-place fixed-angle
	1	User manual
	6	Tube holder, 75 mm
	6	Tube holder, 100 mm
	6	Tube holder, 125 mm

OPTIONAL ACCESSORIES

The following items are optional accessories. Please contact Electron Microscopy Sciences to purchase these accessories.

Optional accessories	Description
	75 mm tube holder, package of 6
	100 mm tube holder, package of 6
	125 mm tube holder, package of 6

SETUP

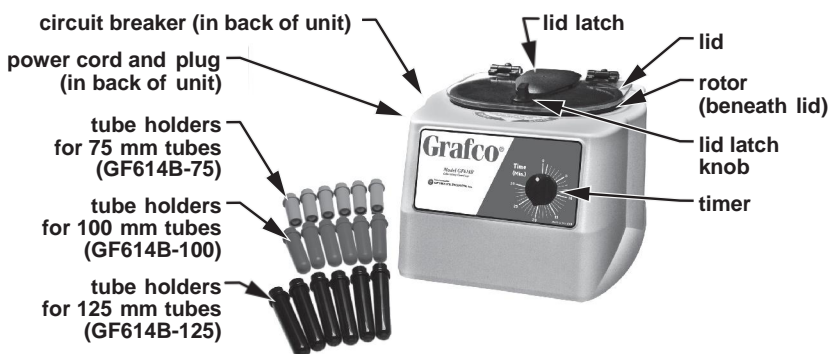
Unpacking

1. Check for obvious damage to the carton or its contents. If damage is evident, please notify the carrier and Electron Microscopy Sciences.
2. Unpack the centrifuge and verify that all of the supplied equipment is present.

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Main features

Picture with main features labeled follows.



Fixed-angle rotor for spinning 75 mm, 100 mm and 125 mm test tubes in specially designed tube holders
Cool-Flow air flow design that prevents overheating of samples
Heavy gauge, durable steel construction
Lid safety switch that prevents the centrifuge from operating unless the lid is closed and latched
Removable rotor for easy cleaning
Brushless A/C motor
Transparent lid for observation of samples and optical speed calibration

Setup location

Choose a setup location which meets the following criteria:

- a) A bench top clearance height of 20" is required in order to open the lid.
- b) A clearance envelope (the space around the centrifuge required for safety) of at least 24" x 24" is required, with the centrifuge at the center. No person or hazardous material shall be permitted in the clearance envelope during operation.

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The operator time within the envelope shall be limited to the time necessary for loading, unloading and centrifuge operation only.

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- c) Unencumbered air flow is required. Proper ventilation is necessary to prevent the overheating of samples as well as premature failure of the centrifuge.
- d) A flat, level surface is required on which to place the centrifuge. Secure the centrifuge to the operating surface by its four suction feet. No level adjustment is necessary.
- e) The power outlet must always be within reach as the power cord is the means of emergency disconnection!

Initial Setup

Info: If any problems are found during the initial setup procedure, refer to the Troubleshooting section. If you are still unable to solve your problem, contact Electron Microscopy Sciences for further assistance.

1. Plug the centrifuge's power cord into a properly grounded 115 Volt AC, 60 Hz electrical wall outlet.
2. Turn the lid latch knob counter-clockwise and open the lid.
3. Spin the rotor by hand; check for free and level rotation.
4. Close the lid. Rotate the lid latch knob clockwise to its complete stop position.
5. Turn the centrifuge on by turning the timer to 10 minutes.
6. Listen to the centrifuge. You should hear a smooth whirring sound.

Info: After the centrifuge has passed this procedure, it is ready for operation.

⚠WARNING: Ensure that Centrifuge is installed as described before use.

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Balanced Loads

⚠ NOTICE: Your centrifuge **must** contain a balanced load in order to work properly. Spinning unbalanced loads may shorten the life of the device and produce unpredictable results. Observe the following rules when loading the rotor.

1. Opposing tube holders must be identical.
2. Opposing tube holders must be empty or loaded with equally weighted samples.
3. If an odd number of samples is to be spun, fill a tube with water to match the weight of the unpaired sample and place it across from the unpaired sample.

Special features

Lid Safety Switch: The lid is secured to the top of the cabinet by a latching knob and pawl system. When the knob is rotated clockwise, the pawl grips the underside of the cabinet opening and prevents the lid from opening. A mechanical stop positions the pawl and prevents it from rotating completely. When rotated to the stop position, the pawl makes contact with a microswitch mounted underneath the cabinet top. The lid safety switch prevents the centrifuge from operating while the lid is open.

Circuit Breaker: This item has a 4 Amp circuit breaker at the rear of the base that disconnects power in the event of an overload, preventing the device from operating.

OPERATION

*Info: Follow the previous **Initial setup** procedure before initial operation.*

1. Ensure that the centrifuge's power cord is plugged into a properly grounded 115 Volt AC, 60 Hz electrical wall outlet.
2. Turn the lid latch knob counter-clockwise and open the lid.
3. Place the test tube samples into the tube holders. Be sure to follow the rules for balanced loads.
5. Close the lid and turn the lid knob clockwise to its complete stop position.
6. Turn on the device by turning the timer to the desired run time.
7. The centrifuge should begin to spin.
8. Once the timer reaches zero (0), the motor will stop and the rotor will coast to a stop. Do not open the lid until the rotor has come to a complete stop.
9. Turn the lid latch knob counter-clockwise and open the lid.
10. Remove the samples.
11. The centrifuge is immediately ready for operation.

MAINTENANCE

With proper care and maintenance your centrifuge will provide years of laboratory service. For proper care, always follow the maintenance instructions in this section.

⚠WARNING: Electrical shock hazard: Do not open the case.
Any disassembly of the device must be performed by a qualified service technician.

Provide Adequate Ventilation

Place the centrifuge on a hard smooth surface for good air circulation. For cooling purposes, the centrifuge draws in ambient air through the air intake cover on the top of the lid and exhausts this air in the rear of the base.

ALWAYS Spin Balanced Loads

Ensure that you always spin a balanced load. This item has a unique counter-balanced motor-mount design which, along with its rubber suction feet, produces excellent vibration dampening. However, out-of-balance loads may break glass test tubes and/or produce unsatisfactory separation results. Proper load balancing will help to improve sample separation and extend the life of the centrifuge. Refer to earlier **SETUP/Balanced loads** section for additional information on balancing the load.

Keep the Tube Holders Clean

⚠WARNING: Always follow the safety guidelines of materials in the event that a substance known to be potentially toxic, radioactive or contaminated with a pathogenetic microorganism is spilled in or on the centrifuge. Small glass fragments left in the tube holder after tube breakage may adhere to the next test tube inserted in that holder. When this tube is handled, these fragments may puncture protective gloves and lacerate the operator's fingers or hand. Remaining fragments may provide stress points on subsequent tubes and result in additional breakage.

If tube breakage occurs, carefully remove the tube holder. Properly dispose of the sample and tube fragments and thoroughly clean both the inside and outside of the tube holder. Replace the tube holder in the rotor.

Motor and Electrical Maintenance: This item uses a brushless A/C motor. The motor and electrical components should not need servicing for the life of the centrifuge.

Keep the Rotor Chamber Clean

⚠ NOTICE: Do not submerge the centrifuge in water or other cleaning solutions as this will cause damage and void your warranty!

Clean the rotor chamber every six months or whenever there is a tube breakage, as described above. Instructions follow to remove the rotor, clean, and re-install the rotor.

To remove the rotor:

⚠ WARNING: Unplug the centrifuge from the electrical outlet at this time to reduce the risk of electric shock.

1. Open the lid.
2. Remove the test tube holders.
3. Remove the knob or nut in the center of the rotor by turning it counter-clockwise. A nut driver may be required.
4. The rotor sits on a cone-shaped adapter. Pull the rotor up and off of this adapter.

To clean:

Clean the rotor chamber, rotor and accessories thoroughly using either isopropyl alcohol, soap and water, or bleach, with a clean towel or cloth.

⚠ NOTICE: Do not use fully or partially halogenated hydrocarbons, ketones, esters or any other chemicals not listed in the previous paragraph; they could damage the rotor and tube holders.

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To re-install the rotor:

1. Place the rotor back onto the cone-shaped adapter. You may need to turn the rotor slightly to align it properly.
2. Slide the rotor onto the rotor cone (it should slide freely).
3. Once a proper fit has been achieved, replace the rotor knob or nut and turn it until it is hand-tight.
4. Replace the tube holders and ensure that they are seated properly.
5. Perform the **SETUP/Initial setup** procedure to ensure that the rotor has been installed correctly and that the centrifuge has not been damaged.

Tube Holder Replacement

Replace the tube holders after 24 months of use or if damaged.

Calibration

(to be performed only by a qualified service technician)

For continued proper operation of the centrifuge, test every two years to ensure that the top speed is within specification (for top speed, see **SPECIFICATIONS** section).

Testing ground continuity and leakage current

(to be performed only by a qualified service technician)

⚠WARNING: To reduce the risk of electric shock, test the ground continuity and line leakage every two years.

TROUBLESHOOTING

Problem	Solution
The rotor does not spin freely	Ensure that nothing has fallen into the rotor chamber If there is nothing obstructing the rotor, contact Electron Microscopy Sciences.
Excessive noise when the device is running	Ensure that the load is balanced Ensure that nothing has fallen into the rotor chamber Ensure that the nut in the center of the rotor is tight Possible faulty motor; contact Electron Microscopy Sciences for further assistance.
The centrifuge does not run	Ensure that the centrifuge is plugged into a properly grounded 115 Volt AC, 60 Hz electrical wall outlet Ensure that the lid latch knob is turned completely clockwise to its stop position. If not, the centrifuge will not operate Ensure that the circuit breaker at the rear of the base, that disconnects power in the event of an overload and prevents the device from operating, is not tripped. If the switch is white, the breaker has tripped. Contact Electron Microscopy Sciences for further assistance.

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SPECIFICATIONS

General Specifications :

Rotor / Rotor Accessories	Rated for a rotation frequency of 3,500 RPM
	Capable of spinning test tubes up to 17 mm x 125 mm
Nominal Speed 125 mm holders	3,150 (± 100) RPM
Nominal RCF 125 mm holders	1,200 (± 80) xg
Nominal Speed 100 mm holders	3,250 (± 100) RPM
Nominal RCF 100 mm holders	1,080 (± 80) xg
Nominal Speed 75 mm holders	3,300 (± 100) RPM
Nominal RCF 75 mm holders	950 (± 80) xg
Maximum capacity	90 ml (6 x 15 ml) Maximum sample density is 1.15 grams / ml (water density = 1.0 grams / ml)
Overall Dimensions (H x W x D)	8.75" x 11.75" x 14" (222.3 mm x 298.5 mm x 355.6 mm)
Weight	13.75 lb (6.24 kg)
Centrifuge Motor	1/30 HP, A/C
Nominal Acceleration Time	45 seconds
Protection Breaker	4 Amp. re-settable
Timer:	mechanical, 1 to 30 minutes
	accuracy ± 10%
Current Requirement	1.0 Amps
Voltage Requirement	115 (± 10) Volts
Frequency	60 Hz

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