



Benchtop Centrifuge

Model 6F


Instructions for Use Manual



Table of Contents

1. Symbols	2
2. Model Description	2
3. Features	2
4. Intended Use	2
5. Warranty	2
6. General Specifications.....	3
7. Caution and Warning Statements	3
8. Setup Location	4
9. Initial Setup Procedure.....	4
10. Control Panel.....	5
11. Verifying Preset Time and Brake	5
12. Changing Preset Time and Brake.....	6
13. Operation	6
14. Balanced Loads	7
15. Troubleshooting	7
16. Rotor Removal and Installation	8
17. Care and Preventative Maintenance	8
18. Cleaning and Disinfection.....	8
19. Emergency Rotor Chamber Entry	9
20. Calibration Testing.....	9
21. Safety	9
22. Replacement Parts.....	10
23. Available Accessories	10

1. Symbols

Symbol	Definition	Use
	Caution	Caution to safety hazard. Potential risk of personal injury or damage to the instrument if improperly handled. Consult the manual before proceeding.

2. Model Description

The Cardinal Health™ Model 6F is a continuous-duty, electronically-controlled horizontal centrifuge with a lid safety interlock system. The unit is controlled by an electronic push-button timer that has been preset for ten (10) minutes, for precise spin times and ease of use. Samples can be safely viewed through the transparent lid. Entry into the machine is restricted during operation by the safety interlock system. The Cardinal Health™ Model 6F features a lighted control panel that displays the status of the machine, easily viewable from a distance.

3. Features

- Swing-out horizontal rotor design, incorporating a unique tube holder that produces horizontally separated samples and spins both 75 and 100 mm tubes
- Cool-Flow air flow design that prevents overheating of samples
- Heavy gauge steel construction for safety and durability
- Lid safety switch that prevents the centrifuge from operating unless the lid is closed and latched
- Automatic safety lid lock, engaged anytime the rotor is in motion
- Removable rotor for easy cleaning
- Brushless permanent split capacitor AC motor
- Clear lid for safe observation of samples and optical calibration of speed
- Electronically controlled timed operation (see pg. 6)
- Push-button operation
- Indicator lights (GREEN when RUNNING, YELLOW while LATCHED, RED while UNLOCKED)

4. Intended Use

General purpose laboratory centrifuge, intended for the density-based separation of fluids through centripetal acceleration.

5. Warranty

Cardinal Health warrants that this centrifuge is free from defects in workmanship and parts for 2 years.

6. General Specifications

Nominal Speed (Horizontal)	3,380 (+/- 100) RPM *
Nominal RCF (Horizontal)	1,600 (+/- 90) xg
Maximum Capacity (Horizontal)	60 mL (6 x 10 mL)
Overall Dimensions (Width x Depth x Height)	12 in. x 14 in. x 9 in. (30 cm x 36 cm x 23 cm)
Centrifuge Motor	1/30 H.P., p.s.c. motor
Maximum Acceleration Time	10 seconds
Protection Breaker	4 Amp re-settable
Timer	electronic, 1 to 30 minutes preset to 10 minutes, +/- 1%
Current Requirement	1.5 Amps
Voltage Requirement	115 (+/- 10) Volts
Frequency	60 Hz
Weight	11 lbs (5 kg)

Any use other than those specified by the Manufacturer is explicitly prohibited. Maximum sample density is 1.15 grams / mL (water density = 1.0 grams / mL).

7. Caution and Warning Statements



This device is intended to be operated by properly trained personnel who have carefully read the operating manual and are familiar with the function of the device. Refer to the clinical laboratory method specified by the specimen receptacle manufacturer or established by the medical technology for the product's applications.



For the safety of both the operator and service personnel, care should be taken when using this centrifuge if handling substances that are known to be toxic, radioactive or contaminated with pathogenic microorganisms. Use appropriate personal protection equipment (PPE). When Risk Group II materials are used (as identified in the World Health Organization "Laboratory Bio-Safety Manual"), a Bio-Seal should be employed. 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.



Unplug the centrifuge before cleaning or performing maintenance.



Inspect centrifuge for cracks or physical damage to cabinet, lid, rotor, or tube holders. Damage may result in unsafe operation. Discontinue use until repairs have been performed.



This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with this operator manual, may cause interference to radio communications.



Operation of this equipment in a residential area may cause interference, in which case the user will be required to correct the interference at his own expense.



Due to the lack of the possibility of human exposure, all Cardinal Health™ centrifuges and accessories sold by Drucker Diagnostics, Inc. are compliant without any special labeling required by the California Safe Drinking Water and Toxic Enforcement Act (Proposition 65).

8. Setup Location

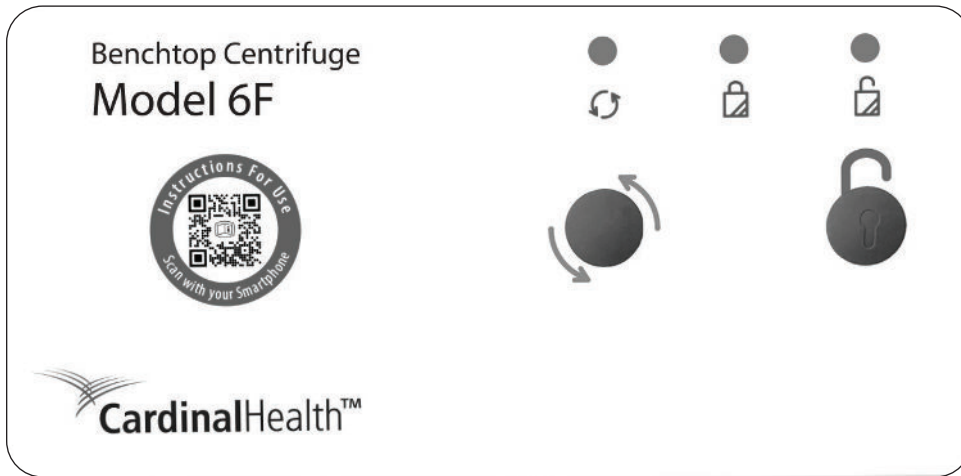
1. Unpack and verify that all of the supplied equipment is present.
The following items come standard with each Cardinal Health™ Model 6F centrifuge:
 - One (1) 6-place horizontal rotor
 - Six (6) 75-100 mm tube holders
 - One (1) line power cord (appropriate for your location)
 - One (1) Quick Start Insert Guide
2. Choose a setup location which meets the following criteria:
 - A clearance height of 20 in. (50.8 cm) is required to open the lid.
 - The clearance envelope is the space around the centrifuge which is required for safety. Choose a setup location which will allow for a clearance envelope of at least 24 in. x 24 in. (with the centrifuge at the center). No person or hazardous material shall be permitted in the clearance envelope during operation. The operator time within the envelope shall be limited to the time necessary for loading, unloading and centrifuge operation only.
 - Proper ventilation is necessary to prevent the overheating of samples as well as premature failure of the centrifuge. Choose an area which will allow unencumbered air flow.
 - The centrifuge is designed to secure to the operating surface by four suction feet. No adjustment is necessary for leveling the centrifuge, however, the surface should be flat and level.




9. Initial Setup Procedure




1. Plug the centrifuge into an approved electrical outlet. For electrical safety, the unit must always be properly grounded. Be sure the outlet is always within reach as the line cord is the means of emergency disconnection.
2. For safety purposes, the locking system is always activated. To deactivate the lid lock to insert or retrieve samples, press the 'OPEN / STOP' button on the control panel. The 'UNLOCKED' indicator light should illuminate. If it does not, refer to the troubleshooting section in this manual. The lid will be unlocked for 15 seconds after pushing the 'OPEN / STOP' button.
3. Turn the latch 1/4 turn counterclockwise and open the lid.
4. Spin the rotor by hand; check for free and level rotation. If the rotor does not spin freely, refer to troubleshooting.
5. Place the six test tube holders inside the rotor and verify that they are seated properly.
6. Close the lid. Rotate the lid knob clockwise to its complete stop position. The 'LATCHED' indicator light should be illuminated. If it is not, make sure that the lid is latched properly. The centrifuge will not run unless the lid is latched and the 'LATCHED' light is on.
7. Turn the centrifuge on by pushing the 'START' button.
8. The 'RUNNING' indicator light will illuminate.
9. The test tube holders will slide up into the horizontal position and the unit will accelerate to full speed.
10. Listen to the sound of the centrifuge. A smooth whirring sound should be heard. If there are any loud or unusual sounds, stop the centrifuge by pushing the 'OPEN / STOP' button immediately and refer to troubleshooting.
11. While the machine is running, try to turn the latch counterclockwise. Power may be cut to the motor but you should be unable to fully turn the latch. If it is possible to turn the latch and open the lid while the unit is running, contact Cardinal Health for assistance. Close and latch the lid.
12. Push the 'OPEN / STOP' button. The 'RUNNING' indicator light should go out and the motor should slow to a stop.
13. The lid should remain locked until the rotor has nearly stopped. If the machine unlocks prematurely, contact Drucker Diagnostics for assistance.

14. Once the rotor has stopped, the interlock system will become disengaged for sixty (60) seconds. The 'UNLOCKED' indicator light will illuminate during this time.
15. To gain entry into the centrifuge after this period has ended, simply press the 'OPEN / STOP' button. The lid will unlock for fifteen (15) additional seconds.
After the centrifuge has passed this procedure it is ready for operation.

10. Control Panel



Indicator Lights		
	Running	Lights up when the machine is in operation (power is being applied to the motor).
	Latched	Lights up when the lid has been closed and latched properly.
	Unlocked	Lights up to indicate that the locking mechanism has been deactivated, allowing access to the rotor chamber.

Buttons		
	Start	Begins a new run (the lid must be closed).
	Unlock	Allows for access into the rotor chamber by disengaging the locking mechanism. Entry is only possible when the rotor is stopped.
	Stop	Pressing the UNLOCK button during operation will terminate the run and unlock the lid after the rotor has come to a stop.

11. Verifying Preset Time and Brake

NOTE: Your centrifuge must be plugged in.

1. Push the OPEN / STOP button to disengage the lock and then open the lid.
2. Push and hold the START button for approximately three (3) seconds. The yellow LATCHED indicator light will begin to flash, indicating program mode.
3. When you release the START button, the RUNNING indicator light will begin to flash. Each flash represents one minute of run time.
4. Press the START button to verify the brake setting. When you release the START button, the RUNNING indicator light will begin to flash. Each flash represents the brake setting, from 1 to 10.

12. Changing Preset Time and Brake

NOTE: Your centrifuge must be plugged in.

1. Push the OPEN / STOP button to disengage the lock and then open the lid.
2. Push and hold the START and OPEN buttons for approximately three (3) seconds. The yellow LATCHED indicator light will begin to flash slowly, indicating that you can now program run time.
3. Press START one time for each minute of run time desired, from a minimum of 1 minute to a maximum of 30 minutes. The green START indicator light will flash each time you press the START button.
4. Press OPEN to enter the run time. You will now begin to adjust the brake setting.
5. Press START to adjust the brake setting, from a minimum of 1 to a maximum of 10. The green START indicator light will flash each time you press the start button.
6. When you are finished, press the 'OPEN' button to exit. Use the above procedure to verify the run time and brake setting change.

13. Operation

NOTE: Follow the initial setup procedure before initial operation.

1. Plug the centrifuge into an approved electrical outlet.
2. Push the 'OPEN / STOP' button and then open the lid.
3. Place the test tube samples into the tube holders. Be sure to follow the rules for balanced loads.
4. Close the lid and turn the lid knob clockwise to its complete stop position. The 'LATCHED' indicator light should turn on to indicate that the latch is closed properly. If the lid knob is not completely latched, the 'LATCHED' indicator light will not turn on and the centrifuge will not operate.
5. The timer has been set to a preset time of ten (10) minutes. To display or change this time setting, refer to the previous section.
6. Turn on the machine by pushing the 'START' button on the control panel.
7. The centrifuge should begin to spin. The 'RUNNING' indicator light should illuminate.

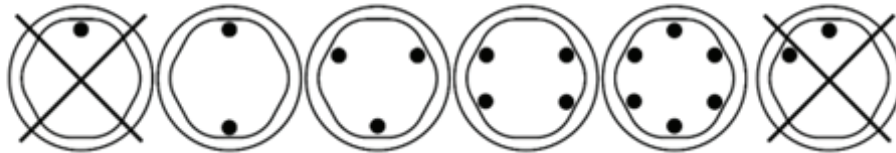
IF A PROBLEM IS FOUND DURING A SPIN THAT REQUIRES THE CENTRIFUGE TO SHUT DOWN, PRESS THE 'OPEN / STOP' BUTTON.

8. The 'RUNNING' indicator light will begin to flash when one minute remains.
9. After time has elapsed, the 'RUNNING' indicator light will extinguish and the rotor will slow to a complete stop.
10. The 'UNLOCKED' indicator light will illuminate and the locking mechanism will disengage allowing entry into the rotor chamber. If it does not, refer to troubleshooting.
11. Turn the lid knob counterclockwise and open the lid.
12. Remove the samples.
13. If the machine re-locks before the samples are removed, press the 'OPEN/STOP' button to unlock the lid for an additional fifteen (15) seconds.

14. Balanced Loads

Your centrifuge must contain a balanced load to work properly. Spinning balanced loads will extend the life of the centrifuge and produce better results. Use the following rules when loading the rotor. 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 this sample.

1. Opposing tube holders must be equally loaded or empty or loaded with equally weighted samples.
2. When loading only 3 tubes, they must be of equal weight.



15. Troubleshooting

NOTE: The latch must be turned completely clockwise to its stop position in order for the centrifuge to operate.

Problem		Solutions
1	The rotor does not spin freely.	<ul style="list-style-type: none"> • Make sure nothing has fallen into the rotor chamber. • If there is nothing obstructing the rotor, the rotor may be damaged. Contact Drucker Diagnostics at 814-692-7661 or 1-866-265-1486 (U.S. toll-free).
2	Excessive noise when the machine is running.	<ul style="list-style-type: none"> • Check to see that the load is balanced. • Make sure that nothing has fallen into the rotor chamber. • Make sure that the screw in the center of the rotor is tight.
3	The centrifuge does not run.	<ul style="list-style-type: none"> • Check the electrical outlet. • Make sure the lid latch is turned completely clockwise to its stop position. When the lid is closed properly, the latch light on the control panel will illuminate. Check the circuit breaker switch at the bottom left of the machine. If the switch is white, the breaker has tripped.
4	The latch light does not come on when the lid is closed.	<ul style="list-style-type: none"> • Make sure that the unit has power. • Make sure the lid latch is turned completely clockwise to its stop position. The latch makes contact with a switch underneath the front top of the cabinet. If this switch is not activated, the light will not turn on and the machine will not run.
5	The run time is not set to the desired length.	<ul style="list-style-type: none"> • Check the run preset by following the instructions on page 5. If the preset is not the desired length, follow the procedure on the next page to change the run preset time.
6	The machine does not unlock after a run has completed.	<ul style="list-style-type: none"> • The lid should remain locked until the rotor has nearly come to a complete stop and then unlock for 60 seconds. If additional unlock time is needed, press the UNLOCK/STOP button with the machine plugged in and the rotor stopped. If the lid remains locked after this and will not unlock, the electronics may have been damaged. Contact Drucker Diagnostics at 814-692-7661 or 1-866-265-1486 (U.S. toll-free) for assistance. • To access the rotor chamber, follow the Emergency Rotor Chamber Entry procedure on page 9.

For servicing information or additional technical support, contact Cardinal Health.

16. Rotor Removal and Installation

To remove the rotor:

1. Unlock the centrifuge by pushing the 'OPEN / STOP' button and unlatch and open the lid.
CAUTION: Unplug the centrifuge from the electrical outlet to eliminate the possibility of electrical shock or other injury.
2. Remove the test tube holders.
3. Remove the nut in the center of the rotor by turning it counterclockwise (a tool may be required).
4. The rotor is sitting on a cone-shaped adapter. Pull the rotor up and off of this adapter.

To install the rotor:

1. Place the rotor back onto the cone-shaped adapter. You may need to turn the rotor slightly to line it up properly.
2. The rotor should slide onto the rotor cone freely.
3. Once a proper fit has been achieved, replace the nut and turn it until it is hand-tight (a tool may be required).
4. Replace the tube holders and verify that they are seated properly.
5. It is recommended that the initial setup procedures be performed to ensure that the rotor has been installed correctly and that no damage has been done to the centrifuge during either the rotor installation or possible rotor chamber cleaning.

17. Care and Preventative Maintenance

With proper care and maintenance your Cardinal Health™ Model 6F centrifuge will provide years of laboratory service. For proper care, the following steps should be taken:

1. **Always Spin Balanced Loads:** Make certain that you are always spinning a balanced load, as shown in the previous section. These centrifuges have a unique counter balanced motor mounting design which produces excellent vibration dampening. However, out-of-balance loads may break glass test tubes and may produce unsatisfactory separation results. Proper load balancing will improve sample separation and extend the life of the centrifuge.
2. **Motor and Electrical Maintenance:** The highest quality electrical components have been selected for the Model 6F centrifuges and should not need maintenance or servicing for the life of the centrifuge.
3. **Remove Accessories Before Moving:** All tube holders, samples, and caps must be removed from the rotor chamber before transporting or storing the centrifuge to prevent damage and injury.
4. **Provide Adequate Ventilation:** For cooling purposes, the Model 6F 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. The centrifuge should be placed on a hard, smooth surface for good air circulation.
5. **Keep the Tube Holders Clean: NOTE:** Always follow the safety guidelines of your laboratory to properly clean up and/or dispose of materials in the event that a substance known to be potentially toxic, radioactive or contaminated with a pathogenic microorganism is spilled in or on the centrifuge. Small glass fragments left in the tube holder after a 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 a 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.
6. **Tube Holder Replacement:** It is recommended that the tube holders be replaced after 24 months of use. Inspect tube holders regularly for cracks. If cracks are discovered, replace immediately.

18. Cleaning and Disinfection

To prolong the life of the centrifuge, cleaning and disinfection is recommended every six months, or whenever there is a spillage or tube breakage. Contaminants must be removed immediately, or corrosion and premature degradation of components can occur.

1. Unplug the centrifuge before cleaning.
2. Apply cleaning solutions with a towel or cloth. Do not submerge the centrifuge in water or other cleaning solutions as this will cause damage and void the warranty.
3. ONLY isopropyl alcohol, soap and water, or a 10% (5500 PPM) bleach solution should be used for cleaning and disinfection of the centrifuge and accessories.
4. All surfaces must be dried immediately after cleaning and disinfecting.
5. TBQ Germicidal products shall not be used, as they will cause damage to the centrifuge and void the warranty.
6. The use of fully/partially halogenated hydrocarbons, ketones, esters, ethers, benzyls, ethyl benzenes, and all other chemicals not prescribed by the manufacturer shall not be used as they may cause damage to the rotor chamber, rotor, tube holders, accessories and centrifuge exterior and void the warranty.
7. It may be necessary to remove the rotor and clean the rotor chamber. Follow the instructions in this manual to remove and reinstall the rotor.

19. Emergency Rotor Chamber Entry

In the event of power failure, it may be impossible to unlock the lid by conventional means. In this case, entry into the rotor chamber may be made by removing the latch label and using a pen to manually disengage the locking mechanism. Pull the mechanism towards the control panel and then unlatch and open the lid. If the unit is damaged, contact Cardinal Health.

20. Calibration Testing

It is recommended that the top speed be tested every two years for continued safe operation. Contact Cardinal Health for further information or testing availability.

21. Safety

The Cardinal Health™ Model 6F complies with US, Canadian, and European Safety standards.

Lid Safety Switch: The Model 6F 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 micro-switch mounted underneath the cabinet top. The lid safety switch prevents the centrifuge from operating while the lid is open. An indicator light on the front of the machine will light up when the lid has been latched properly.

Lid Safety Interlock System: In addition to the Lid Safety Switch, the Cardinal Health™ Model 6F has a true "0 RPM" lid locking system. The lid safety locking system keeps the lid locked at all times when the rotor is in motion (even during power failure). The centrifuge will not allow entry into the rotor chamber unless the centrifuge has power and the rotor is stopped. To open the lid, make sure that the centrifuge is plugged in and, with the rotor stopped, press the 'OPEN / STOP' button.

Note: After the centrifuge has started spinning, it may be possible to rotate the lid knob enough to cause the pawl to lose contact with the lid safety switch. If this happens, the centrifuge motor may lose power, but the lid will still remain locked. If the knob is accidentally moved and this situation should occur, rotate the knob fully clockwise to its stop position and the centrifuge will resume operation.

Circuit Breaker: The Cardinal Health™ Model 6F is protected with a 4 Amp circuit breaker located at the rear of the machine mounted to the base. Any electrical short circuit will cause the breaker to cut power to the machine.

22. Replacement Parts

Part	Part No.
Foot, rubber (Pack of 4)	7724037K
Switch, lid safety	7751068
Rotor, six-place, horizontal	7786061
Motor, 1/30 H.P., 115 V.A.C. permanent split capacitor	7735049
Capacitor, 4uF, 250V A.C.	7729006
Electronic timing and locking board	7717051
Circuit breaker	7751043
Power cord	7760002
Hinge, friction (Pack of 2)	7724071K
Seal, lid gasket	7732018
Universal Tube Holders, 75-100 mm (Pack of 6)	7713079K
Lid Assembly	02-002-1-0027
Front Panel Label	03-0-0003-0282

23. Available Accessories

Part	Part No.
0.5 to 1 mL Tube Adapter (Pack of 6)	7713068K
1.5 to 2 mL Tube Adapter (Pack of 6)	7713065K



FDA Listed



Distributed by:
Cardinal Health
3651 Birchwood Drive
Waukegan, IL 60085 USA
Rev. B 2023-11 • cardinalhealth.com
03-0-0002-0126(B)

© 2023 Cardinal Health. All Rights Reserved. CARDINAL HEALTH and the Cardinal Health LOGO are trademarks of Cardinal Health and may be registered in the US and/or in other countries.

OEM is Drucker Diagnostics. Protected by U.S. Patents #6,811,531, #D718,463 & #D734,489. Other Patents Pending.

03-0-0002-0126 Rev. B