



# Benchtop Centrifuge

HORIZON 6 FLEX


Instructions for Use Manual



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## 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

HORIZON is a versatile line of centrifuges designed with 3 settings to process Chemistry, Coag or Platelet Poor Plasma, and Urine specimens in the same unit. The maximum g-force of 2,000 xg makes HORIZON compatible with most brands of tubes. Cycle settings can be changed to accommodate custom settings.

This general purpose laboratory centrifuge may also be used to spin approved containers with biologics, chemicals (non-flammable, non-explosive, non-volatile, and non-highly reactive), and environmental samples.

## 3. Features

- The first three (3) cycles are conveniently pre-set and labeled for your lab's most common applications. Use the default cycles or customize them as needed.
- If desired, the control panel can be temporarily locked on one cycle for error-free reproducibility and ideal for standardization to a single spin.
- Up to 10 cycles can be programmed for time, speed, and braking and labeled with a custom name. Cycles can be programmed by g-force (RCF) rather than speed to facilitate matching validated cycles and manufacturers' IFUs.
- Lid lighting indicates the centrifuge's status (ready, running, done), informing the operator when tubes are ready for the analyzer and preventing tubes from being left in the centrifuge longer than necessary (patent pending).
- A traditional audible alert indicates the completion of the cycle. The audible alert can be muted.
- Cool-Flow design prevents overheating of samples by using ambient air to keep specimens at room temperature.
- The tube holders are fiber reinforced for high strength, durability, and years of trouble-free use.
- A clear lid permits safe observation of samples and optical calibration of speed.
- The lid safety system prevents the centrifuge from operating unless the lid is closed and latched.
- The lid safety system only allows entry into the centrifuge after the rotor has completely stopped.
- The high-power brushless motor provides years of operation with no routine maintenance.

## 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

Tube Capacity	6 tubes – 3 to 10 mL
Radius with included accessories	5 in. (12.7 cm)
Dimensions (Width x Depth x Height)	12 in. x 14 in. x 9 in. (30 cm x 36 cm x 23 cm)
Weight	12 lbs (5.4 kg)
Noise Level	64 dB
Environmental Range	16°C – 32°C
Voltage	95-253 VAC
Frequency	50/60 Hz
Power Requirement	220 Watts
Centrifuge Motor	½ H.P. Brushless
Maximum Speed	3,800 RPM (+/- 100)
Cycle Time	1 to 30 minutes (+/- 2%)

## 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).



**Important Operating Instructions:** This model centrifuge requires at least 2 tube holders inserted when attempting to run. Running the centrifuge with an empty rotor will cause a motor error and will require a power cycle to fully reset (see Troubleshooting section on Page 7).

## 8. Initial Setup

1. Unpack and verify that all the following are included:
  - a. Centrifuge
  - b. Power cord
  - c. Tube holders
  - d. Quick Start Guide
2. Set up the centrifuge on a flat and level surface. A benchtop clearance height of 21 in. (54 cm) is required to open the lid.
3. The centrifuge should have 6 in. (15 cm) of clear space around the centrifuge. Proper ventilation is necessary to prevent the overheating of samples as well as premature failure of the centrifuge. Choose an area which allows unencumbered air flow, and where the temperature remains between 16°C and 32°C.
4. No hazardous material shall be permitted in the clearance envelope during operation.
5. The operator time within the envelope shall be limited to the time necessary for loading, unloading, and centrifuge operation only.
6. Plug the line cord into the centrifuge.
7. Plug the line cord into an electrical outlet.
8. Turn on the power switch on the back of the centrifuge.
9. Be sure the electrical outlet is always accessible, as the line cord is the means of emergency disconnection.

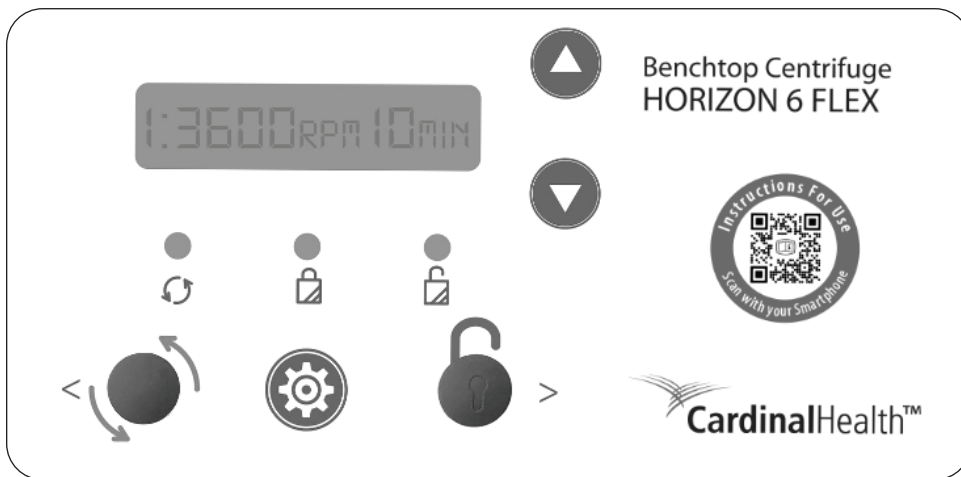
## 9. Operation

1. Place the tubes into the tube holders. Be sure to follow the rules for balanced loads as listed on page 6.
2. Close the lid and turn the lid knob clockwise to its complete stop position.
3. The digital screen shows the currently selected cycle. To select another cycle, press the UP or DOWN button in succession until the desired cycle is selected.
4. Pushing the START button on the control panel will start the spin cycle.
5. When the cycle is completed, the rotor will slow to a complete stop and the lid light will flash.
6. The unlocking mechanism will engage for 60 seconds allowing entry into the rotor chamber. To unlock after more than 60 seconds have elapsed, press the UNLOCK button. The lid will unlock for another 15 seconds.
7. Turn the lid knob counterclockwise and open the lid. The lid light will turn off.
8. You may now safely remove the samples.

## 10. Quick Start

The screen display alternates between the name of the currently selected cycle and its parameters. For convenience, the first three (3) cycles are preset for common applications and can be reprogrammed to your validated cycles:

Factory Settings			
Preset	RPM	Time	G-Force
(1) Chemistry	3,600	10	1,850
(2) Coag (PPP)	3,300	15	1,500
(3) Urine	1,900	5	500






Basic Controls		
	Start	Begins running the cycle displayed on the screen. The lid must be closed.
	Stop	Pressing the UNLOCK button during operation will terminate the run and unlock the lid after the rotor has come to a stop.
	Unlock	Allows access into the rotor chamber by engaging the unlocking mechanism. Entry is only possible when the rotor is stopped.
	Cycle Selection	Press the UP and DOWN arrows to select the desired saved cycle.







To ensure repeatability, the centrifuge can be locked either on one cycle (Single Cycle Lock) or restricted to the current saved cycles (Preset Lock). The Single Cycle Lock also prevents making changes to the parameters of the selected cycle. The Preset Lock allows selection of any saved cycle but prevents changing the parameters of saved cycles.

Single Cycle Lock		
	Lock on Single Cycle	Select desired cycle. Press and hold the UNLOCK button for 5 seconds. Two beeps will confirm that cycle selection is locked.
	Cancel Single Cycle Lock	To re-enable cycle selection, press and hold the UNLOCK button for 5 seconds. Three beeps will confirm that cycle selection is now unlocked.




### Preset Lock

	Enter the Settings Mode	Press the GEAR button.
	Lock Saved Cycles	Press and hold the UNLOCK button for 5 seconds. Two beeps will confirm that the Preset Lock is active.
	Cancel Preset Lock	With lid open and while not in Settings mode, press and hold the UNLOCK button for 5 seconds until two beeps are heard. Saved cycles can again be edited or programmed.

### Setting or Modifying a Cycle

	Cycle Selection	Press the up and down buttons next to the screen to select the desired cycle.
	Enter the Programming Mode	Press the GEAR button.
	Navigate Between Parameters	Use the left and right arrow button until the parameter to be edited is blinking and underlined.
	Change Parameter Values	To change the parameter shown on the display, use the up and down buttons next to the screen.
	Naming the Cycle	Navigate to the cycle name with the left and right arrow. Change the blinking character of the name with the up and down buttons, then move to the next character with the right arrow. Repeat.
	Save and Exit Programming Mode	Press the GEAR button. The cycle displayed on the screen will be automatically saved.

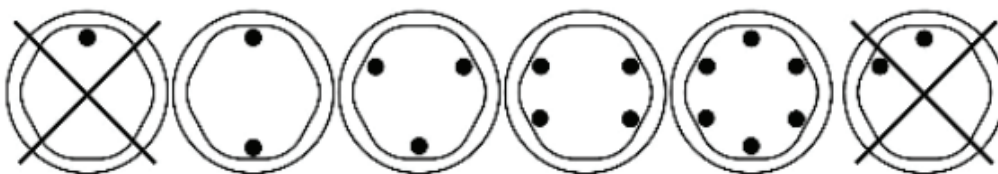
### Display Cycle Count

	Enter Settings Mode	Press the GEAR button.
	Navigate to Cycle Counter	Press the left arrow once to access the cycle counter.
	Exit Settings Mode	Press the GEAR button.

## 11. 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.



## 12. 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"><li>• Make sure nothing has fallen into the rotor chamber.</li><li>• 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).</li></ul>
2	Excessive noise when the machine is running.	<ul style="list-style-type: none"><li>• Check to see that the load is balanced.</li><li>• Make sure that nothing has fallen into the rotor chamber.</li><li>• Make sure that the screw in the center of the rotor is tight.</li></ul>
3	The centrifuge does not run.	<ul style="list-style-type: none"><li>• Check the electrical outlet.</li><li>• 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.</li></ul>
4	The latch light does not come on when the lid is closed.	<ul style="list-style-type: none"><li>• Make sure that the unit has power.</li><li>• 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.</li></ul>
5	The run time is not set to the desired length.	<ul style="list-style-type: none"><li>• Check the run preset by following the instructions on page 6. If the preset is not the desired length, follow the procedure on the same page to change the run preset time.</li></ul>
6	The machine does not unlock after a run has completed.	<ul style="list-style-type: none"><li>• 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.</li><li>• To access the rotor chamber, follow the Emergency Rotor Chamber Entry procedure below. Remove the latch label and use 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 Customer Service for assistance.</li></ul>

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

## 13. Care and Preventative Maintenance

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

- 1. Provide Adequate Ventilation:** For cooling purposes, the Cardinal Health™ HORIZON 6 Flex 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.
- 2. Always Spin Balanced Loads:** Make certain that you are always spinning a balanced load. The Cardinal Health™ HORIZON 6 Flex has a unique counter balanced motor mounting design which, along with its rubber suction feet, 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. Refer to page 6 for additional information on balancing the load.
- 3. 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. Insert a new tube cushion (if necessary) and replace the tube holder in the rotor.



4. **Motor and Electrical Maintenance:** The Cardinal Health™ HORIZON 6 Flex uses a brushless DC motor. It should not need servicing for the life of the centrifuge. The electrical components are selected for high reliability and should not need service.
5. **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.
6. **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.

## 14. 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. Before using any cleaning or decontamination methods except those recommended by the manufacturer, users should check with the manufacturer that the proposed method will not damage the equipment.

1. Unplug the centrifuge before cleaning.
2. Use appropriate personal protective equipment (PPE).
3. 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.
4. 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.
5. All surfaces must be dried immediately after cleaning and disinfecting.
6. TBQ Germicidal products shall not be used, as they will cause damage to the centrifuge and void the warranty.
7. 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.

## 15. Replacement Parts

Part	Part No.
Foot, rubber (Pack of 4)	7724037K
Rotor, six-place, Horizontal	7786067
Motor Assembly	02-005-1-0005
Capacitor, 5uF, 250V A.C.	7729009
Electronic timing and locking board	02-006-0-0019
Circuit Breaker	7751043
Power cord	7760006
Switch & Power Input Assembly	02-004-0-0013
Lid Assembly	02-002-1-0027
Hinge, friction (Pack of 2)	7724071K
Seal, lid gasket	02-002-1-0056
Open/Close Label	03-0-0003-0332
75-100 mm Tube Holder, Blue (Pack of 6)	7713079K
Lid LED Assembly	02-002-1-0112K
Horizon 6 Flex Front Panel Label	03-0-0003-0564
6 Series Soft Button Replacement Kit	00-100-100-009



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Distributed by:

**Cardinal Health**

3651 Birchwood Drive  
Waukegan, IL 60085 USA

Rev. C 2023-12 • [cardinalhealth.com](http://cardinalhealth.com)  
03-0-0002-0188(C)

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03-0-0002-0188 Rev. C