



Benchtop Centrifuge

HORIZON 24 FLEX


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. Initial Setup	4
9. Operation	4
10. Quick Start.....	5
11. Balanced Loads	8
12. Troubleshooting	9
13. Care and Preventative Maintenance	9
14. Cleaning and Disinfection.....	10
15. Replacement Parts.....	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

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 settings can be customized.
- A time and speed/g-force can be quickly entered for a single use cycle. The cycle will not be retained in memory.
- If desired, the control panel can be temporarily locked on one cycle, ideal for standardization to a single spin.
- A Preset Lock can be turned on to prevent changes from being made accidentally to programmed cycles.
- 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) or speed (RPM) to facilitate matching validated cycles and tube manufacturers' IFUs.
- A digital cycle counter tracks the number of cycles the centrifuge has run.
- 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	24 tubes – 3 to 10 mL 12 tubes – 15 mL 6 tubes – 50 mL
Radius with included accessories	6 in. (15.3 cm)
Dimensions (Width x Depth x Height)	15 in. x 17 in. x 9 in. (38 cm x 43 cm x 23 cm)
Weight	31 lbs (14.1 kg)
Noise Level	59 dB
Environmental Range	16°C – 32°C
Voltage	95-253 VAC
Frequency	50/60 Hz
Power Requirement	280 Watts
Centrifuge Motor	½ H.P. Brushless
Maximum Speed	3,400 RPM (+/- 100)
Cycle Time	.5 to 99 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).

8. Initial Setup

1. Unpack and verify that all the following are included:
 - a. Centrifuge
 - b. Power cord
 - c. Tube holders: 4-Place buckets
 - 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.

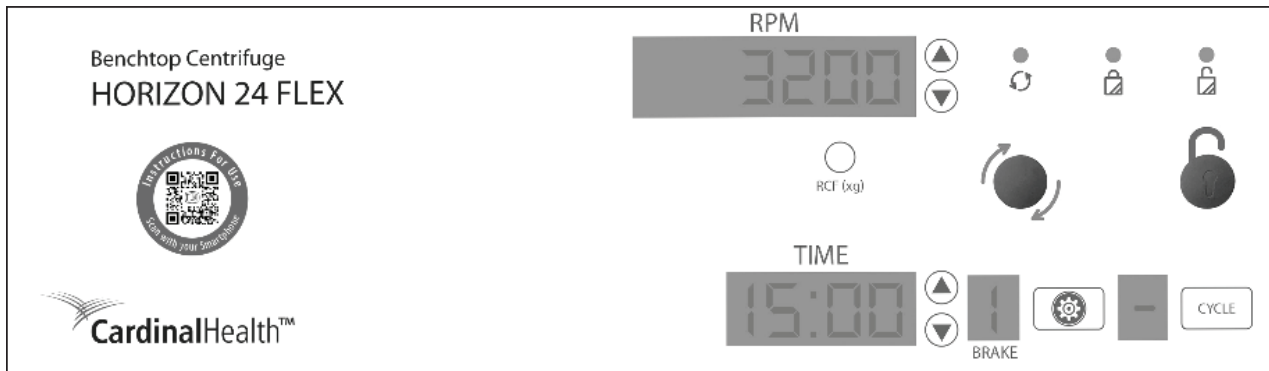
9. Operation

1. Place the tubes into the tube holders. Be sure to follow the rules for balanced loads as listed on page 8.
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 top (RPM) screen display alternates between the name of the currently selected speed. The bottom (TIME) screen displays the time setting. For convenience, the first few cycles are preset as shown and can be reprogrammed to your validated cycles:

Factory Settings			
Preset	RPM	Time	G-Force
(1) Chemistry	3,300	10	1,800
(2) Coag (PPP)	3,000	15	1,500
(3) Urine	1,700	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 CYCLE button to select the desired saved cycle.




Quick Adjust Time and Speed

	Setting Speed	To change the speed (RPM) shown on the top display, use the up and down buttons next to that screen. The CYCLE number is replaced with a "--" in the display, and the top screen displays the speed.
	Setting by G-Force	Press and hold the RCF (xg) button while changing the displayed setting on the top screen, using the up and down buttons next to it. The RPM will automatically adjust.
	Setting Time	Press the up and down buttons next to the TIME display.



Adjusting the Brake Setting

	Enter the Advanced Menu	Press the GEAR button to enter the advanced menu.
	Change Brake Values	While in the advanced menu, navigate to "Brake". Use the UP and DOWN buttons next to the TIME screen to adjust brake to desired value between 0 (no brake applied) and 9 (maximum braking force applied).
	Exit the Menu	Press the GEAR button.


Changing The Audible Beeper

	Enter the Advanced Menu	Press the GEAR button to enter the advanced menu.
	Turn Beeper on or Off	While in the advanced menu, navigate to "Beeper". Switch ON or OFF with the UP and DOWN buttons next to the TIME display. This setting will apply to all cycles.
	Exit the Menu	Press the GEAR button.




Create New Cycle

	Change Settings	Refer to Quick Adjust Time and Speed table to change speed and time to desired values.
	Save Cycle	Hold the CYCLE button until you hear a double beep.




Display Cycle Count

	Display Cycle Count	With the lid open and the unit powered, press and hold the START button. The cycle count will be displayed until the START button is released.
---	---------------------	--












Deleting a Cycle

	Enter the Advanced Menu	With the desired cycle selected, access the menu and enter the advanced menu.
	Navigate to Delete	Using the UP and DOWN buttons, navigate to DELETE. Exit the menu. CYCLE WILL BE DELETED IF MENU IS EXITED WITH DELETE SELECTED.
	Confirm Deletion	Press the CYCLE button to Delete the cycle.

Cycle Lock

	Enter Single Cycle Mode	Select desired cycle. With lid open, press and hold the UNLOCK button. Two beeps will confirm that cycle selection is locked.
	Enter Presets Only Mode	Continue holding the UNLOCK button to enter Presets Only mode. One beep will confirm that cycle selection is now locked. NOTE: If Single Cycle Mode is set, it must be canceled before Presets Only Mode can be set.
	Cancel All Cycle Locks	Hold the UNLOCK button. Three beeps will confirm that the cycle selection is now unlocked.

Modifying a Preset

	Select Preset Setting	Press the CYCLE button to select the Preset Setting you would like to modify.
	Access the Menu	Hold the CYCLE button until you hear a double beep. The cycle number should begin flashing.
 RCF (xg)	Setting by G-Force (Recommended)	Press and hold the RCF (xg) button while changing the setting, using the UP and DOWN buttons next to the display. The RPM will automatically adjust.
	Setting Speed (Alternate)	To change the speed (RPM), use the UP and DOWN buttons next to the display. The g-force will adjust automatically and can be verified by pressing the RCF button.
	Setting Time	Press the UP and DOWN buttons next to the TIME display.
	Enter the Advanced Menu	Press the GEAR button to enter the advanced menu.
	Change Brake Values	While in the advanced menu, navigate to "Brake". Use the UP and DOWN buttons next to the TIME screen to turn brake on and off.
	Turn Beeper On or Off	While in the advanced menu, navigate to "Beeper". Switch ON or OFF with the UP and DOWN buttons next to the TIME display. This setting will apply to all cycles.
	Naming the Cycle	While in the advanced menu, navigate to the cycle name with the UP and DOWN arrows. Press the START button. The * indicates the space selected. Use the UP and DOWN buttons to change characters, then move to the next space with the right arrow >. Press the GEAR button to return to the main programming menu.
 	Save and Exit Settings Mode	Press the GEAR button, followed by the CYCLE button to exit the menu.

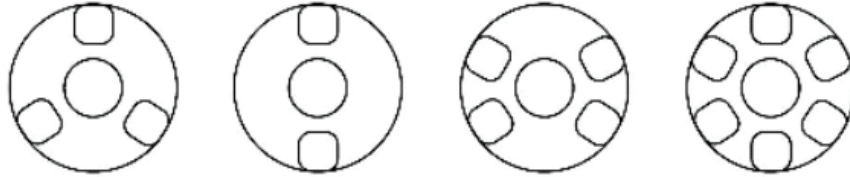
11. Balanced Loads

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.

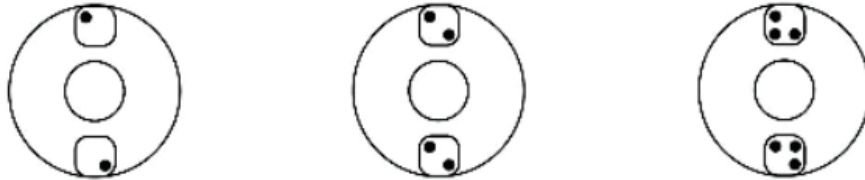
1. Opposing tube holders must be equally loaded or empty or loaded with equally weighted samples.
2. When loading only 3 tubes, they must be of equal weight.

Buckets can be placed around the rotor in any of the rotor loading configurations shown below. Each bucket must be loaded symmetrically with tubes.

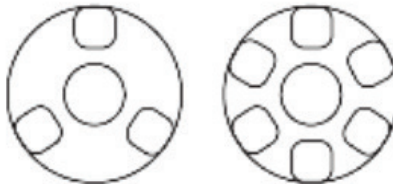
Balanced Rotor Loading



Proper Bucket Loading



15 mL / 125 mm tubes may be spun in the standard HORIZON 24 Flex buckets, but must be loaded as follows:



When three buckets are being used, each bucket must be loaded symmetrically in any configuration below:



When all six buckets are being used, the rotor must be loaded in the following configuration only. Opposing buckets do not need to be filled but must be loaded in exactly the same way.



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"> • 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 the screw in the center of the rotor is tight. • Verify that all four centrifuge feet are properly seated on a flat surface. • Wearing PPE, remove tubes and tube holders/buckets and look for fallen objects or debris. Carefully reach inside the rotor chamber with a tool to remove them. • Inspect the rotor, tube holders or buckets for damage. If the tube holders or buckets have any damage, even slight, safely dispose of them and replace. • If the rotor appears damaged, contact Customer Service for further assistance.
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.
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. <p>If this switch is not activated, the light will not turn on and the machine will not run.</p>
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 same 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 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. <p>If the unit is damaged, contact Customer Service for assistance.</p>

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

13. Care and Preventative Maintenance

With proper care and maintenance your Cardinal Health™ HORIZON 24 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 24 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 24 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 8 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 24 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 2)	7728052K
Lid Tray Assembly	02-002-1-0044
Motor Assembly	03-1-0006-0008
PC Board	02-006-0-0021
Power cord	7760006
Power Supply, 350W	03-1-0005-0193
Lid Assembly	02-002-1-0037
Kit, Hinge (Pack of 2)	7724071K
Seal, lid gasket	02-002-1-0058
Open/Close Label	03-0-0003-0332
Kit, 4PI Carrier Assembly (Pack of 6)	7713023K
Lid LED Assembly	02-006-1-0066K
Horizon 24 Flex Front Panel Label	03-0-0003-0565
12/24 Series Soft Button & Spacer Replacement Kit	00-100-100-010
Replacement Grommet & Bushing Kit	00-100-100-005



FDA Listed



Distributed by:

Cardinal Health

3651 Birchwood Drive
Waukegan, IL 60085 USA

Rev. C 2023-11 • cardinalhealth.com
03-0-0002-0187(C)

© 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.

03-0-0002-0187 Rev. C