

CardinalHealth™

# Benchtop Centrifuge


SERO 12

Instructions for Use Manual



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

The Cardinal Health™ SERO 12 is a compact, highly versatile centrifuge for use in blood banks and clinical laboratories. It is specifically designed to minimize centrifugation time and simplify many basic test procedures, such as blood typing, manual cell washing, cross-matching, genotyping, Coombs testing, and Anti-Rh titers.

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.

- 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.
- 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 and 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.

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

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

The Cardinal Health™ SERO 12 has been designed to facilitate blood testing procedures involving centrifugation, incubation, and cell washing with minimal tube handling. Many procedures can be performed entirely without removing tubes from the centrifuge rotor, thus reducing the possibility of errors in transferring tubes. The following notes on use of the SERO 12 are intended to set practical guidelines for the technologist. When possible, refer to the manufacturer’s I.F.U.

**Agglutination Tests**

Whenever possible, it is important that the anti-serum manufacturer’s instructions be followed on recommended time periods for centrifuging cells with their sera in the SERO 12.

**NOTE:** It is recommended that the optimum centrifugation period be determined by controlled reactions using known cells. This method is the easiest way to determine time necessary to produce the desired tightness of agglutination.

## Incubation

Many blood testing procedures require incubation at 37°C before and after centrifugation. The SERO 12 rotor has been designed to allow the incubation of these reactions without removing the tubes. You may lower the entire rotor into a water bath for the test being performed. When the rotor is removed, water will drain through the perforations in its base. Allow the water to drain completely prior to transporting tubes.

## Cell Washing

The SERO 12 rotor may be conveniently used for many tests that require single or multiple blood cell washings. Because the tubes are maintained at an angle of 45° during centrifugation, the centrifuge is highly efficient in washing cells. The cells are deposited quickly after sliding down the angled tubes.

After the button is formed, the supernatant solution can be readily poured off all tubes simultaneously. This is done by removing the rotor from the drive spindle immediately after it stops spinning, placing the retainer ring around the tubes, and inverting the rotor.



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).



"Universal precautions"<sup>1</sup> should be followed in handling all items contaminated with blood or other bodily fluids.

<sup>1</sup> Recommendations for Prevention of HIV Transmission in Health Care Settings. MMWR 1987; 36 (Supplement #2S)

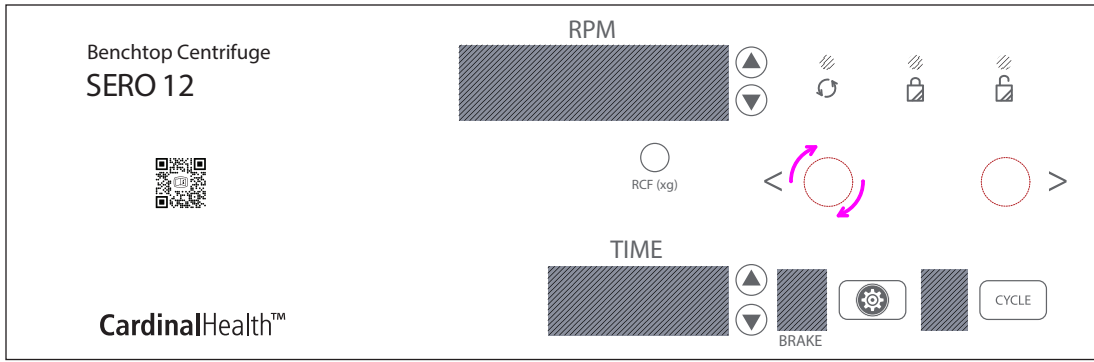
1. Unpack and verify that all of the following are included:
  - a. Centrifuge
  - b. Power cord
  - c. Quick Start Guide
2. Set up the centrifuge on a flat and level surface. A benchtop clearance height of 21 in. (54 cm) is required to open the lid.

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.
- 
1. Place the tubes into the rotor. Be sure to follow the rules for balanced loads as listed on page 7.
  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 starts 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.

Tube Capacity	6 capped tubes, 13 x 75 mm 12 uncapped tubes, 13 x 75 mm
Radius with included accessories	2.8 in. (7.1 cm)
Dimensions (Width x Depth x Height)	13 in. x 15 in. x 9 in. (33 cm x 38 cm x 23 cm)
Weight	27 lbs (12.3 kg)
Noise Level	61 dB
Environmental Range	16°C – 32°C
Voltage	100-240 VAC (± 10%)
Frequency	50/60 Hz
Power Requirement	415 Watts
Centrifuge Motor	½ H.P. Brushless
Maximum Speed	3,600 RPM
Max Cycle Time	99 minutes and 45 seconds
Min Cycle Time	15 seconds

The LED indicator light is on for the cycle currently selected:

Preset	RPM	Time	G-Force
	3,600	15 sec	1,040






	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.




	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.




	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.







	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.





	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	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.
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	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.

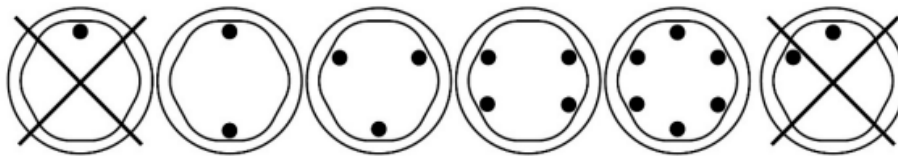
	Enter Single Cycle Mode	Prevents making changes to the single selected cycle parameter. With the lid open, select the cycle you wish to lock, then press and hold the UNLOCK button. Two beeps will confirm that cycle selection is locked.
	Enter Presets Only Mode	Allows selection of any saved cycle and prevents changing the parameters of the saved cycles. With the Lid Open, hold the UNLOCK button to enter Preset Lock. One beep will confirm that the cycle selection is now locked. Select desired cycle. NOTE: If Single Cycle Lock 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.

	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.
	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.

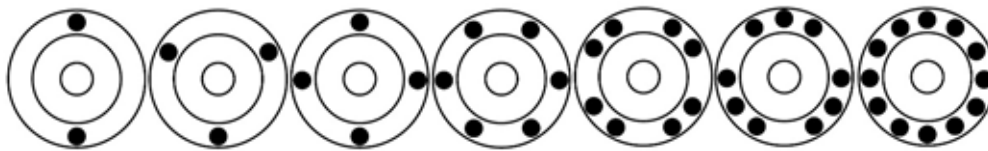
	Change Brake Values	While in the advanced menu, navigate to "Brake". Use the UP and DOWN buttons next to the TIME screen to turn brake on and off.
	Turn Beeper On or Off	While in the advanced menu, navigate to "Beeper". Switch ON or OFF with the UP and DOWN buttons next to the TIME display. This setting 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.

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.

#### 6 Tubes



#### 12 Tubes



With proper care and maintenance your Cardinal Health™ SERO 12 centrifuge will provide years of laboratory service. For proper care, the following steps should be taken:

- Always Spin Balanced Loads:** Make certain that you are always spinning a balanced load. The Cardinal Health™ SERO 12 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 7 for additional information on balancing the load.
- Motor and Electrical Maintenance:** The Cardinal Health™ SERO 12 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.



**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.

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.

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

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.</li> </ul> <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"> <li>• 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.</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, 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.

Foot, rubber (Pack of 4)	7724177K
Lid Tray Assembly	02-002-1-0044
12 Place Rotor Assembly	420545
6 Place, 100 mm Rotor Assembly	420526
Motor Assembly	03-1-0006-0008
PC Board	02-006-0-0021
Power cord	7760006
Power Supply, 350W	03-1-0005-0193
Lid Assembly	02-002-1-0041
Hinge, friction (Pack of 2)	7724071K
Seal, lid gasket	02-002-1-0057
Open/Close Label	03-0-0003-0332
Lid LED Assembly, Red	02-006-1-0066K
SERO 12 Front Panel Label	03-0-0003-0577
12/24 Series Soft Button & Spacer Replacement Kit	00-100-100-010
Replacement Grommet & Bushing Kit	00-100-100-005



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