

**G-Force** and **Spin Time** are the most important considerations for proper fluid separations. G-force is a function of radius and speed, and varies with different centrifuges and rotor configurations. The following are commonly recommended separation settings. Please refer to your tube manufacturer and/or medical procedures manuals for the correct G-force and spin times for each fluid, tube type, and procedure.

- Blood** 3,000+ rpms (1,500+ g) 10 min.
  - Urine** 1,600 rpms (400 g) 5 to 10 min.
  - Semen** 1,600 rpms (400 g) 10 min.
  - Fecals** 1,300 rpms (280 g) 6 min.
- After spinning, allow fecal tubes to sit for an additional 10 minutes before removing the coverslip to allow eggs to adhere better to the coverslip.
- G-Force = 1.118 (R) (N/1,000)<sup>2</sup>**  
*R: radius in millimeters N: rpm's*

### Specifications

Speed Range: 800-5,000 rpm's  
 Max Force: 4,053 g  
 Max Volume: 120 ml  
 Fuse: 5 amp / 250 v  
 Motor: Brushless DC  
 Height: 14.25" (362 mm)  
 Length: 15.5" (394 mm)  
 Width: 13.75" (350 mm)  
 Weight: 38.2 lb (17.3 kg)

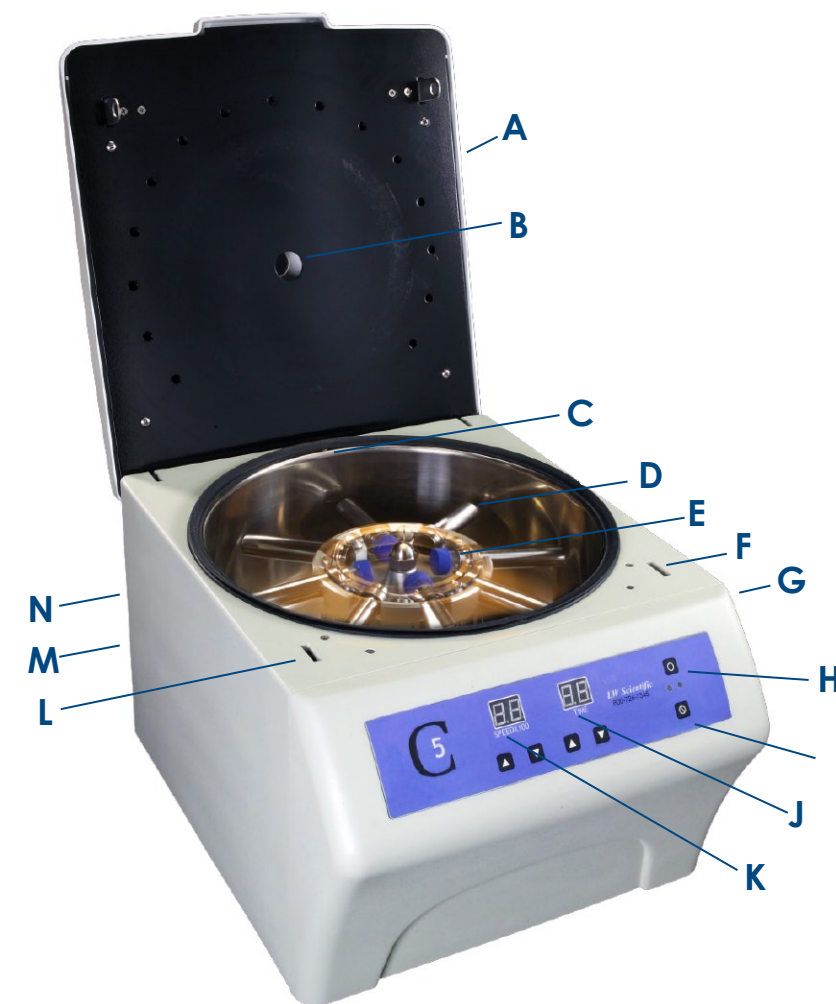
**Blood** can be separated at G-forces between 1,200 and 4,000 G's, and at spin times between 2 minutes and 15 minutes depending upon tube type and procedure. Common routine blood separations are performed at 1,500-2,000 G's for 10 minutes (3,000-4,000 rpms), and platelet-poor plasma separations are done at 4,000 G's in 6-8 minutes (5,000 rpms).

**Warning:** Some types of tubes cannot withstand the high G-forces produced at full speed in the C-5, and tube breakage may result from improper speed settings.

RPM's	G-Forces:			
	No Cushions (145mm radius)	15mm Cushions (130mm radius)	25mm Cushions (120mm radius)	40mm Cushions (105mm radius)
1,000	G-Force 162	G-Force 145	G-Force 134	G-Force 117
1,300	Fecals 274	G-Force 246	G-Force 227	G-Force 198
1,600	Urine / Semen 415	G-Force 372	G-Force 343	G-Force 301
1,800	G-Force 525	G-Force 471	G-Force 435	G-Force 380
2,000	G-Force 648	G-Force 581	G-Force 537	G-Force 470
2,500	G-Force 1,013	G-Force 908	G-Force 839	G-Force 734
3,000	G-Force 1,459	G-Force 1,308	G-Force 1,207	G-Force 1,057
3,500	G-Force 1,986	G-Force 1,780	G-Force 1,643	G-Force 1,438
4,000	Blood 2,594	G-Force 2,325	G-Force 2,147	G-Force 1,878
4,500	G-Force 3,283	G-Force 2,943	G-Force 2,717	G-Force 2,377
5,000	G-Force 4,053	G-Force 3,634	G-Force 3,354	G-Force 2,935



Model pictured:  
**C-5 Centrifuge**  
*Not all features available on all models - see back page for model specifications.*



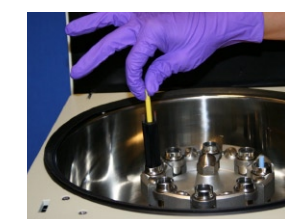
- A** Lid
- B** Small Window for Calibration
- C** Bowl
- D** Tube Shield
- E** Rotor
- F** Zero-rpm Lid Lock
- G** Manual Lid Lock Override
- H** On / Run Button
- I** Off / Open-Lid Button
- J** Digital Timer
- K** Digital Tachometer
- L** Lid-closed safety switch
- M** 5amp Fuse
- N** On / Off Switch (on rear)

### Warranty

The C-5 is covered by a limited 1-year warranty on parts and labor from date of purchase. If there is any indication of a problem, **DO NOT OPERATE** the centrifuge until you have contacted LW Scientific. Operating the unit after noticing a problem could compound a simple problem and cause an unnecessary expense to the owner. LW Scientific support staff will trouble shoot problems over the phone, and attempt to solve problems in the most expedient manner. This may include sending parts that can easily be installed by the user, or directing the user through a simple adjustment to the unit. Making repairs to the unit without authorization from LW Scientific will void the warranty. If the centrifuge must be shipped in for repair, LW Scientific will issue a Return Merchandise Authorization (RMA) number. You will need to provide the serial number and have either a warranty card on file at LW Scientific, or proof of purchase.



50ml Rotor



Crit-Carrier LW-CC8



Tube Shields and Cushions

**Recommended Upgrades:**

Ask your authorized LWS dealer about additional accessories

## Introduction

The **C-Series** is available in two models: **C-5** and **C-3 Select**. Both models feature an 8-place horizontal swing-out rotor.

The **C-3 Select** is the economical choice for routine blood, urine, semen and fecal separations at precalibrated speeds up to 3,000 rpm (1,500 g). This unit features a mechanical 30-minute timer and a SELECTABLE speed control dial. Maximum tube size is 130mm long by 17mm diameter (15ml size).

The **C-5 model** is the premium choice with programmable / digital controls and variable speeds up to 5,000 rpm (4,000g), which produces platelet-poor-plasma in minutes. Simply program the time and speed, and touch the start button. Maximum tube size is 128mm long by 16.5mm diameter (15ml size).

## Unpacking and Set up

- 1 LW Scientific packs each C-5 centrifuge with utmost care. All units undergo a QC check prior to shipping from Lawrenceville, GA to ensure proper operation. Examine the outer and inner containers for any visible damage, and retain the packing material. If there is visible damage, please contact the shipper or your distributor, as our warranty does not cover shipping damage.
- 2 Remove the centrifuge from the shipping container and inspect for possible shipping damage. **DO NOT OPERATE THE CENTRIFUGE AT THIS POINT.**
- 3 Read and complete the warranty card and return the address portion via mail or fax to LW Scientific. The warranty card documents your purchase. Failure to return the warranty card may void any warranty claims on the unit.
- 4 Place the centrifuge on a sturdy, level surface. Plug the power cord into the appropriate power outlet.
- 5 Turn the power on with the on/off switch on the back of the unit. **DO NOT OPERATE THE CENTRIFUGE AT THIS POINT.**
- 6 The lid on the C-5 remains locked while at rest and while spinning. To release the lid while at rest push the **OPEN** or **OFF** button, which will unlock the lid for 7-10 seconds. After 10 seconds, the lid will relock. If power fails, the lid can be manually opened by inserting a narrow rod into the release hole on the front right side of the unit.
- 7 Inspect the chamber. Remove all packing material from the chamber, install the rotor (see insert instruction page) and ensure that all the tube shields are in place. Make sure that no tube shields or tube cushions other pieces have fallen loose into the bowl. Make sure that the rotor nut is tight. **DO NOT OPERATE THE CENTRIFUGE AT THIS POINT.**
- 8 Eight tube cushions are also included with your C-5 to accommodate smaller tubes. Additional tube cushions are available in 15mm (TC-15MM), 25mm (TC-25MM), and 40mm (TC-40MM) sizes. Make sure that all shields and cushions are balanced on the rotor at all times. Proceed to "Operation".

## Troubleshooting

<b>No power:</b>	Plug into another outlet. Check the fuse (fuse filament should be visible).
<b>Wobbles and shakes:</b>	Remove all tube shields and clean them out. Check for cushions or dried fluids.
<b>Makes excessive noise:</b>	Tighten rotor nut. Ensure rubber gasket is in place between bowl and motor.
<b>Breaking tubes:</b>	Turn the speed down. Check your tube limits. Discard old tubes and try new ones.
<b>Lid won't open:</b>	If power fails, you must override the lid-lock by pushing a pin or screwdriver into the hole in the side of the unit to manually press the lock pin back while pulling upward on the lid.

## Operation

- 1 Do not insert test tubes at this time. Close the lid, and set the speed to "10" (1,000 rpms) and the time to "5" minutes.
- 2 Start the unit. The unit should come up to speed with a smooth sound and little or no vibration. If there is excessive vibration or noise, shut off the unit immediately and contact LW Scientific.
- 3 Now turn the speed up to the highest setting of "50", and check for smooth sound and little vibration. If there is excessive vibration or noise, shut off the unit immediately and contact LW Scientific.

**The unit is now ready to be loaded.**

- 4 **ALWAYS BALANCE THE LOAD.** Be certain to balance tubes of equal weight across from each other on the rotor. You can only balance 2, 4, 6, or 8 tubes at a time on an 8-place rotor. If you need to spin only one tube, you must use another tube filled with water to balance the rotor. **When spinning fecals, use the same fecal solution in the balance tube, because water is much lighter than the dense fecal solutions (see Fecal Hints insert).** Proper balancing will improve sample separation and will extend the life of the centrifuge. Spinning out-of-balance loads may break tubes, and can cause damage to the unit which *will not be covered under warranty*.
- 5 **ALWAYS MAKE SURE TUBES ARE SUPPORTED FROM THE BOTTOM.** Never allow a tube to hang by its cap on the rim of the tube shield. When the unit reaches high speed, the stopper top will pop off and the tube will break as it hits the bottom of the shield. The cap may also cause damage inside the bowl. *Damage due to improper loading will not be covered under warranty.*
- 6 **KNOW THE G-FORCE LIMITS OF YOUR TUBES.** The C-5 at full speed will produce enough g-force to break some lowcost types of tubes. Be certain that you are not exceeding the recommended g-forces for the brand of tubes that you use.
- 7 **NEVER FORCE A TUBE INTO THE SHIELDS.** Tubes should fit easily into and out of the tube shield. Make sure the tubes do not exceed the length limits listed in the "Introduction", or the tubes may hit the top of the lid and break upon start-up.
- 8 Select the desired speed and time and start the centrifuge. The C-5 cannot be opened while the rotor is turning.
- 9 Once the unit has completed the spin and come to a complete stop, the bell will ring. The lid will remain unlocked for 7-10 seconds, then relock for safety. To unlock later, simply push the **OPEN** or **OFF** button.

## Care and Maintenance

With proper care and maintenance, your C-5 centrifuge will provide years of laboratory service. Please follow these guidelines:

- 1 Use only high quality test tubes. Lower quality or inexpensive glass or plastic tubes may fracture and release their contents into the tube chamber. Make sure you know the maximum force allowed for the tubes you are spinning.
- 2 Never force a tube into the tube shield. The tube shields and cushions were designed to accommodate most common sizes of tubes. Custom sizes of the tube cushions are available from LW Scientific for odd tube sizes.
- 3 Keep the tube shields clean. If a tube breaks inside a shield, clean all the debris from the shield and bowl and disinfect.
- 4 Motor and electrical maintenance: The C-5 uses a maintenance-free brushless motor and its bearings are permanently lubricated. It should not need servicing for the life of the unit. Likewise, the electrical components were designed for high reliability and should not need regular service. However, if repairs are needed, please contact LW Scientific.

