



- A** Lid
- B** ON/OFF Switch (DC Power Jack)
- C** Run Button
- D** Stop/Open Button
- E** Speed Setting
- F** Time Setting
- G** Emergency Release Hole
- H** Lid Latch

Introduction

The Universal Centrifuge from LW Scientific is the perfect solution for both laboratories and doctors' offices. This newest member of our USA centrifuge initiative features a ZERO-RPM locking lid for safety and digital programming of time ranging from 1-99 minutes and speed ranging from 500-3400rpm. Achieve up to 1550g with the fixed-angle rotor or 1809g with the swing-out rotor, resulting in clean, easy to read lines of separation. The LWS Universal centrifuge has a DC motor and comes with a 110-220v auto-switching power supply.

Maximum test-tube size for the **8-place fixed-angle rotor** is 122mm tall and 17.5mm wide if spinning 8 tubes (full load), and 131mm tall and 17.5mm wide if spinning 4 tubes (every other position).

Maximum test-tube size for the **6-place swing-out rotor** is 131mm tall and 17.5mm wide if spinning 6 tubes.

Maximum micro-tube size for the **40-place micro-tube rotor** is 11mm wide (at the collar) and 50mm tall.

Maximum 50ml tube size for the **4-place 50ml rotor** is 30mm wide and 120mm tall.

Warranty

LW Scientific instruments have a one (1) year limited warranty. This warranty is not valid on normal wear and tear, cosmetic damages caused by chemicals, solvents, and/or cleaning solutions, as well as acts of God.

Please register your product online at: www.lwscientific.com/warranty_form.

Important: Warranty information must be completed within 30 days of purchase. Failure to fill out the warranty form may void any warranty claims on the unit.

Installation & Setup

- 1 LW Scientific packs each Universal centrifuge with utmost care. All units undergo a QC check prior to shipping from LW Scientific headquarters in 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 Place the centrifuge on a sturdy, level surface. Plug the power cord into the appropriate power outlet.
 - 4 Turn the power on with the on/off switch on the back of the unit. The power light and digital display should light up. **DO NOT OPERATE THE CENTRIFUGE AT THIS POINT.**
 - 5 The latch of the Universal centrifuge may be locked while at rest. To open a locked lid, please do the following:
 - a. Push the Stop/Open button
 - b. Gently turn the lid latch counterclockwise to the UNLOCK position.
 - c. If the latch is not rotated to the UNLOCK position within a few seconds of pushing the Stop/Open button, the lid will relock and steps a-b must be repeated.
- ATTENTION:** When the proper sequence is followed, your centrifuge lid will open easily. Do not force the lid latch into position, as this may cause breakage of the lid latch mechanism.
- 6 If power fails when using the unit, see instructions under Troubleshooting (below).
 - 7 Inspect the rotor chamber. Install all the tube shields in the rotor. Make sure that no loose debris is in the bowl. Make sure that the rotor screw is tight using a #2 Phillips screwdriver. **DO NOT OPERATE THE CENTRIFUGE AT THIS POINT.**

Operation

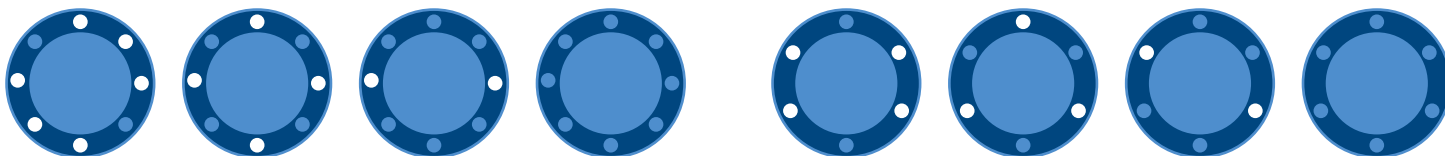
- 1 Do not insert test tubes at this time. Close the lid and turn the latch clockwise to the LOCK position. The latch of the Universal must remain in the locked position (maximum clockwise rotation) while spinning. Set the speed to "10" (1,000rpm) and the time to "5" minutes using the up and down buttons on the front label.
- 2 Start the unit by pressing the RUN button. 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, check the troubleshooting tips, and contact LW Scientific if not resolved.
- 3 Once the unit completes a cycle, the lid will automatically unlock. The lid is designed to open only after the speed has reached 0 rpm. Open the lid by gently turning the latch counterclockwise to the UNLOCK position and then lifting the lid. If the latch is not rotated to the UNLOCK position promptly, the lid will relock. If that occurs, follow instructions in Step 6 under Installation and Setup (above). Again, do not force the lid latch into position, as this may cause breakage of the lid latch mechanism.

CAUTION: Do not attempt to open the unit while spinning.

- 4 Now turn the speed up to the highest setting of "34," 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.
- 5 **ALWAYS BALANCE THE LOAD.** Be certain to balance tubes of equal weight across from each other on the rotor. If you need to spin only one tube, you must use another tube filled with similarly equal fluid (or water) to balance the rotor. 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.

8-Place, Fixed-Angle Rotor Balance Options:

6-Place, Swing-Out Rotor Balance Options:



- 6 **ALWAYS MAKE SURE TUBES ARE SUPPORTED FROM THE BOTTOM**, using proper tube shields and/or tube inserts. Never allow a tube to hang by its cap on the rim of the tube shield, which can cause the stopper top to pop off and the tube to 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.
- 7 **KNOW THE G-FORCE LIMITS OF YOUR TUBES.** The Universal at full speed will produce enough g-force to break some tubes. Be certain that you are not exceeding the recommended g-forces for the brand of tubes that you are using.
- 8 **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 interfere with each other.
- 9 Once loaded, select the desired speed and time and start the centrifuge. The Universal cannot be opened while the rotor is turning without interrupting the cycle.
- 10 Once the unit has completed the cycle and come to a complete stop, an audible BEEP will sound. The latch can now be turned counter-clockwise to open the lid.

IMPORTANT: Time and speed values from the previous 4 cycles are automatically saved into memory. To recall previous values, press the **STOP/OPEN** button while the lid is open. This convenient feature will save time when switching between processes.

WARNING: Always ensure rotor is secure before each use!

Troubleshooting

No Power: Plug into another outlet.

Wobbles and Shakes: Remove all tube shields, and clean them out. Check for tube inserts or dried fluids in tubes. Test run without test tubes or tube shields in place.

Makes Excessive Noise: Tighten rotor screw.

Breaking Tubes: Turn the speed down. Check your tube limits. Discard old tubes and try new ones.

Lid Will Not Open: If the unit has power, follow Step 6 under **Installation and Setup** to unlock your unit. In the event of power failure, override the lid lock mechanism by pushing the supplied Manual Release Tool or a small screwdriver into the hole in the top of the unit marked as EMERGENCY RELEASE to manually disengage the lock. Gently turn the lid latch counterclockwise to the UNLOCK position. Partway through the turn, you must lift the release tool or screwdriver out of the hole so the latch can complete its rotation.

CAUTION: Do not open with the manual release tool while the unit is running.

Care and Maintenance

- 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 were design to accommodate most common sizes of tubes.
- 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 If a large amount of fluid has spilled inside the unit, carefully remove the tube shields and rotor and clean the inside of the rotor chamber and the top of the motor.

*The horizontal metal rotor and tube shields can be autoclaved.

Because of the safety issues with high g-forces in a centrifuge, it is recommended that rotors be inspected every 6 months for corrosion and fatigue. If there is any indication of wear, the rotor should be removed from service. Contact LW Scientific for return instructions, so the rotor can be evaluated by an LW Scientific technician for repair or replacement. It is also recommended that after 2 years of service rotors and tube shields* be returned to LW Scientific for inspection. Following these procedures will ensure safety of lab personnel as well as extend the life of the centrifuge.

***NOTE:** Plastic tube shields should be replaced at least once a year. Tube shields should be inspected once a month for wear or damage. Tubes that are being used in high volume applications should be replaced every three months or sooner.

Specifications

Fluid Recommendations:

	Speed	Time
Whole Blood	3400	10 min.
Urine	1800	5-10 min.

Nominal Speed:	500-3400 rpm
Fuse:	10A
Height:	9.9in
Width:	14.9in
Depth:	14.5in
Weight:	12lbs
Boxed Dims:	16x16x12in
Boxed Weight:	17lbs

LED Display Definitions:

Green LED ON:
Lid is locked / Ready for cycle

Green LED blinking quickly RED LED ON:
Unit accelerating

Green LED blinking slowly RED LED ON:
Unit at operating speed

Red LED blinking/display is "00":
Lid locked / Cycle complete

G-Force with Fixed Rotor:

RCF (g's)	Radius (mm)	RPM
31	112	500
80	112	800
125	112	1000
180	112	1200
245	112	1400
282	112	1500
321	112	1600
406	112	1800
501	112	2000
606	112	2200
721	112	2400
846	112	2600
982	112	2800
1127	112	3000
1282	112	3200
1364	112	3300
1450	112	3400

G-Force with Swing-Out Rotor: Micro-Tube & 50ml Rotor:

RCF (g's)	Radius (mm)	RPM
39	140	500
100	140	800
156	140	1000
225	140	1200
306	140	1400
352	140	1500
400	140	1600
507	140	1800
626	140	2000
757	140	2200
901	140	2400
1058	140	2600
1227	140	2800
1408	140	3000
1602	140	3200
1704	140	3300
1809	140	3400

RCF (g's)	Radius (mm)	RPM
29	102	500
73	102	800
115	102	1000
165	102	1200
224	102	1400
258	102	1500
293	102	1600
371	102	1800
458	102	2000
554	102	2200
660	102	2400
774	102	2600
898	102	2800
1031	102	3000
1173	102	3200
1247	102	3300
1324	102	3400

The Universal Centrifuge is intended for use as a general laboratory centrifuge. MKT-7.5.3.-L-110 | Rev 9