MXU Combination Centrifuge

Instruction Manual



Introduction

The USA MXU Combination Centrifuge spins everything a clinic requires, from veterinary fecals with coverslips to serum separations to urine sediments and even microhematocrits! This unit features a HYBRID rotor with both angled and swing-out tube sleeves, and is specifically designed to spin 75mm microhematocrit tubes and 1-15ml microtubes and test tubes. This USA-made centrifuge features a ZERO-RPM locking lid for safety and digital programming of time and speed ranging from 800-3400rpm. Achieve up to 1450g with the fixed-angle tube sleeves and 1809g with the swing-out tube sleeves resulting in clean, easy-to-read lines of separation. The HYBRID rotor allows for 4 swing-out fecals with coverslips on the tubes while spinning for the BEST ova recoveries, and the removable rotor and bowl makes cleanup a breeze!

To run microhematocrit tubes, simply insert your 75mm capillary tubes into the Crit Carrier, place carriers into the two opposing angled tube sleeves for a balanced load, and spin at 3,400 rpm for 6 minutes for accurate Packed Cell Volume (PCV) percentages.

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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

This symbol refers to hazards that may be encountered when using this product.

CAUTION means that damage to product or environment could occur.
WARNING means that injury or contamination could occur.

What's included:

- MXU centrifuge unit
- 1 Rotor thumbscrew
- 1 EZ Reader card
- 6 Black plastic small tube sleeve inserts
- 6 Green plastic microtube inserts
- 1 3-prong wall cord
- 1 Hybrid rotor
- 2 4-place Crit Carriers
- 2 Silver metal angled tube sleeves
- 4 Black metal swing-out tube sleeves
- 6 Green plastic microtube inserts
- 1 12vDC power adapter

1. LW Scientific packs each MXU 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 front of the unit. The digital display should light up. **DO NOT OPERATE THE CENTRIFUGE AT THIS POINT.**
5. The lid on the MXU centrifuge remains locked while at rest and while spinning. To open the lid while at rest, push the **STOP** button, then press on the lid within 3 seconds to release the lid lock. After 3 seconds, the lid will relock. If power fails, the lid can be manually opened by inserting the Manual Lid Release Tool into the release hole on the front right side of the unit.
6. If power fails when using the unit, see instructions under 'Troubleshooting' section.
7. Inspect the rotor chamber. Make sure there is no loose debris in the bowl. Make sure that the rotor thumb screw is tight. **DO NOT OPERATE THE CENTRIFUGE AT THIS POINT.**
8. Install all 6 metal tube shields into the rotor, ensuring that the 4 black metal swing-out sleeves are hanging on the pins, and the two silver metal angled sleeves are inserted into the two rotor holes.

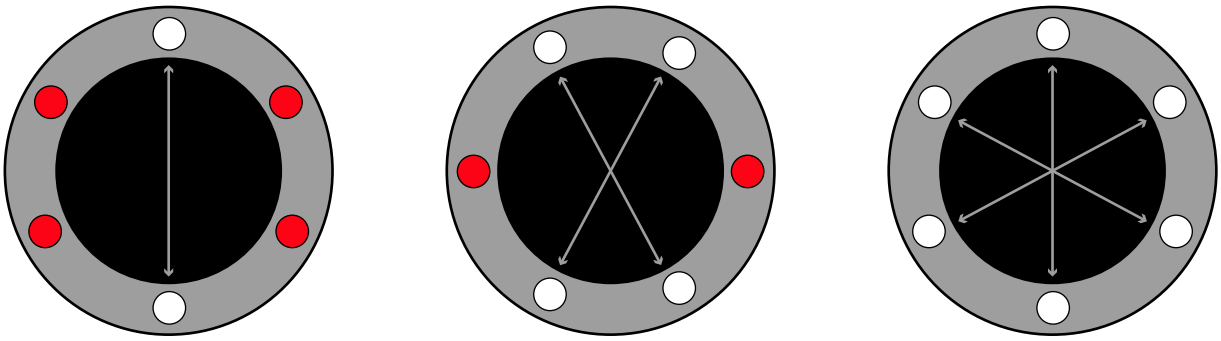
WARNING: Ensure the rotor is securely fixed to the rotor shaft. Failure to properly secure the rotor could lead to personal injury or damage to the centrifuge.

Initial Testing

1. Do not insert test tubes at this time. 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. The MXU cannot be opened while the rotor is turning. Once the unit has completed the cycle and come to a complete stop, an audible BEEP will sound. To open the lid while at rest, push the **STOP** button, then press on the lid within 3 seconds to release the lid lock. The lid will relock after 3 seconds for safety. To unlock later, simply push the **STOP** button and press the lid again.
4. Next, 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 the unit off immediately and contact LW Scientific.
5. The unit is now ready to be loaded.

Operation

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.



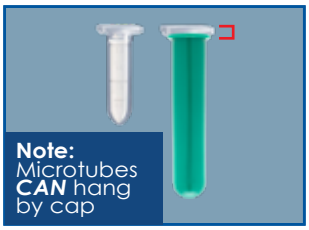
KNOW THE G-FORCE LIMITS OF YOUR TUBES. The MXU at full speed will produce enough g-force to break some tubes. Be certain that you are not exceeding the recommended g-forces for the brand of tubes that you are using.

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.

Hybrid Rotor Loading

Serum Tubes:
Serum separations can be done in all 6 rotor positions. Use proper tube sleeves depending on tube size so that test-tubes are supported on their bottom and NOT hanging by their caps. Ensure tubes are balanced.

Micro Tubes:
Microtubes can be spun in all 6 rotor positions using the green microtube inserts. Microtubes are designed to hang by their collar on the top of the green inserts. Ensure tubes are balanced.



Urine Tubes:
Urinalysis can be done in all 6 rotor positions. Ensure tubes are balanced.

Fecal Tubes:
Fecals should be spun in the 4 black metal swing-out tube sleeves. Ensure tubes are balanced. Load either 2 or 4 fecal tubes with coverslip on top for the best ova recovery, following the included Fecal Floatation Instructions for proper technique.

Once balanced and loaded, select the desired speed and time and start the centrifuge.

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Microhematocrit Tubes:

1. The Crit Carriers MUST always be spun in the 2 angled silver metal tube sleeves.
2. After filling and sealing a 75mm microhematocrit capillary tube, insert the tube into a hole in one of the Crit Carriers. Note the hole number and color (eg. Blue #2) for proper identification of the tube when loading multiple samples.
3. Insert BOTH Crit Carriers into the silver angled metal tubes sleeves, across from each other for proper balance. If spinning only one microhematocrit sample, it is not necessary to load another 75mm capillary tube for balance because the tube is very light, but BOTH Crit Carriers should always be across from each other.
4. Spin the centrifuge at 3400rpm for 6 minutes.
5. Remove the microhematocrit tube and read the PCV percentage using the included EZ Reader Card.

Once balanced and loaded, select the desired speed and time and start the centrifuge.

3 EASY STEPS TO ACHIEVE ACCURATE PCV RESULTS:

Insert capillaries in the Crit Carrier.

Insert the carrier in the angled, silver metal tube sleeves.

Spin at 3,400 rpm for 6 (+/-1) minutes.

Important: For accurate PCV results, always spin Crit Carriers in the angled, silver metal tube sleeves. **NOT** black, metal swing-out tube sleeves.

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Memory Feature

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

WARNING: Always ensure the rotor screw/thumbscrew is tight and secure before each use!

Troubleshooting

No Power: Plug into another outlet. Check that wall cord is pushed firmly into the AC adapter block.

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 5 under **Installation and Setup** to unlock your unit. In the event of power failure, the lid can be manually opened by inserting the Manual Lid Release Tool into the release hole on the front right side of the unit.

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 designed 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, rotor, and bowl. Use warm, soapy water or diluted bleach to clean and disinfect the removeable bowl.

   *The metal rotor and metal tube sleeves 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.

Specifications

Nominal Speed:	500-3400 rpm
Fuse:	10A
Height:	9.12" (231 mm)
Length:	16" (406 mm)
Width:	14" (355 mm)
Weight without rotor:	17.1 lb (7.76 kg)
Weight with rotor:	18.35 lb (8.32 kg)

G-Force Chart

G-Force with 2-place Angled Tube Sleeves (112mm radius):

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

FLUID RECOMMENDATIONS	SPEED	TIME
Whole Blood	3400	10 minutes
Microhematocrit	3400	6 (+/-1) minutes
Urine	1600	5 to 10 minutes

G-Force with 4-place Metal Swing-Out Tubes Sleeves (140mm radius):

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

FLUID RECOMMENDATIONS	SPEED	TIME
Whole Blood	3400	10 minutes
Urine	1600	5 to 10 minutes
Fecals with Coverslips	1300	6 minutes

The MXU Centrifuge is intended for use as a general laboratory centrifuge.

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