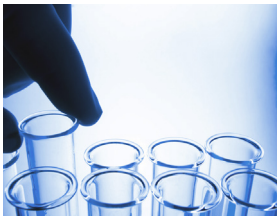
MXU Touch Centrifuge

Instruction Manual





Introduction

The USA-made MXU Touch centrifuge from LW Scientific is the perfect solution for clinics, laboratories, and universities. Spin blood, urine, and veterinary fecal test tubes in either the 8-place angled or 6-place swing-out rotor, plus spin microhematocrits in the HYBRID combination rotor which includes Crit Carriers. The MXU Touch centrifuge features touch-screen digital controls with 4 programmable memory settings for quick and accurate operation. Additionally, the one-of-a-kind removable bowl makes cleanup a breeze! Other features include a ZERO-RPM locking lid for safety and adjustable speed control ranging from 500-3500 rpm.

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.

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

Includes:

MXU with 6-place HYBRID Rotor:
- 4 swing-out metal tube shields
- 2 angled tube shields
- 6 small tube shields
- 6 green microtube inserts
- Pair of 4-place Crit Carriers
- EZ Reader Card for PCV
- Power adapter

MXU with 6-place Swing-Out Rotor:
- 6 swing-out metal tube shields
- 6 small tube shields
- 6 green microtube inserts
- Power adapter

MXU with 8-place Angled Rotor:
- 8 large tube shields
- 8 small tube shields
- 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** button 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 Touch centrifuge remains locked while at rest and while spinning. To open the unit, push and hold down the lid and press **OPEN** on the touchscreen display. If power fails, the lid can be manually opened by moving the Manual Lid Release Lever located on the bottom of the unit while pressing down the lid to release the latch.

6. 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 (8-place angled rotor: use #2 Phillips screwdriver, 6-place swing-out rotor: tighten thumbscrew by hand). **DO NOT OPERATE THE CENTRIFUGE AT THIS POINT.**

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

Operation

1. Do not insert test tubes at this time. Set the speed to 1,000 rpm and the time to 5 minutes using the touchscreen operation instructions located further in this manual.

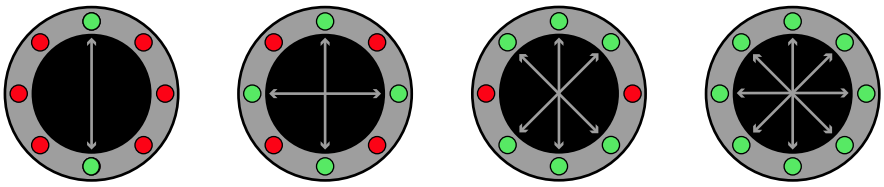
2. Start the unit by pressing the **RUN** button. The unit should come up to speed with a smooth sound and little or no vibration. If there is excessive vibration or noise, shut off the unit immediately, check the 'Troubleshooting' tips, and contact LW Scientific if not resolved.

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.

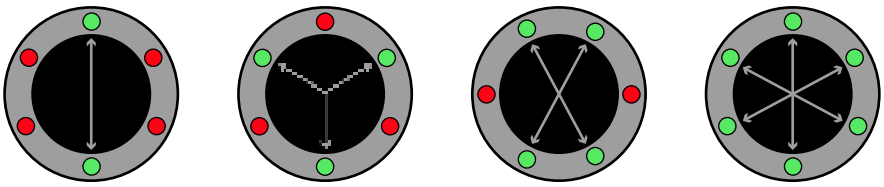
4. Next, turn the speed up to the highest setting of 3500 rpm and check for smooth sound and little vibration. (If there is excessive vibration or noise, shut off the unit immediately and contact LW Scientific.) The unit is now ready to be loaded.

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.

Balance Options:
8-Place **Fixed-Angle Rotor**



Balance Options:
6-Place **HYBRID Rotor** and 6-Place **Swing-Out Rotor**



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.

***Microtubes are an exception. Microtubes are designed to hang by their collar on top of the green inserts.**

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.

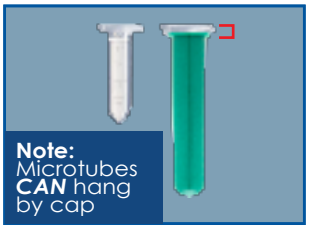
Once loaded, select the desired speed and time and start the centrifuge.

WARNING: Always ensure rotor is secure before each use!

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 **Fecal Floatation** Instructions found by navigating to *www.lwscientific.com/pages/manuals-and-resources* under the **MXU Combination** tab.

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

Touchscreen Operation

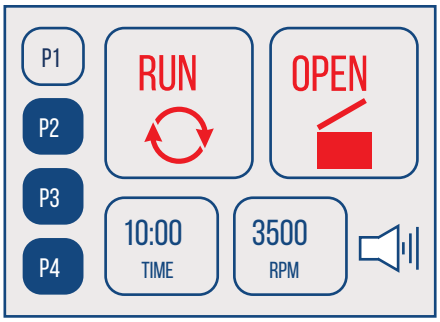
The following instructions describe the touchscreen **Graphical User Interface (GUI)** usage for LW Scientific MXU Touch Centrifuges. Upon plugging in the unit and pressing the power switch to ON, the touch screen will activate and display the .

The various display pages are noted throughout the Touch Screen Operation Instructions and refer to corresponding sections. It is recommended to refer to these sections for guidance.

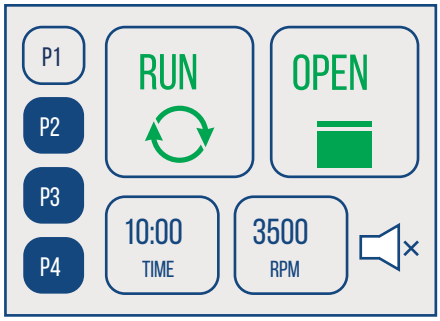
1 Home Page

The **Home Page** shows the following sections:

LID OPEN:



LID CLOSED:



- Run Button
- Open Button
- Set Time (minutes:seconds)
- Set RPM (revolutions per minute)
- Preset Buttons
- Mute/Unmute Button

Idling at the **Home Page** for 60 seconds will activate the sleep screen. Touching the screen or unlocking/locking the lid will return the user to the **Home Page**.

Run Button:
When the lid is in the UNLOCK position, the Run Button will display red RUN text and a red run symbol. Attempting to press the Run Button at this stage will cause the unit to not run and instead display the **Error Page**. Pressing the Error Button will return the user to the **Home Page**.

Open Button:
The status of the lid (LOCK or UNLOCK) is displayed on the Open Button. When the lid is in the LOCK position, the Open Button will display green OPEN text and a green closed symbol. To open the lid, press down on the lid then push the **OPEN** botton on the touchscreen display. You should hear an audible click unlocking the lid and allowing you to open it.

To prepare the centrifuge for use, close the lid and push it down until it clicks to lock. The screen will display green symbols as shown above in the LID CLOSED screen.

Pressing the Run Button at this stage will begin centrifuge operation with the currently active time and RPM settings and display the **Running Page** (See Section 2: Running Page).

Preset Buttons:
The currently active preset is highlighted. Selecting a different preset will highlight the selected preset and change the Time and RPM to the corresponding settings. Entering the **Centrifuge Settings Page** (See Section 3: Centrifuge Settings Page) will cause the currently active preset to be deselected. Any changes made through the **Centrifuge Settings Page** will be reflected in the Time and RPM until a preset is reselected or the unit is power cycled.

To set Time and RPM:
The current centrifugation time and RPM parameters are displayed at the bottom of the screen. Pressing the Time or RPM buttons will display the **Centrifuge Settings Page**.

Mute/Unmute Button:
Pressing this button will disable or enable the system sounds of the centrifuge. These system sounds accompany the following events:

- Unit Power On
- Spin Cycle Initialization
- Spin Cycle Completion
- Unmute

2 Running Page

The **Running Page** shows the following sections:

After pressing Run, the acceleration page will display

Once the centrifuge reaches speed, the count down timer will display.

After the timer reaches '0', the deceleration page will display.

Current RPM
Displays the Current RPM. The Current RPM updates as the rotor accelerates or decelerates.

Acceleration
Displays whether the motor is accelerating or decelerating. When the motor reaches the desired RPM, this section is replaced with the Display Timer.

Display Timer
Displays the time remaining after the centrifuge reaches the set RPM.

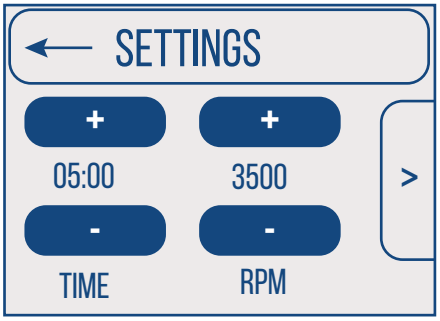
When the Display Timer reaches 00:00, the motor begins deceleration until coming to a complete stop. The "Done" screen will display.

Back Arrow Button
Pressing the Back Arrow Button during acceleration or Display Timer countdown will begin deceleration until the motor comes to a complete stop. The "Done" screen will display.

To exit the **Running Page** and return to the **Home Page**, press the Back Arrow Button when the "Done" screen is displayed.

3 Centrifuge Settings Page

The **Centrifuge Settings Page** shows the following sections:



- Time (minutes:seconds)
- RPM (revolutions per minute)
- +/- buttons above and below the Time and RPM
- Back Arrow Button
- Next Page Button

The **Centrifuge Settings Page** allows the user to set a specific time and RPM without changing a preset default. Reselecting a preset or power cycling the unit will cause the changes made in **Centrifuge Settings Page** to be lost.

To set Time and RPM
To increase or decrease the Time, press the + or - button respectively. The maximum/minimum time is 60:00/00:15.

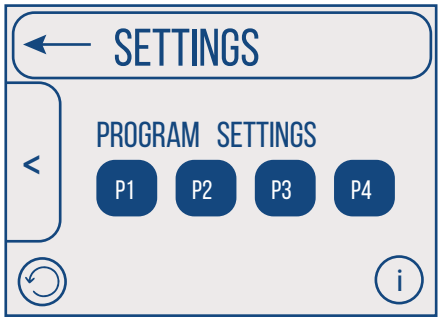
To increase or decrease the RPM, press the + or - button respectively. The maximum/minimum RPM is 3500/500.

Press and hold the + or - buttons to continuously change the Time or RPM in increments.

Back Arrow Button
To save any changes made to the Time and RPM, exit the **Centrifuge Settings Page**, and return to the **Home Page**, press the Back Arrow Button.

Next Page Button
To enter **Centrifuge Additional Settings Page**, press the Next Page Button.

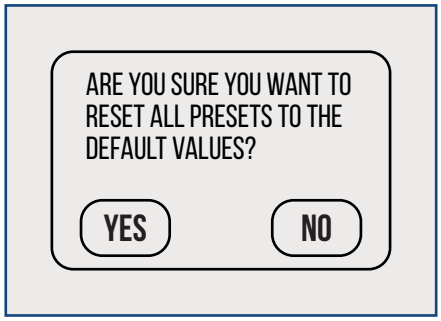
4 Centrifuge Additional Settings Page



- Run Button
- Time (minutes:seconds)
- RPM (revolutions per minute)
- Preset Buttons

Program Presets (P1, P2, P3, P4)
To change the default Time and RPM values of a preset, press the corresponding program preset button. Changes made to preset defaults will remain unless preset defaults are reset.

Reset Preset Defaults Icon
To reset all changes made to the preset defaults, press the reset preset defaults icon.



Selecting "Yes" on the following confirmation window will reset all preset settings to their default values:

PRESET	TIME (MINUTES)	RPM	APPLICATIONS
P1	10:00	3500	Serum Separation
P2	05:00	1800	Urine Sediment
P3	06:00	1500	Veterinary Fecal
P4	06:00	3500	Microhematocrit (Combination models only)

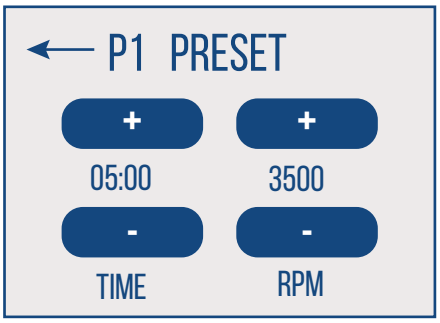
Information Icon
To enter the **Diagnostics Page**, press the information icon.

Back Arrow Button
To return to the **Home Page**, press the Back Arrow Button.

Previous Page Button
To return to the **Centrifuge Settings Page**, press the Previous Page Button

5 Programming Page - For programming the presets (P1, P2, P3, P4)

The **Programming Page** shows the following sections:



- Time (minutes:seconds)
- RPM (revolutions per minute)
- +/- buttons above and below the Time and RPM
- Back Arrow Button

There is a **Programming Page** for each preset (P1, P2, P3, P4). The **Programming Page** can be entered by selecting a preset on the **Centrifuge Additional Settings Page**.

To set Time and RPM
To increase or decrease the Time, press the + or - button respectively. The maximum/minimum time is 60:00/00:15.

To increase or decrease the RPM, press the + or - button respectively. The maximum/minimum RPM is 3500/500.

Press and hold the + or - buttons to continuously change the Time or RPM in increments.

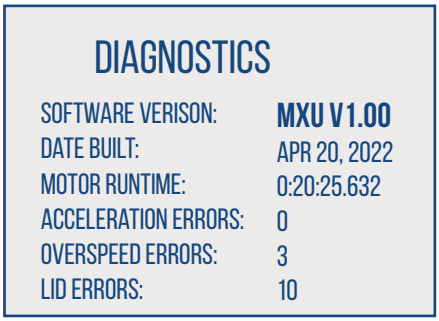
Changes made to the Time and RPM in the Programming Page are NOT reset after the unit is turned off and on again.

Back Arrow Button
To save any changes made to the Time and RPM, exit the **Centrifuge Settings Page**, and return to the **Home Page**, press the Back Arrow Button.

6 Diagnostics Page

To enter the **Diagnostics Page**, press the information icon on the bottom right corner of the **Centrifuge Additional Page Settings**.

The **Diagnostics Page**, displays the following sections:



- Software Version #
- Date Built
- Motor Runtime
- Acceleration Error Count
- Overspeed Error Count
- Lid Error Count

To exit the **Diagnostics Page** and return to the **Home Page**, press the screen.

7 Error Page

The **Error Page** shows the following sections:

- Error Message
- Error Button

Improper usage of the unit will cause the interface to display the Error Page.

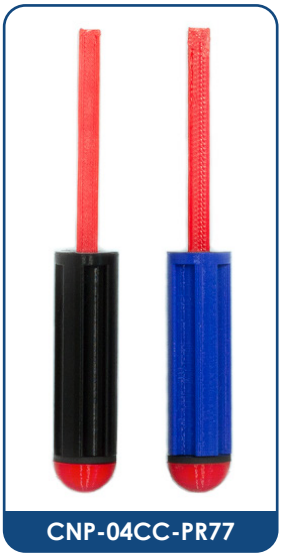
Error Message
Displays the method to resolve the error.

ERROR MESSAGE	CAUSE	SOLUTION
Motor over max speed.	Unit accelerates beyond acceptable RPM.	Discontinue use of unit. Contact LWS for service.
Motor not acclerating.	Unit cannot accelerate to set RPM.	Discontinue use of unit. Contact LWS for service.
Run aborted. Please close lid. Wait for lid to lock.	Attempted to run unit with open lid. Opened lid during run.	Close the lid, then press the screen to resolve the error.
Cannot begin while rotor is spinning.	Attempted to run unit while the rotor is spinning.	Wait for the rotor to completely stop.

Error Button
Pressing the error button will return the display to the **Home Page**.

Spinning Microhematocrit Tubes (HYBRID Only)

1. After filling and sealing a 75mm microhematocrit capillary tube, insert the tube into a hole in one of the Crit Carriers. Note which hole number position (1 through 8) for proper identification of the tube when loading multiple samples.
2. Insert BOTH Crit Carriers into two blue tube 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.
3. Spin the centrifuge at 3500rpm for 6 minutes.
4. Remove the microhematocrit tube and read the PCV percentage using the included EZ Reader Card.



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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:	500-3500 rpm
Height:	9.25" (234.95mm)
Length:	17.125" (434.97mm)
Width:	14" (355.6mm)
Weight without rotor:	22.9lbs (10.38kg)

G-Force Chart

G-Force with 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
1534	3500

FLUID RECOMMENDATIONS	SPEED	TIME
Whole Blood	3500	10 minutes
Microhematocrit	3500	6 (+/-1) minutes
Urine	1600	5 to 10 minutes

G-Force with 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
1917	3500

FLUID RECOMMENDATIONS	SPEED	TIME
Whole Blood	3500	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.