



DX C8700 Series Centrifuge

(Model C8704, C8706, C8724 with touch button control)

OPERATION MANUAL

(Version 5.0)

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Rev. c8700-v5.0

— **CAUTION** —

Read this manual completely before operating the centrifuge

Introduction:

UNICO® is constantly working to improve our products with the latest technological innovations. UNICO® PowerSpin™ DX C8700 Series centrifuge is designed with features to meet the safety and functionality needs in today's med/vet and health care industries.

Description/ Intended Use:

UNICO® PowerSpin™ C8700 Series centrifuges with digital variable speed control and electronic timer and zero RPM safety lid latch system are specially designed for demanding laboratory work in clinical labs, industrial or biological labs where separation for blood or other materials is desirable.

Specifications and Features:

Model	C8724 / C8724E	C8706 / C8706E	C8704 / C8704E
Capacity	24 x 10ml Angled	6 x 15ml Horizontal	4 x 50ml Horizontal
Max. Speed	4000rpm	4000rpm	4000rpm
Speed Range	500-4000rpm	500-4000rpm	500-4000rpm
Max. RCF	1848g	1848g	1848g
Timer	1:00-99:99	1:00-99:99	1:00-99:99
Motor	DC 300W	DC 300W	DC 300W
Noise	65 dB	65 dB	65 dB
Power	110V / 220V	110V / 220V	110V / 220V
Dimension	350 x 380 x 290mm	350 x 380 x 290mm	350 x 380 x 290mm
Weight	20kg(44 lbs)	20kg(44 lbs)	20kg(44 lbs)

- 3 preset programs for blood, urine and fecal; easy to select buttons while wearing gloves
- Set any centrifugation protocol by using set, up arrow, down arrow and enter buttons
- Wide rotor selection for use with standard 3 to 50 ml tubes
(Optional adapters may be required for tubes less than 10 ml or 100mm length)
- Digital variable speed control with speed range from 500 RPM to 4000 RPM
- Automatic Speed (RPM) and G-Force (RCF) real-time digital display
- Electronic 1:00-99:59 timer with beep signal at end of run (then the lid latch will open).
- Automatic time and speed memory reset to the last run for repetitive protocols
- Memorized time and speed settings: The centrifuge will memorize the last time and speed settings when the unit is turned off. It will resume the previous time and speed settings when the unit is turned on
- Selections of different level of acceleration and deceleration controls
- Maintenance free brushless DC motor
- Safety: Zero RPM lid latch protection - The centrifuge lid cannot be opened until the unit stops spinning. It will not run unless the lid is properly closed.
- Suction cup rubber feet for stable bench top operation
- Power switch with indicator light tells when unit is powered on
- Power on/off switch located on back of unit

Construction:

The enclosure of the PowerSpin C8700 Series centrifuge is made of easy to clean and disinfect high impact plastic. The internal rotor chamber is made of stainless steel. A safety device is installed to prevent the lid from opening while the centrifuge is running. The motor is mounted on spring-belt mounts to provide quiet running and less vibration. The Stainless Steel rotor chamber can be easily cleaned and disinfected.

Accessories:

Each PowerSpin C8700 centrifuge comes equipped with the rotor(s) with pre-installed tube shields per your order.

Unpacking and Installation:

The centrifuge is packed in cushioning Styrofoam in a box for maximum protection during shipping. Please examine the unit upon receiving and retain all packing until the unit has been tested. The warranty excludes any damage caused by shipping. Inspect for any possible shipping damage. If you note any damage, please contact your sales representative. Please save and store the original packaging. If it becomes necessary to return the instrument to us, we ask that it be returned in the original packaging.

Unpack the shipping carton carefully and verify that the shipment is complete. It should include the following items:

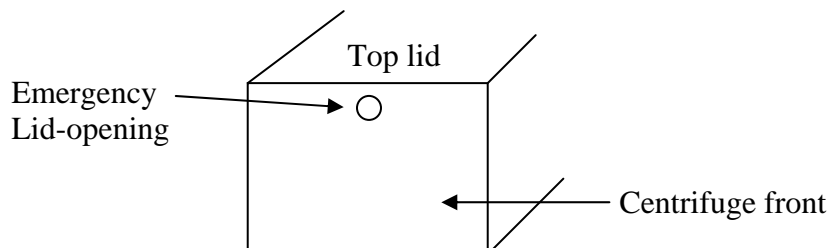
PowerSpin C8700 series specific model centrifuge	1 unit
Power cord	1 pc.
Operation Manual	1 pc.
Adjustable Rotor Bolt Wrench	1 pc.
Screwdriver	1 pc.

Follow simple procedures below to prepare the centrifuge for use:

1. Remove the centrifuge from its packaging and place it on a sturdy flat, dry surface.
Do not plug-in or turn on the centrifuge!
2. Locate the small hole above the operation panel on the upper front of the centrifuge. This is the Emergency lid latch manual override designed to open the electronically controlled lid latch in the event of a power loss. Using a small screw driver (or a rod with 2mm or less in diameter); insert the tool into the emergency lid-opening hole as showed below. Push the tool to the right to release the safety lock and open the lid.

Special packing cushion foam is packed inside the rotor chamber of the centrifuge to protect the rotor and shields during shipping.

REMOVE THIS FOAM PRIOR TO OPERATION OF THE CENTRIFUGE.

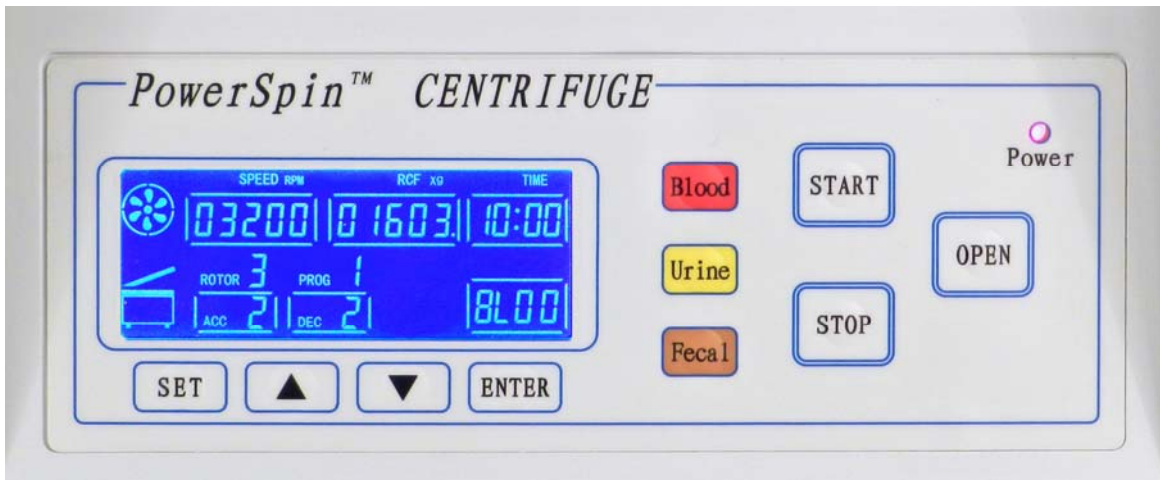


3. The centrifuge rotor is pre-installed. No rotor installation or calibration is required.
4. The power inlet is located in the back of the centrifuge. Plug in one end of the power cord to the inlet and the other end to a power outlet.

Caution: Make sure the voltage of the power source matches the voltage input of centrifuge.

Parameter Setting and Key Pad Controls

The PowerSpin C8700 Series centrifuge control panel shown below:



C8700 offers 3 preset programs (cannot be modified by user):

Blood - preset to 3200RPM/1603RCF for 10 min

Urine - preset to 1800RPM/505RCF for 5 min

Fecal - preset to 1300RPM/257RCF for 10 min

Users can set their own parameters using “Set” and “Enter” buttons, changing every parameter by pushing “Up” or “Down” buttons.

The parameters will be selected in the sequence as showed on the display: Speed; RCF; Time; ACC (acceleration); DEC (deceleration); Rotor and Program (1-9).

When the parameter is selected the parameter value display will flash. Press the UP arrow button to increase the value and press the Down arrow button to decrease the value. Press the ENTER button again to confirm and to move to the next parameter.

Speed Setting and Speed Setting Change:

Speed Setting: Press SET button and the speed value displayed will flash. Use UP or Down button to change the running speed. The speed range is 500 to 4000rpm in 100rpm increments. The display will show actual running speed and RCF (g) force in real time during spinning.

Change during Operation: use the same procedure to change speed setting.

Note: RCF will change automatically based on speed. You may choose to set the RCF instead of speed. When you reset RCF the speed setting will be calculated and reset automatically.

Timer, Time Setting and Time Setting Change:

Timer setting: Press Set button until the time value displayed flashes. Use UP or Down button to change the running time. The timer range is 1:00 to 90:59 in 1 sec. increments. While running, the display will show the timer count down in real time.

Use the same procedure to change time setting during operation.

Acceleration Setting and Change:

Press Set button until ACC(acceleration) displayed flashes. Use UP or Down button to select the acceleration level (1,2,3 from high to low).

ACC Level	1	2	3
Acceleration Time from 0 to 3400rpm	30 seconds	40 seconds	50 seconds

Deceleration Setting and Change

Press to confirm the ACC setting and DEC will flash. Use UP or Down button to select the DEC (deceleration) level (1,2,3 from faster to slower).

DEC Level	1	2	3
Deceleration Time from 3400rpm to 0rpm	35 seconds	40 seconds	45 seconds

Start Button: Press Start button to spin samples. The centrifuge will not spin if the lid is not closed or not properly closed.

Note: Make sure the samples are balanced in the rotor!

Stop Button: Press to stop the centrifuge at anytime.

Open Button: Press the Open button to open the lid. The Open button will only open the lid when the rotor is not spinning.

Emergency Lid-opening:

The lid features an electronically controlled safety system to prevent it from being opened accidentally while the centrifuge is spinning. However, situations may arise when the lid needs to be opened manually (For example if you lose electrical power and samples are still in the centrifuge).

To open manually, locate the small hole on the upper front of the centrifuge. Using a small screw driver (or a rod with 2mm or less in diameter); insert the tool into the lid-opening hole; push/slide the tool to the right to release the safety lock and open the lid.

Operation:

1. Plug the centrifuge into a grounded outlet. Make sure the voltage is correct
2. Turn the power switch on the rear panel of the unit “On”
3. Open the lid by pressing the Open button on the front control panel
4. Load your specimen tubes into the tube shields

**** CAUTION ****

Make sure that the specimen tubes are balanced.

Always balance rotor with tubes of equal size, fill and weight!

(See safety section below)

5. Close the lid firmly
6. Set the timer to the desired time
7. Set the speed to the desired RPM
8. Set the acceleration level and deceleration level.
9. Press the Start button to start the run
10. After the centrifuge rotor has come to a complete stop (three beeping sounds), the lid safety latch will automatically be released. It is now safe to open the lid and remove your specimens

Note: When the centrifuge run is complete, the timer will be automatically reset to the last timer setting and the centrifuge is ready for the next run.

Safety:

Your PowerSpin C8700 centrifuge is a carefully designed and built instrument. Please take note of the following safety precautions.

Lid with zero rpm lid latch (electronically operated):

NEVER ATTEMPT TO OPEN THE LID UNTIL THE ROTOR HAS COME TO COMPLETE STOP!

Load Balance:

Always make sure the load is balanced before operating the centrifuge.

It is very important that tubes with equal loads (fill and weight) are placed opposite each other in the rotor. Also, when spinning a single specimen tube, another specimen tube of the same size filled with water (or an equal volume of another liquid) must be in-place directly opposite from the specimen tube to maintain balance. If the centrifuge is not properly balanced, damage could occur.

CAUTION: If excessive noise or vibration is noticed during a run, immediately press “Stop” to turn off the centrifuge and recheck the balance.

Maintenance:

Be sure to disconnect the power cord before attempting to clean the centrifuge.

This centrifuge is designed to be relatively maintenance free. The motor is a brushless type and has permanently sealed bearings so oiling is not necessary. A surface cleaner such as Formula 409 can be used to clean the outside of the instrument. The rotor chamber and cover can be disinfected with a mild solution of bleach or other disinfecting liquid and allowed to dry. Do not drench or immerse the unit in any liquid!

CAUTION: Do not use any cleaning “**SOLVENTS**” on any part of the centrifuge as the chemicals can cause damage to the instrument.

Periodic Rotor and Tube Holders inspection and replacement:

Rotors and Tube Holders should be removed and inspected for defects at least every 6 months at a minimum, and/or each time the rotor is removed for cleaning. Rotors and Tube Shields should be replaced annually, consult your sales representative for more information.

Calibration:

According to Code of Federal Regulations Title 21, centrifuges require verification or calibration as follows:

1) Before initial use; 2) after repair or adjustments; and 3) 6 month after use. The centrifuge timer, however, should be checked for accuracy at least every 3 month. The timer is an electronic timer is designed to be accurate to 5min ± 10sec. The speed should fall within ±100rpm of the speed display. Since the speed displayed on the centrifuge is from a real time digital sensor mounted in the motor, it reflects the real running speed of the rotor.

Electrical Shock Hazard:

Do not attempt to operate this instrument near water or liquid spill. Unplug the unit before cleaning or repairing. Periodically check the condition of the power cord for cuts or damage. Do not operate with a damaged cord.

Biohazard:

If a tube breaks, a biological hazard may exist. Unplug the instrument. Clean using approved laboratory procedures. Always wear the proper protective clothing and gloves. Use a suitable disinfectant and dispose of the sample properly. Refer to the guidelines set forth by OSHA, etc.

Centrifuge Service:

If you feel that your centrifuge needs factory service, please contact the UNICO customer service department for assistance. Simple problems may be resolved over the telephone. If the instrument needs to be returned to UNICO, an R.G.A. (Return Goods Authorization) number will be issued. Please reference the R.G.A. number on the paperwork packed with the instrument, and on the outside of the carton.

REPAIRS OR MODIFICATIONS MADE TO THE CENTRIFUGE BY AN UNAUTHORIZED PARTY WILL VOID THE WARRANTY.

Problem Solving:

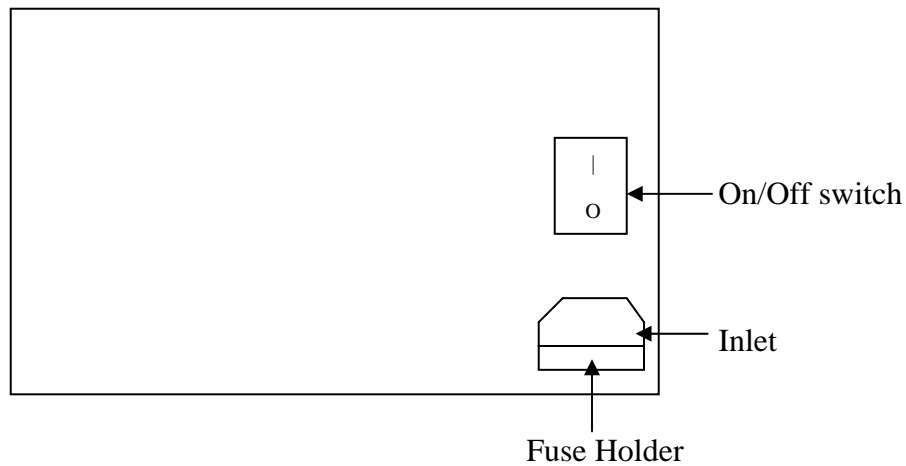
1. Centrifuge does not start:
 - a) Check to determine if centrifuge is plugged in.
 - b) Check that lid is properly closed.
 - d) Check that Power switch in the back of unit is in the “on” position.

- e) Check that the power indicator light (with the switch) is lit. A failure of the power light to illuminate could indicate a need for a new fuse when the unit is properly plugged in, switch is turned on and the lid is closed.
2. Excessive noise when running. If the noise is irregular or different in tone, be sure that there is no paper or debris in the rotor or rotor chamber. Make sure the load is balanced in the rotor.
3. Indicator light fails to light:
 - a) Unit is not turned on or no power supply.
 - b) Fuse is blown.
4. Fuse Replacement:

Caution: DISCONNECT THE POWER CORD BEFORE REPLACING FUSE.

Follow the procedures below to replace the fuse:

- a) Unplug the power cord. Turn the on/off switch to “off”
- b) Remove the power cord from the power inlet on the back of the centrifuge.
- c) Locate the fuse holder. The fuse holder is a part of the power inlet.



- d) Use a Philip type screwdriver to take the snap-in type holder cover off. Remove the blown fuse and replace it with the same type and rating fuse which is: **250V 4A**
 - e) Put the snap-in fuse holder back.
5. Intermittent motor operation, or no operation:
Contact your representative for possible motor replacement.

PowerSpin DX C8700 Series Centrifuge Trouble Shooting

	Error Code	Cause	Solution
1	E-1	Unbalanced load	Check and make sure the load is balanced
2	E-2	Exceed preset speed	<ol style="list-style-type: none"> 1. Check and make sure no interference exist 2. Contact technical support
3	E-3	Lid latch problem	<ol style="list-style-type: none"> 1. Check if the lock is engaged 2. Check wiring and cable connection
4	E-4	No speed signal	<ol style="list-style-type: none"> 1. Make sure power is on 2. Make sure lid latch is engaged 3. Make sure the fuse is fine. 4. Check the inter wiring and connections
5	E-8	Communication error.	<ol style="list-style-type: none"> 1. Check wiring and connections
6	Noisy	<ol style="list-style-type: none"> 1. Unbalanced load 2. Object falling into the chamber 3. Rotor locking nut loose 4. Motor malfunctioning 	<ol style="list-style-type: none"> 1. Balance the load 2. Remove the object 3. Secure the locking 4. Check and replace motor
7	Power LED does not lit	<ol style="list-style-type: none"> 1. No power supply or switch is not on 2. Fuse may blow off 3. LED is dead 	<ol style="list-style-type: none"> 1. Plug in and switch it on 2. Replace the fuse 3. Replace the LED
8	Sample separation failed	<ol style="list-style-type: none"> 1. Running speed/RCF is not enough 2. Running time is not enough 3. Rotor is not secured to the motor shaft 	<ol style="list-style-type: none"> 1. Increase the RPM 2. Increase total running time 3. Engage the rotor to motor shaft.
9	Centrifuge shaking	<ol style="list-style-type: none"> 1. Load is not balanced. 2. Short tube adapters not evenly placed 3. Motor cushion failed 	<ol style="list-style-type: none"> 1. Balance the load. 2. Even the short tube adapters. 3. Replace motor cushions
10			

Warranty:

This instrument is warranted against defects in materials and workmanship for a period of one (1) year from the date of shipment to the customer. This warranty is limited to the repair and replacement of parts, which prove to be defective during the warranty period. This warranty is not valid for parts damaged, lost, or which fail because of accident, fire, theft, acts of nature, negligence, misuse, operating with an unbalanced load or the use of chemicals, which have a deleterious effect. This warranty is conditioned upon the manufacturer retaining the option of replacing parts up to and including the entire instrument.

Note: This warranty does not cover on-site service visits or repair and will not extend to any repairs or modifications made to the instrument by any party other than the factory authorized technicians (authorization must be in writing), or a party authorized by UNICO. Also, this warranty shall be in effect only upon the notice of the defect to the manufacturer or its authorized distributor, or dealer, within five (5) days after the occurrence of said defect. No other warranty of any kind is made expresses or implied. The warranty described above shall be the sole and exclusive remedy available to the purchaser. Correction of defects, in the manner and for the period of time described above, shall constitute complete fulfillment of all liabilities and responsibilities of the manufacturer to the purchaser with respect to the product, and shall constitute full satisfaction of all claims whether based on contract, negligence, and strict liability or otherwise. In no event shall the manufacturer be liable, or in any way responsible for any damages or defects in the product that were caused by repairs or attempted repairs performed by anyone other than the manufacturer's dealer or station, nor shall the manufacturer be liable or in any way responsible for any incidental or consequential economic or property damages. Some states do not allow the exclusion of incidental or consequential damage, so the above exclusion may not apply to you.

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