



**PowerSpin™**  
**BX Series**  
Centrifuge

**OPERATION & SERVICE**  
**MANUAL**

Version 1.0

United Products & Instruments, Inc.  
182 Ridge Road, Suite E, Dayton, NJ 08810, USA  
**800-588-9776 Fax: 732-274-1151 Web: [www.unicosci.com](http://www.unicosci.com)**

— CAUTION! —

**Read this manual before operating the PowerSpin™ BX centrifuge**

## **General Information**

### **Introduction:**

UNICO® has been providing quality laboratory equipment for the medical labs for years. We are constantly working to improve our products with the latest technological innovations.

### **Description/ Intended Use:**

The UNICO® PowerSpin™ BX centrifuge with digital variable speed control and electronic timer is specially designed to run for years of demanding laboratory work in clinical labs, physician's offices as well as in any chemical, industrial or biological labs where separation for blood or other materials is desirable.

### **Features:**

- High Speed centrifuge, variable speed from 1,000 to 13,000 RPM
- Three rotor options:
  - 6 place rotor for 10ml SST Tubes (Model C881), from 1,000 to 6,000 RPM
  - 24 place rotor for Microhematocrit tubes (Model C882), up to 13,000 RPM
  - 24 place rotor for Micro Centrifuge Tubes (Model C883), up to 13,000 RPM
- Automatic rotor recognition
- Automatic unbalance detection and shutdown
- Safety rotor locking nut
- 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.
- Push button digital speed and time controls with speed range of 1,000-13,000 RPM
- Large LCD: Speed /RCF/Time simultaneous, real time digital display.
- Electronic 99 minutes timer with beeping signal at end of run.
- Automatic time and speed reset to the last time speed and time setting for repeated job.
- Memorized time and speed settings: The centrifuge will memorize the last time and speed settings when the unit is powered down. It will resume the previous time and speed settings when the unit is turned on.
- Maintenance free brushless DC motor.
- Power switch with indicator light tells when unit is powered on.
- Power on/off switch located on back of unit.

# Operation Instruction

## Unpacking and Installation:

The centrifuge is cushioned by Styrofoam inside the shipping box. 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. Save 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. Depending on the model, it may include the following items:

Model	Main Unit (C880)	Rotor 1 (C880-01)	Rotor 2 (C880-02)	Rotor 3 (C880-03)	Cord & Tools
		6 x10ml	24 capillary	24 x 1.5ml	
C881	X	X			X
C882	X		X		X
C883	X			X	X
C884	X	X	X		X
C885	X	X	X	X	X

**Note:** The rotor is protected by foam cushions in the rotor chamber. Do not operate the centrifuge before the foam is removed!!

1. Take the centrifuge from the Styrofoam and place it on a sturdy, dry, flat surface.  
Do not turn on the centrifuge!
2. Use a small screw driver (or a rod with Ø4mm or less in diameter) to open the lid. Insert the tool into the emergency lid-opening hole on the front. Push the tool to left to open the lid.

Packing cushion foam is packed inside the chamber of the centrifuge to prevent the rotor and shields from moving during shipping.

## **REMOVE THIS FOAM PRIOR TO OPERATION OF THE CENTRIFUGE**

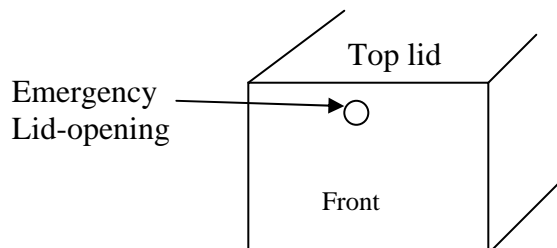


Fig. 1

3. Make sure the rotor is installed firmly. To change rotor, refer to “Change rotor” section. No rotor 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 an 115V power outlet.

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

**Technical Specifications:**

	Rotor 2	Rotor 3	Rotor 1
Maximum Speed	13000RPM ±1% LCD		6000 RPM ±1%
Maximum G force	16249g LCD	15493g LCD	3623g LCD
Maximum Capacity	24 xΦ 1.5mm x 75mm Micro-Hematocrit Rotor	24 x 1.5ml or 2ml Micro Rotor	6 x 10ml Rotor
Rotor Radius	86 mm	82 mm	92 mm
Timer Range	0-99 minutes LCD		
Speed Range	1000-13000 RPM		
Motor	Brushless DC motor		
Input Power	250 W		
Power Supply	AC 110V, 60Hz		
Dimension	270mm x 320mm x 220mm ( W x D x H )		
Working condition	Temperature: 5-40°C; Moisture: ≤ 80%; No conductive dust, no explosive gas, no corrosive gas		

**BX Centrifuge Control Buttons and Functions:**

MODE UP DOWN START STOP OPEN PULSE



**Mode button:** Switches large, main display between RPM, RCF and time

**Up & Down button:** To increase or decrease the setting (speed/RCF or time)

**Timer setting:** Press the Mode button to select Time as main display. Use the up or down arrow to preset the running time. The timer range is from 1 min. to 99 minutes. The display will show counting down time.

To change timer setting during operation, press the up or down arrow button. To increase time setting, press up arrow button, otherwise, down arrow button.

**Speed setting:** Press the Mode button to select Speed as main display Use the up or down arrow to preset the running speed. The speed range is from 1,000 RPM to 13,000 RPM in 100 RPM increments (Max. 6000 RPM for blood tube rotor).

To change speed setting during operation, press the up or down arrow buttons. To increase speed setting, press the “up” arrow button or “down” arrow button.

**Start Button:** Press Start button to spin sample. The centrifuge will not spin if the lid is not completely closed and latched.

**Note:** Always make sure the samples are balanced!!

**Stop Button:** Stop the centrifuge at anytime.

**Open Button:** Open the centrifuge lid only when the centrifuge is not spinning.

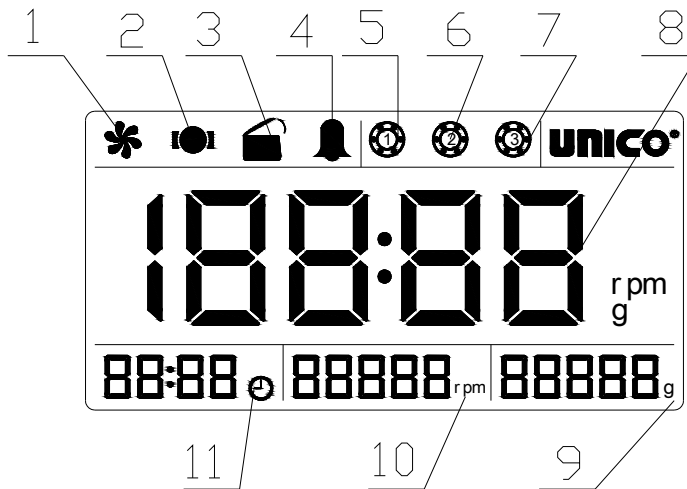
**Pulse Button:** The centrifuge will run when the Pulse button is pressed and held. The running time will display on the LCD.

**Emergency Lid-opening:**

The lid is designed to prevent it from being opened accidentally while the centrifuge is spinning. There may be situation when the lid needs to be opened manually (For example if you lose electrical power and samples are still in the centrifuge).

To open the lid manually, use the lid-opening tool (or a small screw driver). Insert the tool into the emergency lid-opening hole on front (as showed in Installation Section). Insert the tool into the hole and push left to release the safety lock and open the lid.

**LCD Display and Symbols:**



1. Running	2. Braking	3. Lid Open	4. Alarm/Warning
5. Rotor 1 (6 x10ml)	6. Rotor 2	7. Rotor 3 (24x1.5ml)	8. Main Display (Time,

blood tube)	(Microhematocrit 24 place)	micro rotor )	rpm or RCF)
9.RCF (g)	10. Speed (rpm)	11. Time	

**Operation:**

1. Plug the centrifuge into a power source outlet. Make sure the voltage is correct.
2. Open the lid by pressing the Open button on the control panel.
3. Place the specimen tubes into the tube shields of the rotor.

**CAUTION!!**

**Make sure that the specimen tubes are balanced! Always balance rotor with tubes of equal size and equal fill. (See safety section below)**

4. Close the lid firmly.
5. Set the timer to the desired time by pressing the up or down arrow. To speed up time setting, press and hold the arrow button.
6. Press the Start button to start the spin
7. After the centrifuge rotor has come to a complete stop (beeping sounds), the lid will automatically be released (for a few seconds). Open the lid.

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.

**Hematocrit value reading**

The lid of the hematocrit rotor is also a Hematocrit reader. To read the hematocrit value, hold the rotor and rotate the lid until the upper end of the liquid meets the 100% line. Find where the separation fall into and take the value (hematocrit value).

**Changing rotors:** There are three rotor options:

	Type	Max. Speed	Max. RCF	Model(s)
Rotor 1	6x10ml blood tube	6,000rpm	3623g	C881, C884, C885
Rotor 2	Microhematocrit, 24 place	13,000rpm	16249	C882, C884, C885
Rotor 3	24 x 1.5ml micro	13,000rpm	15495	C883, C885

The rotor is mounted on the motor shaft with a safety locking nut. For safety consideration, the locking nut will not be threaded on if the rotor is not properly seated and engaged on the cross-bar. There is a step-up block on the shaft and a slot on each rotor as shown in the picture below. The step-up block on the shaft needs to be engaged in the rotor slot.

Follow the steps below to install a rotor on:

1. Turn off the centrifuge power switch (and preferably unplug the unit). Remove the rotor to be replaced by loosening the rotor spindle locking nut.

2. Rotate the motor shaft (spindle) so that the step-up block is at 12 o'clock and 6 o'clock. That is to align the block with the lid-latch of the centrifuge.
3. Hold the rotor and rotate it until the slot is in line with the step-up block (and the lid-latch opening). Then press down to engage the rotor into the shaft.

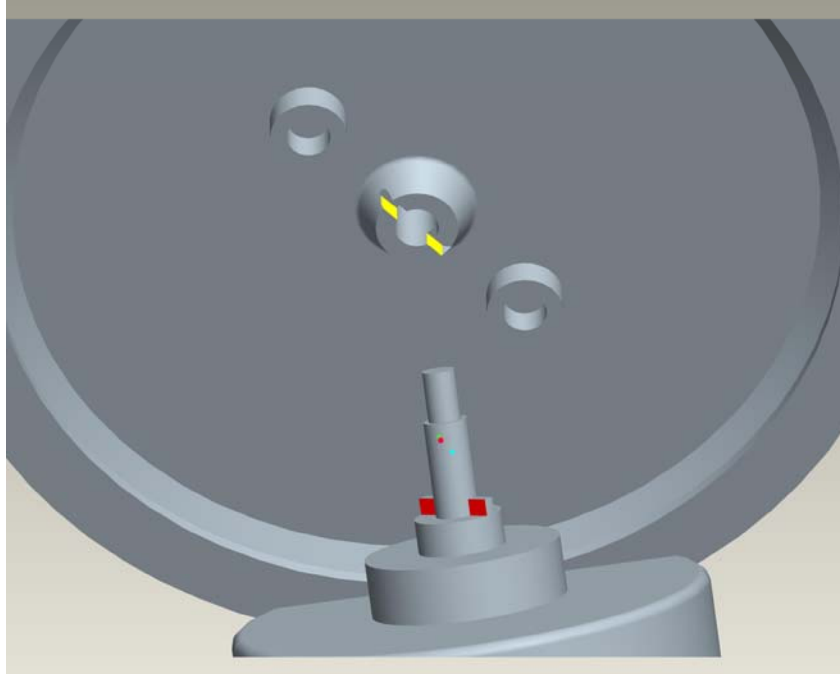


Fig. 2

Align and engage the step-up on the shaft with the slot on the rotor.

**Safety:**

Your PowerSpin™ BX centrifuge is a carefully designed and built instrument. When operated properly, it presents no safety hazards, however, please take note of these 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 that the load is balanced before operating the instrument!**

It is very important that tubes with equal loads 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 must be installed directly across from the specimen tube to maintain balance. If the centrifuge is not properly balanced, damage could occur. If excessive noise or vibration is noticed during a run, stop the centrifuge and recheck the balance.

## **Maintenance and Service**

### **Maintenance:**

Be sure to disconnect the power before attempting to clean. 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!

### **Periodic Rotor and Tube Holders inspection and replacement**

Rotors and Tube Holders should be removed and inspected for defects at least every 6 months or each time the rotor is removed for cleaning. Plastic rotors and tube shields should be replaced every 3 years.

### **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  $5\text{min} \pm 10\text{sec}$ . The speed should fall within  $\pm 100\text{rpm}$  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, CLIA, etc.

### **Service:**

If you feel that your centrifuge needs factory service, please call us and speak to a customer service representative to determine the nature of the problem. Simple problems may be resolvable over the telephone. If the instrument needs to be returned to Unico, a 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.**

**Trouble Shooting:**

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 Lit:
  - a) Unit is not turned on or no power supply.
  - b) Fuse is blown.
4. Intermittent motor operation or no operation:

Contact your representative for possible motor replacement.

**Emergency Lid-opening:**

The lid is designed to prevent it from being opened accidentally while the centrifuge is spinning. There may be situation when the lid needs to be opened manually (For example if you lose electrical power and samples are still in the centrifuge).

To open the lid manually, use the lid-opening tool (or a small screw driver). Insert the tool into the emergency lid-opening hole on front (as showed in Installation Section). Insert the tool into the hole and push left to release the safety lock and open the lid.



Fig. 3

**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 (Fig. 4 and Fig. 5) Put the snap-in fuse holder back.



Fig. 4



Fig. 5

### Replace Seal on Lid

The lid seal last a long time if well maintained. However it may become dirty or damaged after being in use for a while. Follow the steps below to replace the lid seal.

1. Remove the old seal from the lid by pulling it out as shown in Fig. 6
2. Install the new seal starting from one end. Hold the seal with fingers as shown in Fig. 7 and insert the seal into the slot.



Fig.6



Fig.7

### Change Rotors:

There are three different rotors for BX centrifuges: 24 place microhematocrit rotor with lid; 6 place 10ml tube rotor and 24 place miro-tube rotor with lid. The following pictures show how to remove and change BX rotor:

1. For microhematocrit rotor and micro-tube rotor remove the lid by turning the lid locking nut counterclockwise.(Fig.8 )
2. Use the wrench supplied to loose the rotor locking nut as shown in Fig. 9

3. Pull the rotor out by holding the rotor edge of micro-hematocrit or micro-tube rotor (Fig.10). For 6 place rotor remove the tubesheild and grab the holder with your fingers as shown in Fig.11



Fig. 8



Fig.9



Fig.10



Fig.11

The rotor is mounted on the motor shaft with a safety locking nut. For safety consideration, the locking nut will not be threaded on if the rotor is not properly seated and engaged on the cross-bar. There is a step-up block on the shaft and a slot on each rotor as shown in the picture below. The step-up block on the shaft needs to be engaged in the rotor slot.

Follow the steps below to install a rotor on:

5. Turn off the centrifuge power switch (and preferably unplug the unit). Remove the rotor to be replaced by loosening the rotor spindle locking nut.
6. Rotate the motor shaft (spindle) so that the step-up block is at 12 0'clock and 6 0' clock. That is to align the block with the lid-latch of the centrifuge.
7. Hold the rotor and rotate it until the slot is in line with the step-up block (and the lid-latch opening). Then press down to engage the rotor into the shaft.

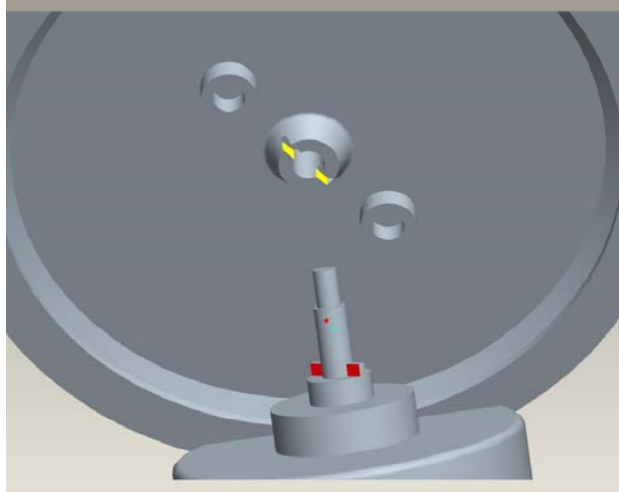


Fig. 12

Align and engage the step-up on the shaft with the slot on the rotor.

### **BX Case Removal from Base:**

1. Find a flat clean surface better with soft cover or cloth.
2. Remove rotor from BX chamber (Refer to rotor change instruction in this manual).
3. Flip over BX so that the lid is sitting on the table surface (Fig. 13 )
4. Use screw driver to loose the screws as shown.
5. Then put BX upright. Lift the case with two hands as shown in Fig. 14



Fig. 13



Fig. 14

### **Replace LCD Display**

1. Remove BX case from base (refer to BX Case Removal instruction in this manual).
2. Remove the touch button bracket by loosening the two locking nuts as shown in Fig.15.
3. Remove the LCD-mounting-base from BX case by loosening the two screws as shown in Fig.16
4. The LCD is mounted on the mounting-base by 4 screws. Loose those screws to remove the old LCD.
5. Reverse the procedures above to install the new LCD display.

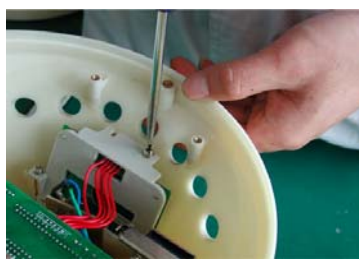


Fig. 15

Fig. 16

### Replace Lock Assembly

1. Remove BX case from base (refer BX Case Removal instruction in this manual).
2. The lock assembly is mounted on the case by two screws. Use screw driver to loose those screws as shown in Fig. 17. Pull the lock assembly out from the bottom.
3. Align the two threaded holes on the lock frame with the holes on the case. Hold the lock assembly straight and lock it into position as shown in Fig. 18. Make sure the orientation of the lock must be as shown in Fig. 18.



Fig.17



Fig.18

### Replace Motor-Driving PCB

1. Remove BX case from base (refer BX Case Removal instruction in this manual).
2. Disconnect all the cables from the Motor-Driving PCB. Please make sure to mark and remember all the connectors and the relations to their related components. This is very important for installing and connecting those components correctly to the new motor-drive PCB.
3. Remove the old motor-driving PCB from the base and install the new one.
4. Connect all the cables back to the new driving PCB. Make sure to follow the sequences marks taken in step 2.



Fig. 19

Fig.20

## Replace Motor

1. Remove BX case from base (refer BX Case Removal instruction in this manual).
2. Disconnect the cable to the motor-driving PCB
3. Remove the old motor and install the new motor (Fig.21 )
4. Reconnect the cable to the motor driving PCB.



Fig.21

## Replace Suspension Support

The BX motor is mounted on a plated supported by three rubber suspension supports. Follow the steps below to replace the suspension supports:

1. Remove the motor and the PCBs by following the relative instructions in this manual.
2. Remove the bottom plate from the base housing (Fig.22 and Fig.23 ).
3. Hold the rubber suspension support with your fingers. Use a tool to loose the locking nut on the other side of the bottom plate. Remove the old suspension support.
4. When installing new suspension support hold the rubber suspension support and tight the locking nut from the other side SLOWLY (Fig.24 ). Make sure it is tight. Do not force it. Twisting the suspension support will cause the motor unbalanced and the centrifuge noisy.



Fig. 22



Fig. 23



Fig.24

## 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, 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 will not extend to any repairs or modifications made to the instrument by some party other than the manufacturer 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 express 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, 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.

# PowerSpin™ BX Centrifuge

Parts and Nomenclature

