



## Centrifuge Model: K-SPIN

The K.M.I. **K-SPIN** centrifuge is a portable, bench-top centrifuge designed for clinical, educational and industrial applications. The centrifuge features a 6 place 45 degree angle nylon rotor and nylon shields which will accommodate tubes ranging in size from 7 to 17mm in diameter and 100 to 133mm in length. This includes 7ml, 10ml, and 15ml Vacutainer\* tubes.

The centrifuge operates at a fixed speed of 3300 rpm and develops an RCF force of 1380 x G. Sedimentation is controlled by centrifugation time. The motor is thermally protected and has permanently lubricated ball bearings. The cast iron base and vibration isolation mounting provide additional stability.

The feet on which the centrifuge rests incorporate suction cups which adhere to smooth bench tops. This serves to reduce the movement of the unit during operation. In order to prevent damage to these feet, **never pick the unit straight up off the bench top. Always slide the unit off the edge of the work surface.**

The **K-SPIN** centrifuge also features a 15 minute timer with a "HOLD" position to give the user the option of continuous operation. The timer selector functions as the power switch, engaging the motor when the run time has been set and the lid is securely closed and locked.

The **K-SPIN** has a lid latch to positively secure the lid closed. The latch is operated by a knob located at the front of the lid. The latch operates through a quarter turn.

**Warning: Always be sure that the lid is latched before operating the unit.**

\* Vacutainer is a registered trademark of Becton-Dickinson Co.



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# INSTRUCTIONS

## INSTALLATION

To install the centrifuge, perform the following:

1. Place the centrifuge base on a flat, smooth, level surface.
2. Remove the 6 shields from their packing and carefully insert them into the six holes in the rotor.
3. Place rotor on drive shaft. Align flat on drive shaft with hole position "1" on rotor.
4. Secure rotor (with supplied thumbscrew) onto the drive shaft. **CAUTION: Apply finger tight pressure only: do not use wrench or other tool.**
5. Be sure the 6 shields are in place. **Never run without all shields in place.**

## CONTROLS

### Lid-Power Interlock:

The lid interlock is designed to interrupt power of the motor whenever the lid is opened. This interlock is implemented by a leaf switch. The lid should not be used as an ON/OFF switch.

### Time Control:

The time control is the power switch for the motor. To start a run, the time control is simply turned to the desired centrifugation time. During the run, the timer rotates counter-clockwise to indicate the time remaining. The user may also use the "HOLD" feature to make self-timed runs by placing time control into its "HOLD" position.

## OPERATION

Centrifuge operation involves simply loading the rotor, closing and latching the lid, and selecting a centrifugation time. The rotor must be properly loaded to achieve good sedimentation and vibration free operation. Tubes of the same capacity and load must be placed 180 degrees apart. Use water if necessary to balance the load if there is an odd number of tubes. Balance the load to within 1.0 gram.

### Procedure:

To operate the centrifuge, perform the following:

1. Turn the time control to OFF.
2. Connect the unit to an appropriate "Hospital Grade" power source.
3. Unlatch and open the lid; place tubes into rotor in a balanced pattern.
4. Close and latch the lid.
5. Rotate the time control CW beyond, then CCW back to, desired setting.
6. When the rotor has stopped spinning, raise the lid and remove the tubes.
7. **ROTOR CAN BE STERILIZED BY COLD PROCEDURES ONLY.**

## SAFETY

When unit is properly operated, it does not present any safety hazards. However, the following safety precautions should be observed:

### **Lid Latch:**

Be certain the lid is securely latched before operating unit.

### **Lid-Power Interlock:**

Do not attempt to defeat the interlock. Do not operate the centrifuge if the interlock has failed.

### **Balancing Load:**

Always load the rotor in a balanced pattern. If excessive vibration or noise develops during a run, discontinue operation. Never use shot, mercury, or weights to balance the load.

### **Electrical shock hazard:**

Always use power source marked "Hospital Grade", to ensure proper grounding. Disconnect unit from its power source before cleaning. As there are no user serviceable parts inside of centrifuge, refer all servicing to qualified personnel.

### **Potential Biohazard:**

If spills or tube breakage occurs, there may be biological hazard present. Clean using approved facility protocol. Rotor may be sterilized ONLY with cold sterilization procedures.

### **Damage:**

Do not operate unit if it shows signs of chemical or mechanical damage.

### **Maintenance:**

The centrifuge requires no other maintenance other than routine cleaning with a damp cloth and mild detergent. Because of the potential biohazard, any spills should be cleaned immediately. To clean the bowl, lid, rotor, and shields, perform the following:

**NOTE: Rotor and shields may be sterilized using cold sterilization procedures.**

1. Disconnect the unit from its power source.
2. Wipe the bowl and lid with a mild detergent soaked cloth.
3. Remove rotor and shields and wash in a mild detergent solution.

**NOTE: Visually inspect rotor and shields for evidence of damage and replace if necessary.**

## Determining Relative Centrifuge Force

To determine the relative centrifugal force (RCF), RPM and tube tip radius must be known. Different rotor loads, tubes, line voltage, and condition of the centrifuge will effect the centrifuge. An access hole for a phototachometer is provided in the lid. The tube tip radius is defined as the distance from the center of the shaft to the farthest end of the tube. When installed in the rotor on the **K-SPIN**, the distance is fixed at 11.32cm with shields installed, but with no tube adapters or cushions.

RCF is defined as the force acting on a sample being centrifuged relative to the force, due to gravity, that normally acts on it. Such force must take into account the tip radius of the installed tube and the RPM at which it is spinning. Assuming that the normal gravitational force is at sea level, the following formula expresses the strength of the gravity field to which the sample is subjected:

$$\text{RCF} = 1.12 \times 10^{-5} \times R \times \text{RPM} \times \text{RPM}$$

$$R = \text{Tip radius in cm. (11.32cm)}$$

$$\text{RPM} = \text{Speed in revolutions per Min.}$$

$$1.12 \times 10^{-5} = \text{Universal constant for sea level installation}$$



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