

THE DRUCKER CO.
Reliability in Laboratory Centrifuges Since 1932



Operator's Manual

Model 614V • Laboratory Centrifuge

Rev. 8.0

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WARNING: Care should be taken when handling substances that are known to be toxic, radioactive or contaminated with pathogenic microorganisms when using this centrifuge for the safety of both the operator and service personnel. When Risk Group II materials are used, (as identified in the World Health Organization "Laboratory Bio-Safety Manual"), a Bio-Seal should be employed. The Bio-Seal accessory for the model 614 tube holders is the non-aerosol shield cap, p/n 7713011. More than one level of protection must be provided in the case of materials of a higher group. The use of flammable or explosive materials as well as those materials which chemically react vigorously is prohibited.

Model Description:

The **Model 614V** is a continuous duty, variable-speed centrifuge designed for the small lab or doctor's office for the purposes of separating laboratory fluids. The unit is controlled by a mechanical timer settable from 1 to 30 minutes. Samples can be safely viewed through the transparent lid. In the event that the lid is opened during a run, the power to the motor is disconnected.

For warranty information, turn to page 11.

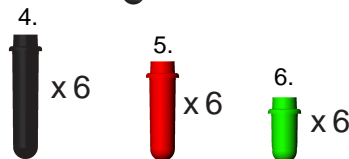
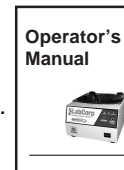
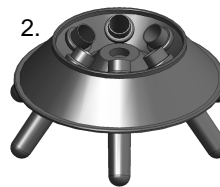
Supplied Equipment*:

The following items come standard with each **Model 614V** centrifuge:

1. One (1) Model 614V centrifuge
2. One (1) six-place fixed-angle rotor p/n 7786047
3. Operator's manual

Optional Accessories:

4. Six (6) 125mm tube holders p/n 7713026
5. Six (6) 100mm tube holders p/n 7713031
6. Six (6) 75mm tube holders p/n 7713033



* The rotor and rotor accessories are rated for a rotation frequency of 3,500 RPM.

Features:

- Fixed-angle rotor for spinning 75mm, 100mm and 125mm test tubes in specially designed tube holders
- Variable-speed
- Cool-Flow air flow design that prevents overheating of samples
- Heavy gauge steel construction for safety and durability
- Lid safety switch that prevents the centrifuge from operating unless the lid is closed and latched
- Removable rotor for easy cleaning
- Brushless A/C motor
- Clear lid for safe observation of samples and optical calibration of speed

Specifications:

General Specifications for the Model 614V Centrifuge

Speed Range:

125mm holders:	1000 to 3200 (+/- 10%) RPM
75/100mm holders:	1500 to 3400 (+/- 10%) RPM

Force Range:

125mm holders:	100 to 1200 xg
100mm holders:	200 to 1200 xg
75mm holders:	200 to 1000 xg

Maximum capacity:

90 mL (6 x 15 mL)*

Overall Dimensions (H x W x D):

8.5 in. x 11 in. x 12.5 in.

Centrifuge Motor:

1/30 HP, A/C

Nominal Acceleration Time:

100 seconds

Protection Breaker:

4 Amp. re-settable

Timer:

mechanical, 1 to 30 minutes
accuracy +/- 10%

Current Requirement:

1.0 Amps

Voltage Requirement:

115 (+/- 10) Volts

Frequency:

60 Hz

Weight:

18.5 lbs.

Before using any cleaning or decontamination methods except those recommended by the manufacturer, users should check with the manufacturer that the proposed method will not damage the equipment. See page 7, (bottom), for the recommended cleaning solutions.

Any use other than those specified by the Manufacturer is explicitly prohibited.

Setup Location:

1. Unpack the centrifuge and verify that all of the supplied equipment is present.
2. Choose a setup location which meets the following criteria:
 - a) A bench top clearance height of 20" is required in order to open the lid.
 - b) The clearance envelope is the space around the centrifuge which is required for safety. Choose a setup location which will allow for a clearance envelope of at least 24" x 24", (with the centrifuge at the center). No person or hazardous material shall be permitted in the clearance envelope during operation. The operator time within the envelope shall be limited to the time necessary for loading, unloading and centrifuge operation only.
 - c) Proper ventilation is necessary to prevent the overheating of samples as well as premature failure of the centrifuge. Choose an area which will allow unencumbered air flow.
 - d) The centrifuge is designed to secure to the operating surface by four suction feet. No adjustment is necessary for leveling the centrifuge, however, the surface should be flat and level.
 - e) **Be sure the outlet is always within reach as the line cord is the means of emergency disconnection!**

Initial Setup Procedure:

If any problems are found during the initial setup procedure, refer to the troubleshooting section on page 8. For further assistance, contact The Drucker Company at 814-342-6205.

1. Plug the centrifuge in to an approved electrical outlet. For electrical safety, the unit must always be properly grounded.
NOTE: This centrifuge must be plugged into a powered outlet for 1 hour prior to operation for proper calibration! It is not necessary that the machine be running, it must simply have power supplied to it. Failure to do so may result in inaccurate speed control. To maintain calibration, leave the unit powered at all times.
2. Turn the latch counter-clockwise and open the lid.
3. Spin the rotor by hand; check for free and level rotation.
4. Close the lid. Rotate the lid knob clockwise to its complete stop position.
5. Set the speed control to "MAX". Turn the centrifuge on by setting the timer to 10 minutes.
6. Listen to the centrifuge. A smooth whirring sound should be heard.

After the centrifuge has passed this procedure it is ready for operation.

BALANCED LOADS

Your centrifuge must contain a balanced load in order to work properly. Use the following rules when loading the rotor. Spinning balanced loads will extend the life of the machine and produce better results.

1. *Opposing tube holders must be identical and must contain the same cushion, or none at all.*
2. *Opposing tube holders must be empty or loaded with equally weighted samples.*
3. *If an odd number of samples is to be spun, fill a tube with water to match the weight of the unpaired sample and place it across from this sample.*

Operation:

NOTE: Follow the initial setup procedure on page 4 before initial operation.

1. Turn the latch counter-clockwise and open the lid.
2. Insert cushions (if needed) into the tube holders for the tube size you are using. Refer to 'Tube Holder Configurations' (page 6) for assistance.
3. Place the test tube samples into the tube holders. Be sure to follow the rules for balanced loads.
4. Close the lid and turn the lid knob clockwise to its complete stop position.
5. Set the speed control to the desired speed setting. Be sure to use the appropriate scale for the tube holder size you are using. If you are using a mixture of tube holders, use the scale for the longest of the holders.
6. Turn on the machine by turning the timer to the desired run time.
7. The centrifuge should begin to spin.
8. Once the timer reaches zero (0), power will be cut to the motor and the rotor will coast to a stop. Do not open the lid until the rotor has come to a complete stop.
9. Turn the lid knob counter-clockwise and open the lid.
10. Remove the samples.
11. The centrifuge is immediately ready for operation.

Rotor Removal and Installation:

To remove the rotor:

CAUTION: Unplug the centrifuge from the electrical outlet at this time to eliminate the possibility of electrical shock or other injury.

1. Open the lid.
2. Remove the test tube holders.
3. Remove the knob or nut in the center of the rotor by turning it counter-clockwise. A nut driver may be required.
4. The rotor is sitting on a cone-shaped adapter. Pull the rotor up and off of this adapter.

To install the rotor:

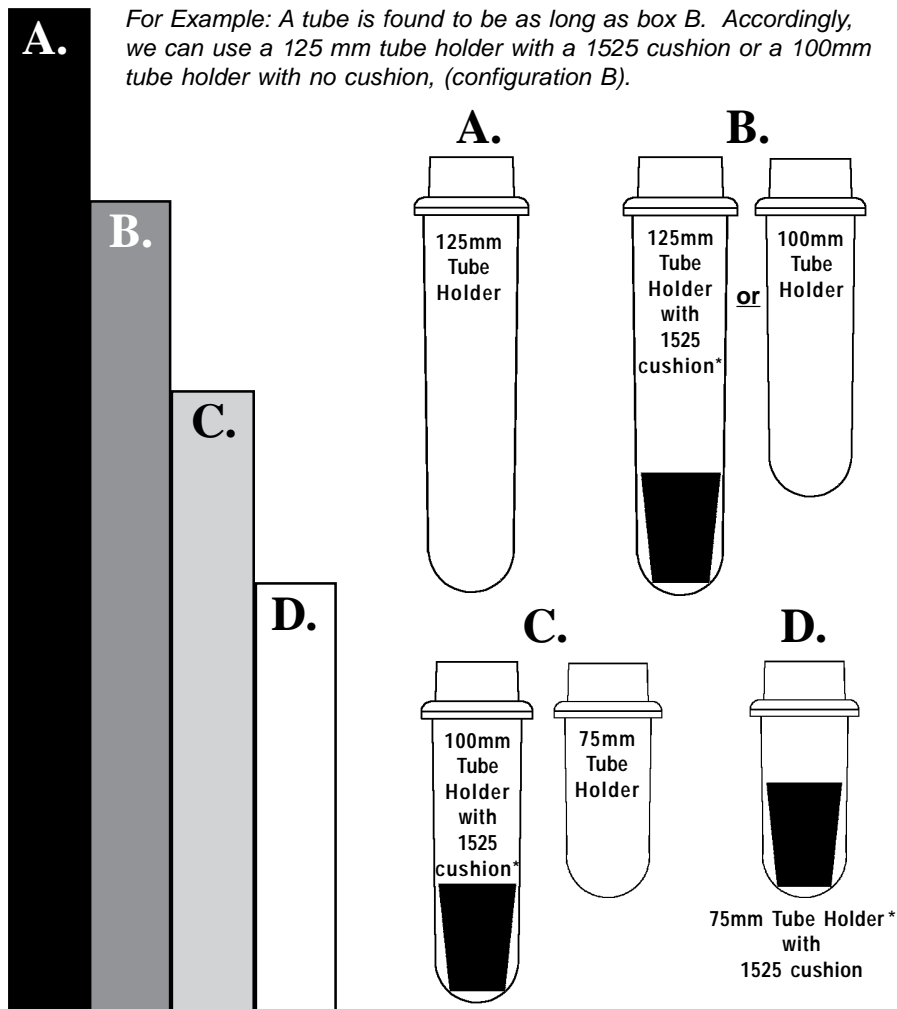
1. Place the rotor back onto the cone-shaped adapter. You may need to turn the rotor slightly to line it up properly.
2. The rotor should slide onto the rotor cone freely.
3. Once a proper fit has been achieved, replace the rotor knob or nut and turn it until it is hand-tight.
4. Replace the tube holders and verify that they are seated properly.
5. It is recommended that the initial setup procedures be performed to ensure that the rotor has been installed correctly and that no damage has been done to the centrifuge during either the rotor installation or possible rotor chamber cleaning. See page 4 for this procedure.

Tube Holder Configurations:

The fixed-angle rotor that came with your **Model 614V** is capable of spinning test tubes up to 17mm x 125mm. Use the following chart and drawing to determine which tube holder and cushion combination should be used with your application.

DIRECTIONS:

1. Compare the tube to be spun with the four boxes shown below.
2. Find the box that most closely matches the tube's length. **NOTE:** The tube length with its stopper or cap must be shorter than the chosen box or the tube will not fit properly in the tube holder.
3. Match the letter from the chosen box with one of the configurations shown.



* This part is available as an accessory. Contact The Drucker Company for assistance.
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Care and Preventative Maintenance:

With proper care and maintenance your centrifuge will provide years of laboratory service. For proper care, the following steps should be taken:

1. **Provide Adequate Ventilation:** For cooling purposes, the centrifuge draws in ambient air through the air intake cover on the top of the lid and exhausts this air in the rear of the base. The centrifuge should be placed on a hard smooth surface for good air circulation.
2. **Always Spin Balanced Loads:** Make certain that you are always spinning a balanced load. The Model 614V has a unique counter balanced motor mounting design which, along with its rubber suction feet, produces excellent vibration dampening. However, out-of-balance loads may break glass test tubes and may produce unsatisfactory separation results. Proper load balancing will improve sample separation and extend the life of the centrifuge. Refer to page 4 on balanced loads for additional information on balancing the load.
3. **Keep the Tube Holders Clean:** *NOTE: Always follow the safety guidelines of your laboratory to properly clean up and/or dispose of materials in the event that a substance known to be potentially toxic, radioactive or contaminated with a pathogenetic microorganism is spilt in or on the centrifuge.* Small glass fragments left in the tube holder after a tube breakage may adhere to the next test tube inserted in that holder. When this tube is handled, these fragments may puncture protective gloves and lacerate the operator's fingers or hand. Remaining fragments may provide stress points on subsequent tubes and result in additional breakage. If a tube breakage occurs, carefully remove the tube holder. Properly dispose of the sample and tube fragments and thoroughly clean both the inside and outside of the tube holder. Insert a new tube cushion (if necessary) and replace the tube holder in the rotor.
4. **Motor and Electrical Maintenance:** The Model 614V uses a brushless A/C motor. It should not need servicing for the life of the centrifuge. The electrical components are selected for high reliability and should not need service.
5. **Keep the Rotor Chamber Clean:** Every six months, or whenever there is a tube breakage, (refer to the note in #3), it may be necessary to remove the rotor and clean the rotor chamber. Follow the instructions on page 5 to remove and re-install the rotor.

CAUTION: Before cleaning, always unplug the line cord from the electrical outlet to eliminate the risk of electric shock.

The rotor chamber, rotor and accessories shall be thoroughly cleaned using either isopropyl alcohol, soap and water, or bleach. The use of Fully/Partially Halogenated Hydrocarbons, Ketones, Esters and all other chemicals not prescribed by the manufacturer may cause damage to the rotor and tube holders and shall not be used.

Apply cleaning solutions with a towel or cloth. ***Do not submerge the centrifuge in water or other cleaning solutions as this will cause damage and void your warranty!***

6. **Rotor and Tube Holder Replacement:** It is recommended that the rotor and tube holders be replaced after 24 months of use.

Safety:

The Model 614V complies with all requirements of UL standard 3101-2-20.

Lid Safety Switch: The lid is secured to the top of the cabinet by a latching knob and pawl system. When the knob is rotated clockwise, the pawl grips the underside of the cabinet opening and prevents the lid from opening. A mechanical stop positions the pawl and prevents it from rotating completely. When rotated to the stop position, the pawl makes contact with a micro-switch mounted underneath the cabinet top. The lid safety switch prevents the centrifuge from operating while the lid is open.

Circuit Breaker: The Model 614V is protected with a 4 Amp circuit breaker located at the rear of the machine mounted to the base. Any electrical short circuit will cause the breaker to cut power to the machine.

Calibration and Earth Ground Testing:

It is recommended that the top speed, ground continuity and line leakage be tested every two years for continued safe operation. The unit may be calibrated by a qualified technician, (see page 9). Contact The Drucker Company for further information or testing availability.

Troubleshooting:



NOTE:
The latch must be turned completely clockwise to its stop position in order for the centrifuge to operate.

1. Problem: The rotor does not spin freely.
Solutions: – Make sure nothing has fallen into the rotor chamber. – If there is nothing obstructing the rotor, contact The Drucker Company for further assistance.
2. Problem: Excessive noise when the machine is running.
Solutions: – Check to see that the load is balanced. – Make sure that nothing has fallen into the rotor chamber. – Make sure that the nut in the center of the rotor is tight. – Have a technician test the motor and replace it if necessary.
3. Problem: The centrifuge does not run.
Solutions: – Check the electrical outlet. – Make sure the lid latch is turned completely clockwise to its stop position. – Check the circuit breaker switch at the bottom left of the machine. If the switch is white, the breaker has tripped. Contact The Drucker Company for further assistance.
4. Problem: Speed control is not accurate.
Solutions: – The centrifuge must be plugged in for at least one (1) hour prior to use. Failure to do so will result in poor speed control. – Check to make sure that the correct speed scale is being used for the tube holders you are using. – Contact The Drucker Company for further assistance.

Speed Calibration:

If it is found that the speed control on the model 614V is inaccurate, it may be calibrated. Perform the following procedure to calibrate the model 614V.

1. Plug the unit into a 115V A.C. electrical outlet.
2. The unit must remain plugged in for at least one hour to allow the motor to reach its required operating temperature. Without this "warm-up" period, the motor control will not be accurate.
3. Once the unit has warmed up it may be calibrated. Place the black 125 mm test tube holders in the rotor chamber. Place a piece of reflective tape on the rotor, (if not already done).



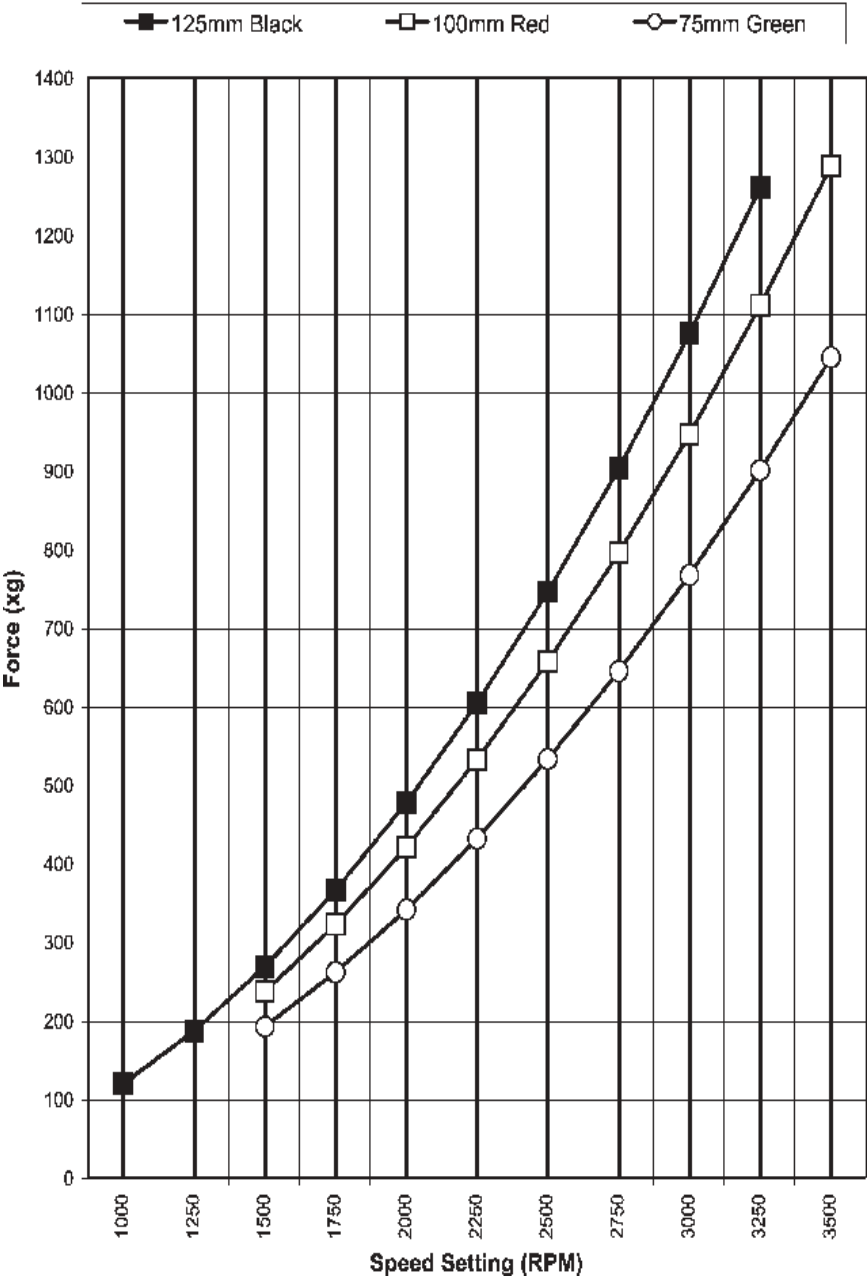
Calibration access hole

4. Locate the calibration access hole on the underside of the centrifuge near the front on the right side.
5. Set the speed control to 1500 RPM and turn on the timer.
6. The rotor will begin to turn and accelerate.
7. Allow the rotor to reach full speed by waiting approximately 90 seconds.
8. Check the speed of the rotor using a phototachometer and the piece of reflective tape on the rotor.
9. Use a small screwdriver and adjust the speed potentiometer through the calibration access hole. Turn the potentiometer clockwise (looking from the bottom of the machine) to increase the speed.
10. Check other speeds and make adjustments to the calibration potentiometer as needed. Take note that the speed control should be accurate to +/- 10% of the speed shown on the dial.

Contact your authorized dealer or The Drucker Company if additional assistance is needed.

RCF Conversion Chart

Use this chart to select a speed setting when a desired g-force is desired.



WARRANTY:

The Drucker Company warrants that this centrifuge is free from defects in workmanship and parts for 12 months.

Replacement Parts:

Part No.	Description
7724037	Foot, rubber
7751068	Switch, lid safety
7786047	Rotor, six-place fixed-angle
7735049	Motor, 1/30 H.P., P.S.C.
7722027	Timer, mechanical
7751043	Circuit Breaker
7724022	Front Panel Label
7760002	Power cord
7714101	Pawl, latch, lid
7714103	Knob, latch, lid
7712260	Lid
7724071	Hinge, friction
7732018	Seal, lid gasket
7732019	Seal, rotor chamber gasket
7713033	Tube holder, green, for 75mm tubes
7713031	Tube holder, red, for 100mm tubes
7713032	Tube holder, black, for 125mm tubes

Available Accessories:

1" Tube cushion



p/n 1525



Shield caps

p/n
7713011



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