

Reliability in Laboratory Centrifuges Since 1932
THE DRUCKER CO.



Operator's Manual

Models **614B**, **614L**, **614U/UL** and **614V/VL**
Laboratory Centrifuge

Rev. 5.0

Description:

Intended Use:

The Drucker model 614 is a low-cost, high-performance laboratory centrifuge designed for the separation of laboratory fluid samples.

Versions of the Model 614 include:

- 614B:** 3,150 RPM* (1,200 RCF) with a lid safety switch
- 614L:** 3,150 RPM* (1,200 RCF) with a lid safety interlock system
- 614U:** 1,700 RPM* (350 RCF) with a lid safety switch
- 614UL:** 1,700 RPM* (350 RCF) with a lid safety interlock system
- 614V:** 0-3,150 RPM* (0 to 1,200 RCF) with a lid safety switch
- 614VL:** 0-3,150 RPM* (0 to 1,200 RCF) with a lid safety interlock system

* Nominal speed with a line voltage of 115 Volts at 60 Hz, +/- 100 RPM
Given specifications are for the black test tube holders designed for 15ml, (16mm x 125mm), test tubes. The use of different holders and/or cushions will slightly alter the top speed and RCF.

Supplied Equipment:

The following items are supplied with each model 614 centrifuge:

1. One (1) six-place, fixed angle, polycarbonate rotor.
2. One (1) operator's manual
3. One or more of the following based on your accessory package:
 - Six (6) 125mm test tube holders, Black
 - Six (6) 100mm test tube holders, Red
 - Six (6) 75mm test tube holders, Green
 - Six (6) 1525 test tube cushions
 - Six (6) 9150 test tube cushions

Features:

Important features of the Model 614 centrifuge include the following:

- Conforms to UL STD 3101-1 and Certified to CAN/CSA STD C22.2 NO. 1010.1, (Models 614B, 614L, 614V, 614VL Only), ETL LISTED.
- Lid safety switch that cuts power to the motor if the lid is opened during operation
- The model 614L, 614VL and 614UL have a "0" RPM lid safety interlock system that prevents the lid from being opened until the rotating head reaches approximately "0" RPM.
- Quiet Operation
- Brushless AC motor
- Two part molded inner housing of flame retardant polymer for superior strength and sound absorption
- Cool-Flow air flow design that prevents overheating of samples
- Heavy gauge welded steel cabinet construction for safety and durability
- Clear lid for safe observation of samples and optical calibration of speed.
- Optional 8-place rotor
- Timed operation from 1 to 30 minutes
- Variable speed (Model 614V/VL only)

Installation and Operation:

Performance / Calibration:*

It is recommended that your Model 614 centrifuge be calibrated every 6 months. The max speed of a 614B, L, V or VL should fall between 3050 and 3250 RPM* when unloaded; this will give a separation force of 1120 - 1280 xg*. The max speed of a 614U or UL should fall between 1600 and 1800 RPM* when unloaded; producing a separation force of 310 - 390 xg*. A photo tachometer is suggested to determine RPM. If your centrifuge fails to operate within its prescribed range, contact your authorized dealer or The Drucker Company.

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Environmental Conditions: The 614 centrifuge is not intended for outside use or for use in extreme environmental conditions. Any use other than the manufacturer's suggested usage may impair the protection provided by the unit.

External Packaging and Inspection: Carefully examine the centrifuge and document any damage that can be attributed to mishandling. A signed inspection report should be furnished by the shipping company.

Note: The Drucker Company is Not Responsible for transit damage.

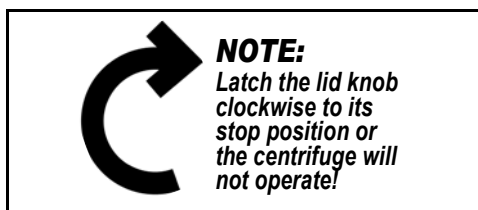
Setup Procedure: Unpack the centrifuge and inspect for obvious damage; place the centrifuge on a hard, stable surface. *Note:* A bench top clearance height of 23 inches (min.) is required to open the centrifuge lid.

Note: Failure to provide adequate space for ventilation can cause damage to the samples plus overheating and premature failure of the centrifuge.

1. Unlatch and open the lid; remove any protective shipping material, literature, tube cushion packages, etc., that may have been shipped inside the centrifuge.
2. Spin the rotor by hand; check for free and level rotation. If the rotor spins evenly, continue on to step 3. If the rotor does not turn freely or there seems to be an obstruction, call your authorized dealer or The Drucker Company before proceeding.
3. Close and latch the lid. Verify that the timer is "OFF". Plug the line cord into an approved electrical outlet. Be sure the outlet is always within reach as the line cord is the means of emergency disconnection.
4. Turn power on to the unit by setting the time to (5) minutes.
NOTE: Model 614V/VL : Turn the speed to 3,050 RPM.
The rotor should start spinning smoothly with no excessive noise.
5. Listen to the sound of the centrifuge; a smooth whirring sound should be heard. If there are any loud and unusual sounds, stop the centrifuge immediately. ***Do not proceed!*** Call your Authorized Dealer or The Drucker Company.

Safety:

1. **Lid Safety Switch (all 614 models):** During operation, 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 and prevents the lid from opening. A mechanical stop limits the pawl travel. When rotated to this stop position, the pawl activates a safety micro-switch which allows the centrifuge to operate. ***Unless contact is made by the pawl with this safety switch, the centrifuge will not start or continue in operation.*** If an attempt is made to open the lid while the centrifuge is in operation, power will be cut to the motor.



2. **Lid Safety Interlock System (Model 614L, 614UL and 614VL):** In addition to the Lid Safety Switch, the models 614L, 614UL and 614VL have a “0 RPM” lid interlocking system. As the motor starts spinning, a locking solenoid activates and prevents the lid from being opened. A red diode on the top-front of the cabinet illuminates indicating that the lid is “Locked”. ***The solenoid will keep the lid locked during operation and until the motor has reached approximately “0” RPM.***

Note: After the centrifuge has started spinning, it may be possible to rotate the lid knob enough to cause the pawl to lose contact with the lid safety switch. If this happens, the centrifuge motor will lose power, ***but the lid will still remained locked until the motor has reached “0” RPM.*** If the knob is accidentally moved and this situation should occur, rotate the knob fully clockwise to its stop position and the centrifuge will resume operation.

3. **Model 614L/UL/VL Emergency Lid Removal:** If, for any reason, the safety lid interlock system should fail and the lid cannot be opened after the motor has stopped spinning, the centrifuge samples may be removed by performing the following:

- a. Remove the four (4) screws that attach the lid to the hinges.
- b. Lift the lid clear of the hinges and pull back so that the pawl clears the underside of the cabinet.
- c. Remove the lid.
- d. Remove the samples.
- e. Call the Drucker Company for repair.

4. **Tube Holders:** It is recommended that the tube holders be replaced after 24 months of use.

Safety (cont'd):

5. Model 614L/UL/VL Lid Lock Safety Check:

- a. Verify that the Timer is in the "OFF" position. Open the lid and spin the rotor by hand.
- b. The red LED on the top of the cabinet should illuminate and a low "click" sound should be heard. When the rotor stops spinning the red LED should go out and the "click" sound should repeat.
- c. With the centrifuge turned on and the rotor spinning, try to open the lid by rotating the lid knob counter-clockwise. The knob will rotate slightly and you should hear the motor lose power but you should not be able to completely rotate the lid knob or open the lid.
- d. Rotate the knob clock-wise back to its stop position. You should hear the motor resuming operation.
- e. If the centrifuge successfully passes steps a-d of this section it is ready for operation. If there are any problems **Do not proceed!** Call your Authorized Dealer or The Drucker Company.

6. Keep the Test Tube Holders Clean: Small glass fragments left in the tube holder after a tube breakage may puncture protective gloves and lacerate the operator's fingers or hand. Fragments left may also 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; 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.

Temperature Control:

The model 614 centrifuge has a unique molded-in air channel that circulates ambient room air through the rotation chamber to cool the samples. This air is then exhausted out through the base to cool the motor.

Care and Preventative Maintenance:

With proper care and maintenance, the Drucker 614 centrifuge will provide years of laboratory service. For proper care, the following steps should be taken:

1. **Provide Adequate Ventilation:** For cooling purposes, the model 614 draws air in through a space in the bottom front of the cabinet and exhausts this air through holes in the base. The centrifuge should be placed on a hard smooth surface for good air circulation.
2. **Always Spin Only Balanced Loads:** Make certain that opposing tube holders are filled with equal weight samples or equivalent weight water filled tubes. When using tube holders of different types or when using cushions, make sure that opposing configurations are identical. The 614 has a unique counter balanced motor mounting design which, along with its all steel construction and rubber suction feet, produces excellent vibration dampening. However, out-of-balance loads may break glass test tubes and may produce unsatisfactory separation results. Proper sample balancing will improve sample separation and extend the life of the centrifuge.

Care and Preventative Maintenance (cont'd):

3. **Clean The Inside Of The Centrifuge:** The 614 centrifuge is designed with a removable rotor chamber cover to permit servicing and cleaning of the inside of the rotor chamber. Every six months, or whenever there is a tube breakage that allows samples to enter the rotor chamber area, it is advisable to remove this cover and clean the inside of the centrifuge. To clean the centrifuge proceed as follows:

- a. Unplug the centrifuge.
- b. Close and latch the lid.
- c. Remove the eight screws attaching the cabinet to the base and lay the cabinet on its side adjacent to the centrifuge base (take precaution not to over extend the electrical wires).
- d. With your hand, or with the use of a blunt object, remove the snap-on plastic ring at the top of the rotation chamber.
- e. Remove the rotor by unscrewing the locking nut on the motor shaft.
- f. Disinfect and clean the inside of the centrifuge. To reassemble, first replace the rotor taking care to line the motor pin up with the slot on the underside the rotor. Replace the locking nut on top of the rotor and tighten until the rotor is secure. Snap the plastic ring back on the rotation chamber and place the six test tube holders back in the rotor. Finally, place the cabinet over the base and reattach it with the eight screws.

CAUTION: For cleaning, do not fully submerge the centrifuge in water or use an excessive amount of cleaning solution as this may cause permanent damage to the electrical components.

4. **Motor and Electrical Maintenance:** The motor of the 614 is a brushless induction type; It should not need servicing for the life of the centrifuge. The electrical components are selected for high reliability and should not need service. *If any of these parts should fail they must be repaired or replaced by a qualified service technician.*

SPECIFICATIONS:

General specifications for the Model 614 Centrifuge

Nominal Speed 614B/614L*		3,150 RPM
Nominal Force (RCF) 614B/614L*		1,200 x g
Speed Range 614V/VL*		0 to 3,150 RPM
Force Range 614V/VL*		0 to 1,200 x g
Nominal Speed 614U/614UL*		1,700 RPM
Nominal Force (RCF) 614U/614UL*		350 x g
Maximum Capacity Six-place		90 ml. (6 x 15 ml)
Maximum Capacity Eight-place		120 ml. (8 x 15 ml)
Overall	Height with Lid Closed	8.5 in. (21.59 cm.)
Dimensions	Height with Lid Open	15.75 in. (40.0 cm.)
	Width	10.5 in. (26.67 cm.)
	Depth	12.25 in. (31.12 cm.)
Centrifuge Motor		1/30 HP Shaded Pole, AC
Protection Breaker		4 Amp. Re-settable
Timer		Mechanical; 1 to 30 minutes
Max. Power Requirements		120 Watts
Voltage		120 Volts
Frequency		50/60 Hz
Weight (Including Rotor and (6) tube holders)		15 lbs. (6.8 kg)

* Given specifications are for the black test tube holders designed for 15ml, (16mm x 125mm), test tubes. The use of different holders and/or cushions will slightly alter the top speed and RCF.

REPLACEMENT PARTS:

Part No.	Description
7724079	Foot, rubber
7760002	Power cord
7751068	Switch, lid safety
7722029	Timer, mechanical, 30 minutes
7724145	Knob, timer
7714102	Pawl, latch, lid
7714103	Knob, latch, lid
7712313	Lid, clear
7724071	Hinge, friction
7732206	Seal, lid gasket
7786047	Rotor, 1936 six-place polymer
7786041	Rotor, 1938 eight-place aluminum
7735050	Motor, model 614B, 614L and 614V/VL
7735021	Motor, model 614U and 614UL
7717064	AC motor control, model 614V/VL
7745016	Locking solenoid ("L" versions)
7717071	PC board, lid lock ("L" versions)
7713024	Tube holder, green, for 75mm tubes
7713019	Tube holder, red, for 100mm tubes
7713026	Tube holder, black, for 125mm tubes
1525	Test Tube Cushions for 10mL test tubes



200 SHADY LANE
PHILIPSBURG, PA 16866
TEL: (814) 342-6205 TOLL FREE: 1-888-299-7778
FAX: (814) 342-6211

ON THE WEB at www.druckercompany.com