

Replacement Parts:

Part No.	Description
7724079	Foot, rubber
7751069	Switch, lid safety
7786029	Rotor lid
7786030	Rotor, six-place horizontal
7735049	Motor, 1/30 H.P., 115 V.A.C. permanent split capacitor
7729006	Capacitor, 4uF, 250V A.C.
7717071	641 Lock/Brake PC Board
7722028	Timer, mechanical, 30 minutes
7722027	Timer, mechanical, 30 minutes (with bell)
7760002	Power cord
7724145	Knob, timer
7714101	Pawl, latch, lid
7714103	Knob, latch, lid
7712313	Lid
7724071	Hinge, friction
7732206	Seal, lid gasket
7745016	Locking solenoid assembly, (Model 641)
7739009	Diode, lock Indicator, red, 14V (Model 641)
7713019	Tube holder, red, for 100mm tubes

Available Accessories:

1525 Tube cushion

For 75mm tubes in the 8410 tube holder and 50mm and smaller tubes in the 8406 tube holder.
 p/n 1525



Non-aerosol shield caps

p/n 7713011



8406 Tube Holder

For 15mm x 75mm tubes and 15mm x 50mm tubes (w/ p/n 1525)
 p/n 7713024



Call your authorized dealer or The Drucker Company for information on ordering accessories.



Model 640 Shown



Operator's Manual

Horizontal Separation Laboratory Centrifuge



THE DRUCKER CO.
 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

Carefully examine the centrifuge and document any damage that can be attributed to mishandling. If there is damage to the unit, inspect the box for signs of shipping damage and notify the shipper.

The Drucker Company is **Not Responsible** for transit damage.

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Model Description:

The model 640 is a continuous duty horizontal centrifuge. It comes standard with a see-thru lid and a lid safety switch.

If the lid is opened during operation, power is cut to the motor. The centrifuge cannot be operated while the lid is open.

The 640 is powered by a brushless permanent split capacitor AC motor for excellent acceleration and efficient, cool operation. The nominal speed of the model 640 is approximately 3,250 RPM with a separation force of 1,500 xg.



The model 641 builds on the great features of the model 640. In addition to the lid safety switch, the 641 has a true "0" RPM lid safety interlock system. The lid cannot be opened while the centrifuge is in operation. The model 641 also includes an electronic braking system which reduces braking time to approximately 25 seconds. The model 641 is powered by the same high-quality brushless AC permanent split capacitor motor and has a nominal speed of 3,250 RPM with a separation force of 1,500 xg.

Safety:

Model 640 Lid Safety Switch: The Horizon 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. If an attempt is made to open the lid while the centrifuge is in operation, power will be cut to the motor.

Model 641 Lid Safety Lock System: In addition to the Lid Safety Switch, the model 641 has a true "0 RPM" lid locking 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 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 remain locked until the rotor 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.

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

	<p><u>Safety Precautions:</u></p> <ol style="list-style-type: none"> 1. Plug the centrifuge into an approved 115 Volt A.C. outlet. Be sure that the outlet is always within reach as it is the means of emergency disconnection. 2. Always spin balanced loads. 3. Never open the lid until the rotor has come to a complete stop. 4. Never stop the rotor by hand or place your hand inside the rotor chamber while the machine is running. 5. Always unplug the unit before any cleaning or servicing is performed.
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Troubleshooting:

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, call your authorized dealer or The Drucker Company.

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.

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. The latch makes contact with a switch underneath the front top of the cabinet. If this switch is not activated, the unit will not run.
- Check the circuit breaker switch at the bottom left of the machine. If the switch is white, the breaker has tripped. Call your authorized dealer or The Drucker Company.

For servicing information or additional technical support call your authorized dealer or The Drucker Company at 1-888-299-7778.

Care and Preventative Maintenance:

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

1. **Provide Adequate Ventilation:** For cooling purposes the Horizon draws in cool ambient air and exhausts this air through holes in the base of the cabinet. The centrifuge should be placed on a hard smooth surface for good air circulation.

2. **Always Spin Balanced Loads:** Make certain that opposing tube holders are filled with an equal volume sample or an equivalent weight water-filled tube. The Horizon has a unique counter balanced motor mounting design which, along with it's 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.

3. **Keep the Tube Holders Clean:** 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. 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.

4. **Clean The Inside Of The Centrifuge:** Every six months, or whenever there is a tube breakage that allows samples to enter the rotor chamber area, it is advisable to clean the inside of the centrifuge. To clean the centrifuge:

1. Unplug the centrifuge and close and latch the lid.
2. Remove the eight screws attaching the cabinet to the base and lay the cabinet on its side next to the centrifuge base (take care not to over-extend the electrical wires).
3. Remove the test tube holders.
4. Remove the rotor by removing the nut on the motor shaft and then pulling the rotor straight up.
5. Disinfect and clean the inside of the centrifuge.

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

6. To reassemble, first replace the rotor taking care to line the motor pin up with the slot on the underside of the rotor. Replace the nut at the center of the rotor.
7. Place the six test tube holders back in the rotor.
8. Finally, place the cabinet over the base. Check that the plastic rotor chamber is positioned properly and is not caught on any part of the upper cabinet. Use caution when placing the cabinet back on the rotor chamber to avoid damaging the wiring.
No excess wiring may extend into the rotor chamber!
9. Reattach it to the base with the eight screws.

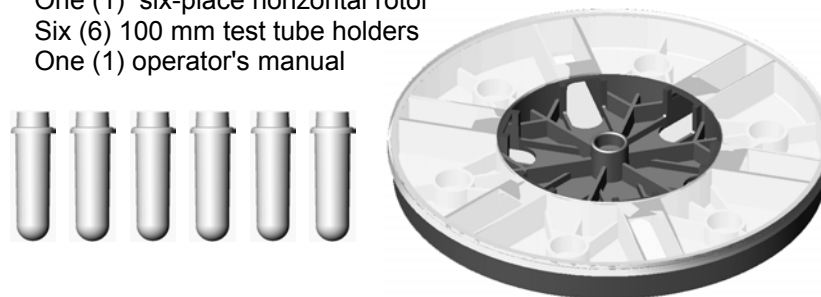
5. **Motor and Electrical Maintenance:** The Horizon uses a brushless permanent split capacitor AC motor. It should not need servicing for the life of the centrifuge. The electrical components are selected for high reliability and should not need service. **If any of these parts should fail they must be repaired or replaced by a qualified service technician.**

6. It is recommended that the tube holders be replaced after 24 months of use.

Supplied Equipment:

The following items are supplied with each model 640 centrifuge:

1. One (1) six-place horizontal rotor
2. Six (6) 100 mm test tube holders
3. One (1) operator's manual



Features:

- Swing-out horizontal rotor design (patent pending), incorporating a unique test tube holder that produces horizontally separated samples while requiring no additional parts
- Cool-Flow air flow design that prevents overheating of samples
- Heavy gauge steel cabinet construction for safety and durability
- Lid safety switch that cuts power to the motor if the lid is opened during operation
- Locking Lid, (Model 641 Only), that prevents entry into the centrifuge until the rotor has stopped spinning
- Brushless permanent split capacitor AC motor
- Clear lid for safe observation of samples and optical calibration of speed
- Optional tube holders specifically designed for 75mm test tubes
- Timed operation from 1 to 30 minutes
- Electric Braking (Model 641 Only)

Specifications:

General Specifications for the Horizon Centrifuge

Nominal Speed (at 115 V A.C.):	3,250 (+/- 100) RPM
Nominal RCF (w/ 100 mm tubes):	1,500 (+/- 100) xg
Maximum capacity six-place:	60 ml. (6 x 10 mL)
Overall Dimensions (H x W x D):	8in. x 12.5in. x 14.25in.
Centrifuge Motor:	1/30 HP, p.s.c. motor
Nominal Acceleration Time:	30 seconds
Protection Breaker:	4 Amp. resettable
Timer:	30 minutes, mechanical
Max. Power Requirements:	90 watts
Voltage:	115 Volts
Frequency:	60 Hz
Weight	18 lbs.

Nominal Braking Time:

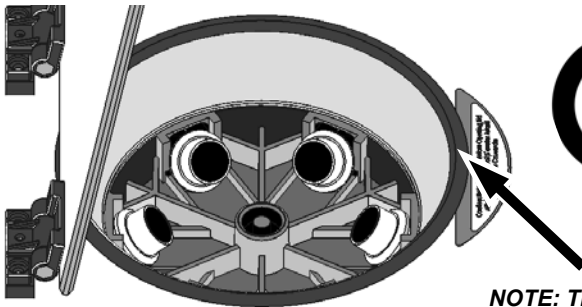
Model 640: approx. 100 seconds **Model 641:** approx. 25 seconds

Initial Setup Procedure:

Unpack the centrifuge and inspect for obvious damage; place the centrifuge on a hard, flat, stable surface. **Note:** A bench top clearance height of 18 inches (min.) is required to open the centrifuge lid.

Failure to provide adequate space for ventilation can cause damage to the samples as well as overheating and premature failure of the centrifuge.

1. Unlatch and open the lid; remove any protective shipping material literature, etc., that may have been shipped inside the centrifuge.
2. Spin the rotor by hand; check for free and level rotation.
If the rotor does not spin freely, refer to page 7 on troubleshooting.
3. Place the six test tube holders inside the rotor (as shown below), and verify that they are seated properly.
4. 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!**



NOTE:
Latch the lid knob clockwise to its stop position or the centrifuge will not operate!

NOTE: The lid must be closed and latched properly to engage a safety switch that enables the machine to run. Make sure that the knob is latched clockwise to its complete stop position.

5. Turn power on to the unit by setting the time to (5) minutes. The rotor should start spinning smoothly with no excessive noise.
If any excessive noise is heard, refer to page 7 on troubleshooting.
- 5B. Model 641 Only: As the rotor begins spinning, the red lock indicator diode on the top of the cabinet should illuminate and a slight clicking sound may be heard. The lid should be securely locked and you should not be able to rotate the lid knob in a counter-clockwise motion. If an attempt is made to open the lid, power will be cut to the motor. To reapply power, rotate the knob clockwise to its stop position. *If the lid does not lock, contact your authorized dealer or The Drucker Company.*
6. The test tube holders should slide up into the horizontal position.
7. 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 and refer to page 7.*
8. Turn the timer to zero. Power will be cut to the motor and the rotor will begin to spin down.
- 8B. Model 641 Only: When the timer times down to zero, power will be cut to the motor but the lid should stay locked until the rotor reaches approximately (0) RPM. *If the lid does not remain locked or will not unlock, contact your authorized dealer or The Drucker Company.*

If no problems are found, the centrifuge is ready to operate!

Operation: (Follow the initial setup procedure before initial operation.)

1. Plug the centrifuge into an approved 115 Volt A.C., 60 Hz. outlet.
Be sure the outlet is always within reach as the line cord is the means of emergency disconnection!
2. Unlatch the lid by turning the lid knob counter-clockwise. Open the lid.
3. Insert cushions (if needed) into the tube holders for the tube size you are using. Refer to 'Tube Holder Configurations' (this page) for assistance.

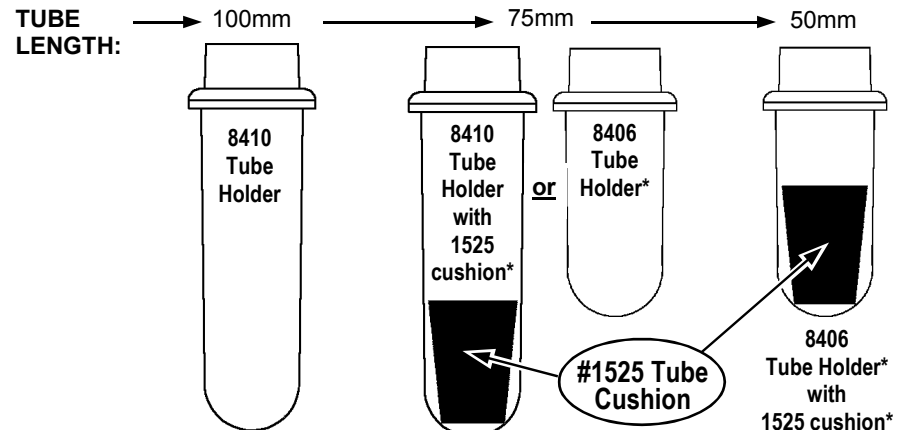
Note on balanced loads: Your centrifuge must contain a balanced load in order to work properly. To ensure that the load is balanced, keep these rules in mind when inserting cushions and test tube samples:

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.

4. Place the test tube samples into the tube holders. Be sure to follow the rules for balanced loads.
 5. Close the lid and turn the lid knob clockwise to its complete stop position.
If the lid knob is not completely latched, the centrifuge will not operate!
 6. Turn the timer knob to the desired time interval. Adjustments may be made to the timer by turning the knob in either direction to set the time interval.
 7. The centrifuge should begin to spin. If it does not, refer to page 7.
 8. After time has elapsed, the machine will shut off and the rotor will spin down.
- CAUTION: Do not open the lid until the rotor has come to a complete stop! Under no circumstances should the operator try to slow the rotor by hand as this may cause damage to the samples and/or bodily injury.**
9. Turn the lid knob counter-clockwise and open the lid.
 10. Remove the samples. The centrifuge can be used again immediately.

Tube Holder Configurations:

Your Horizon centrifuge can spin various test tube sizes from 1.5mL to 10mL with the appropriate accessories. Use the following drawing to determine which holder and cushion combination is necessary for your application.



* These parts are available as accessories.
Call your authorized dealer or The Drucker Company for ordering information.