

642M







Operator's Manual



TABLE OF CONTENTS

Symbols.....	1
Caution and Warning Statements	2
Model Description	4
Intended Use	4
Warranty.....	4
Supplied Equipment	4
Features	4
General Specifications	5
Initial Setup Procedure.....	5
Control Panel	6
Verifying The Preset Time.....	7
Changing The Preset Time	7
Operation.....	7
Spinning Balanced Loads	8
Rotor Removal And Installation.....	8
To remove the rotor.....	8
To install the rotor	8
Care And Preventative Maintenance	8
Cleaning and Disinfection	9
Transportation	9
Troubleshooting	10
Emergency Rotor Chamber Entry	11
Calibration Testing	11
Safety	11
Replacement Parts.....	12
Available Accessories	12

Symbols

Symbol	Definition	Use
	Caution	Caution to safety hazard. Potential risk of personal injury or damage to the instrument if improperly handled. Consult the manual before proceeding.
	Manufacturer	Manufacturer of record
	Electrical and electronic products recycling symbol	Recycle only as electronic waste. Do not dispose in normal waste
	RoHS Compliant	Compliance with RoHS environmental standards
	MET Listing	Denotes conformity to specific safety standards and regulations.
FDA LISTED	FDA Listed	Denotes that the product has been properly listed with the FDA.
	ISO Certification	Denotes conformity to quality standards and quality management systems.

CAUTION AND WARNING STATEMENTS



This device is intended to be operated by properly trained personnel who have carefully read the operating manual and are familiar with the function of the device. Users should also comply with the specimen receptacle manufacturer's specific instructions for use, in addition to any other protocols established by the testing organization.



WARNING: For the safety of both the operator and service personnel, care should be taken when using this centrifuge if handling substances that are known to be toxic, radioactive or contaminated with pathogenic microorganisms. Use appropriate personal protection equipment (PPE). When Risk Group II materials are used, (as identified in the World Health Organization "Laboratory Bio-Safety Manual"), a Bio-Seal should be employed. In the event that materials of a higher risk group are being used, more than one level of protection must be provided. The use of flammable or explosive materials as well as those materials which have a vigorous chemical reaction is prohibited.



Unplug the centrifuge before cleaning or performing maintenance.



WARNING: Inspect centrifuge for cracks or physical damage to cabinet, lid, rotor, or tube holders. Damage may result in unsafe operation. Discontinue use until repairs have been performed.



The use of flammable or explosive materials as well as those materials which have a vigorous chemical reaction is prohibited.



For your safety and durability of the machine, never transport or store centrifuge with tube holders inside the machine.



WARNING: "Universal precautions"¹ should be followed in handling all items contaminated with blood or other bodily fluids.



This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with this operator manual, may cause interference to radio communications.



Operation of this equipment in a residential area may cause interference, in which case the user will be required to correct the interference at his own expense.



Operation of this equipment in a manner not specified by the manufacturer may impair the protection provided by the equipment.



Electrical Safety protection is provided by properly connecting the centrifuge to earth ground. Use only the manufacturer provided line cord and ensure that it is connected to a properly grounded power receptacle. Failure to do so will result in an electrical hazard.



WARNING: Do not make modifications to or remove any hardware from rotor without prior authorization from Drucker Diagnostics.



WARNING: Only use Drucker Diagnostics components in this centrifuge.



Due to the lack of the possibility of human exposure, all Drucker centrifuges and accessories sold by Drucker Diagnostics, Inc. are compliant without any special labeling required by the California Safe Drinking Water and Toxic Enforcement Act (Proposition 65).

1 Recommendations for Prevention of HIV Transmission in Health Care Settings. MMWR 1987; 36 (Supplement #2S)

MODEL DESCRIPTION

The Model 642M is a 12VDC continuous-duty, electronically-controlled horizontal centrifuge intended for mobile applications where the Vehicle has a 12VDC power supply (cigarette lighter). The unit has a lid safety interlock system and is controlled by an electronic push-button timer that has been preset for ten (10) minutes, for precise spin times and ease of use. Samples can be safely viewed through the transparent lid. Entry into the machine is restricted during operation by the safety interlock system. The Model 642M features a lighted control panel that displays the status of the machine, easily viewable from a distance.

This general-purpose laboratory centrifuge may also be used to spin approved containers with biologics, chemicals (non-flammable, non-explosive, non-volatile, and non-highly reactive), and environmental samples.

INTENDED USE

General purpose laboratory centrifuge, intended for the density based separation of fluids through centripetal acceleration.

WARRANTY

Drucker Diagnostics warranties that this centrifuge is free from defects in workmanship and parts for 2 years.

SUPPLIED EQUIPMENT

One (1) six-place horizontal rotor	P/N 7786061
Six (6) 75-100 mm tube holders	P/N 7713079
One (1) Car Seat	P/N 03-1-0012-0139

The rotor and accessories are rated for a rotation frequency of 4,000 RPM.
For optional accessories, see page 12 of this manual.

FEATURES

- 12VDC power supply (cigarette lighter) for mobile centrifugation
- Swing-out horizontal rotor design, 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 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
- Locking lid that allows entry into the centrifuge only after the rotor has completely stopped
- Brushless permanent split capacitor AC motor
- Clear lid for safe observation of samples and optical calibration of speed
- Electronically controlled timed operation (see pg. 7)
- Push-button operation
- Indicator lights:

	Color	Status
'RUNNING'	Green	Power is applied to the motor
'LATCHED'	Yellow	Lid is closed and latched
'UNLOCKED'	Red	Lock system is deactivated

GENERAL SPECIFICATIONS

Operating Voltage	12-24V DC
Power	100 Watts
Maximum Load	6 x 10 mL
Maximum Sample Density	1.15 grams/mL
Nominal Speed (75-100 mm)	3,400 (± 175) RPM @ 13.8V
Nominal RCF (75-100 mm)	1,650 xg
Nominal Voltage	13.8V
Noise	≤ 65 dB(A)
Dimensions (H x W x D)	9 in. x 12 in. x 14 in.
Weight	12 lbs
Environmental Conditions	
Set-up Site	Indoor Use Only
Altitude	Up to 2,000m from Sea Level
Ambient Temperature	5 °C to 40 °C
Humidity	Maximum relative humidity 80% for temperatures up to 31 °C, decreasing linearly to 50% relative humidity at 40 °C
Overtoltage Category	II
Pollution Degree	2

Any use other than those specified by the Manufacturer is explicitly prohibited.
Maximum sample density is 1.15 grams / mL, (water density = 1.0 grams / mL)

INITIAL SETUP PROCEDURE

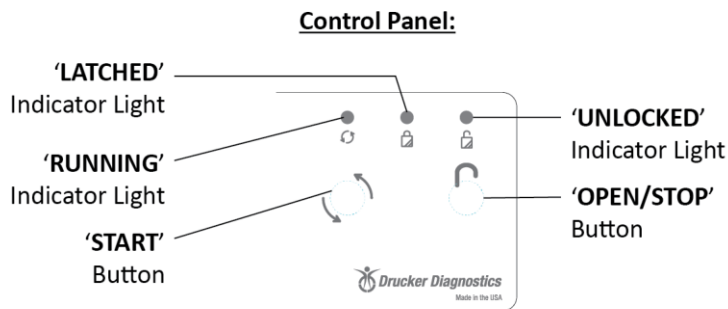
If any problems are found during the initial setup procedure, refer to the troubleshooting section on page 10. For further assistance, contact Drucker Diagnostics at 814-692-7661.

1. Place the car seat on the chosen seat in your vehicle.
2. Wrap the vehicles' seatbelt around the car seat and latch it securely. Make sure the car seat is firmly in place.
3. Carefully place the centrifuge into the secured car seat. Ensure it is stable and not at risk of shifting during transport.
4. Plug the power cord into the automobile's 12V accessory outlet.
5. For safety purposes, the locking system is always activated. To deactivate the system, (in order to insert or retrieve samples), press the 'OPEN / STOP' button on the control panel. The 'UNLOCKED' indicator light should illuminate. If it does not, refer to the troubleshooting section of this manual. The lid will be unlocked for 15 seconds after pushing the 'OPEN / STOP' button.
6. Turn the latch counterclockwise and open the lid.
7. Spin the rotor by hand, check for free and level rotation. If the rotor does not spin freely, refer to the troubleshooting section of this manual.
8. Place the six test tube holders inside the rotor and verify that they are seated properly.
9. Close the lid. Rotate the lid knob clockwise to its complete stop position. The 'LATCHED' indicator light should be illuminated. If it is not, make sure that the lid is latched properly. The centrifuge will not run unless the lid is latched and that the 'LATCHED' light is on.
10. Turn the centrifuge on by pushing the 'START' button.
11. The 'RUNNING' indicator light will illuminate.
12. The test tube holders will slide up into the horizontal position and the unit will accelerate to full speed.

13. Listen to the sound of the centrifuge. A smooth whirring sound should be heard. If there are any loud or unusual sounds, stop the centrifuge by pushing the 'OPEN / STOP' button immediately and refer to the troubleshooting section of this manual.
14. While the machine is running, try to turn the latch counterclockwise. Power may be cut to the motor, but you should be unable to fully turn the latch. If it is possible to turn the latch and open the lid while the unit is running, contact Drucker Diagnostics for assistance. Close and latch the lid.
15. Push the 'OPEN / STOP' button. The 'RUNNING' indicator light should go out and the motor should slow to a stop.
16. The lid should remain locked until the rotor has nearly stopped. If the machine unlocks prematurely, contact Drucker Diagnostics for assistance.
17. Once the rotor has stopped, the interlock system will become disengaged for sixty (60) seconds. The 'UNLOCKED' indicator light will illuminate during this time.
18. To gain entry into the centrifuge after this period has ended, simply press the 'OPEN / STOP' button. The lid will unlock for fifteen (15) additional seconds.

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

CONTROL PANEL



<p>'RUNNING' Indicator Light</p>	<p>Lights up when the machine is in operation, (power is being applied to the motor).</p>	<p>'START' Button</p>	<p>Begins a new run, (the lid must be closed, see pg. 8).</p>
<p>'LATCHED' Indicator Light</p>	<p>Lights up when the lid has been closed and latched properly.</p>	<p>'OPEN/STOP' Button</p>	<p>Allows for access into the rotor chamber by disengaging the locking mechanism. Entry is only permitted when the rotor is stopped. Pressing this button during operation will terminate the run and unlock the lid after the rotor has come to a stop.</p>
<p>'UNLOCKED' Indicator Light</p>	<p>Lights up to indicate that the locking mechanism has been deactivated, allowing access to the rotor chamber.</p>		

Circuit Breaker: The Model 642M is protected with a 15 Amp fuse, located inside the 12V power adapter. Any electrical short circuit will cause the fuse to cut power to the machine.

VERIFYING THE PRESET TIME

NOTE: Your centrifuge must be plugged in.

- a. Push the OPEN / STOP button to disengage the lock and then open the lid.
- b. Push and hold the START button for approximately three (3) seconds. The Yellow LATCHED indicator light will begin to flash, indicating program mode.
- c. When you release the START button, the RUNNING indicator light will begin to flash. Each flash represents one minute of run time.
- d. Press the START button to verify the brake setting. When you release the START button, the RUNNING indicator light will begin to flash. Each flash represents the brake setting, from 1 to 10.

CHANGING THE PRESET TIME

NOTE: Your centrifuge must be plugged in.

- a. Push the OPEN / STOP button to disengage the lock and then open the lid.
- b. Push and hold the START and OPEN buttons for approximately three (3) seconds. The yellow LATCHED indicator light will begin to flash slowly, indicating that you can now program run time.
- c. Press START one time for each minute of run time desired, from a minimum of 1 minute to a maximum of 30 minutes. The green START indicator light will flash each time you press the START button.
- d. Press OPEN to enter the run time. You will now begin to adjust the brake setting.
- e. Press START to adjust the brake setting, from a minimum of 1 to a maximum of 10. The green START indicator light will flash each time you press the start button.
- f. When you are finished, press the 'OPEN' button to exit. Use the above procedure to verify the run time and brake setting change.

OPERATION

NOTE: Follow the initial setup procedure on page 5 before initial operation.

1. Plug the power cord into the automobile's 12V accessory outlet.
2. Unlock the lid by pressing the OPEN/STOP button on the control panel. The UNLOCKED indicator light should illuminate. The lid will be unlocked for 15 seconds after pushing the OPEN/STOP button.
3. Turn the latch counterclockwise and open the lid.
4. Spin the rotor by hand, check for smooth rotation free from excessive wobble.
5. Place six test tube holders (supplied) of the same type inside the rotor and verify that they are seated properly.
6. Close the lid. Rotate the lid knob clockwise to its stop position. The 'LATCHED' indicator light should be illuminated. If it is not, make sure that the lid is latched properly. The centrifuge will not run unless the lid is latched and the 'LATCHED' light is illuminated.
7. Start a centrifugation cycle by pushing the START button.
8. The 'RUNNING' indicator light will illuminate.
9. The test tube holders will slide up into the horizontal position and the rotor will accelerate to full speed.
10. Listen to the sound of the centrifuge. A smooth whirring sound should be heard. If there are any loud or unusual sounds, stop the centrifuge by pushing the OPEN/STOP button.
11. Push the OPEN/STOP button. The 'RUNNING' indicator light should go out and the motor should slow to a stop.
12. The lid should remain locked until the rotor has nearly stopped. If the centrifuge unlocks prematurely, contact Drucker Diagnostics for assistance.
13. Once the rotor has stopped, the interlock system will become disengaged for sixty (60) seconds. The 'UNLOCKED' indicator light will illuminate during this time.
14. To gain entry into the centrifuge after this period has ended, simply press the OPEN/STOP button. The lid will unlock for fifteen (15) additional seconds.

SPINNING 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.

ROTOR REMOVAL AND INSTALLATION

TO REMOVE THE ROTOR

1. Unlock the centrifuge by pushing the 'OPEN / STOP' button and unlatch and open the lid.
CAUTION: Unplug the centrifuge from the electrical outlet to eliminate the possibility of electrical shock or other injury.
2. Remove the test tube holders.
3. Remove the nut in the center of the rotor by turning it counterclockwise (a tool 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 nut and turn it until it is hand-tight, (a tool may be required).
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 5 for this procedure.

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 Model 642M 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 642M 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 8 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 pathogenic 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 642M uses a brushless permanent split capacitor AC motor. It should not need routine servicing for the life of the centrifuge. The electrical components are selected for high reliability and should not need routine service.
5. **Tube Holder Replacement:** It is recommended that the tube holders be replaced after 24 months of use. Inspect tube holders regularly for cracks. If cracks are discovered, replace immediately.
6. **Remove Accessories Before Moving:** All tube holders, samples, and caps must be removed from the rotor chamber before transporting or storing the centrifuge to prevent damage and injury.

CLEANING AND DISINFECTION

To prolong the life of the centrifuge cleaning and disinfection is recommended every six months, or whenever there is a spillage or tube breakage. Contaminants must be removed immediately, or corrosion and premature degradation of components can occur.



Cleaning and Decontamination may be necessary as a safeguard before laboratory centrifuges, rotors, and any accessories are maintained, repaired, or transferred.

1. Unplug the centrifuge before cleaning.
2. Apply cleaning solutions with a dampened towel or cloth ONLY. Do not spray or pour cleaning solution directly onto or into the centrifuge. Do not saturate or submerge the centrifuge in water or other cleaning solutions as this will cause damage, create a safety risk, and void the warranty.
3. ONLY isopropyl alcohol, soap and water, or a 10% (5500 PPM) bleach solution should be used for cleaning and disinfection of the centrifuge and accessories.
4. All surfaces must be dried immediately after cleaning and disinfecting.



TBQ Germicidal products shall not be used, as they will cause damage to the centrifuge and void the warranty.

5. The use of fully/partially halogenated hydrocarbons, ketones, esters, ethers, benzyls, ethyl benzenes, and all other chemicals not prescribed by the manufacturer shall not be used as they may cause damage to the rotor chamber, rotor, tube holders, accessories and centrifuge exterior and void the warranty.
6. It may be necessary to remove the rotor and clean the rotor chamber. Follow the instructions on page 8 to remove and reinstall the rotor.

TRANSPORTATION

During transportation, accessories can become dislodged from the rotor and fall into the rotor chamber where they can remain unnoticed.

Before transporting the centrifuge in a vehicle, make certain that the centrifuge is secured sufficiently to prevent shifting sliding or rolling, and that there are no tube holders or accessories in the rotor or rotor chamber.

TROUBLESHOOTING

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

<p>The rotor does not spin freely.</p>	<ul style="list-style-type: none"> ○ Make sure nothing has fallen into the rotor chamber. ○ If there is nothing obstructing the rotor, the rotor may be damaged. contact Drucker Diagnostics for further assistance.
<p>Excessive noise when the machine is running.</p>	<ul style="list-style-type: none"> ○ 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.
<p>The centrifuge does not run.</p>	<ul style="list-style-type: none"> ○ Check the electrical outlet. ○ Make sure the lid latch is turned completely clockwise to its stop position. When the lid is closed properly, the latch light on the control panel will illuminate. ○ Check the circuit breaker switch at the bottom left of the machine. If the switch is white, the breaker has tripped. Contact Drucker Diagnostics for further assistance. ○ The printed circuit board may be damaged. Have a technician test and replace the circuit board if necessary.
<p>The latch light does not come on when the lid is closed.</p>	<ul style="list-style-type: none"> ○ Make sure that the unit has power. ○ 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 light will not turn on and the machine will not run.
<p>The machine does not unlock after a run has completed.</p>	<p>The lid should remain locked until the rotor has nearly come to a complete stop and then unlock for 60 seconds. If additional unlock time is needed, press the 'OPEN / STOP' button with the machine plugged in, and the rotor stopped. If the lid remains locked after this and will not unlock, the electronics may have been damaged. Contact Drucker Diagnostics for assistance. To access the rotor chamber, follow the procedure on page 11, "Emergency Rotor Chamber Entry".</p>
<p>The run time is not set to the desired length.</p>	<p>Check the run preset by following the instructions on page 7. If the preset is not the desired length follow the procedure on the same page to change the run preset time.</p>
<p>Rotor speed is lower than specified range</p>	<p>Rotor speed is calibrated at 13.8VDC. Confirm source voltage meets or exceed this value. Motor speed will vary according to source voltage.</p>

EMERGENCY ROTOR CHAMBER ENTRY

In the event of power failure, it may be impossible to unlock the lid by conventional means. In this case, entry into the rotor chamber may be made by removing the latch label and using a pen to manually disengage the locking mechanism (see photo). Pull the mechanism towards the control panel and then unlatch and open the lid. If the unit is damaged, contact your authorized dealer or Drucker Diagnostics.



CALIBRATION TESTING

It is recommended that the top speed be tested every two years for continued safe operation. Contact Drucker Diagnostics for further information or testing availability.

SAFETY

The Model 642M complies with US, Canadian, and European Safety standards.

- The centrifuge should be placed on a stable, flat surface.
- Before using the centrifuge, check the rotor. Do not operate the centrifuge if the rotor is loose, or does not rotate freely.
- Rotors and accessories that show evidence of damage or corrosion or are to be taken out of service.
- The centrifuge must be taken out of service if safety related damages are found in the rotor chamber.
- Do not open the lid until the rotor has come to a complete stop.
- For use only on smooth level surfaces, or approved stands.
- Do not move the centrifuge while it is plugged in or running.
- **Do not operate the centrifuge in a moving automobile.**

Lid Safety Switch: The Model 642M 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. An indicator light on the front of the machine will light up when the lid has been latched properly.

Lid Safety Interlock System: In addition to the Lid Safety Switch, the Model 642M has a true “0 RPM” lid locking system. The lid safety locking system keeps the lid locked at all times, (even during power failure), and requires that the rotor be at rest in order to unlock the lid. The centrifuge will not allow entry into the rotor chamber unless the centrifuge has power and the rotor is stopped. To open the lid, make sure that the centrifuge is plugged in and, with the rotor stopped, press the ‘OPEN / STOP’ button.

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 may lose power, but the lid will still remain locked. 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.

REPLACEMENT PARTS

Part No.	Description
7724037K	Foot, rubber (Pack of 4)
7745017	Lid Switch Assembly
7786061	Rotor, six-place, horizontal
7760016	Power Cord
02-005-1-0009	Motor Assembly
7751079	Fuse
7724071K	Hinge, friction Kit (Pack of 4)
7732018	Seal, lid gasket
02-002-1-0027	Lid Assembly
03-0-0003-0188	Front Panel Label
02-006-1-0047	Control board
7713079K	Shield for 75/100 mm tubes (Pack of 6)
03-1-0012-0139	Car Seat

AVAILABLE ACCESSORIES



**0.5 to 1 mL Tube
Adapter (Pack of 6)**
p/n 7713068K



**1.5 to 2 mL Tube
Adapter (Pack of 6)**
p/n 7713065K

This operator's manual is part number 03-0-0002-0321 Rev. A

FDA LISTED



E112532



INSTRUCTIONS FOR DISPOSAL OF WEEE BY USERS IN THE EUROPEAN UNION



This product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, waste disposal service, or where you purchased the product.



Designed, built, and supported in the USA

Drucker Diagnostics

Protected by U.S. Patents #6,811,531, & #D718463 Other Patents Pending

