

DASH

APEX SERIES

Operator's Manual

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MODEL DESCRIPTION

DASH Apex is engineered for STAT sample processing. When used with the Drucker DASH Approach to centrifugation, the DASH Apex cuts your turnaround time (TAT) by up to 20 minutes.

FEATURES

- Simple 2-Button interface
- Three (3) easily selectable pre-set cycles are conveniently labeled for your lab's most common applications. Use the default cycles or customize them as needed. An LED light indicates the current selected setting.
- If desired, the control panel can be locked on one preset cycle for error-free reproducibility.
- Lid lighting indicates the centrifuge's status (ready, running, done), keeping your TAT down (patent pending).
- A traditional audible alert indicates the completion of the cycle.
- Cool-Flow air flow design prevents overheating of samples by maintaining room temperature.
- Carbon fibers are used to reinforce the tube holders and provide high strength and durability.
- A clear lid permits safe observation of samples and optical calibration of speed.
- The lid safety system only allows entry into the centrifuge after the rotor has completely stopped.
- The lid safety system prevents the centrifuge from operating unless the lid is closed and latched.
- The high power brushless DC motor provides years of operation with no routine maintenance.

INTENDED USE

This centrifuge is an IVD accessory, and therefore subject to the former EU IVD Directive 98/79/EC and the current EU IVD Regulation 2017/746. It is a laboratory product designed to separate components by generation of relative centrifugal force. It separates human and animal samples – such as blood, urine and other body fluids -- collected in appropriate specimen receptacles, either alone or with reagents or other additives. As a general purpose laboratory centrifuge, it is designed to also run other containers filled with chemicals (non-flammable, non-explosive, non-volatile, and non-highly reactive only), environmental samples, and other non-human body samples. This centrifuge should be operated by trained personnel only. Any use other than those intended by the Manufacturer is explicitly prohibited. [Maximum sample density is 1.15 grams/mL].

WARRANTY

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

- ⚠ **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.

INITIAL SETUP

- Unpack and verify that all the following are included:
 - Centrifuge
 - Power cord/supply
 - Tube holders: 6 for Apex 6, 12 for Apex 12, or 6 buckets for Apex 24
 - Operating Manual
- Setup the centrifuge on flat and level surface. A bench top clearance height of 21" (54 cm) is required to open the lid.
- The centrifuge should have 6" (15 cm) of clear space around the centrifuge. Proper ventilation is necessary to prevent the overheating of samples as well as premature failure of the centrifuge. Choose an area which allows unencumbered air flow, and where the temperature remains between 16°C and 32°C.
- No 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.
- Plug the line cord into the external power supply brick.
- Plug the connector from the power supply into the back of the centrifuge.

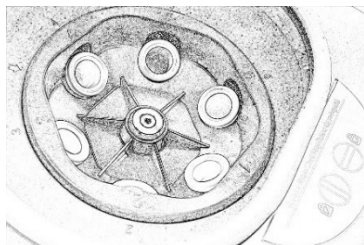
Apex 6: The flat surface with the two arrows on the housing around the connector will face upward.
NOTE: When disconnecting, the black housing will first retract before the metal connector pulls out.

Apex 12 & 24: The side of the connector with the plastic hook will face upward. NOTE: To remove the connector from the centrifuge, the rear portion of the plastic hook must be depressed to raise the hook and allow the contacts to slide apart.

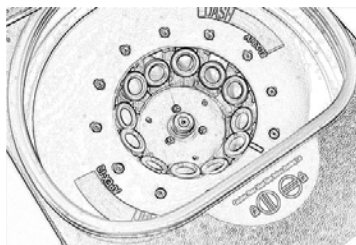
- Plug the line cord into an approved electrical outlet.

⚠ BE SURE THE ELECTRICAL OUTLET IS ALWAYS ACCESSIBLE AS THE LINE CORD IS THE MEANS OF EMERGENCY DISCONNECTION!

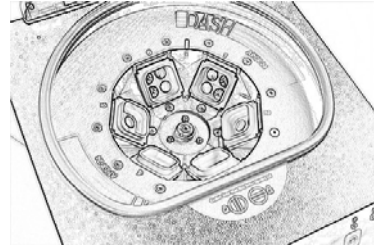
DASH Apex 6



DASH Apex 12



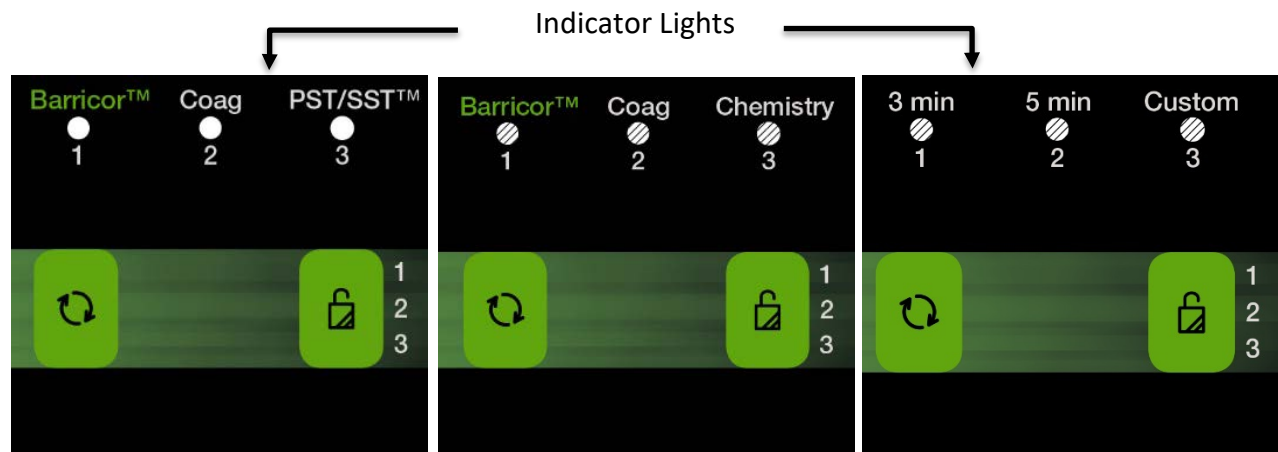
DASH Apex 24



QUICK START

The LED indicator light is on for the cycle currently selected. Depending on your unit, you may have the following cycles:

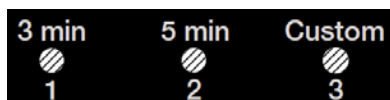
Barricor™:	For BD Vacutainer® Barricor™ tubes
Coag:	For Coagulation or Platelet Poor Plasma (PPP)
PST/SST™:	For BD PST™ & SST™ tubes with gel or blood tubes without gel
Chemistry:	For BD PST™ II & SST™ II tubes with gel or blood tubes without gel
3 Min:	STAT centrifugation at 4,000 xg
5 Min:	STAT centrifugation at 4,000 xg (6 and 12) or 3,000 xg (24)
6 Min:	STAT centrifugation at 3,000 xg
Custom:	This setting can be customized to your lab's validated cycles.



	Start	Begins running the cycle indicated by the cycle indicator LED light. The lid must be closed.
	Unlock	Allows access into the rotor chamber by disengaging the locking mechanism. Entry is only possible when the rotor is stopped.
	Stop	Pressing the UNLOCK button during operation will terminate the run and unlock the lid after the rotor has come to a stop.

	Cycle Selection	The LED light is on for the cycle currently selected. To change the selected cycle, press the UNLOCK button in succession until the desired cycle is selected. Two seconds after selection, the button reverts to its UNLOCK function.
	Lock Cycle Selection	Select desired cycle. Press and hold the UNLOCK button for 5 seconds. Two beeps will confirm that cycle selection is locked.
	Unlock Cycle Selection	To re-enable cycle selection, press and hold the UNLOCK button for 5 seconds. Three beeps will confirm that cycle selection is now unlocked.

SETTINGS



Factory Settings	DASH Apex 6			DASH Apex 12			DASH Apex 24		
Cycle	RPM	Time	G-Force	RPM	Time	G-Force	RPM	Time	G-Force
3 min	5,300	3	4,000	5,200	3	4,000	4,200	5	3,000
5 min	5,300	5	4,000	5,200	5	4,000	4,200	6	3,000
Custom	3,800	7	2,000	3,600	7	2,000	3,500	7	2,000



Factory Settings	DASH Apex 6			DASH Apex 12			DASH Apex 24		
Cycle	RPM	Time	G-Force	RPM	Time	G-Force	RPM	Time	G-Force
Barricor™	5,300	3	4,000	5,200	3	4,000	4,200	5	3,000
Coag	5,300	5	4,000	5,200	5	4,000	4,200	6	3,000
PST/SST™	3,800	7	2,000	3,600	7	2,000	3,500	7	2,000



Factory Settings	DASH Apex 6			DASH Apex 12			DASH Apex 24		
Cycle	RPM	Time	G-Force	RPM	Time	G-Force	RPM	Time	G-Force
Barricor™	5,300	3	4,000	5,200	3	4,000	4,200	5	3,000
Coag	5,300	5	4,000	5,200	5	4,000	4,200	6	3,000
Chemistry (PSTII/SSTII™)	4,600	5	3,000	4,400	5	3,000	4,300	5	3,000

Custom cycles, if desired:

Cycle	Tube Type	RPM	G-Force (RCF)
1			
2			
3			

NOTE: Timer starts when speed reaches 90% of set speed. Deceleration time is not included in cycle time.

REVIEW CYCLE TIME AND SPEED SETTINGS

Your settings may not be standard. To review current settings, follow this procedure:

- The lid must be open to review the selected cycle time and speed.
- Press and hold the START button until you hear a beep.
- Release the START button, the centrifuge will beep and the LED light will flash once for each minute of run time in the current cycle.
- Pressing the START button again will cause the unit to beep and the LED light to flash once for each 100 rpm in the current cycle.
- The centrifuge will automatically revert to normal mode at the end.

CHANGING CYCLE TIME AND SPEED SETTINGS

- The lid must be open to change the selected cycle time and speed.
- Select the cycle you wish to change.
- Press and hold the START and UNLOCK buttons together until the LED light flashes.
- Press the START button for each minute of run time.
- Move to speed setting mode by pressing the UNLOCK button.
- Press the START button once for each 100 rpm.
- Press the UNLOCK button to exit setting mode.

OPERATION

- Place the tubes into the tube holders. Be sure to follow the rules for balanced loads as listed in the next section.
- Close the lid and turn the lid knob clockwise to its complete stop position.
- The LED light is on for the cycle currently selected. The selected cycle determines the run time and speed. To change the selected cycle, press the UNLOCK button in rapid succession until the desired cycle is selected. Two seconds after selection, the button reverts to its UNLOCK function.
- Pushing the START button on the control panel starts the spin cycle.
- When the cycle is completed, the rotor will slow to a complete stop and the lid light will flash.
- The locking mechanism will disengage for 60 seconds allowing entry into the rotor chamber. To unlock after more than 60 seconds have elapsed, press the UNLOCK button. The lid will unlock for another 15 seconds.
- Turn the lid knob counterclockwise and open the lid. The lid light will turn off.
- You may now safely remove the samples.

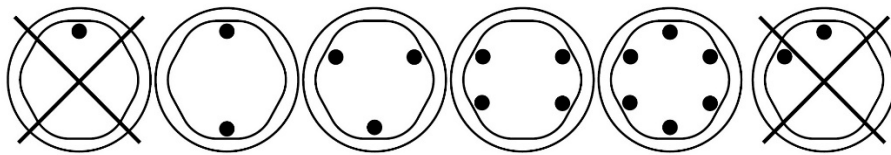
BALANCING LOADS



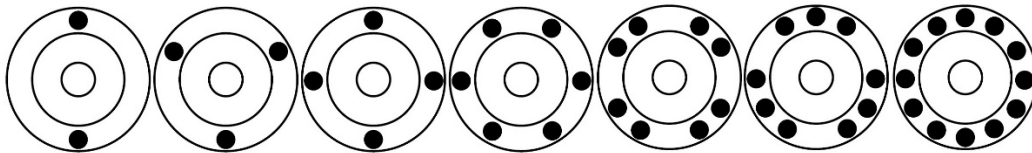
Your centrifuge must contain a balanced load to work properly. Spinning balanced loads will extend the life of the centrifuge and produce better results. Use the following rules when loading the rotor. If an odd number of samples is to be spun, fill a tube with water to match the weight of the unpaired sample and place it across from this sample.

*Opposing tube holders must be equally loaded or empty or loaded with equally weighted samples.
When loading only 3 tubes, they must be of equal weight.*

6 Tube Centrifuges

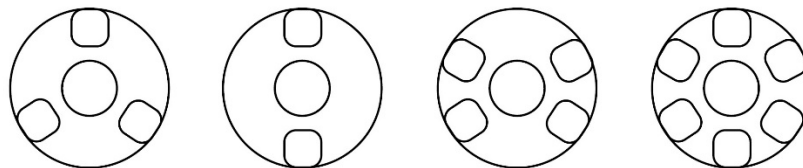


12 Tube Centrifuges

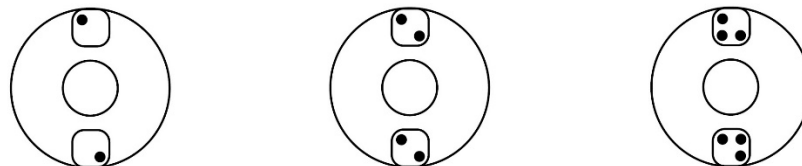


24 Tube Centrifuges

Balanced Rotor Loading



Proper Bucket Loading



*Buckets can be placed around the rotor in any of the rotor loading configurations shown.
Each bucket must be loaded symmetrically with tubes as above.*

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:

- **Always Spin Balanced Loads:** Make certain that you are always spinning a balanced load, as shown in the previous section. These centrifuges have a unique counter balanced motor mounting design which 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.
- **Motor and Electrical Maintenance:** The highest quality electrical components have been selected for the DASH Apex centrifuges and should not need maintenance or servicing for the life of the centrifuge.
- **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.
- **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. Before using any cleaning or decontamination methods other than those recommended by the manufacturer, users should verify with the manufacturer that the proposed method will not damage the equipment.

- Unplug the centrifuge before cleaning.
- Use appropriate personal protective equipment (PPE).
- 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 the warranty.
- ONLY isopropyl alcohol or a 10% (5500 PPM) bleach solution should be used to disinfect the centrifuge and its accessories.
- All surfaces must be dried immediately after cleaning and disinfecting.



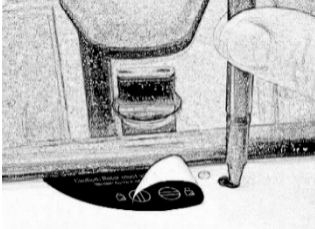
TBQ GERMICIDAL PRODUCTS ARE NOT RECOMMENDED AS THEY MAY CAUSE DAMAGE TO THE CENTRIFUGE. WIPE OFF THOROUGHLY AFTER USE TO PREVENT VOIDING THE WARRANTY.

- 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.

TROUBLESHOOTING

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

<p>The centrifuge does not run</p>	<ul style="list-style-type: none"> ○ Verify that the centrifuge is powered. One of the LED lights should be on. ○ Make sure the lid latch is turned completely clockwise to its stop position. ○ If the centrifuge still does not run, contact Customer Service.
<p>The rotor does not spin freely</p>	<ul style="list-style-type: none"> ○ Make sure nothing has fallen into the rotor chamber, following the procedure above. ○ If nothing obstructs the rotor, the rotor may be damaged. Contact Customer Service for further assistance.
<p>The centrifuge makes a rattling noise when running</p>	<ul style="list-style-type: none"> ○ Stop the centrifuge. Open the lid. ○ Wearing PPE, remove tubes and tube holders/buckets and look for fallen objects or debris. Carefully reach inside the rotor chamber with a tool to remove them. ○ Inspect the rotor, tube holders or buckets for damage. ○ If the tube holders or buckets have any damage, even slight, safely dispose of them and replace them. ○ If the rotor appears damaged, contact Customer Service for further assistance.
<p>Excessive noise or vibration when the centrifuge is running</p>	<ul style="list-style-type: none"> ○ Verify that all four centrifuge feet are properly seated on a flat surface. ○ Insure that the load is balanced according to instructions in the “Balancing Loads” section of this manual. ○ Make sure that nothing has fallen into the rotor chamber.
<p>The centrifuge stops and beeps continuously</p>	<p>The load is not balanced. Press the UNLOCK button, open the lid, and balance the load as recommended elsewhere in this manual.</p>
<p>The cycle time and speed are not set to the desired value</p>	<p>Check the setting by following the instructions in the section on Changing Cycle Settings. If the preset is not the desired length, follow the procedure on the same page to change the run preset time.</p>

<p>The centrifuge does not unlock after a run is completed</p>	<ul style="list-style-type: none"> ○ Wait until the rotor has come to a complete stop. If the lid knob still cannot be rotated, press the UNLOCK button and try again. <ul style="list-style-type: none"> ○ If no LED light is on, the unit is not powered and the lid will not unlock by conventional means. Remove the latch label and use a pen to manually disengage the locking mechanism. 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. 
<p>The lid does not open</p>	<ul style="list-style-type: none"> ○ Insure that the lid knob is turned fully counterclockwise. ○ If the knob cannot be turned counterclockwise, turn it fully clockwise, press UNLOCK, and turn counterclockwise. ○ If the lid remains locked after this and will not unlock, the electronics may have been damaged. Contact customer service for assistance.
<p>Clicking noise during braking gets loud</p>	<ul style="list-style-type: none"> ○ Make sure that the screw in the center of the rotor is tight.
<p>Lid does not stay up</p>	<ul style="list-style-type: none"> ○ Tighten the center screw on the lid hinge.

GENERAL SPECIFICATIONS

The rotor and accessories are rated for the maximum rotation frequency shown in the table below.

<p>Apex 6</p>	<p>Tube Capacity</p>	<p>6 tubes – 3 to 10 mL</p>
	<p>Radius with included accessories</p>	<p>5 in (12.7 cm)</p>
	<p>Dimensions (Height x Width x Depth)</p>	<p>8 in x 11 in x 13 in (20 cm x 28 cm x 34 cm)</p>
	<p>Weight</p>	<p>12 lbs. (5.4 kg)</p>
	<p>Noise Level</p>	<p>61 dB</p>
	<p>Environmental Range</p>	<p>16 – 32 °C</p>
	<p>Voltage</p>	<p>95 -253 VAC</p>
	<p>Frequency</p>	<p>50/60 Hz</p>
	<p>Power Requirement</p>	<p>220 Watts</p>
	<p>Centrifuge Motor</p>	<p>½ H.P. Brushless DC</p>
	<p>Maximum Speed</p>	<p>5,300 RPM</p>
	<p>Cycle Time</p>	<p>1 to 30 minutes (+/- 2%)</p>

Apex 12	Tube Capacity	12 tubes – 3 to 10 mL
	Radius with included accessories	5.25 in (13.3 cm)
	Dimensions (Height x Width x Depth)	9 in x 12.5 in x 14.75 in (23 cm x 32 cm x 37 cm)
	Weight	34 lbs. (15 kg)
	Noise Level	61 dB
	Environmental Range	16 – 32 °C
	Voltage	95 -253 VAC
	Frequency	50/60 Hz
	Power Requirement	230 Watts
	Centrifuge Motor	½ H.P. Brushless DC
	Maximum Speed	5,200 RPM
	Cycle Time	1 to 30 minutes (+/- 2%)

Apex 24	Tube Capacity	24 tubes – 3 to 10 mL
	Radius with included accessories	6 in (15.3 cm)
	Dimensions (Height x Width x Depth)	9 in x 14.5 in x 17 in (23 cm x 37 cm x 43 cm)
	Weight	39 lbs. (17 kg)
	Noise Level	64 dB
	Environmental Range	16 – 32 °C
	Voltage	95 -253 VAC
	Frequency	50/60 Hz
	Power Requirement	220 Watts
	Centrifuge Motor	½ H.P. Brushless DC
	Maximum Speed	4,200 RPM
	Cycle Time	1 to 30 minutes (+/- 2%)

Use only with approved accessories from the original manufacturer. A complete list of accessories is available at www.DruckerDiagnostics.com.

CALCULATING THE G-FORCE

The I.F.U.s of tube manufacturers recommend cycles at a minimum G-Force. For included accessories, a conversion table is shown on the next page.

For other tube holders, the G-Force can be calculated if you know the RPM and the radius:

In Centimeters:

$$\text{RCF or G-force} = 0.00001118 \times \text{Rotor Radius (cm)} \times (\text{RPM})^2$$

In Inches:

$$\text{RCF or G-force} = 0.0000284 \times \text{Rotor Radius (in)} \times (\text{RPM})^2$$

	APEX 6	APEX 12	APEX 24
	Radius	Radius	Radius
	5.0 in	5.25 in	6.0 in
	12.7 cm	13.3 cm	15.3 com
RPM	G-Force	G-Force	G-Force
1000	140	150	170
1100	170	180	210
1200	200	210	250
1300	240	250	290
1400	280	290	330
1500	320	340	380
1600	360	380	450
1700	400	450	500
1800	450	500	550
1900	500	550	600
2000	600	600	700
2100	650	650	750
2200	700	700	800
2300	750	800	900
2400	800	850	1000
2500	900	900	1050
2600	950	1000	1150
2700	1050	1100	1250
2800	1100	1200	1350
2900	1200	1250	1400
3000	1300	1350	1500
3100	1350	1400	1650
3200	1450	1500	1750

	APEX 6	APEX 12	APEX 24
	Radius	Radius	Radius
	5.0 in	5.25 in	6.0 in
	12.7 cm	13.3 cm	15.3 com
RPM	G-Force	G-Force	G-Force
3300	1550	1600	1850
3400	1650	1700	2000
3500	1750	1800	2100
3600	1850	1950	2200
3700	1950	2050	2300
3800	2050	2150	2450
3900	2150	2300	2600
4000	2300	2400	2850
4100	2400	2500	2900
4200	2500	2600	3000
4300	2600	2750	3150
4400	2750	2900	N/A
4500	2900	3000	N/A
4600	3000	3150	N/A
4700	3150	3300	N/A
4800	3300	3450	N/A
4900	3400	3600	N/A
5000	3550	3750	N/A
5100	3700	3900	N/A
5200	3850	4000	N/A
5300	4000	N/A	N/A

Product Family: DASH Apex Series (Apex 6, Apex 12, Apex 24)

Complies with UL61010-1/CSA C22.2 No. 61010-1 and IEC61010-2-020

Protected by U.S. Patents #6,811,531, #D718,463, & #D734,489. Other Patents Pending



RoHS
Compliant

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.



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