Drucker Diagnostics Dash Series Apex 6 Centrifuge User Manual

Contents

Drucker Diagnostics

Drucker Diagnostics Dash Series Apex 6 Centrifuge

Instructions

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.
	CE Mark	Denotes conformity to specific European directives and regulations.
	MET Listing	Denotes conformity to specific safety standards and regulations.
	UK Mark	Denotes conformity to specific UK directives 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.

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. 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.

FEATURES

- ATURES
- 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 settings can be customized. An LED light indicates the current selected setting.
- If desired, the control panel can be locked on one preset cycle, ideal for standardization to a single spin.
- 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

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.

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. [Refer to the clinical laboratory method specified by the specimen receptacle manufacturer or established by the medical technology for the product's applications.]
- 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.
- 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.
- 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.

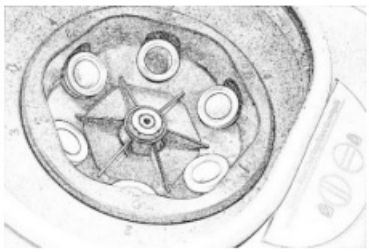
- Due to the lack of the possibility of human exposure, all Drucker centrifuges and accessories sold by Drucker Diagnostics, Inc. are compliant without any special labeling required by the California Safe Drinking Water and Toxic Enforcement Act (Proposition 65).

INITIAL SETUP

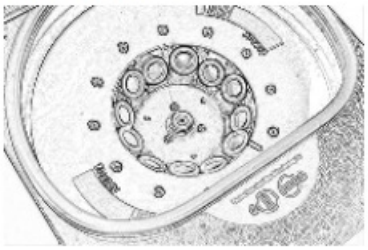
- Unpack and verify that all the following are included:
  - Centrifuge
  - Power cord
  - Tube holders: 6 for Apex 6, 12 for Apex 12, or 6 buckets for Apex 24
  - Quick Start Guide
- Setup the centrifuge on flat and level surface. A bench top clearance height of 21” (54 cm) is required to open the lid.
- 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 centrifuge.
- Plug the line cord into an electrical outlet.
- Turn on the power switch on the back of the centrifuge

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

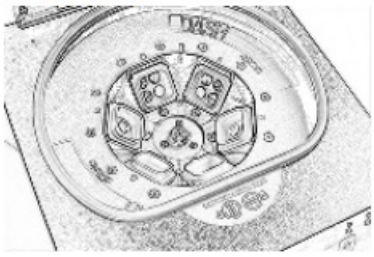
DASH Apex 6



DASH Apex 12



DASH Apex 24



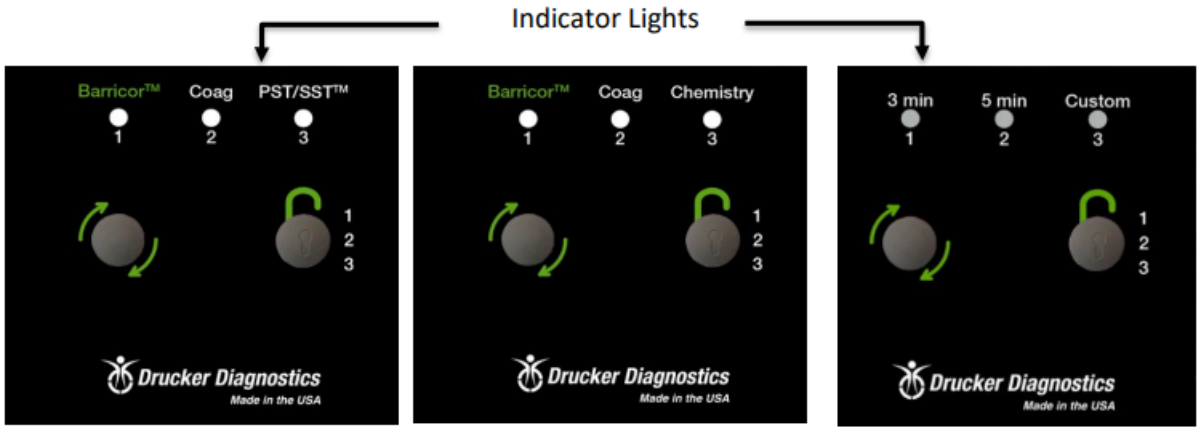
OPERATION

- Place the tubes into the tube holders. Be sure to follow the rules for balanced loads as listed on page 8.
- The front panel LED is illuminated for the currently selected cycle. The selected cycle determines the run time and speed. To select another cycle, press the UNLOCK button in succession until the desired cycle is selected. **Note:** cycle selection is only available with the lid open.
- Close the lid and turn the lid knob clockwise to its complete stop position.
- 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.

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

- **BarricorTM:** For BD Vacutainer® BarricorTM tubes
- **Coag:** For Coagulation or Platelet Poor Plasma(PPP)
- **PST/SSTTM:** For BD PSTTM & SSTTM tubes with gel or blood tubes without gel
- **Chemistry:** For BD PSTTM II & SSTTM 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 above the numbers indicates the cycle currently selected. To change the selected cycle, open the lid and 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	Open lid. 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, open lid, then 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 opened 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

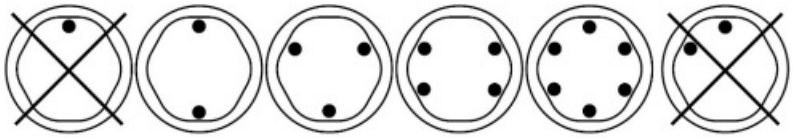
- The lid must be opened to change the selected cycle time and speed.
- Select the cycle you wish to change.
- Press and hold the START and UNLOCK buttons together until the LED light flashes.
- Press the START button for each minute of run time.
- Move to speed setting mode by pressing the UNLOCK button.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

BALANCING LOADS

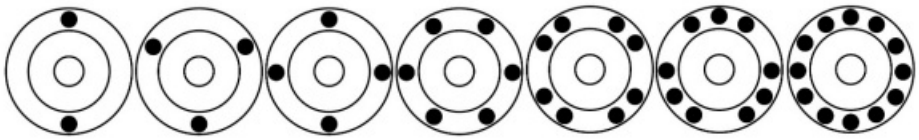
Your centrifuge must contain a balanced load to work properly. Spinning balanced loads will extend the life of the centrifuge and produce betterresults. Use the following rules when loading the rotor. If an odd number of samples is to be spun, fill a tube with water to match the weight of the unpaired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

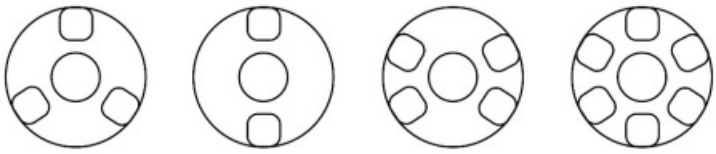


12 Tube Centrifuges

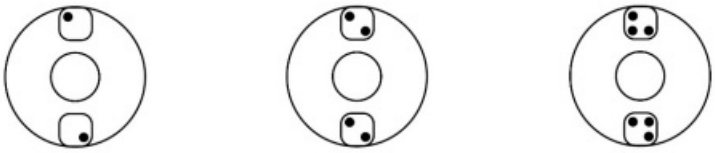


24 Tube Centrifuges

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 orstoring the centrifuge to prevent damage and injury.

CLEANING AND DISINFECTION

To prolong the life of the centrifuge, cleaning and disinfection isrecommended 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.

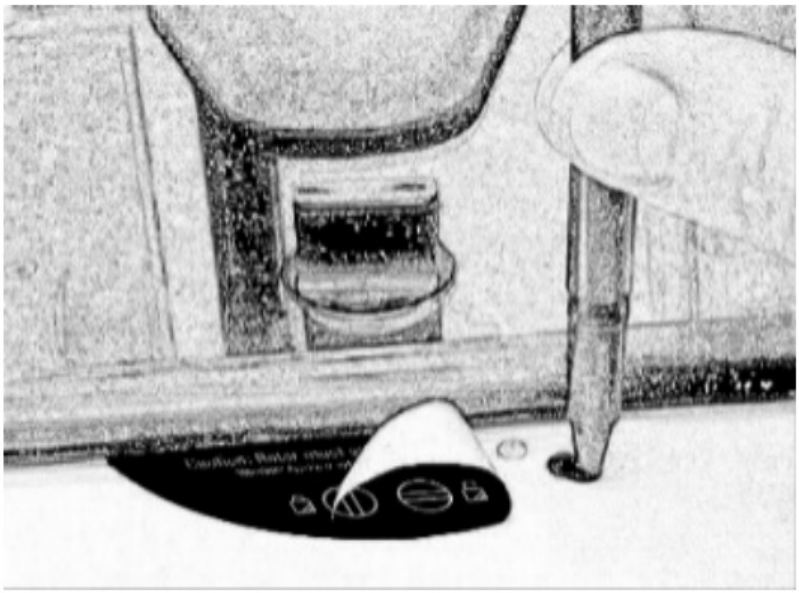
- Unplug the centrifuge before cleaning.
- Use appropriate personal protective equipment (PPE).
- Apply cleaning solutions with a towel or cloth. Do not submerge the centrifuge in water or other cleaning solutions as this will cause damage and void the warranty.
- ONLY isopropyl alcohol or a 10% (5500 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. REFRAIN FROM USING 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.

The centrifuge does not run	o Verify that the centrifuge is powered. One of the LED lights shoul d be on. o Make sure the lid latch is turned completely clockwise to its stop position. o If the centrifuge still does not run, contact Customer Service.
The rotor does not spin freely	o Make sure nothing has fallen into the rotor chamber, following th e procedure above. o If nothing obstructs the rotor, the rotor may be damaged. Contac t Customer Service for further assistance.

The centrifuge makes a rattling noise when running	o Stop the centrifuge. Open the lid. o 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. o Inspect the rotor, tube holders or buckets for damage. o If the tube holders or buckets have any damage, even slight, saf ely dispose of them and replace them. o If the rotor appears damaged, contact Customer Service for furt her assistance.
Excessive noise or vibration when the centrifuge is running	o Verify that all four centrifuge feet are properly seated on a flat sur face. o Ensure that the load is balanced according to instructions in the “ Balancing Loads” section of this manual. o Make sure that nothing has fallen into the rotor chamber.
The centrifug e continuously **stops** **and** **beeps**	The load is not balanced. Press the UNLOCK button, open the lid, a nd balance the load as recommended elsewhere in this manual.
The cycle time and speed are not set t o the desired value	Check the setting by following the instructions in the section on Cha nging Cycle Settings. If the preset is not the desired length, follow th e procedure on the same page to change the run preset time.

The centrifuge does not unlock after a run is completed	o 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.  o 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. o If the unit is damaged, contact your authorized dealer or Drucker Diagnostics.
The lid does not open	o Ensure that the lid knob is turned fully counterclockwise. o If the knob cannot be turned counterclockwise, turn it fully clockwise, press UNLOCK, and turn counterclockwise. o If the lid remains locked after this and will not unlock, the electronics may have been damaged. Contact customer service for assistance.
Clicking noise during braking gets loud	o Make sure that the screw in the center of the rotor is tight.
Lid does not stay up	o 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.

Apex 6	Tube Capacity	6 tubes – 3 to 10 mL
	Radius with included accessories	5 in (12.7 cm)
	Dimensions (Height x Width x Depth)	8 in x 11 in x 13 in (20 cm x 28 cm x 34 cm)
	Weight	12 lbs. (5.4 kg)
	Noise Level	61 dB
	Environmental Range	16 – 32 ^{0}C
	Voltage	100 – 240 VAC
	Frequency	50/60 Hz
	Power Requirement	225 Watts
	Centrifuge Motor	½ H.P. Brushless DC
	Maximum Speed	5,300 RPM
	Cycle Time	1 to 30 minutes (+/- 2%)

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 ^{0}C
	Voltage	100 – 240 VAC
	Frequency	50/60 Hz
	Power Requirement	415 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 ^{0}C
	Voltage	95 – 253 VAC
	Frequency	50/60 Hz
	Power Requirement	220 Watts
	Centrifuge Motor	½ H.P. Brushless DC
	Maximum Speed	4,300 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 below.

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

- **In Centimeters:** RCF or G-force = 0.00001118 x Rotor Radius (cm) x (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

- **In Inches:** RCF or G-force = 0.0000284 x Rotor Radius (in) x (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
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

REPLACEMENT PARTS

DASH APEX 6

Part No. Description

- **7724037K** Foot, rubber
- **02-002-1-0028** Lid Tray Assembly
- **02-001-0-0011** Rotor Assembly, Dash Apex 6
- **02-005-1-0010** Motor Assembly
- **02-006-0-0011** PC Board
- **7760006** Power cord
- **03-1-0005-0192** Internal Power Supply
- **02-002-1-0027** Lid Assembly
- **7724071K** Hinge, friction
- **02-002-1-0056** Seal, lid gasket
- **03-0-0003-0313** Open/Close Label
- **03-1-0007-0046K** 75/100mm Tube Holder, Black
- **02-002-1-0026** Lid LED Assembly, Green
- **00-100-100-009** 6 Series Soft Button Replacement Kit

DASH APEX 12

- **7724177K** Foot, rubber
- **02-006-1-0044** Locking Lid Tray Assembly, 11”
- **02-001-0-0009** 12-Place Rotor, Horizontal
- **02-005-1-0012** Motor Assembly
- **02-006-0-0011** PC Board
- **7760006** Power cord
- **03-1-0005-0193** Power Supply
- **02-002-1-0041** Lid Assembly
- **7724071K** Hinge, friction
- **02-002-1-0057** Seal, lid gasket
- **03-0-0003-0313** Open/Close Label
- **03-1-0007-0046K** 75/100mm Tube Holder, Black
- **00-100-100-010** 12/24 Series Soft Button & Spacer Replacement Kit
- **00-100-100-005** Replacement Grommet & Bushing Kit

DASH APEX 24

- **7728052K** Foot, rubber
- **02-006-1-0044** Locking Lid Tray Assembly, 11”
- **02-001-0-0008** 24-Place Rotor, Horizontal
- **02-005-1-0012** Motor Assembly
- **02-006-0-0011** PC Board
- **7760006** Power cord
- **03-1-0005-0193** Power Supply
- **02-002-1-0037** Lid Assembly
- **7724071K** Hinge, friction
- **02-002-1-0058** Seal, lid gasket

- **03-0-0003-0313** Open/Close Label
- **02-004-0-0012** 4 Place Carrier, Carbon Fiber
- **00-100-100-010** 12/24 Series-Soft Button & Spacer Replacement Kit
- **00-100-100-005** Replacement Grommet & Bushing Kit

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

To access previous manuals, please click the relevant link below: DASH Apex 6, 12, 24 Operator's Manual, Rev G

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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CUSTOMERSERVICE@DRUCKERDIAGNOSTICS.COM DRUCKERDIAGNOSTICS.COM

Documents / Resources

	Drucker Diagnostics Dash Series Apex 6 Centrifuge [pdf] User Manual Dash Series Apex 6 Centrifuge, Dash Series, Apex 6 Centrifuge, 6 Centrifuge, Centrifuge

References

- Clinical Centrifuges & Hematology Instruments | Drucker Diagnostics
- Clinical Centrifuges & Hematology Instruments | Drucker Diagnostics
- Clinical Centrifuges & Hematology Instruments | Drucker Diagnostics