

CENTRIFUGE

Operator's Manual

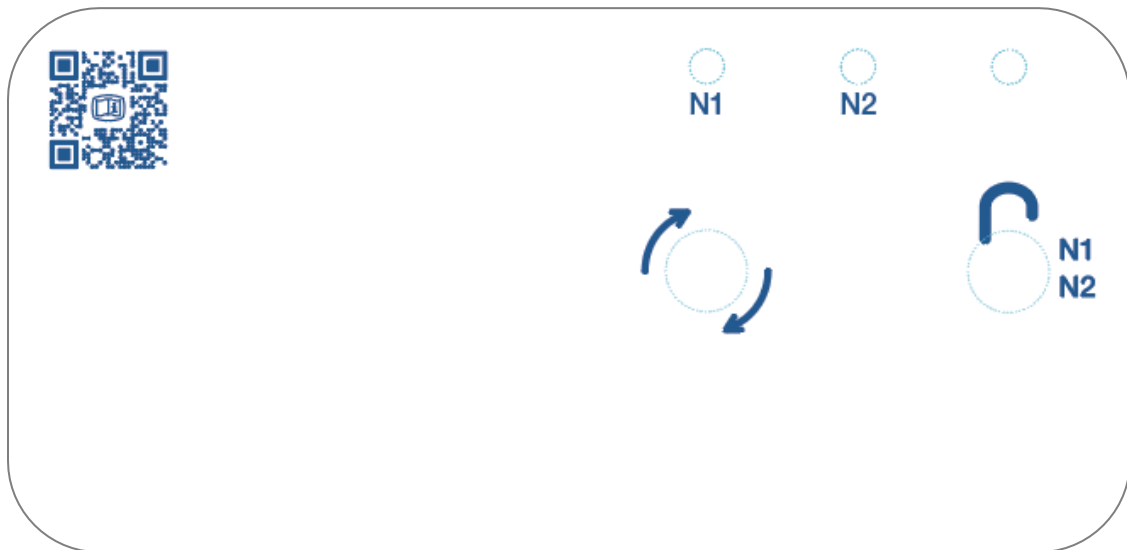










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SYMBOLS

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.

CAUTION 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

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

- Simple 2-Button interface
- Three (3) easily selectable pre-set cycles are conveniently labeled for your applications. LED light indicates the current selected setting.
- 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.

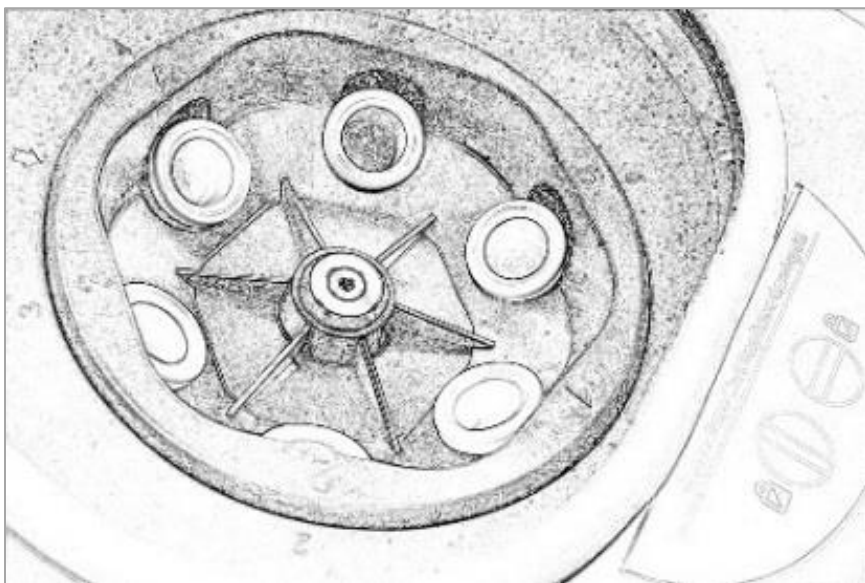
WARRANTY

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

INITIAL SETUP

- Unpack and verify that all the following are included:
 - Centrifuge
 - Power Cord
 - Six (6) Tube Holders
 - 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!

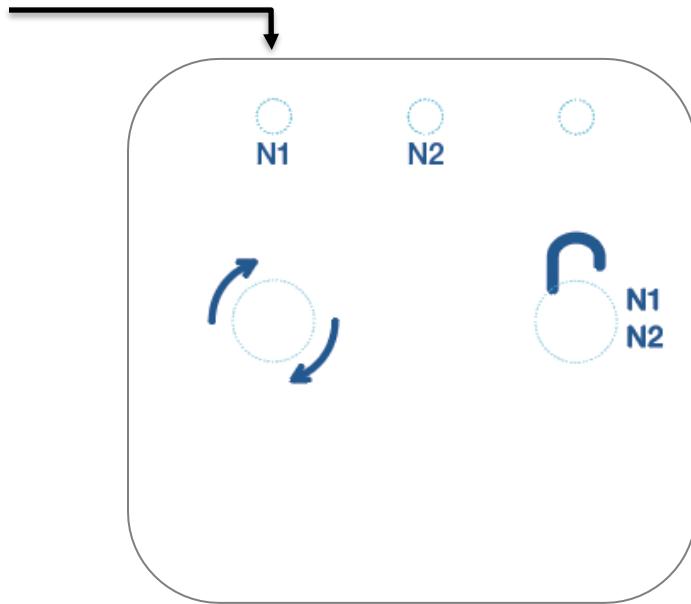
DASH Apex 6



QUICK START

The LED indicator light is on for the cycle currently selected.

Indicator Lights



	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.
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OPERATION

- Place the tubes into the tube holders. Be sure to follow the rules for balanced loads as listed in the following section.
- 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.

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

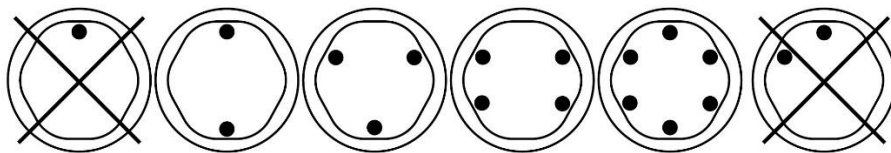
- When the cycle is completed, the rotor will slow to a complete stop and the lid light will flash.
- The locking mechanism will disengage for 60 seconds allowing entry into the rotor chamber. To unlock after more than 60 seconds have elapsed, press the UNLOCK button. The lid will unlock for another 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



*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

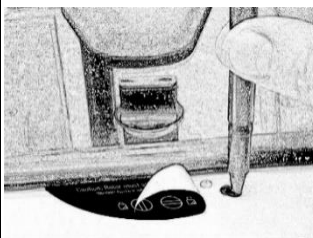
To prolong the life of the centrifuge, cleaning and disinfection is recommended every six months or whenever there is a spillage or tube breakage. Contaminants must be removed immediately or corrosion and premature degradation of components can occur. Before using any cleaning or decontamination methods other than those recommended by the manufacturer, users should verify with the manufacturer that the proposed method will not damage the equipment.

- Cleaning and Decontamination may be necessary as a safeguard before laboratory centrifuges, rotors, and any accessories are maintained, repaired, or transferred.
- Unplug the centrifuge before cleaning.
- Use appropriate personal protective equipment (PPE).
- 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.
- 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.

<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. ○ Ensure 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>	<ul style="list-style-type: none"> ○ The load is not balanced. Press the UNLOCK button, open the lid, and balance the load as recommended elsewhere in this manual.
<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"> ○ Ensure 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.

Apex 6	Tube Capacity	6 tubes – 3 to 10 mL
	Radius with included accessories	5 in (12.7 cm)
	Dimensions (H x W x D)	9 in x 12 in x 14 in (23 cm x 30 cm x 36 cm)
	Weight	12 lbs. (5.4 kg)
	Noise Level	61 dB
	Supply Voltage	100 – 240 (+/- 10%)
	Supply Frequency	50 - 60 Hz
	Current Consumption	2.2A at 115VAC 1.1A at 230VAC
	Centrifuge Motor	½ H.P. Brushless DC
	Maximum Speed	5,300 RPM
	Cycle Time	1 to 30 minutes (+/- 2%)
	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
	Overvoltage Category	II
Pollution Degree	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:

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

APEX 6	
Radius	
	5.0 in
	12.7 cm
RPM	G-Force
1000	140
1100	170
1200	200
1300	240
1400	280
1500	320
1600	360
1700	400
1800	450
1900	500
2000	600
2100	650
2200	700
2300	750
2400	800
2500	900
2600	950
2700	1050
2800	1100
2900	1200
3000	1300
3100	1350
3200	1450

In Inches:

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

APEX 6	
Radius	
	5.0 in
	12.7 cm
RPM	G-Force
3300	1550
3400	1650
3500	1750
3600	1850
3700	1950
3800	2050
3900	2150
4000	2300
4100	2400
4200	2500
4300	2600
4400	2750
4500	2900
4600	3000
4700	3150
4800	3300
4900	3400
5000	3550
5100	3700
5200	3850
5300	4000

REPLACEMENT PARTS

DASH APEX 6

Part No.	Description
7724037K	Foot, rubber (Pack of 4)
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 (Pack of 2)
02-002-1-0056	Seal, lid gasket
03-0-0003-0313	Open/Close Label
03-1-0007-0046K	75/100mm Tube Holder, Black (Pack of 6)
02-002-1-0102K	Kit, Dash Apex 6 Lid Tray Assy, Yellow LED PCBA
00-100-100-009	6 Series Soft Button Replacement Kit

This operator's manual is part number 03-0-0002-0319, Rev. A

Product Family: DASH Apex Series (DASH Apex 6)

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

FDA LISTED



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



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