

BOOST

2 Flex

Operator's Manual

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MODEL DESCRIPTION

Satisfy your lab's most diverse processing requirements with the BOOST 2 Flex. Customize settings and check every detail on the digital display. Program up to 10 custom cycles.

FEATURES

- Any of the ten (10) cycles may be customized and/or conveniently pre-set for your lab's most common applications. Use pre-set cycles or customize them as needed.
- A time and speed/g-force can be quickly entered for a single use cycle. The cycle will not be retained in memory.
- If desired, the control panel can be temporarily locked on one cycle for error-free reproducibility.
- A Preset Lock can be turned on to prevent changes from being made accidentally to programmed cycles.
- Up to 10 cycles can be programmed for time, speed, and braking and labeled with a custom name. Cycles may be programmed by g-force (RCF) rather than speed to facilitate matching validated cycles and manufacturers' IFUs.
- A digital cycle counter tracks the number of cycles the centrifuge has run.
- Lid lighting indicates the centrifuge's status (ready, running, done), informing the operator when tubes are ready for the analyzer and preventing tubes from being left in the centrifuge longer than necessary (patent pending).
- A traditional audible alert indicates the completion of the cycle. The audible alert can be muted.
- Cool-Flow design prevents overheating of samples by using ambient air to keep specimens at room temperature.
- The carriers are fiber reinforced for high strength, durability, and years of trouble-free use. (Autoclave-compatible carriers are also available as an alternative option. Contact Drucker Diagnostics Customer Service for more information.)
- A clear lid permits safe observation of samples and optical calibration of speed.
- The lid safety system prevents the centrifuge from operating unless the lid is closed and latched.
- The lid safety system only allows entry into the centrifuge after the rotor has completely stopped.
- The high-power brushless motor provides years of operation with no routine maintenance.

INTENDED USE

The Boost 2 Flex is intended to be used as a general-purpose laboratory centrifuge, intended for safe and rapid density-based separation of fluids, including physiologic fluids, in approved specimen receptacles for qualitative or quantitative test procedures.

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.
- ⚠ Unplug the centrifuge before cleaning or performing maintenance.
- ⚠ **WARNING:** Inspect centrifuge for cracks or physical damage to cabinet, lid, rotor, or carriers. 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).
- ⚠ **WARNING:** Only use Drucker Diagnostics components in this centrifuge.
- ⚠ **WARNING:** Do not remove any hardware from rotor without prior authorization from Drucker Diagnostics.
- ⚠ Users of centrifuge should validate the processing of their disposable for their specific application prior to use.
- ⚠ **WARNING:** The maximum combined weight allowed to be loaded into each carrier, including Drucker provided components, shall not exceed maximum specifications. Refer to the **General Specifications** of this manual for maximum carrier load specification.

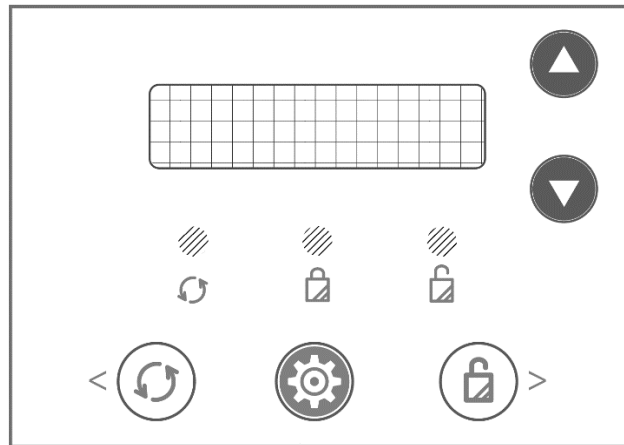
INITIAL SETUP





- Unpack and verify that all the following are included:
 - Centrifuge
 - Power cord
 - Carriers
 - 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 provided line cord (or equivalently rated line cord) into the centrifuge
- Plug the line cord into an approved electrical outlet.
- Turn on the power switch located on the back of the centrifuge.

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

QUICK START



The screen display alternates between the name of the currently selected cycle and its parameters.






	Start	Begins running the cycle displayed on the screen. The lid must be closed.
	Unlock	Allows access into the rotor chamber by engaging the unlocking 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	Press the up and down buttons next to the screen to select the desired saved cycle.

To ensure repeatability, the centrifuge can be locked either on one cycle (Single Cycle Lock) or restricted to the saved cycles (Preset Lock). The Single Cycle Lock also prevents making changes to the parameters of the selected cycle. The Preset Lock allows selection of any saved cycle but prevents changing the parameters of saved cycles.

SINGLE CYCLE LOCK







	Lock on Single Cycle	Select desired cycle. Press and hold the UNLOCK button for 5 seconds. Two beeps will confirm that cycle selection is locked.
	Cancel Single Cycle Lock	To re-enable cycle selection, press and hold the UNLOCK button for 5 seconds. Three beeps will confirm that cycle selection is now unlocked.

PRESET LOCK

	Enter Settings Mode	Press the GEAR button.
	Lock Saved Cycles	Press and hold the UNLOCK button for 5 seconds. Two beeps will confirm that the Preset Lock is active.
	Cancel Preset Lock	With lid open and while not in Settings mode, press and hold the UNLOCK button for 5 seconds until two beeps are heard. Saved cycles can again be edited or programmed.

SETTING OR MODIFYING A CYCLE

Up to 10 cycles can be named, programmed for time, speed, and braking, and saved in memory.

	Cycle Selection	Press the up and down buttons next to the screen to select the desired cycle.
	Enter Programming Mode	Press the GEAR button.
	Navigate between Parameters	Use the left and right arrow button until the parameter to be edited is blinking and underlined.
	Change Parameter Values	To change the parameter shown on the display, use the up and down buttons next to the screen.
	Naming the Cycle	Navigate to the cycle name with the left and right arrow. Change the blinking character of the name with the up and down buttons, then move to the next character with the right arrow. Repeat.
	Save and Exit Programming Mode	Press the GEAR button. The cycle displayed on the screen will be automatically saved.

OPERATION

- Place the tubes into the carriers.
 - ⚠ **WARNING:** The maximum combined weight allowed to be loaded into each carrier, including Drucker provided components, shall not exceed maximum specifications. Refer to the **General Specifications** of this manual for maximum carrier load specification.
 - ⚠ 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 digital screen shows the currently selected cycle. To select another cycle, press the UP or DOWN button in succession until the desired cycle is selected.
- Pushing the START button on the control panel will start the spin cycle.
- When the cycle is completed, the rotor will slow to a complete stop and the lid light will flash.
- The unlocking mechanism will engage 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. 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 carriers must be equally loaded, or empty, or loaded with equally weighted samples.

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 centrifuges and should not need maintenance or servicing for the life of the centrifuge.
- **Carrier Replacement:** It is recommended that the carriers be replaced after 24 months of use. Inspect carriers regularly for cracks. If cracks are discovered, replace immediately.
- **Remove Accessories Before Moving:** All carriers and samples 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.



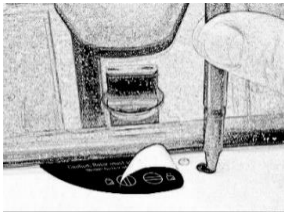
TBQ Germicidal products are not recommended as they may cause damage to the centrifuge. Wipe off thoroughly after use to prevent voiding the warranty.

- 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. The screen should be lit. ○ If “Lid not closed” message is displayed, 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 carriers and look for fallen objects or debris. Carefully reach inside the rotor chamber with a tool to remove them. ○ Inspect the rotor and carriers for damage. ○ If the carriers 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>	<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 centrifuge is stuck on one of the settings</p>	<p>Cycle selection is locked. Press the UNLOCK button for 5 seconds.</p>
<p>Only a few cycles can be accessed</p>	<p>The Preset Lock is active. To deactivate it, press the UNLOCK button for 5 seconds, until you hear 2 beeps, then again until the next 2 beeps. All cycles can now be accessed and/or amended.</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 Setting or Modifying a Saved Cycle. If the preset is not the desired length, follow the procedure on the same page to change the preset time.</p>

<p>Cycle parameters cannot be changed</p>	<ul style="list-style-type: none"> ○ If cycle selection is locked on one cycle, press the UNLOCK button for 5 seconds. Then, press the GEAR button and follow the instructions elsewhere in this manual. ○ If different saved cycles can be selected but not modified, the centrifuge is in Preset Lock mode. Press the GEAR button, then the UNLOCK button for 5 seconds. You should now be able to change cycle parameters.
<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 Customer Service for assistance. 
<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>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.

BOOST 2 Flex	
Tube Capacity	2 tubes - up to 1.1" dia x 4.76" long (2.8 cm dia x 12.1 cm long)
Dimensions (H x W x D)	14 in x 12 in x 9 in (36 cm x 30 cm x 23 cm)
Weight	12 lbs. (5.4 kg)
Sound Level	64 dB A
Environmental Range	16 – 32 degree C
Voltage	95 -253 VAC
Frequency	50/60 Hz
Power Requirement	220 Watts
Centrifuge Motor	1/30 HP Permanent Split Capacitor (PSC) AC motor
Max g-Force	2,000 xg
Max Speed	3,800 RPM
Max Carrier Load	65.0 grams
Cycle Time	1 to 30 minutes (+/- 2%)

CALCULATING THE G-FORCE

The I.F.U.s of tube manufacturers recommend cycles at a minimum G-Force, which can be calculated if you know the RPM and the radius. Use the formula below or go to www.druckerdiagnostics.com/g-force-calculator/.

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

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

BOOST 2 Flex

Radius 4.98 in (12.65 cm)
(Displayed RCF is calculated at a 12.6 cm radius)

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Product Family: BOOST Series (BOOST 2 Flex)

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

Protected by U.S. Patents #6,811,531, # 7,422,554, #D718,463, & #D734,489. Other Patents Pending

FDA LISTED



**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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