

Tulip[®]

NANOSPIN PRO

Horizon 6 Flex FA










Operator's Manual



TABLE OF CONTENTS

Symbols	1
Model Description	2
Features	2
Intended Use	2
Warranty.....	2
Caution and Warning Statements	3
Initial Setup	3
Operation	4
Quick Start.....	6
Single Cycle Lock	7
Setting or Modifying a Cycle	7
Balancing Loads.....	8
Care and Preventative Maintenance.....	8
Cleaning and Disinfection.....	9
Centrifuge and Accessories.....	9
Autoclave Sterilization	9
Troubleshooting.....	9
General Specifications.....	12
Calculating the G-Force	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.
	Electrical Hazard	Hazardous Voltage. Potential risk of personal injury or damage to the instrument.
	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.
	UKCA Mark	Denotes conformity to specific UK directives and regulations
	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.

MODEL DESCRIPTION

HORIZON is a versatile line of centrifuges pre-programmed with the most convenient cycle settings for ease of use. Cycle settings can be changed to accommodate custom settings.

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

- The first cycle is conveniently pre-set and labeled for your lab's most common applications.
- If desired, the control panel can be temporarily locked on one cycle, ideal for standardization to a single spin.
- Up to 10 cycles can be programmed for time, speed, and braking and labeled with a custom name. Cycles can be programmed by g-force (RCF) rather than speed to facilitate matching validated cycles and manufacturers IFUs.
- Lid lighting indicates the centrifuge's status (ready, running, done), informing the operator when tubes/syringes are ready for the analyzer and preventing the tubes/syringes 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 tube/syringe holders are fiber reinforced for high strength, durability, and years of trouble-free use.
- 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

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.

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 products applications.]



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. If 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.



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



Unplug the centrifuge before cleaning or performing maintenance.



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



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



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



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.



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/syringe holders, pack of 6
 - Tube/syringe Inserts, pack of 6
 - 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 approved electrical outlet.
 - Turn on the power switch in the back of the centrifuge.



Be sure the electrical outlet is always accessible as the line cord is the means of emergency Disconnection!

OPERATION

- Place the tube/syringe holders into the slots on the centrifuge rotor. Tube/syringe holders do not snap or click into place. All tube/syringeholders must be in place regardless of the number of samples to be spun.



Important Operating Instructions: This model centrifuge requires at least 2 tube/syringe holders inserted when attempting to run. Running the centrifuge with an empty rotor will cause a motor error and will require a power cycle to fully reset (see Troubleshooting section on page 9).

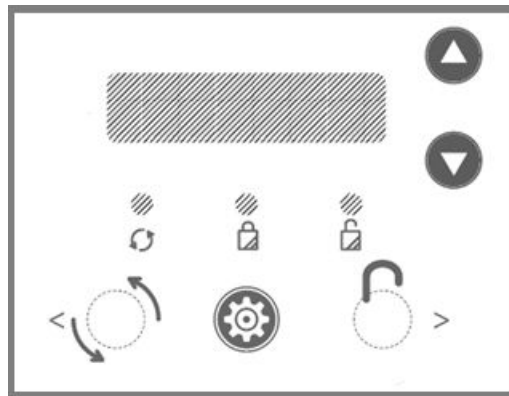
- Place the green inserts into the tube/syringe holders. The inserts do not snap or click into place, but should slide easily into the tube/syringe holder and rest there.
- The inserts and tube/syringe holders are designed be autoclavable and hold crowned and capped 10cc or 20cc BD syringes. Make sure syringe caps are installed and Tulip Crowns are secured prior to loading the syringes into the Nanospin Pro.
- Insert/slide syringes into appropriate tube/syringe holders or tube/syringe inserts. Never force a syringe into the insert. The inserts are designed to hold 10cc and 20cc BD syringes. For detailed instructions on the Tulip Crown System, please reference the Tulip Crown Quick Start Guide, (included) or found at www.tulipmedical.com/getstarted. If you do not have the proper Tulip Crowns, contact Tulip Medical Products at: sales@tulipmedical.com or call 1.858.270.5900.
- Place the capped syringes into the inserts. 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.

QUICK START

The screen display alternates between the name of the currently selected cycle and its parameters. For convenience, the first cycle is preset for common applications and can be reprogrammed to your validated cycles:



	Adipose Separation	PPP / PRF	(3)
RPM	2,800	1,800	1,800
Time	3 minutes	8 minutes	12 minutes
G-Force	1,000 xg	400 xg	400 xg



	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. One beep 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. One beep will confirm that cycle selection is now unlocked.

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.
	Displaying the Correct g-force	To display the real g-force (RCF) for the cycle, the right tube/syringe holder must be selected. If the holder selection in the program does not match the tube/syringe holder used, the RCF number displayed will not reflect the actual value.
	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.

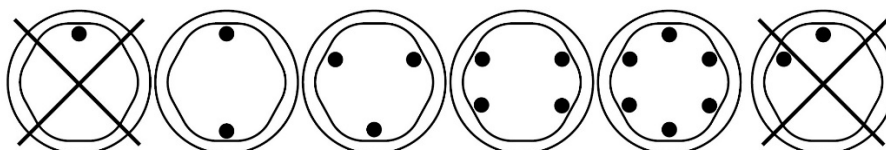
BALANCING LOADS



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/syringe with water to match the weight of the unpaired sample and place it across from this sample.

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

6 Tube Centrifuges



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.
- **Tube/Syringe Holder and Tube/Syringe Insert Replacement:** It is recommended that the tube/syringe holders and tube/syringe inserts be replaced after 24 months of use, or after 50 autoclave cycles (see Autoclave Sterilization section). Inspect tube/syringe holders and tube/syringe inserts regularly for cracks. If cracks are discovered, replace immediately.
- **Remove Accessories Before Moving:** All tube/syringe holders, tube/syringe inserts, samples, and caps must be removed from the rotor chamber before transporting or storing the centrifuge to prevent damage and injury.

CLEANING AND DISINFECTION

CENTRIFUGE AND ACCESSORIES

To prolong the life of the centrifuge, cleaning and disinfection is recommended every six months or whenever there is a spillage or tube/syringe 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 dampened towel or cloth **ONLY**. Do not spray or pour cleaning solution directly onto or into the centrifuge. Do not saturate the centrifuge or submerge the centrifuge in water or other cleaning solutions as this will cause damage, create a safety risk, and void the warranty.
- All surfaces must be dried immediately after cleaning and disinfecting.
- **ONLY** isopropyl alcohol or a 10% (5500 PPM) bleach solution should be used to disinfect the centrifuge and its accessories.



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/syringe holders, accessories and centrifuge exterior and void the warranty.

AUTOCLAVE STERILIZATION

In addition to the aforementioned centrifuge cleaning and disinfection requirements, the below tube/syringe holder and tube/syringe insert components are also capable of withstanding steam sterilization via autoclaving.



ONLY the below indicated Drucker components are rated for autoclave steam sterilization. Do not autoclave Drucker components that are not explicitly rated for autoclave sterilization.



Components must be replaced after the maximum amount of rated autoclave cycles has been reached.



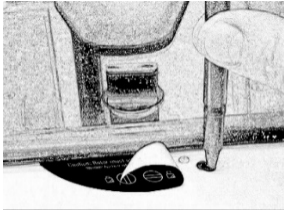
Users of centrifuge should validate the efficacy of the steam sterilization process for their specific application prior to use.

Component	Approved Autoclave Parameters	Maximum Number of Autoclave Cycles
Tube/syringe Holder 03-1-0007-0141	134 °C / 273 °F 5 minute hold time	50 cycles
Tube/syringe Insert, Green 03-1-0007-0166	134 °C / 273 °F 5 minute hold time	50 cycles

TROUBLESHOOTING

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

The centrifuge does not run	<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.
The rotor does not spin freely	<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.
The centrifuge makes a rattling noise when running	<ul style="list-style-type: none"> ○ Stop the centrifuge. Open the lid. ○ Wearing PPE, remove tubes/syringes and tube/syringe holders and look for fallen objects or debris. Carefully reach inside the rotor chamber with a tool to remove them. ○ Inspect the rotor and tube/syringe holders for damage. ○ If the tube/syringe holders have any damage, even slight, safely dispose of them and replace them. ○ If the rotor appears damaged, contact Customer Service for further assistance.
Excessive noise or vibration when the centrifuge is running	<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.
The centrifuge stops and beeps continuously	<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>Confirm that all tube/syringe holders are properly loaded into the Centrifuge rotor.</p>
The centrifuge is stuck on one of the settings	<p>Cycle selection is locked. Press the UNLOCK button for 5 seconds.</p>
The cycle time and speed are not set to the desired value	<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 preset time.</p>
Cycle parameters cannot be changed	<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.

<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>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.

Tube/Syringe Capacity	6 – 10cc or 20cc syringes
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	115 / 230 VAC
Frequency	50/60 Hz
Power Requirement	200 Watts
Centrifuge Motor	½ H.P. Brushless
Max g-Force	1,600 xg
Max Speed	3,500 RPM (+/- 100)
Cycle Time	1 to 30 minutes (+/- 2%)

CALCULATING THE G-FORCE

The I.F.U.s of tube/syringe 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/.

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

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

Radius	4.5 in (11.5 cm)
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This operator's manual is part number 03-0-0002-0261, Revision B

To access previous manual revisions, please click the relevant link below:

[Revision A](#)

Product Family: HORIZON Series (HORIZON 6 Flex FA)

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



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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