



Drucker Diagnostics HORIZON 6 Compact Routine SET and LOCK Centrifuge User Manual

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Model 6, 6 FA, 12, & 24
Operator's Manual








(Image of Horizon 6 Shown)

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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	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.
FDA LISTED	FDA Listed	Denotes that the product has been properly listed with the FDA.
ISO13485 certified	ISO Certification	Denotes conformity to quality standards and quality management systems.

MODEL DESCRIPTION

HORIZON is a versatile line of centrifuges designed with 3 settings to process Chemistry, Cog or Platelet Poor Plasma, and Urine specimens in the same unit. The maximum g-force of 2,000 xu makes HORIZON suitable for wide variety of applications. Cycle settings can be customized if desired.

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

- o Simple 2-Button interface
- o Three (3) 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.
- o If desired, the control panel can be locked on one preset cycle, ideal for standardization to a single spin.
- o 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.
- o A traditional audible alert indicates the completion of the cycle.
- o Cool-Flow design prevents overheating of samples by using ambient air to keep specimens at room temperature.
- o The tube holders are fiber reinforced for high strength, durability, and years of trouble-free use.
- o A clear lid permits safe observation of samples and optical calibration of speed.
- o The lid safety system prevents the centrifuge from operating unless the lid is closed and latched.
- o The lid safety system only allows entry into the centrifuge after the rotor has completely stopped.
- o 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 & 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 receptible manufacturer's specific instructions for use, in addition to any other protocols established by the testing organization.
- 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.

INITIAL SETUP

- Unpack and verify that all the following are included:
 - Centrifuge
 - Power cord
 - 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 power cord into the centrifuge
- Plug the power cord into an electrical outlet.
- Turn on the power switch on the back of the centrifuge.

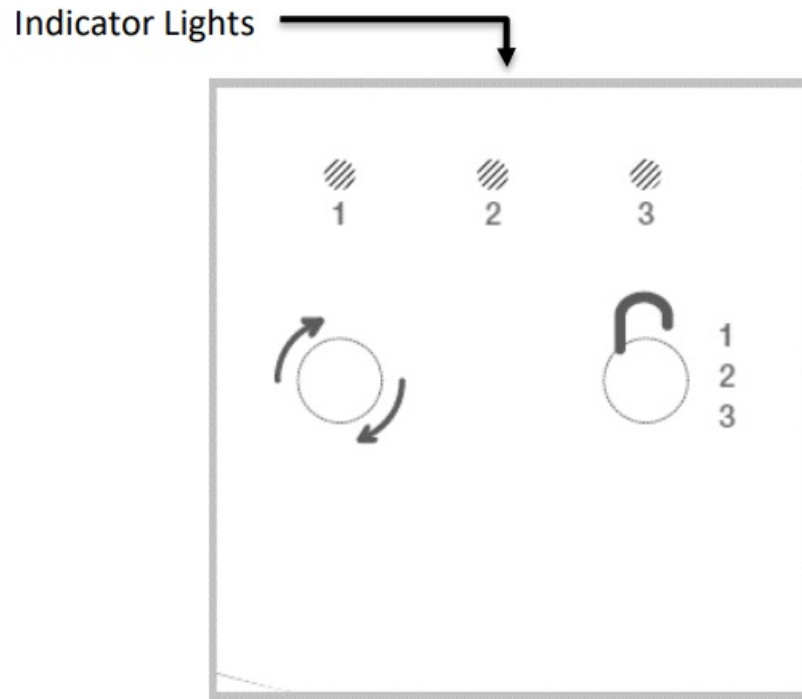


BE SURE THE ELECTRICAL OUTLET IS ALWAYS ACCESSIBLE AS THE LINE CORD IS THE MEANS OF EMERGENCY DISCONNECTION!

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 front panel LED is illuminated for the currently selected cycle. To select another cycle, press the UNLOCK 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 lid will unlock 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.
- With the lid unlocked, turn the lid knob counterclockwise and open the lid. The lid light will turn off.
- You may now safely remove the samples.

QUICK START



Each number represents a preset cycle. Above each cycle number is an LED indicator light. The LED indicator light changes to indicate the cycle currently selected:

- (1) Chemistry This setting is factory preset for Chemistry tubes
- (2) Cog (PPP) This setting is factory preset for Coagulation or Platelet Poor Plasma (PPP)
- (3) Urine This setting is factory preset for urine tubes

	Start	Begins running the cycle indicated by the cycle indicator LED light. The lid must be closed.
	Unlock	Allows access into the rotor chamber when rotor is not moving by engaging the unlocking mechanism. Entry is only possible when the rotor is stopped.
	Stop	Pressing the UNLOCK button when the centrifuge rotor is in motion 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, 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

STANDARD SETTINGS

		(1) Chemistry	(2) Cog (PPP)	(3) Urine
	RPM	3,600	3,300	1,900
HORIZON 6	Time (Mins)	10	15	5
	G-Force	1,800 xg	1,500 xg	500 xg
	RPM	3,500	3,200	1,800
HORIZON 12	Time (Mins)	10	15	5
	G-Force	1,800 xg	1,500 xg	500 xg
	RPM	3,300	3,000	1,700
HORIZON 24	Time (Mins)	10	15	5
	G-Force	1,800 xg	1,500 xg	500 xg
	RPM	3,900	3,800	2,200
	Time (Mins)	10	15	5
HORIZON 6 FA	Blue Tube Holders 75 & 100 mm tubes G-Force	1,600 xu	1,500 xu	500 xu
	Orange Tube Holders 125 mm tubes G-Force	1,850 xu	N/A	600 xu

REVIEW CYCLE TIME AND SPEED SETTINGS

Factory programmed cycles are shown on the rear of the centrifuge, on the Factory Set Cycles label. 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. 10 beeps / flashes equal 10 minutes of run time. Run time starts when the rotor reaches 90% of desired speed and stops when the rotor starts decelerating.
- 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. 38 beeps / flashes equal 38 x 100 or 3,800 Revolutions per Minutes (RPM)
- 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.

LABELING CYCLES (OPTIONAL LABEL)

Factory programmed cycles are shown on the rear of the centrifuge, on the Factory Set Cycle Label. Your centrifuge arrives with an erasable label above the control panel. This label allows you to identify your cycles by the name you use in your lab (for example: CChem, Cog, blue top, 10 minutes...) or by the cycle parameters (5 minutes @ 1,800 xu).

Use a permanent marker to resist cleaning with a bleach solution. Erase with rubbing alcohol. For further protection, the label can be taped over with transparent tape after writing.

BALANCING LOADS

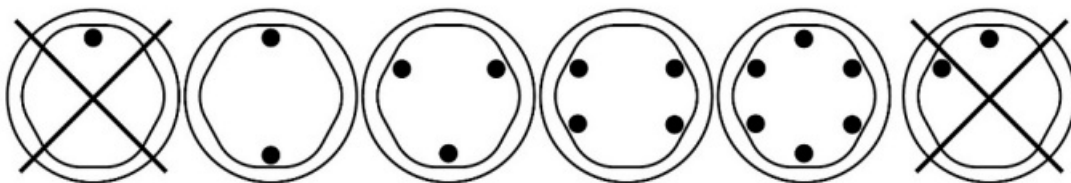


Your centrifuge must contain a balanced load to work properly. Spinning balanced loads will extend the life of the centrifuge and produce better results. Use the following rules when loading the rotor. If an odd number of samples is to be spun, fill a tube with water to match the weight of the unpaired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

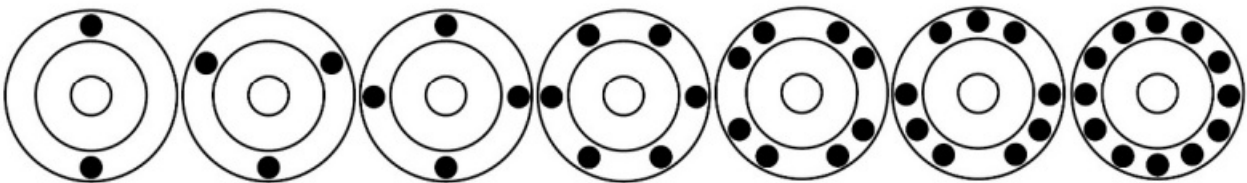
Opposing tube holders must be equally loaded, empty, or loaded with equally weighted samples.

When loading only 3 tubes, they must be of equal weight.

6Tube Centrifuges

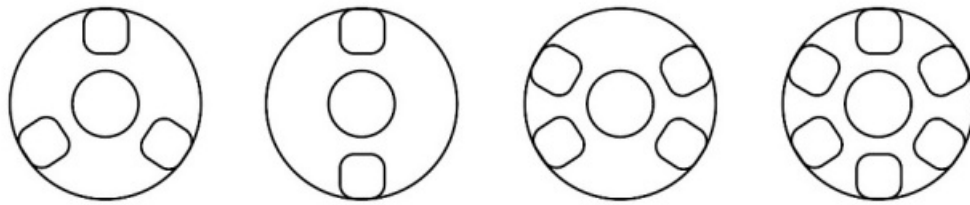


12 Tube Centrifuges

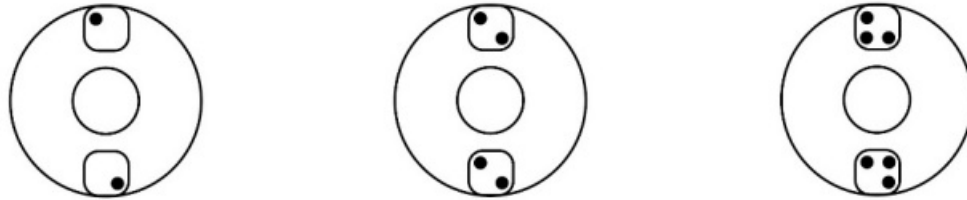


24 Tube Centrifuges

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 motor and electrical components should not need maintenance or servicing for the life of the centrifuge.
- **Tube Holder Replacement:** Replace tube holders 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, clean and disinfect 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.

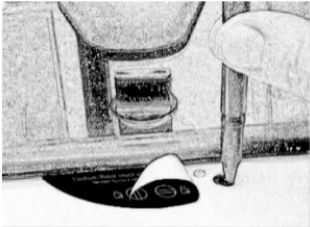
TBQ GERMICIDAL PRODUCTS ARE NOT RECOMMENDED AS THEY MAY CAUSE DAMAGE TO THE CENTRIFUGE. WIPE OFF THOROUGHLY AFTER USE TO PREVENT VOIDING THE WARRANTY.

- 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.

The centrifuge does not run	<ul style="list-style-type: none"> o Verify that the centrifuge is powered. One of the LED lights should 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	<ul style="list-style-type: none"> o Make sure nothing has fallen into the rotor chamber, following the procedure above. o 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"> 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, safely dispose of them and replace them. o 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"> o Verify that all four centrifuge feet are properly seated on a flat surface. 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 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 holders are properly loaded into the centrifuge rotor.</p>
The centrifuge will not switch between 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>

<p>The centrifuge does not unlock after a run is completed</p>	<ul style="list-style-type: none"> 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.  <ul style="list-style-type: none"> 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 Customer Service for assistance.
<p>The lid does not open</p>	<ul style="list-style-type: none"> 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.
<p>Clicking noise during braking gets loud</p>	<ul style="list-style-type: none"> o 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"> o Tighten the center screw on the lid hinge.

GENERAL SPECIFICATIONS

	HORIZON 6	HORIZON 12	HORIZON 24	HORIZON 6 FA
Tube Capacity	6 tubes – 3 to 10 mL	12 tubes – 3 to 10 mL	24 tubes – 3 to 10 mL , 12 tubes – 3 to 15 mL , 6 tubes – 50 mL	6 tubes – 3 to 15 mL
Dimensions (H x W x D)	14 in x 12 in x 9 in (36 cm x 30 cm x 23 cm)	15 in x 13 in x 9 in (38 cm x 33 cm x 23 cm)	17 in x 15 in x 9 in (43 cm x 38 cm x 23 cm)	14 in x 12 in x 9 in (36 cm x 30 cm x 23 cm)
Weight	12 lbs. (5.4 kg)	34 lbs. (15 kg)	39 lbs. (17 kg)	12 lbs. (5.4 kg)
Sound Level	64 dB A	56 dB A	59 dB A	64 dB A
Environmental Range	16 – 32 degree C	16 – 32 degree C	16 – 32 degree C	16 – 32 degree C
Voltage	95 -253 VAC	95 -253 VAC	95 -253 VAC	95 -253 VAC
Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Power Requirement	220 Watts	280 Watts	280 Watts	220 Watts
Centrifuge Motor	½ H.P. Brushless	½ H.P. Brushless DC	½ H.P. Brushless DC	½ H.P. Brushless
Max g-Force*	2,000 xu	2,000 xu	2,000 xu	1,600 xu / 1,850 xu
Max Speed	3,800 RPM (+/- 100)	3,700 RPM (+/- 100)	3,400 RPM (+/- 100)	3,900 RPM (+/- 100)
Cycle Time	1 to 30 minutes (+/-2 %)	1 to 30 minutes (+/-2 %)	1 to 30 minutes (+/-2 %)	1 to 30 minutes (+/-2 %)

*The rotor and accessories are rated for the maximum rotation frequency shown.

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: $\text{RCF or G-force} = 0.00001118 \times \text{Rotor Radius (cm)} \times (\text{RPM})^2$		
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	HORIZON 6	HORIZON 12	HORIZON 24	HORIZON 6 FA	
				Blue Tube (75 & 100 mm)	Orange Tube (125 mm)
Radius	5 in (12.7 cm)	5.25 in (13.3 cm)	6 in (15.3 cm)	3.75 in (9.5 cm)	4.25 in (11 cm)

REPLACEMENT PARTS

HORIZON 6 AND HORIZON 6 FA

Part No.	Description
7724037	Horizon 6 & Horizon 6 FA Foot, rubber
02-002-1-0064	Horizon 6 & Horizon 6 FA Lid Tray Assembly
7786067	Horizon 6 Rotor, six-place, Horizontal
7786068	Horizon 6 FA Rotor, six-place, Fixed Angle
02-005-1-0005	Motor Assembly
7729009	Capacitor, 5uF, 250V A.C.
02-006-0-0017	Electronic timing and locking board
7751043	Circuit Breaker
7760006	Power cord
02-004-0-0035	Switch & Power Input Assembly
02-002-1-0027	Lid Assembly
7724071	Hinge, friction
02-002-1-0056	Seal, lid gasket
03-0-0003-0332	Open/Close Label
7713079	75/100mm Tube Holder, Blue
7713044	125mm Tube Holder, Orange (Fixed Angle Only)
02-002-1-0068	Lid LED Assembly
03-0-0003-0338	Horizon 6 Front Panel Label
03-0-0003-0339	Horizon 6 FA Front Panel Label
03-1-0001-0090	Button Cover No Emboss
03-1-0001-0089	Button Cover Embossed

HORIZON 12 AND HORIZON 24

Part No.	Description
7724177	Horizon 12 Foot, rubber
7725082	Horizon 24 Foot, rubber
02-006-1-0013	Horizon 12 & Horizon 24 Locking Lid Tray
02-001-0-0009	Horizon 12 Rotor, 12 place Horizontal
02-001-0-0008	Horizon 24 Rotor, 24 place Horizontal
02-005-1-0012	Motor Assembly
02-006-0-0011	Electronic timing and locking board
03-1-0005-0193	Power Supply
7760006	Power cord
02-002-1-0041	Horizon 12 Lid Assembly
02-002-1-0037	Horizon 24 Lid Assembly
7724071	Hinge, friction
02-002-1-0057	Horizon 12 Seal, lid gasket
02-002-1-0058	Horizon 24 Seal, lid gasket
03-0-0003-0332	Open/Close Label
7713079	Horizon 12 75/100mm Tube Holder, Blue
7713023	Horizon 24 4pl Carrier Assembly
02-002-1-0046	Lid LED Assembly, Blue
03-0-0003-0335	Horizon 12 Front Panel Label
03-0-0003-0336	Horizon 24 Front Panel Label
03-1-0001-0090	Button Cover No Emboss
03-1-0001-0089	Button Cover Embossed

Product Family: HORIZON Series (HORIZON 6, 6 FA, 12, & 24)

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, & 10,994,285. 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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This operator's manual is part number 03-0-0002-0124 Rev. F

Documents / Resources

<p>HORIZON Models 6, 6i, 12, & 24 Operator's Manual</p>  <p><small>Drucker Diagnostics</small></p>	<p>Drucker Diagnostics HORIZON 6 Compact Routine SET and LOCK Centrifuge [pdf] User Manual</p> <p>HORIZON 6 Compact Routine SET and LOCK Centrifuge, HORIZON 6, Compact Routine SET and LOCK Centrifuge, SET and LOCK Centrifuge, LOCK Centrifuge</p>
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References

- [Clinical Centrifuges & Hematology Instruments | Drucker Diagnostics](#)
- [G-Force Calculator | Drucker Diagnostics](#)