TRUEBOND SET 3

Veterinary Centrifuge

Operator's Manual

FOR VETERINARY USE ONLY

Drucker Diagnostics

TABLE OF CONTENTS

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 receptable 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

TrueBond Set 3 is a versatile centrifuge designed with 3 settings to process Serum, Fecal, Urine, and Microhematocrit specimens in the same unit. The maximum g-force of 2,000 xg makes TrueBond 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

- Simple 2-Button interface
- 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 indicator 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), informing the operator when tubes are ready for the analyzer and preventing tubes from being left in the centrifuge longer than necessary.
- A traditional audible alert indicates the completion of the cycle.
- Cool–Flow design prevents overheating of samples by using ambient air to keep specimens at room temperature.
- The tube 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

Veterinary Use Only. 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.

How To Video Links

To access our How To Video, please click the relevant link below:

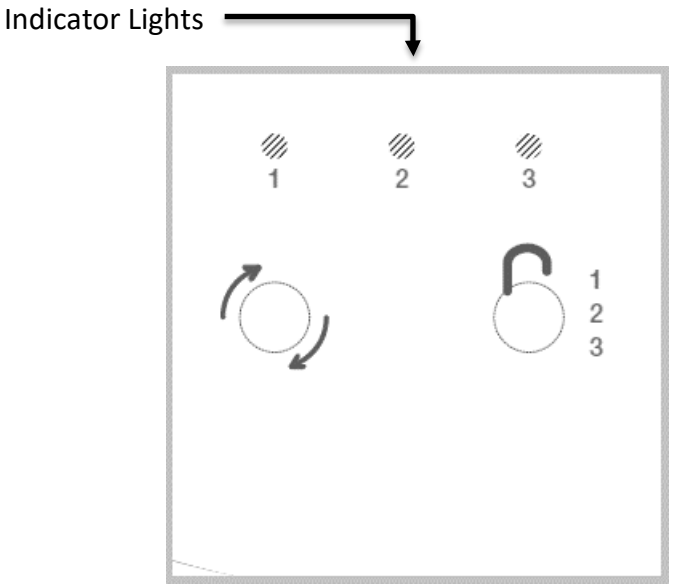
Horizon 6

Initial Setup

- Unpack and verify that all the following are included:
    - Centrifuge
    - Power cord
    - Tube holders
        - 75/100mm Tube Holders, Pack of 6
        - 125mm Tube Holders, Pack of 6
    - Pediatric Tube Adapters
        - 1 to 1.5mL, Pack of 6
    - Microhematocrit Inserts, Pack of 2
    - Veterinary Microhematocrit Reader Card
    - 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!

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:

	**Start**	Begins running the cycle indicated by the cycle LED indicator 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 indicator 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.

OPERATION

- Place the tubes into the tube holders. Be sure to follow the rules for balanced loads as listed on page 9.
- 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 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.

SETTINGS

STANDARD SETTINGS

	(1) Serum	**(2) Urine / Fecal**	**(4) Microhematocrit**
RPM	3900	2000	3800
Time (mins)	10	5	6
G-Force (75-100mm - Blue)	1650	425	1550
G-Force (125mm – Orange)	1850	500	N/A

Review Cycle Time, Speed, and Brake 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 centrifuge must be powered on and lid must be unlocked 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 indicator 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 indicator 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).
- Pressing the START button again will cause the unit to beep and the LED indicator light to flash once for each brake setting increment in the current cycle. 0 beeps / flashes means brake = OFF, 1 beep / flash means brake = 1, etc.
- The centrifuge will automatically revert to normal mode at the end.

Changing Cycle Time, Speed, and Brake Settings

Default factory programmed cycles are shown on the rear of the centrifuge, on the Factory Set Cycles label. To modify these settings, follow this procedure:

- The centrifuge must be powered on and lid must be unlocked 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 indicator light flashes.
- Press the START button once per each minute of desired run time.
    - Minimum value: 1 minute
    - Maximum value: 30 minutes
- Move to speed setting mode by pressing the UNLOCK button.
- Press the START button once per each desired increment of 100 rpm.
    - Minimum value: 1,000 RPM
    - Maximum value: Refer to General Specifications section for your centrifuge's maximum speed.
- Move to brake setting mode by pressing the UNLOCK button.
- Press the START button once per each desired increment of brake value.
    - Minimum value: 0 (Brake OFF)
    - Maximum value: 9 (Full Brake)
- 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: Serum, Urine, blue top, 10 minutes…) or by the cycle parameters (5 minutes @ 1,800 xg).

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.

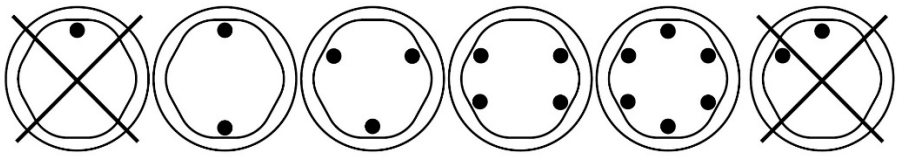
Balancing Loads

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.

If spinning only one microhematocrit tube within an individual microhematocrit insert it is not necessary to balance due to their light weight, but both Microhematocrit inserts should always be across from each other.

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 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.


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 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.
- 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.

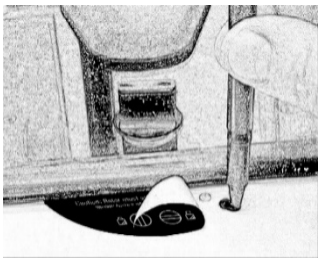

TBQ GERMICIDAL PRODUCTS ARE NOT RECOMMENDED AS THEY MAY CAUSE DAMAGE TO THE CENTRIFUGE. WIPE OFF THOROUGHLY AFTER USE TO PREVENT VOIDING THE WARRANTY.

- 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	○ Verify that the centrifuge is powered. One of the LED indicator 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.
The rotor does not spin freely	○ 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	○ 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.
Excessive noise or vibration when the centrifuge is running	○ 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	The load is not balanced. Press the UNLOCK button, open the lid, and balance the load as recommended in the "Balancing Loads" section of this manual. Confirm that all tube holders are properly loaded into the centrifuge rotor.
The centrifuge will not switch between settings	Ensure the lid is open. If the lid is open and cycle selection is still locked, press and hold the UNLOCK button for 5 seconds.
The cycle time, speed, or brake are not set to the desired value	Check the setting by following the instructions in the section on "Changing Cycle Settings". If the preset parameter is not the desired setting, follow the procedure in the next section to change the desired parameter.

The centrifuge does not unlock after a run is completed	○ 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.  ○ If no LED indicator 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.
The lid does not open	○ 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.
Clicking noise during braking gets loud	○ Make sure that the screw in the center of the rotor is tight.
Lid does not stay up	○ Tighten the center screw on the lid hinge.

GENERAL SPECIFICATIONS

	Blue Tube, 75-100 mm p/n 7713079	Orange Tube, 125 mm p/n 7713044
Tube Capacity	6 tubes – 3 to 10 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)	14 in x 12 in x 9 in (36 cm x 30 cm x 23 cm)
Weight	12 lbs. (5.4 kg)	12 lbs. (5.4 kg)
Sound Level	64 dB A	64 dB A
Supply Voltage	100 - 240 (+/- 10%)	100 - 240 (+/- 10%)
Supply Frequency	50 - 60 Hz	50 - 60 Hz
Current Consumption	3.6A at 115VAC 1.8A at 230VAC	3.6A at 115VAC 1.8A at 230VAC
Centrifuge Motor	½ H.P. Brushless	½ H.P. Brushless
Max g-Force	1,600 xg	1,850 xg
Max Speed*	3,900 RPM (+/- 100)	3,900 RPM (+/- 100)
Cycle Time	1 to 30 minutes (+/- 2%)	1 to 30 minutes (+/- 2%)
Environmental Conditions		
Set-up Site	Indoor Use Only	Indoor Use Only
Altitude	Up to 2,000m from Sea Level	Up to 2,000m from Sea Level
Ambient Temperature	5 °C to 40 °C	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	Maximum relative humidity 80% for temperatures up to 31 °C, decreasing linearly to 50% relative humidity at 40 °C
Overvoltage Category	II	II
Pollution Degree	2	2

*The rotor and accessories are rated for the maximum rotational 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:
RCF or G-force = 0.00001118 x
Rotor Radius (mm) x $(RPM)^2$

In Inches:
RCF or G-force = 0.0000284 x
Rotor Radius (in) x $(RPM)^2$

	Blue Tube (75 & 100 mm) 7713079	**Orange Tube (125 mm) 7713044**
Radius	3.75 in (9.5 cm)	4.25 in (11 cm)

REPLACEMENT PARTS

Part No.	**Description**
7724037K	Foot, rubber (Pack of 4)
7786068	Rotor, six-place, Fixed Angle
02-005-1-0010	Motor Assembly
02-006-0-0057	PC Board, 2 Button, H6 BLDC
7760006	Power cord
02-004-0-0035	Switch & Power Input Assembly
02-002-1-0027	Lid Assembly
7724071K	Hinge, friction (Pack of 2)
02-002-1-0056	Seal, lid gasket
03-0-0003-0332	Open/Close Label, Light
7713079K	75/100mm Tube Holder, Blue (Pack of 6)
7713044K	125mm Tube Holder, Orange (Pack of 6)
02-004-0-0027K	Microhematocrit Insert (Pack of 2)
03-1-0007-0059K	1 to 1.5 mL Pediatric Tube Adapter (Pack of 6)
02-002-1-0102K	Kit, D6 Lid Tray Assembly, Yellow LED PCBA
00-100-100-009	6 Series Soft Button Replacement Kit
02-006-0-0046	Veterinary Microhematocrit Reader Card Kit
03-0-0003-0914	Front Panel Label, Drucker

This operator's manual is part number 03-0-0002-0323 Rev. A

Product Family: HORIZON Series (HORIZON 6, 6 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, & 10,994,285. Other Patents Pending

FDA LISTED E112532

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

Drucker Diagnostics
200 Shady Lane, Suite 170 – Philipsburg, PA 16866, USA
+1-866-265-1486 (U.S. only) - +1-814-692-7661
customerservice@druckerdiagnostics.com druckerdiagnostics.com

ISO 13485 Medical Devices Quality Management