

# **Drunker Diagnostics Flex 12 Programmable STAT Centrifuge Instruction Manual**

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**Drunker Diagnostics Flex 12 Programmable STAT Centrifuge** 



# Symbols

Symbol	Definition	Use
		Caution to safety hazard.
	Caution	Potential risk of personal injury or damage to the instrument if improperly handled. Consult the manual before proceeding.
***	Manufacturer	Manufacturer of record.
	Electrical and electro nic products recyclin g symbol	Recycle only as electronic waste. Do not dispose in normal waste.
RoHS	RoHS Compliant	Compliance with RoHS environmental standards.
C€	CE Mark	Denotes conformity to specific European directives and regulations.
CA	UK Mark	Denotes conformity to specific UK directives and regulations
E112532	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.
bsi 150 13485 Material Devices Plassagement	ISO Certification	Denotes conformity to quality standards and quality management sy stems.

# **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 the 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).

Recommendations for Prevention of HIV Transmission in Health Care Settings. MMWR 1987; 36 (Supplement #2S)

# **MODEL DESCRIPTION**

Discover a better way to spin STAT with Drucker Diagnostics' DASH Flex 12 centrifuge. Minimize lab error, reduce turnaround time, and streamline training with the digital display, programmable cycle settings, and powerful performance.

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 three (3) cycles are conveniently pre-set and labeled for your lab's most common applications. Use the default cycles or settings can be customized.
- 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, ideal for standardization to a single spin.

- A Preset Lock can be turned on to prevent changes from being made to programmed cycles.
- 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 (RPM) to facilitate matching validated cycles and manufacturers IFUs.
- 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 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**

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.

# **HOW TO VIDEO LINKS**

To access our How To Videos, please click the link below. Dash Flex 12

#### **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 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!

# **QUICK START**

The top screen display alternates between the name of the currently selected speed. The bottom screen displays the time setting. For convenience, the first three (3) cycles are preset for common applications and can be reprogrammed to your validated cycles:

# • 3 min

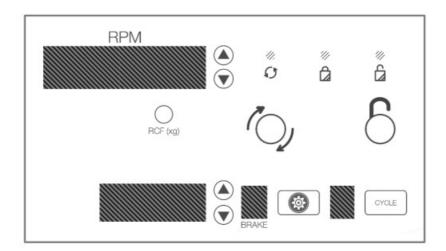
STAT centrifugation at 4,000 xg

# • 5 min

STAT centrifugation at 4,000 xg

#### Custom

This setting can be customized to your lab's validated cycles.



	Start	Begins running the cycle displayed on the screen. The lid must be clo sed.
8	Stop	Pressing the UNLOCK button during operation will terminate the run and unlock the lid after the rotor has come to a stop.
8	Allows access into the rotor chamber by engaging the unlocking manual hanism. Entry is only possible when the rotor is stopped.	
CYCLE	Cycle Selection	Press the CYCLE button to select the desired saved cycle.

# **SETTINGS**

# **QUICK ADJUST TIME AND SPEED**

Change time, speed (RPM) or g-force (RCF) for a single cycle.

	Setting Speed	To change the speed (RPM) shown on the top display, use the up a nd down buttons next to that screen. The CYCLE number is replace d with a "—"in the display, and the top screen displays the speed.
RCF (xg)	Setting by G-Force	Press and hold the RCF (xg) button while changing the displayed s etting on the top screen, using the up and down buttons next to it. T he RPM will automatically adjust.
	Setting Time	Press the up and down buttons next to the TIME display.

# **ADJUSTING THE BRAKE SETTING**

Enter the Advanced Menu	Press the GEAR button to enter the advanced menu.
Change Brake Valu es	While in the advanced menu, navigate to "Brake". Use the UP and DOWN buttons next to the TIME screen to adjust brake to desired v alue between 0 (no brake applied) and 9 (maximum braking force applied).
Exit the Menu	Press the GEAR button.

# CHANGING THE AUDIBLE BEEPER

Enter the Advanced Menu	Press the GEAR button to enter the advanced menu.
Turn Beeper On or	While in the advanced menu, navigate to "Beeper". Switch ON or O FF with the UP and DOWN buttons next to the TIME display. This s
Off	etting will apply to all cycles.



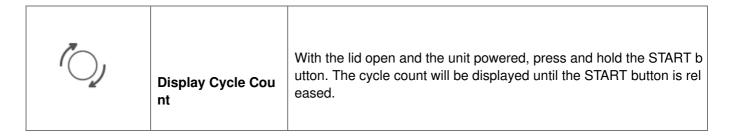
# **Exit the Menu**

Press the GEAR button.

# **CREATE NEW CYCLE**

	Change Settings	Refer to previous table (Quick Adjust Time and Speed) to change s peed and time to desired values.
CYCLE	Save Cycle	Hold the CYCLE button until you hear a double beep.

# **DISPLAY CYCLE COUNT**



# **MODIFYING A PRESET**

Save up to 10 custom cycles. The top screen alternates between cycle name and speed.

CYCLE	Select Preset Setti ng	Press the CYCLE button until to select the Preset Setting you would like to modify
CYCLE	Access the Menu	Hold the CYCLE button until you hear a double beep. The cycle nu mber should begin flashing.
RCF (xg)	Setting by G-Force (Recommended)	Press and hold the RCF (xg) button while changing the setting, usin g the UP and DOWN buttons next to the display. The RPM will auto matically adjust.
	Setting Speed (Alte rnate)	To change the speed (RPM), use the UP and DOWN buttons next t o the display. The g-force will adjust automatically and can be verified by pressing the RCF button.
	Setting Time	Press the UP and DOWN buttons next to the TIME display.
	Enter the Advanced Menu	Press the GEAR button to enter the advanced menu.
	Change Brake Valu	While in the advanced menu, navigate to "Brake". Use the UP and DOWN buttons next to the TIME screen to turn brake on and off.
	Turn Beeper On or Off	While in the advanced menu, navigate to "Beeper". Switch ON or O FF with the UP and DOWN buttons next to the TIME display. This s etting will apply to all cycles.
	Naming the Cycle	While in the advanced menu, navigate to the cycle name with the U P and DOWN arrows. Press the START button. The * indicates the space selected. Use the UP and DOWN buttons to change characters, then move to the next space with the right arrow >.  Press the GEAR button to return to the main programming menu.
CYCLE	Save and Exit Setti ngs Mode	Press the GEAR button, followed by the CYCLE button to exit the m enu.

# **DELETING A CYCLE**

CYCLE	Enter the Advanced Menu	With the desired cycle selected, access the menu and enter the advanced menu.
	Navigate to Delete	Using the UP and DOWN buttons, navigate to DELETE. Exit the m enu. WARNING: CYCLE WILL BE DELETED IF MENU IS EXITED WITH DELETE SELECTED
CYCLE	Confirm Deletion	Press the CYCLE button to Delete the cycle

# **CYCLE LOCK**

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 selected cycle parameters. The Preset Lock allows selection of any saved cycle and prevents changing the parameters of saved cycles.

6	Enter Single Cycle	Select desired cycle. With lid open, press and hold the UNLOCK bu tton. Two beep will confirm that cycle selection is locked.
6	Enter Preset Lock	Continue holding the UNLOCK button to enter Preset Lock. One be ep will confirm that cycle selection is now locked. NOTE: If Single Cycle Lock is set, it must be canceled before Preset Lock can be set.
6	Cancel Lock	Hold the UNLOCK button. Three beeps will confirm that the cycle s election is now unlocked.

# **PRESET CYCLES**

	3 min	5 min	Custom
RPM	5,200	5,200	3,600
Time	3	5	7
G-Force	4,000 xg	4,000 xg	2,000 xg

#### **OPERATION**

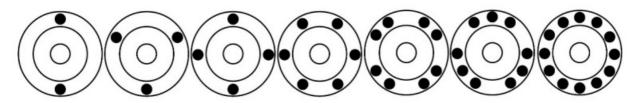
- Place the tubes into the tube holders. Be sure to follow the rules for balanced loads as listed in the next section.
- Close the lid and turn the lid knob clockwise to its complete stop position.
- The digital screen shows the currently selected cycle. To select another cycle, press the UP or DOWN 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. 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.

# 12 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 centrifuge 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**

- 1. 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.
- 2. 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.
- 3. 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.

The centrifuge does not run	<ul> <li>o Verify that the centrifuge is powered. One of the LED lights shoul d be on.</li> <li>o If "Lid not closed" message is displayed, make sure the lid latch i s turned completely clockwise to its stop position.</li> <li>o If the centrifuge still does not run, contact Customer Service.</li> </ul>
The rotor does not spin freely	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> <li>o Stop the centrifuge. Open the lid.</li> <li>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.</li> <li>o Inspect the rotor, tube holders or buckets for damage.</li> <li>o If the tube holders or buckets have any damage, even slight, saf ely dispose of them and replace them.</li> <li>o If the rotor appears damaged, contact Customer Service for furt her assistance.</li> </ul>
Excessive noise or vibration when the centrifuge is running	<ul> <li>o Verify that all four centrifuge feet are properly seated on a flat sur face.</li> <li>o Ensure that the load is balanced according to instructions in the "Balancing Loads" section of this manual.</li> <li>o Make sure that nothing has fallen into the rotor chamber.</li> </ul>
"Abort" is displayed on the top screen	The centrifugation cycle has been interrupted.
The centrifuge stops and be eps continuously	The load is not balanced. Press the UNLOCK button, open the lid, a nd balance the load as recommended elsewhere in this manual.
The centrifuge is stuck on one of the s ettings	Cycle selection is locked. Press the UNLOCK button for 5 seconds.
Only a few cycles can be accessed	The Preset Lock is active. To deactivate it, press the UNLOCK butto n for 5 seconds, until you hear 2 beeps, then again until the next 2 b eeps. All cycles can now be accessed and/or amended.
The cycle time and speed (RPM) are n ot set to the desired value	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.

Cycle parameters cannot be changed	<ul> <li>o If cycle selection is locked on one cycle, press the UNLOCK butt on for 5 seconds. Then, press the GEAR button and follow the instructions elsewhere in this manual.</li> <li>o If different saved cycles can be selected but not modified, the centrifuge is in Preset Lock mode. Press the UNLOCK button for 5 seconds until two beeps are heard, then again until the next two beeps. You should now be able to change cycle parameters.</li> </ul>
The centrifuge does not unlock after a run is completed	o Wait until the rotor has come to a complete stop. If the lid knob st ill cannot be rotated, press the UNLOCK button and try again.  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 pent o 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.
The lid does not open	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.
Clicking noise during braking gets lou	o Make sure that the screw in the center of the rotor is tight.
Lid does not stay up	o 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 Capacity	12 tubes – 3 to 10 mL
Dimensions (W x D x H)	13 in x 15 in x 9 in
	(33 cm x 38.1 cm x 22.9 cm)
Weight	34 lbs. (13.7 kg)
Sound Level	61 dB A
Supply Voltage	100 – 240 (+/- 10%)
Supply Frequency	50 – 60 Hz
	3.6A at 115 VAC
Current Consumption	1.8A at 230 VAC
Centrifuge Motor	½ H.P. Brushless
Max g-Force	4,000 xg
Max Speed	5,200 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
	Maximum relative humidity 80% for temperatures up to 31 °C, decreasing linearly to 50% relative
Humidity	humidity at 40 °C
Overvoltage Category	II
Pollution Degree	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 <a href="https://www.druckerdiagnostics.com/g-force-calculator/">www.druckerdiagnostics.com/g-force-calculator/</a>.

# • In Centimeters:

- RCF or G-force = 0.00001118 x
- Rotor Radius (cm) x (RPM)2

# • In Inches:

- RCF or G-force = 0.0000284 x
- Rotor Radius (in) x (RPM)2

**Radius** 5.25 in (13.3 cm)

#### REPLACEMENT PARTS

#### Part No. Description

- 7724177K Foot, rubber (Pack of 4)
- 02-002-1-0044 Lid Tray Assembly
- 02-001-0-0009 12-Place Rotor, Horizontal
- 02-005-1-0012 Motor Assembly
- 02-006-0-0021 PC Board
- 7760006 Power cord
- 03-1-0005-0247K 400W Power Supply Kit Assembly
- 02-002-1-0041 Lid Assembly
- 7724071K Hinge, friction (Pack of 2)
- 02-002-1-0057 Seal, lid gasket
- 03-0-0003-0313 Open/Close Label
- 03-1-0007-0046K 75/100mm Tube Holder, Blue (Pack of 6)
- 02-002-1-0067K Kit, Lid LED Assembly, Green
- 03-0-0003-0398 Dash Flex 12 Front Panel Label
- 00-100-100-010 12/24 Series Soft Button & Spacer Replacement Kit
- 00-100-100-005 Replacement Grommet & Bushing Kit

#### **PREVIOUS MANUAL REVISIONS**

To access previous manuals, please click the relevant link below:

- Revision D
- · Revision E
- Revision F

# This operator's manual is part number 03-0-0002-0142 Rev. G

- Product Family: DASH Flex Series
- 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

# 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

- 200 SHADY LANE, SUITE 170 PHILIPSBURG, PA 16866, USA
- +1-<u>866-265-1486</u> (U.S. ONLY) +1-<u>814-692-7661</u>

- CUSTOMERSERVICE@DRUCKERDIAGNOSTICS.COM
- DRUCKERDIAGNOSTICS.COM

# **Documents / Resources**





<u>Drunker Diagnostics Flex 12 Programmable STAT Centrifuge</u> [pdf] Instruction Manual Flex 12 Programmable STAT Centrifuge, Flex 12, Programmable STAT Centrifuge, STAT Centrifuge, Centrifuge

# References

User Manual

Manuals+, Privacy Policy

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