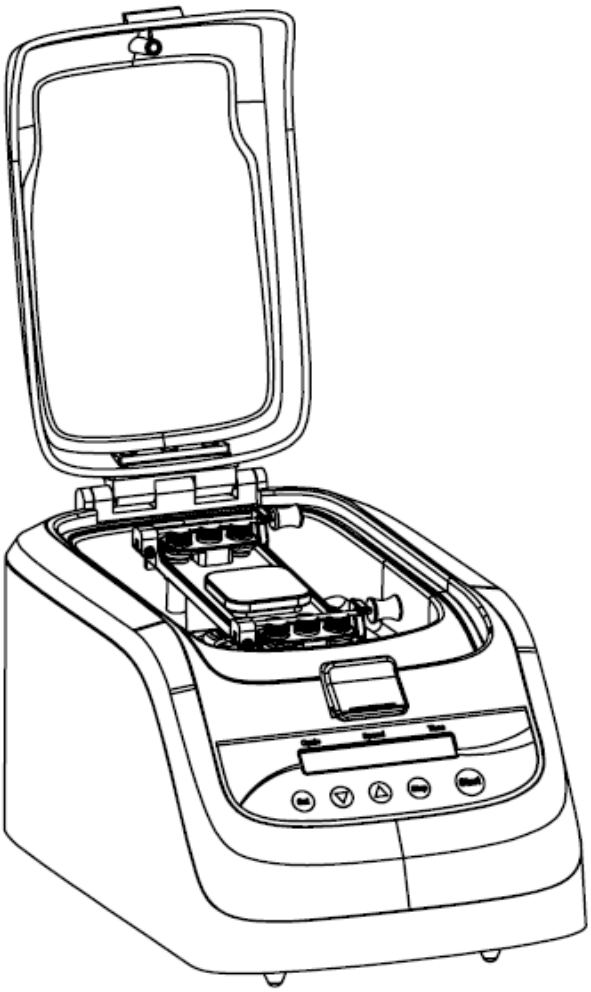
BeadBug™-6

Microtube Homogenizer



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Foreword

Thank you for purchasing the BeadBug-6 Microtube Homogenizer. This manual contains instructions for the proper operation and care of this instrument. Please read the manual carefully before attempting to operate the unit and keep it available for future use.

Prior to initial operation:
Please check the instrument and accessories against the packing list when first opening the shipping carton. Report any damage, discrepancy, or missing items to the supplier immediately. Shipping damage should be reported to the carrier. Keep the packaging unit the unit has been shown to be in full operating condition.

Included in this package should this manual, the instrument, two tube holders for 3 x 0.2ml tubes and the power cord/adapter. The BeadBug 6 is a universal voltage instrument. Please be sure that the power cord complies with local voltage requirements.

Safety Warnings and Guidelines

1. Important operation information:

Read this manual carefully before attempting to operate the instrument.

Read this manual prior to powering up the instrument. Pay special attention to the guidelines and directions below and become familiar with all safety warnings and guidelines.

2. Safety:

The operation, maintenance and repair of the Instrument should comply with the basic guidelines and safety warnings below. Noncompliance may interfere with the useable life of the instrument, safety protection, and may void the warranty.

Use this product indoors. Do not operate in a damp or wet environment.

Before using the instrument, read the manual carefully. This instrument is designed for use in laboratory environments and must be operated by skilled personnel with the appropriate training.

Do not attempt to open the housing or repair the instrument. Disassembly will void the warranty. If there is a service issue with the instrument, please contact the supplier.

Before operation, ensure that the voltage rating on the instrument matches your local voltage. The rated electrical load of the outlet should not be lower than that of the instrument's demand. If the power cord is damaged, it should be replaced. Do not locate the power cord where it will have objects placed on it or where it will be walked on. When unplugging the instrument, do not pull the plug out of the socket by the cord.

Install the instrument in a cool, dry location free from dust, direct sunlight or strong lights. The instrument should be placed away from corrosive gasses, strong magnetic fields and heat sources. Allow at least 4 inches on all sides of the instrument for proper air circulation. If using 2 instruments side by side, they should be placed at least 100cm apart.

The power switch is located on the rear of the instrument. After use, the power to the instrument should be turned off. If the instrument will not be used for a long period of time, it should also be unplugged and covered with a cloth or plastic to keep it free of dust.

The instrument should be unplugged immediately and the supplier contacted in the event of:

- **Liquid leaking into the instrument**
- **Smoke or fire**
- **Abnormal operation – ie sound or smell**
- **Instrument has been dropped or outer housing has been damaged**
- **Functioning of the instrument changes.**

3. Maintenance

The tube holder should be cleaned with a cloth dampened with a small amount of alcohol. The outside of the unit can be cleaned with a damp cloth or mild detergent if required.

Always disconnect power to the unit before any cleaning procedure. Do not apply cleaning solutions directly to the tube holder or chamber. Do not use corrosive agents while cleaning. Do not submerge the instrument of pour solutions over it.

Contents

Chapter 1 Introduction

The BeadBug-6 is a microtube homogenizer designed for use with biological samples. Samples are placed in a tube with the appropriate grinding media and buffer, and subjected to a three-dimensional, high speed motion.

Features:

- Simple user interface
- Small footprint
- Capacity for 6 x 2.0ml tubes or 2x5ml tubes
- Wide variety of grinding media for an array of sample types
- Adjustable speed, time, “rest” interval and cycles

Chapter 2 Specifications

1. Normal operating conditions:

Ambient temperature：5°C - 35°C

The relative humidity：≤70%

Power：24VDC 6A

2. Basic parameters and characteristics

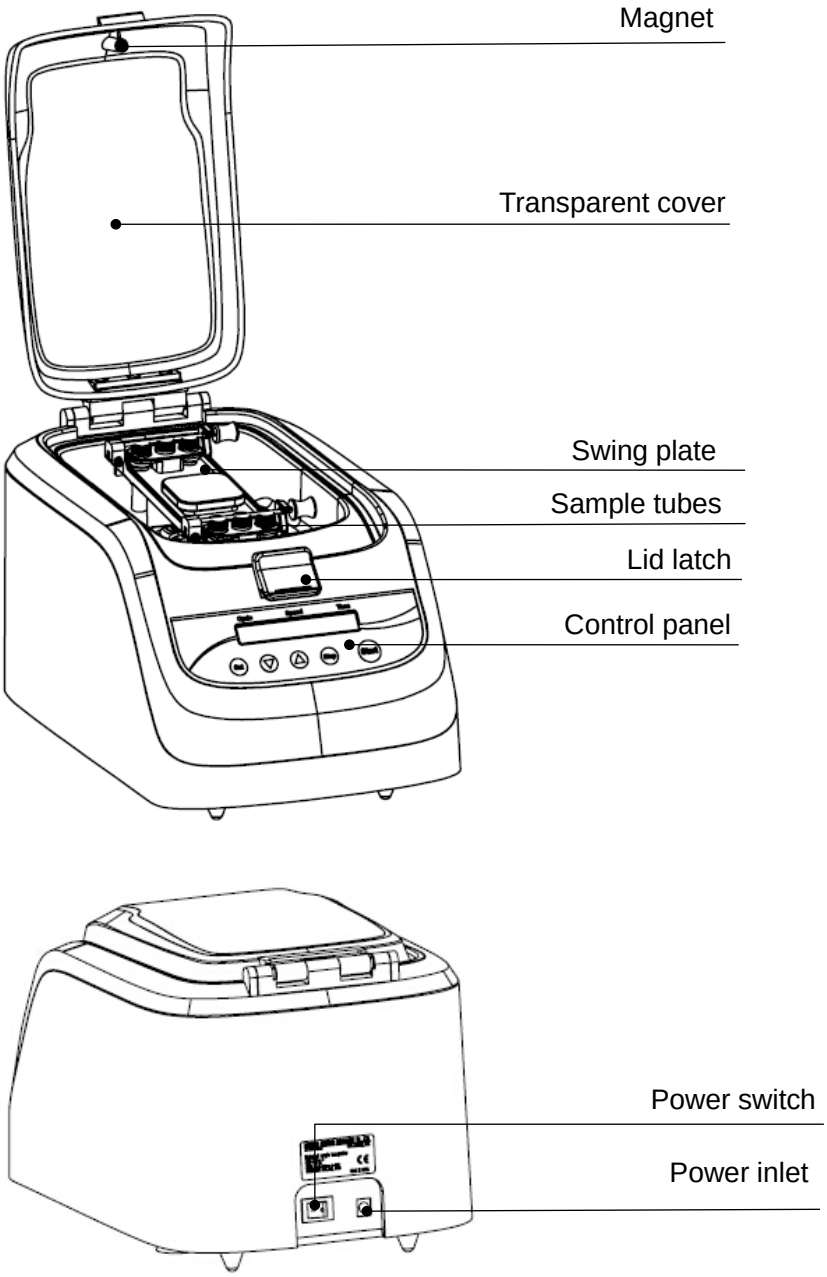
Type / Parameter	BeadBug-6
Display	LCD
Sample capacity	6 x 2ml tubes/or 2 x 5ml tubes*
Cycle duration	1 sec to 90 sec in 1 sec increments
Pause	1 sec to 90 sec in 1 sec increments
Number of cycles	1 to 10
Speed	4.00m/s - 7.00m/s(2500 - 4350rpm), in 0.05m/s increments
Acceleration time	≤2s
Deceleration time	≤2s
Noise	≤65db
Input power	144W
Adapter	24VDC 6A
Dimension(WXDXH)	218mm x 354mm x 206mm
Weight（kg）	8.9kg
Warranty	2 years

*Requires the use if 5ml adapters, purchased separately

Chapter 3 Basic Instructions

This chapter focuses on the structure, operation keys, and display of the instrument, as well as preparatory work before starting. Please read this chapter before initial operation

1. Structure overview

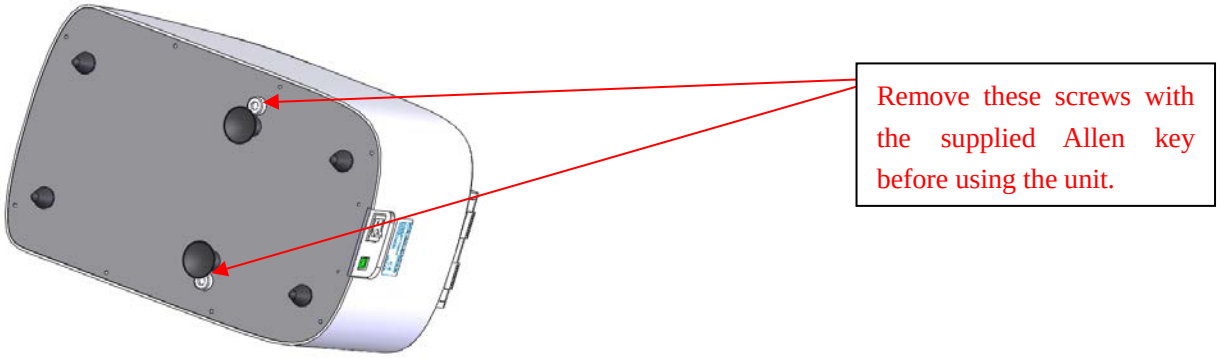


2. Installation and Tube Loading

2.1 Removing Shipping Screws

The BeadBug-6 is shipped with motor stabilizing screws. ***These screws must be removed before use.*** Failure to do so may damage the unit.

Locate the shipping screws on the bottom of the unit (see image below). Using the supplied Allen key, remove these screws completely.



2.2 Connect Power

Connect one end of the adapter to the power inlet in the back of the unit. Connect the power cord to the adapter and then to the wall outlet

2.3 Loading Samples

2.3.1 The BeadBug-6 has a capacity for 6x2.0ml tubes. For proper operation, samples must be balanced. If only one sample is to be processed, a tube of the same weight must be used to balance it. Refer to the figure below for loading patterns

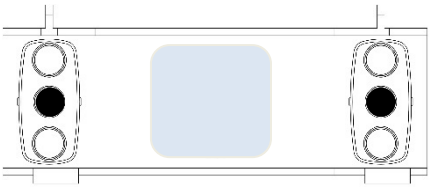


Fig 2.1

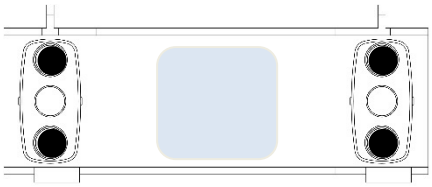


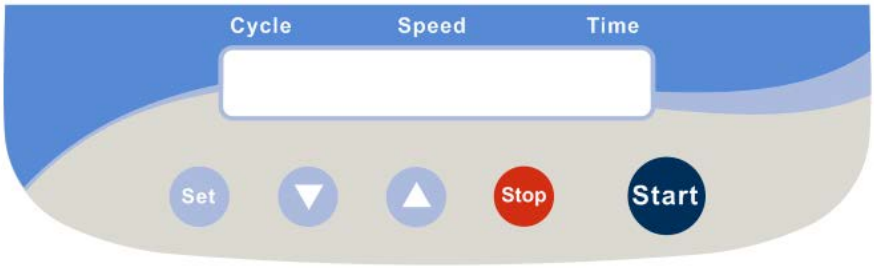
Fig 2.2

2.3.2 Up to three samples are loaded into each of the removable tube holders. Do not run the unit without the tube holders and tubes in place. Be sure to press the tubes firmly into the holder. Once the tubes are loaded, the tube holder retaining bar is then lowered into place over the tops of the tubes and the right side is locked into the silver restraining bar latch.

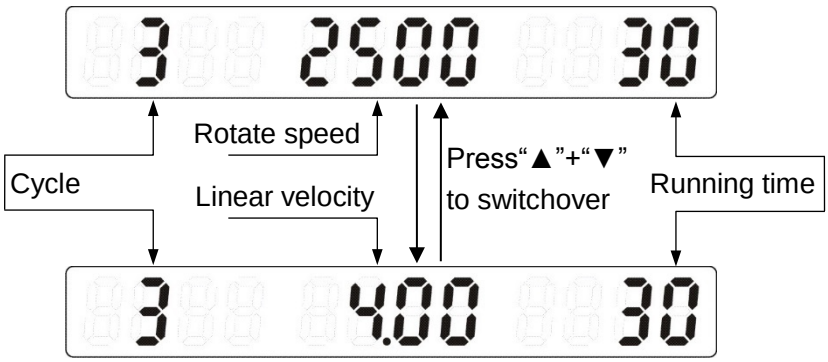
Be sure that the sample tubes are locked in place and the transparent cover closed before attempting to operate the unit. Failure to balance tubes and lock the retaining bar in place can result in damage to the unit.

Chapter 4 Operation Guide

1. Operation Panel and Display



Display



2. Control Panel Functions

Set : Press to enter the programming mode and set operating parameters. Pressing multiple times will toggle between the parameters.

▲ ▼ : Press to enter the value of the selected parameter.

Stop : Press to stop operation of a program

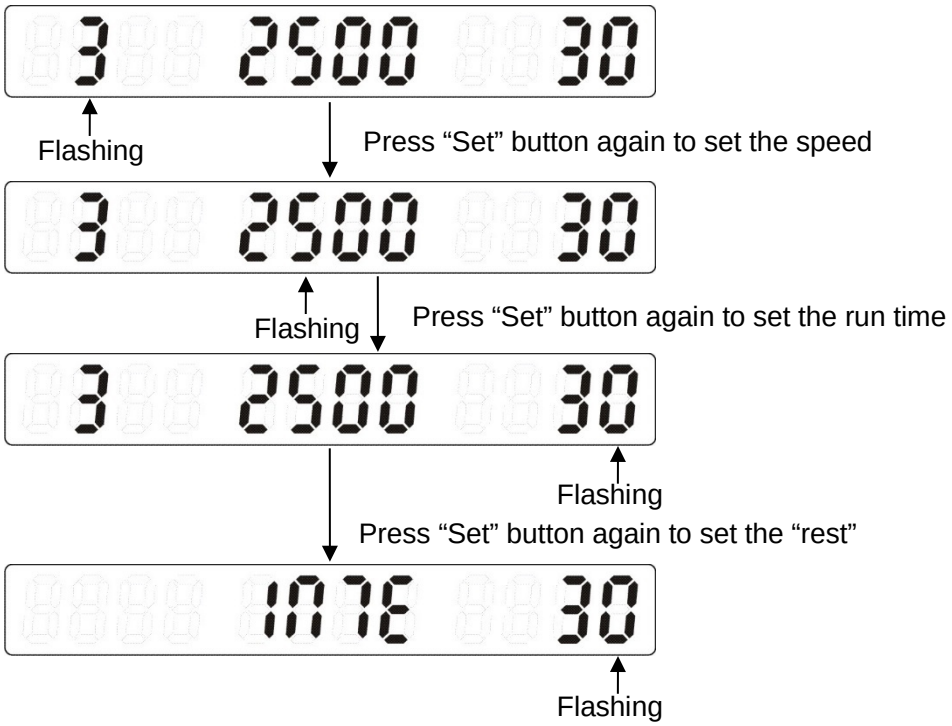
Start : Press to run a program

3. System Check

Upon turning on the instrument, a self-check is performed. he display will flash 8's on the screen three times (shown below) and then the last run parameters will be displayed.

4. Setting Run Parameters

4.1 Press "Set" button to enter the programming interface. Cycle number (1-10) will flash. Press "▲" or "▼" to set the cycle number.



Pressing the "Set" button again will cycle back to the first step in the process. If no buttons are pressed for 3 seconds, the parameters will be saved and the programming mode will be exited. To start a run with the set parameters, simply press "Start".

4.2 Press the "▲"+"▼" buttons simultaneously to switch between linear velocity (4.00 – 7.00m/s) and rpm (2300-4350).

A typical run will consist of the following parameters:
3 cycles, speed of 4350rpm or 7.00m/s, 30 seconds with a 30 second rest.

5. Tips for Setting Up Samples

- Homogenization beads are available in a variety of sizes and materials. Be sure to choose the size and material best matched to your application. See the Bead Compatibility Chart later in this manual for bead recommendations. If unsure, contact Benchmark for support at info@benchmarkscientific.com.

- For the most efficient homogenization, tubes should be no more than ½ full of beads, sample and buffer.

- Many times, sample shape cannot be controlled. If it can, remember that a long thin sample will homogenize faster than a short, square one.

- Do not over load tubes, sample size should be 100mg or less.

- Homogenize in short bursts of 20-30 seconds with a 30 second rest in between cycles.

- After homogenization, spin tubes briefly in a centrifuge to bring the beads and debris to the bottom of the tube. Pipette off the lysate for further processing.

6. Beads and Accessories

Prefilled 2.0ml tubes

D1031-01 Prefilled 2.0ml tubes, Silica (Glass) Beads, 0.1mm Acid Washed, 50pk
D1031-05 Prefilled 2.0ml tubes, Silica (Glass) Beads, 0.5mm Acid Washed, 50pk
D1031-10 Prefilled 2.0ml tubes, Silica (Glass) Beads, 1.0mm Acid Washed, 50pk
D1032-01 Prefilled 2.0ml tubes, Zirconium Beads, 0.1mm Triple-Pure - High Impact, 50pk
D1032-05 Prefilled 2.0ml tubes, Zirconium Beads, 0.5mm Triple-Pure - High Impact, 50pk
D1032-10 Prefilled 2.0ml tubes, Zirconium Beads, 1.0mm Triple-Pure - High Impact, 50pk
D1032-15 Prefilled 2.0ml tubes, Zirconium Beads, 1.5mm Triple-Pure - High Impact, 50pk
D1032-30 Prefilled 2.0ml tubes, Zirconium Beads, 3.0mm Triple-Pure - High Impact, 50pk
D1032-SK Prefilled - Triple-Pure Starter Kit, 10 each of 0.1, 0.5, 1.0, 1.5 and 3.0mm
D1033-28 Prefilled 2.0ml tubes, Stainless Steel, 2.8mm Acid Washed, 50pk
D1033-30G Prefilled 2.0ml tubes, Garnet Shards and one 6 mm Zirconium Bead, 50pk
D1034-MX Prefilled 2.0ml tubes, 0.1mm Silica, 1.4 mm Zirconium & 4mm Silica Beads, 50pk
D1032-60 Prefilled 2.0ml tubes, 6 mm Ceria Based Zirconium Oxide Satellite, 50pk
D1034-28 Prefilled 5.0ml tubes, Stainless Steel beads, 2.8mm Acid Washed, 50pk**

Empty Tubes

D1031-T20 2.0ml tubes (empty) pack of 1000 with caps and sealing ring

D1031-T21 2.0ml tubes (empty) pack of 50 with caps and sealing ring
D1031-RF 2.0ml reinforced tubes (empty) pack of 500 with cap and sealing ring
C1005-SC5 5.0ml tubes (empty), pack of 500 with cap**

Bulk Beads

D1131-01 Bulk Beads, Silica (glass), 0.1mm, acid washed, 200g
D1131-05 Bulk Beads, Silica (glass), 0.5mm, acid washed, 200g
D1131-10 Bulk Beads, Silica (glass), 1.0mm acid washed, 200g
D1132-01TP Bulk Beads, Zirconium, 0.1mm, Triple-Pure Molecular Biology Grade, 250g
D1132-05TP Bulk Beads, Zirconium, 0.5mm, Triple-Pure Molecular Biology Grade, 250g
D1132-10TP Bulk Beads, Zirconium, 1.0mm, Triple-Pure Molecular Biology Grade, 250g
D1132-15TP Bulk Beads, Zirconium, 1.5mm, Triple-Pure Molecular Biology Grade, 250g
D1132-30TP Bulk Beads, Zirconium, 3.0mm, Triple-Pure Molecular Biology Grade, 300g
D1133-28 Bulk Beads, Stainless Steel, 2.8mm, acid washed, 1,000/pk
D1132-60 Bulk Beads, 6 mm Zirconium Oxide, Ceria Stabilized, 50/pk
D1133-G Garnet shards, bulk, acid washed, 250g bottle

5ml Tube Holder

D1036-A5 Holder for 1x5ml tubes in BeadBug-6, pack of 2

**Requires use of the 5ml tube holder
Custom fills available for quantity orders.

7. Bead Compatibility Chart

	Bead material	Silica			Zirconium					Steel	Garnet with Zr Satellite	Silica and Zirconium
	Bead diameter	0.1mm	0.5mm	1.0mm	0.1mm	0.5mm	1.0mm	1.0mm	3.0mm	2.8mm	0.5/6mm	Mixed
Animal	Adipose							X				
	Artery							X	X			
	Bone									X		
	Brain							X	X			
	Insect - fly								X	X		
	Insect - Tick								X	X		
	Insect - Mosquito						X	X	X			
	Gonad							X	X			
	Hair								X	X	X	
	Heart							X	X			
	Kidney							X				
	Liver											
	Lung							X	X			
	Muscle								X	X		
	Pancreas							X	X			
	Skin								X		X	
	Spleen							X	X			
	Teeth								X	X		
Microbial	Algae		X			X						
	Bacteria	X	X		X	X						
	Fungi		X	X		X	X					
	Mold		X			X						
	Spores		X	X		X	X					
	Yeast		X	X		X	X					
Plant and Soil	Leaves								X	X		
	Nuts									X		
	Plant, soft tissue								X	X		
	Plant, tough tissue								X	X	X	
	Seeds								X	X		
	Stems								X	X		
	Soil							X				X
	Coral									X		
Fecal	Stool							X				X
	Scat								X	X		X

Above is a partial list of sample types and suggested beads. For additional information and technical support, contact Benchmark Scientific at info@BenchmarkScientific.com.

Chapter 5 Troubleshooting Guide

Problems and actions

No.	Problem	Possible cause	Solution(s)
1	No display on the screen	No power	Check the power supply and that the unit is plugged in properly
		On/Off button broken	Change button
		Others	Contact supplier
2	Velocity measurement inaccurate	Sensor broken	Contact supplier
		Electric motor broken	
3	No alarm when the cover open when running	Sensor broken	Contact supplier
4	"**E101**" displayed with alarming "Du..."	Overspeed alarm	Contact supplier. Press any key to silence the alarm.
5	"**E104**" displayed with alarming "Du..."	Locked-rotor alarm	Contact supplier. Press any key to silence the alarm
6	"**E501**" displayed with alarming "Du..."	Cover open when running	Close cover. Press any key to silence the alarm
7	"**E503**" displayed with alarming "Du..."	Cover didn't close before running	Close the cover. Press any key to silence the alarm.
8	Buttons don't work	Faulty control panel	Contact supplier

Notes