Boekel Scientific

Blood Collection Mixer
Model 302000
Operating Instructions

Contents

1. Indications for Use

The Boekel Scientific Blood Mixer is intended for use in blood collection centers, hospitals, and locations where it is required to collect whole blood from a donor. This unit is designed in accordance with the most current AABB standards and is FDA listed. The intended operation of the medical equipment is to rock back and forth and that the force is under 20n and will be acceptable and will not harm the operator.

1.1. Contraindications

This device is not intended to be used in the collection of, but not limited to, Umbilical Cord Blood, Platelets, Plasma, or Red Blood Cells.

2. Safety

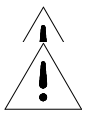
The following symbols marked on the equipment mean:

Caution: Please read and understand all necessary installation and operating instructions prior to operating the system.

Always observe the following safety precautions:

- Use only as specified by the operating instructions or the intrinsic protection may be impaired.
- WARNING: To avoid the risk of electric shock, this equipment must only be connected to a supply main with protective earth.

- WARNING: Do not modify the system or its components. Any alterations or modifications to the system may be dangerous and will void the warranty.
- Connect only to a power supply with a voltage corresponding to that on the serial number label. Only use the AC power adapter and battery supplied with the product.
- After transport or storage in humid conditions, dry out the unit before connecting it to the supply voltage. During drying out, the intrinsic protection may be impaired.



- Disconnect power before servicing, moving, or cleaning.
- Do not position system where it is difficult to reach the inlet or power switch.
- It is the user's responsibility to carry out appropriate decontamination per their SOP if blood or other hazardous material is spilled on the equipment. Refer to Section 8.1**Error! Reference source not found.** for a general guideline on how to proceed with decontamination.
- Before using any cleaning or decontamination method, users should verify that the method of cleaning will not damage the unit.

- If liquid is spilled inside the unit, disconnect it from the power supply and have it checked by a competent person.
- Do not use with flammable, corrosive or hazardous material.
- Electromagnetic interference could affect the operation of the system if it is used in the vicinity of devices that have not been evaluated to the relevant EMC standard/s.

2.1. EMF Interference

This system may cause interference to radio and television reception or to equipment sensitive to electromagnetic fields. When installed properly, the system has been designed to minimize this effect. However, there is no guarantee that electromagnetic interference will not be caused by the system.

If the system does cause interference to radio, television, or other equipment, which can be determined by turning the instrument off and on, the user may attempt to correct the interference by one or more of the following measures:

- Increase the distance between the system and the radio/TV receiver.
- Connect the system to an outlet on an electrical circuit different from that which the radio/TV receiver is connected.

If this system is used near an intense electromagnetic source, interference noise may cause an adverse effect on the system performance or functionality.

The system is designed to minimize possible interference from external electromagnetic fields; however, there is no guarantee that external electromagnetic fields will not influence this instrument.

If the system does incur electromagnetic interference, which can be determined by turning on and off possible source(s) of electromagnetic interference nearby, the user may attempt to correct the interference by one or more of the following measures:

- Reorient the instrument.
- Increase separation between the instrument and possible source(s) of electromagnetic interference.
- Connect the instrument to an outlet on a different electrical circuit from the possible source(s) of electromagnetic interference.
- Check that any other device connected to the system is not affected by electromagnetic interference.

3. Product Information

3.1. Introduction

The Boekel Scientific Blood Mixer offers controlled and gentle motion of blood bags during collection from a donor. Alarms protect the integrity of the product and the unit, and network communication allows for remote monitoring.

4. Assembly

4.1. Unpacking

- Remove packing materials carefully and retain for future shipment or storage of the unit.
- Inspect for damage. Report all shipping damage to the carrier immediately. Shipping damage is covered by the carrier and repair/replacement for shipping damages must be coordinated through the carrier.
- Complete and return the Warranty Registration Card, enter your information online at https://boekelsci.com/support/product-registration.html, or scan the QR code and submit the information online.
- Package should contain:
  (1) Boekel Scientific Blood Mixer
  (1) AC Adapter line cord
  (1) Collection Tray
  (1) Rechargeable Battery
  (1) Operating instructions

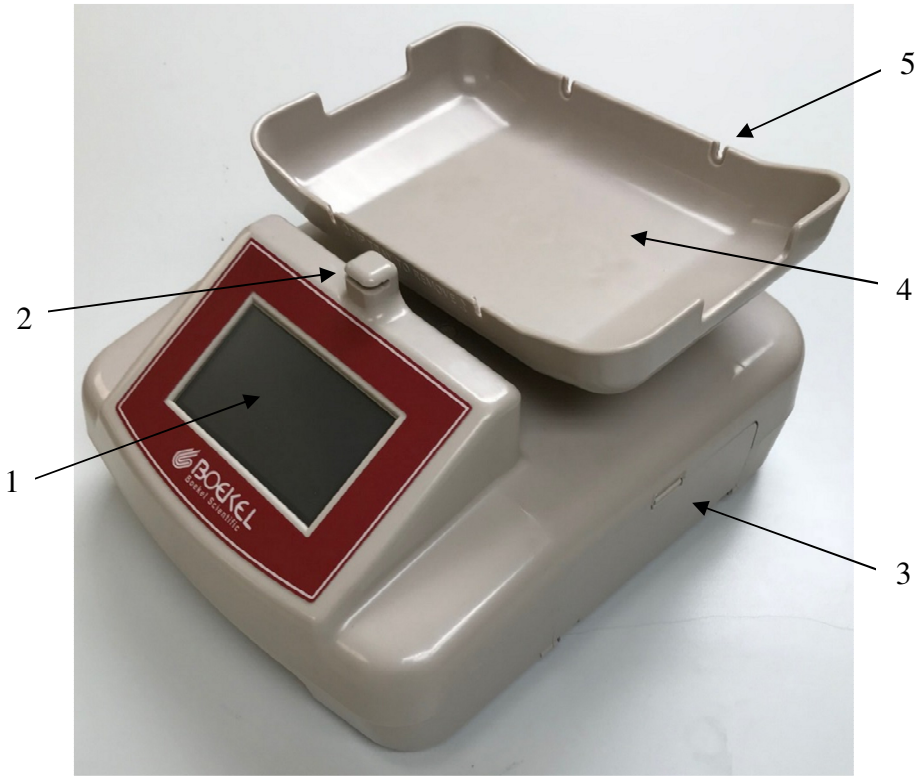
4.2. Installation

1. Place the Blood Mixer on a flat and stable surface, making certain the sides and back have at least 3 inches of clearance.

2. Fit the power line cord into the barrel jack on the rear of the unit and plug the power cord into a properly grounded outlet.

3. Install the tray and ensure that it is empty at this time. Power on the unit using the On/Off switch on the rear of the unit. The device will turn on and ready itself for operation.

5. System Overview



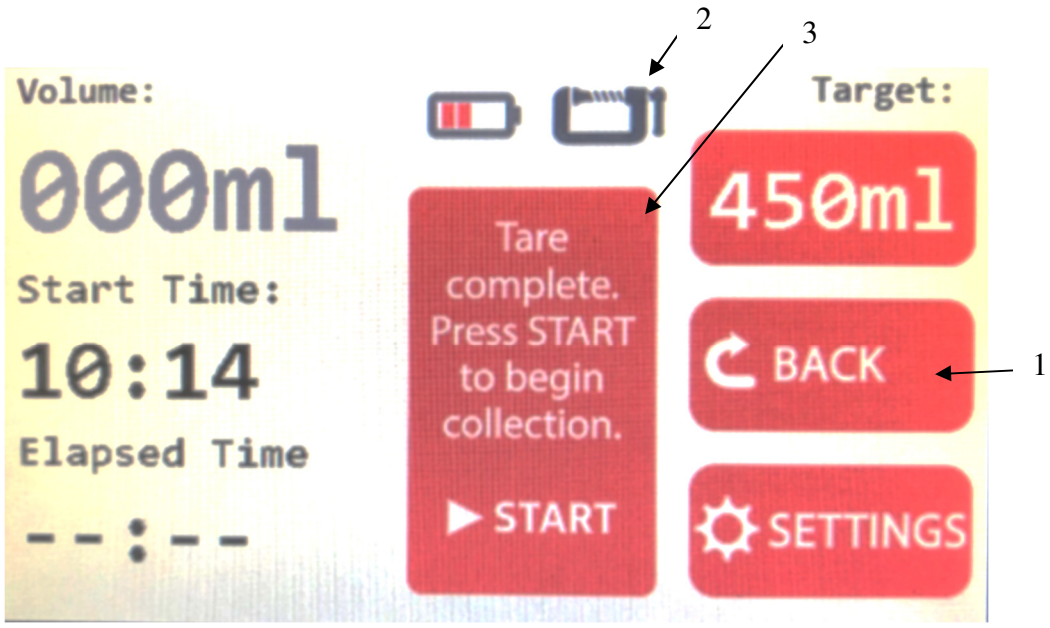
1. Touchscreen display – Used to interface with the system controls.
2. Tubing clamp – Stops flow of blood into bag at the end of the donation cycle.
3. Battery Compartment – Houses the system's rechargeable battery
4. Tray Platform – Rocks gently during collection to keep donated blood in motion.
5. Tubing Retention Notches – Hold the bag tubing in place during blood collection.
6. USB port – Used to connect USB devices to the system.
7. Power Switch – Toggles power to the unit on or off.
8. Barrel Jack Power Input – AC adapter line cord plugs in here to supply power to the system.
9. Ethernet Connection – RJ45 jack for connection to user's networking equipment.

6. Operation

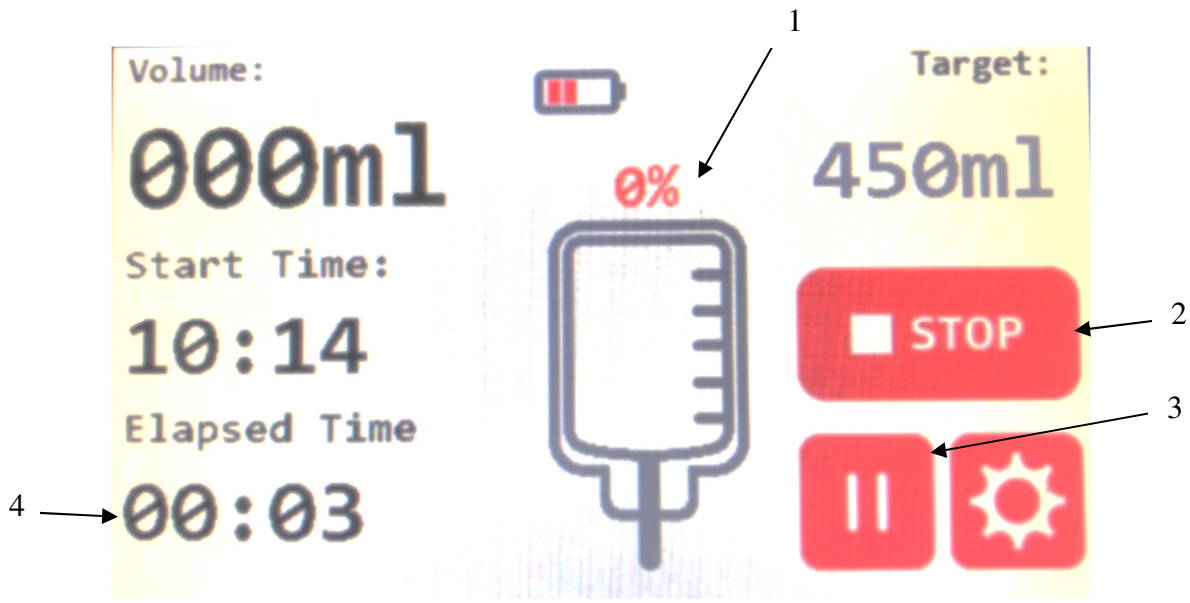
6.1. Startup and Operation

The Blood Mixer can be run on either AC line power using the included power supply or battery power using the included battery. Running the unit on line power with the battery installed will charge the battery. Fit the barrel jack connector of the line cord into the port on the back of the Blood Mixer and turn the power switch to the on (I) position. The Blood Mixer will initialize and immediately tare the scale. Once this activity completes, the unit is ready for use and the following screen appears:

1. Target Fill: Press to change. Target can be set to either volume or time.
2. Tare: Position collection bag in tray with tubing in clamp. Pressing the button will tare the weight of the bag and to go the next screen for the start of collection.
3. Settings Menu: Press to enter settings screen.
4. Real-time measurement: Allows for a weight to be placed on the tray in order to verify calibration of measurement. Text will update in real-time.
5. Current clock time in military (24 hour) format.
6. Battery status: When a battery is installed in the unit, this icon will display its charging status. Plugging the Blood Mixer into AC power while a battery is installed will charge the battery.



1. Back: Press to return to previous screen. Can be used to force a taring operation if the one from the previous screen was compromised.
2. Clamp indicator: Shows that the tubing clamp is engaged when the icon is visible.
3. Start: Press to begin collection. Tubing clamp will disengage, and tray will begin rocking with regular pauses for weighing.

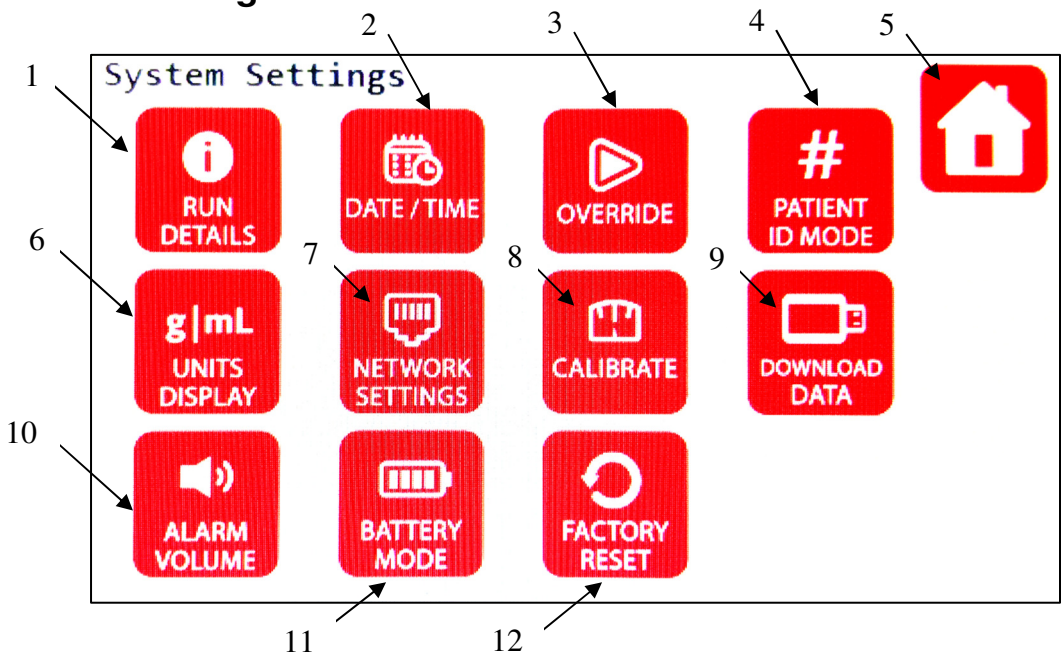


1. Progress: Pictorial representation (with percentage value) of progress of current collection cycle.
2. Stop: Used to stop current cycle and return to the Home Screen.
3. Pause: Used to pause the current cycle with the ability to resume collection at a later time.
4. Elapsed Time: Elapsed time in MM:SS since the start of the current collection cycle.

Once a collection cycle has completed, the Volume in the upper left cycles between displaying of the final volume value and the word “COMPLETE”. The clamp will engage to pinch off the tubing to the bag, and the pictorial of the collection bag will be replaced with the text “Cycle complete. Press HOME to unclamp and begin next cycle.” The device will continue rocking for preservation of the collected sample. At this time, collection is complete, and a user may process the bag per their standard operating procedures. Pressing “HOME” will begin the next collection cycle.

To safely terminate operation of the Blood Collection Mixer, simply turn off power after use, by flipping the rocker switch on the back of the equipment to the off (O) position.

6.2. Settings Screen



1. RUN DETAILS: Shows the full data on the current run.
2. DATE/TIME: Set the current date and time. Does not auto-update for Daylight Savings or other time changes. Date and time are factory set and verified to EST and will need to be changed and verified based on actual time zone unit is being used in. It is recommended to conduct periodic time verifications as necessary.
3. OVERRIDE: Allows continuation of the run if the target has been reached during a therapeutic collection.
4. PATIENT ID MODE: Enable or disable the Patient ID Mode. When enabled, the device will request the Patient ID for a run.
5. HOME: Returns to the home screen.
6. UNITS DISPLAY: Select among displaying milliliters, grams, or both.
7. NETWORK SETTINGS: Allows for assignment of static or dynamic IP address, and other network settings.
8. CALIBRATE: Used to calibrate weigh scale. Suggested calibration weights are an empty tray for the zero value and a tray with an independently calibrated 500g weight. Calibration should be performed annually or whenever unit is moved or being returned to service after maintenance.
9. DOWNLOAD DATA: Used to download the data stored on the device memory in user-selectable time increments (last 24 hours, last 7 days, last 1 month, or all data in the memory). A USB flash drive must be connected to the USB port on the left side of the unit.
10. ALARM VOLUME: The audible volume of system alarms can be increased or decreased by pressing the + and – buttons, respectively.
11. BATTERY MODE: Toggle between low power mode on and off.
12. FACTORY RESET: Resets all calibration values and user changes to the unit.

6.3. Alarms

The Blood Mixer has alarms to protect the product quality and the system itself. When an alarm condition occurs, the unit will display a visual warning on the touchscreen display and beep audibly to alert the user.

6.3.1. Slow Bleed Alarm

Occurs when detected fill rate is lower than pre-programmed threshold. Beeps for one second then pauses for a second and repeats until alarm is silenced or cleared.

6.3.2. Equipment Alarms

Other alarms are designed into the system to protect its components and subsystems. These include: Battery Error, Clamp Error, Mixer Error, Scale Error, and System Error. Should any of these alarms occur, contact Boekel Customer Service for support.

7. Specifications & Operating Conditions

Blood Mixer:	Model # 302000
Electrical:	100-240VAC, 50/60Hz, 0.5A – 1.0A
Battery	14.4VDC Ni-MH, 3500mAh
Operation Temperature Range:	10°C – 25°C Ambient
Humidity:	25-90% (non-condensing)
Connectivity:	RJ45, USB
Product Dimensions:	10.5” [27cm] W x 12.5” [32cm] D x 7” [18cm] H
Shipping Weight:	15 lb. [7kg]
Transport and Storage Temperature Range:	10°C – 50°C
Altitude:	0 - 2,000 m above sea level

8. Recommended Maintenance

All Boekel laboratory products are designed to comply with IEC61010-1. No routine maintenance is required. The expected service life of the product to maintain basic safety needs is ten years.

Refer to local waste regulations for proper procedures regarding the disposal of batteries.

8.1. Cleaning

1. Power down unit using the switch on the rear of the base.
2. Remove mains power supply cord and battery, if installed.
3. Clean exterior of unit with a mild detergent and cloth dampened with water, taking care to avoid any ports or openings in the equipment to the subsystems inside.
4. The collection tray can be removed for a more thorough cleaning, if required.
5. Let air dry or wipe dry. Ensure the unit is completely dry before reassembling and putting the unit back into service.

9. Connectivity

The Blood Mixer operates as a stand-alone piece of equipment. Network connections are only used to indicate the unit is in an alarm state.

MODBUS TCP/IP Connectivity Details

Static or Dynamic IP available.
Inputs Available:
Discrete Inputs (Read Only)

Block Index	Name	Description	Size (bits)
1	IN1	Power Signal	1
2	IN2	Alarm Signal	1
3	OUT1	Alarm Relay	1
4	OUT2	Motor	1
5	OUT3	Battery Charging	1
6	OUT4	Battery On/Mains Off	1
7			
…			
65535		Reserved for future use	

Inputs (Read Only)

Block Index	Name	Description	Size (Bytes)
1	Firmware Version	Firmware Version (ASCII)	6
4	VOL1	Current Volume	2
5	VOL2	Target Volume	2
6	Date	Date	2
7	Time0	Start Time	2
8	Time1	End Time	2
9	Time2	Remaining Time	2
10	Time3	Elapsed Time	2
11	Weight	Current Weight in grams	2
12	Full	Percent Full	2
13	Flow	Average Flow Rate	2
13	Alarm Code	Alarm Condition Error code	2
…			
65535		Reserved for future use	

10. Warranty and Service

10.1. Warranty

When used in the appropriate conditions and in accordance with these operating instructions, Boekel Scientific warrants this product to be free of defective parts, material and workmanship for a period of two years from the date of shipment. The liability of Boekel Scientific for any defective equipment during the warranty period shall be limited to the repair of defective equipment or replacement thereof without charge for parts or labor.

10.2. Service

- Upon request, Boekel Scientific will provide circuit diagrams, component part lists, descriptions, and/or calibration instructions to assist service personnel in parts repair.
- A Boekel Scientific Returned Material Authorization (RMA) number provided by Boekel Scientific is required before any Boekel products are returned for any reason.
  Contact Boekel Customer Service at 1-800-336-6929.
- A Decontamination Certificate must be completed, signed by the user, and returned to Boekel Scientific prior to receiving the RMA number. Please consult the manufacturer or his agent if there is any doubt about the compatibility of decontamination or cleaning agents.
- Please be sure to mark the outside of the returned goods package with this RMA number to ensure prompt handling.

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