

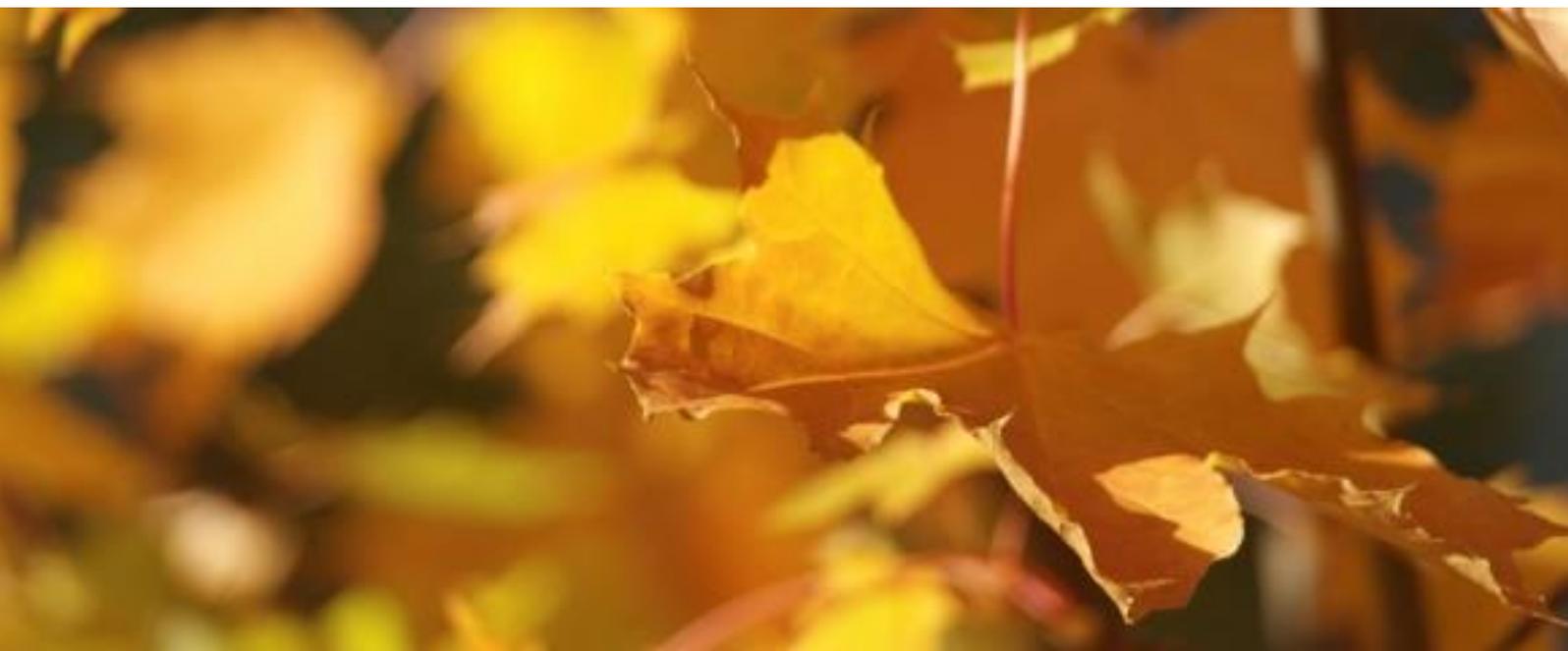
User manual

Biomixer BM550

Valid for Biomixer BM550

HW version 1.xx

SW version 1.x



Manual version 1.04

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1 General safety regulations

If the equipment is not used in a proven manner, the product's protection and safety functions may be violated.

If labels or warning signs on the BM550 are damaged, contact your local dealer.

1.1 Symbols

Descriptions of symbols:

	The user of this product must carefully read the manual regarding important safety regulations and take the necessary precautions.
	This device emits CDRH/IEC Class 2 laser light. Do not stare into beam.
	This product is a medical device.
	Unique Device Identification is a method for labeling and identifying medical equipment.

1.2 Warranty

The manufacturer hereby warrants to the original purchaser that Biomixer is manufactured in a professional and quality manner and, when properly used, will be free from all defects in material and workmanship, for a period of 12 months after delivery from the manufacturer. The warranty includes equipment or components that prove to have faults during the warranty period.

⚠ Only authorized service personnel, approved by the manufacturer, are allowed opening the instrument or making any repair operations. If not, the warranty may be invalid.

The manufacturer will without cost for the customer, repair or replace the faulty equipment. The warranty is not valid if the equipment has been repaired by anyone else than qualified personnel, approved by the manufacturer. The warranty is not valid for the battery since it is considered to be an expendable supply. The warranty is not valid if the equipment has been changed in any way that according to the manufacturer's opinion, affects the reliability or stability of the instrument. The warranty is not valid when the serial number has been changed, crossed-out or been removed, or if the fault has been caused by misuse or abnormal use. In these cases, the manufacturer or their representative will inform the customer about the decision, and if wished by the client, will repair the equipment for normal rate. An estimated price can be given on request. One important condition for

this warranty to be effective is that the Biomixer is used in accordance with the instructions in this manual.

Contact information:

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Industrivägen 17, 972 54 Luleå, Sweden
Telephone: +46 (0) 920-45 06 00
Email: info@abelko.se

Biomixer is marketed by Ljungberg & Kögel AB.

Address: Ljungberg & Kögel AB
Box 1032, SE-251 10 Helsingborg, Sweden
Telephone: +46-(0)42-139860
Fax: +46 (0) 42-132181
Email: info@ljungberg-kogel.com
www.ljungberg-kogel.com

1.3 Target group

This user manual is mainly written for the everyday user. For more detailed information and service information, see the Technical reference manual.

1.4 Severe incidents

Abelko Innovation wants all serious incidents that have occurred when using the Biomixer to be reported to us and the competent authority in the country where you as a user and/or patient are established. Please send your details of the incident to us directly at info@abelko.se.

1.5 Technical feedback

Abelko Innovation is committed to develop high-quality equipment and technical services to all our customers. We welcome any inputs on technical issues that are encountered so that they can be resolved quickly and in the most appropriate manner. Please submit your comments/feedbacks through your local distributors or alternatively email us directly at info@abelko.se

1.6 Manual version

Version 1.01 2019-11-05: First edition of this manual, draft
Version 1.02 2020-09-11: Second edition
Version 1.03 2021-06-10: Third edition
Version 1.04 2021-08-23: Fourth edition

2 Introduction

This user manual is valid for BM550. BM550 is hereinafter called Biomixer if not otherwise noted.

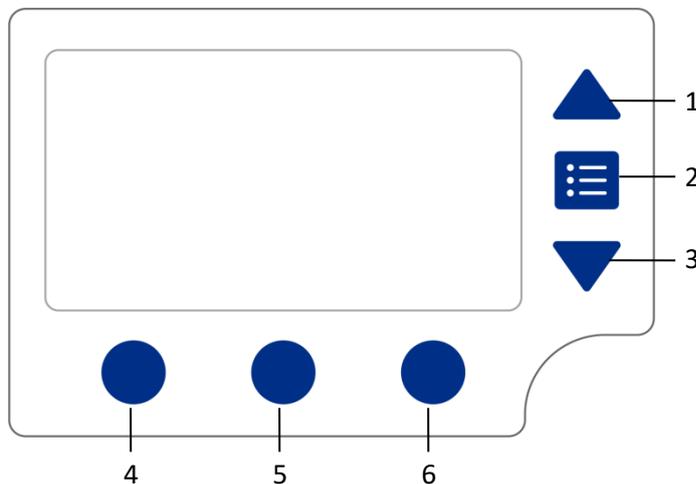
The basic function of the Biomixer is to keep the blood bag in motion during a donation so that blood and anticoagulants in the blood bag are mixed, in order to avoid coagulation. When the set volume has been achieved, the drainage is stopped by closing the blood tube with the built-in clamp. The Biomixer is suitable to be used indoor; hospital and home environments.

The intended users of the product are professional operators trained for their professional role and not laymen.



2.1 Keyboard

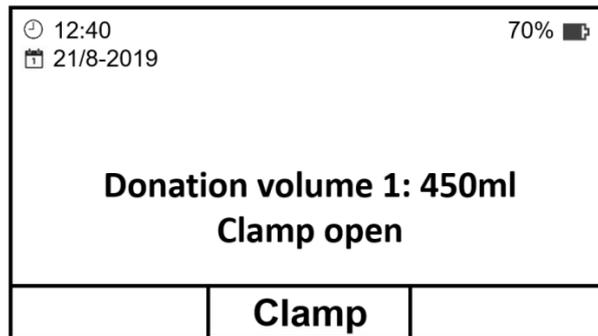
The Biomixer has a set of keys for controlling its functions. The same key can be used for different tasks depending on the text on the display.



Key	Function
1	Used for navigating inside setup menu and to change values.
2	Takes you to a function menu when the main menu is showing. Also used to silence audible signals.
3	Used for navigating inside setup menu and to change values.
4-6	The round buttons are used for different tasks depending on the text on the display.

2.2 Clamp

The clamp which holds the tube in place can have three different status. When **open**, the tube can be placed in the clamp or removed from the clamp. When **closed**, the clamp prevents any flow through the tube. When **locked**, the clamp allows a flow through the tube during a donation, but the tube cannot be removed.



2.3 Barcode reader

If barcodes should be scanned use the barcode reader connected to the Biomixer connector **USB**. The Biomixer can also be equipped with an internal barcode reader located at the front of the display (this is an option for the Biomixer).



3 Installation

⚠ This blood mixer is a precision weighing instrument. In order to maintain high accuracy BM550 should be handled with care and the scale must not be overloaded. Absolute maximum load is 1000g. I.e. the sum of weight for donated volume and tared weight should not exceed 1000g during donation. The tray should never, under any circumstances, be used for lifting or moving the blood mixer.

3.1 Unpacking

Lift the Biomixer up from the box. Be careful not to lift the Biomixer using the tray since it may destroy the balance. Make sure that the blood mixer is intact and that all parts are well set. It should be possible to wriggle the tray sideways according to its intended mixing movements.

3.2 Placement

The Biomixer is best placed on a stable and flat surface and must not be moved while a donation is in progress. It should be placed beyond the patient's reach so that only the operator can access the device. Remember to position the unit so that it is easy to plug in/out the power cable.



In stationary conditions, it is recommended to use Biomixer with BIOLIFT 410 (separate manual). BIOLIFT 410 is a mobile table, with a moving shelf (up and down) designed to fit the Biomixer.

⚠ Use of this equipment adjacent to or stacked with other equipment should be avoided because it could result in improper operation. If such use is necessary, this equipment and the other equipment should be observed to verify that they are operating normally.

⚠ Always keep distance between the Biomixer and active high-frequency equipment.

⚠ Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the Biomixer, including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result.

⚠ The emissions characteristics of this equipment make it suitable for use in industrial areas and hospitals (CISPR 11 class A). If it is used in a residential environment (for which CISPR 11 class B is normally required) this equipment might not offer adequate protection to radio-frequency communication services. The user might need to take mitigation measures, such as relocating or re-orienting the equipment.

3.3 Communication and connecting

The Biomixer can be delivered with different types of communication.

Note! Always use the Biomixer on a switched network and a firewall protected net.



⚠ Use of accessories, transducers and cables other than those specified or provided by the manufacturer of this equipment could result in increased electromagnetic emissions or decreased electromagnetic immunity of this equipment and result in improper operation.

3.3.1 Ethernet

If it is equipped with Ethernet, connect to the network using a network cable to the outlet marked **Com**.

3.3.2 RS485

If equipped with RS485, connect to the network using a RJ12 6P6C cable to the outlet marked **Com**. To do this, you need a cable kit with an adapter.



Figure 1 Cable kit and adapter for communication with RS485 between Biomixer and PC.

3.3.3 USB

It is also possible to collect the donation data on a USB memory that is connected to the outlet marked **USB**. This is the same outlet used for an external barcode reader. If you are going to use an external barcode reader and store donation data to a USB memory, you need to change the Biomixer's settings. Note that the **Setup** menu can be password protected. Contact authorized personnel if you need to access these settings.

1. From the main menu, push the menu-key  and select **Setup** in the list.
2. Choose **Donation** and set **Send data to: USB memory**. Click **Save**.
3. Go to **Send data automatic** and set it to **No**. Click **Save**.

This prevents the Biomixer from trying to send data to the barcode reader and give communication errors after each completed donation.

4. After the donation is completed (one or more), disconnect the external barcode reader from the USB port and replace it with the USB memory.
5. Push the menu key  and select **Send buffered donation data**. Now the Biomixer transfers the donation data from the Biomixer's memory to the USB memory.

3.3.4 BmCom

In order to communicate with the Biomixer from a PC, use BmCom. BmCom is a Windows software for the Biomixer. It is used to configure the procedure of barcode scanning during blood donation; it performs firmware update, and is also acting as a server, collecting donation through USB memory or LAN-bus. Download the latest version from ljungberg-kogel.com.



Connected ITE-equipment must be evaluated according to IEC 60950-1.

3.3.5 Barcode reader (internal/external)

If an external barcode reader is being used, connect the barcode reader to its connector on the Biomixer marked **USB**. Alternatively, an internal scanner can be used. It is also possible to have both internal and external barcode reader operating in parallel. Always use external barcode readers recommended by the manufacturer (article number 9-55033-00). Connection of other barcode readers may damage the reader as well as the mixer.



This device emits CDRH/IEC Class 2 laser light. Do not stare into beam.

3.3.6 Power supply

Make sure that the line voltage is the same as the charger that comes with the Biomixer and also, that the right type of plug is available. Connect the charger in a free socket and to the blood mixer's charger inlet (marked **Charger 2430**, article number 9-55027-00).

Note! The internal battery is only charged when the Biomixer is **On** and the **Charger 2430** is connected. The battery status is indicated in the upper right corner on the main menu of the display.

Start the Biomixer by setting the power switch to **On**. Biomixer runs a short set-up sequence and when it is finished the main menu is showing on the display. At the first start-up, the Biomixer needs to be calibrated, see 4.2 Calibration. The Biomixer is now ready to be used. Note that the Biomixer needs at least 20% battery without connected charger and 10% battery with connected charger to be able to start a donation.

3.3.7 Details inputs and outputs

Description of inputs and outputs for mixer unit:

Name	Type	Description	Max voltage	Max current	Max cable length
Charger2430	Input	24V DC-power	26.4V	2A	2 meters
Service	Input	USB-micro for configuration and firmware update	5V	500mA	1,5 meters
USB	Output	USB-A for barcode scanner or mass storage device	5V	500mA	1,5 meters

Display	Input	Display connection, power + communication	13V	1.5A	1,5 meters
Com	Input/output	Expansion port for RS485: twisted pair Ethernet: at least CAT 5	5V	500mA	Ethernet: 55 meters RS485: 700 meters
Sealer	Output	Future use	-	-	-

Description of inputs and outputs for display unit:

Name	Type	Description	Max voltage	Max current	Max cable length
Mixer	Input/output	Display connection, power + communication	13V	1.5A	1,5 meters

 Use of accessories, transducers and cables other than those specified or provided by the manufacturer of this equipment could result in increased electromagnetic emissions or decreased electromagnetic immunity of this equipment and result in improper operation.

4 Service and maintenance

 Only authorized service personnel, approved by the manufacturer, are allowed opening the instrument or making any repair operations.

4.1 Check of calibration

It is recommended to, on a regular basis check the weighing accuracy of the scale. A sound calibration interval is at least once per week or if the Biomixer is being moved between different type of environments with different type of temperatures. It is also recommended to calibrate the Biomixer after it has been transported.

From the main menu, push the menu-key  and select **Calibration control** in the list. The Biomixer enters a weighing state and show both weight in grams and calculated volume in ml (1ml blood weighs 1.06g). Put a reference weight (available by Ljungberg & Kögel) with 450ml (477g) on the tray. The Biomixer should now be showing 450ml +/- 1% (445-455ml). If the calibration is outside these limits, please go to section 4.2.

4.2 Calibration

If the **Calibration control** shows **Error** (the deviation is too big, roughly +/- 5ml), a new calibration must be performed before a new collection can be started. Remove the reference weight and go back to the main menu and select **Calibrate** from the list. From the main menu, push the menu-key



and select **Calibrate** in the list. Follow the instructions on the display. Always use a reference weight from Ljungberg & Kögel when calibrating.

⚠ Remember to perform the calibration at the same room temperature that the Biomixer will be used in.

4.3 Battery charging

If the Biomixer is to be used mobile (without access to charger) the battery must be charged. The battery is fully charged when the display shows 100%. The Biomixer needs at least 20% battery without connected charger and 10% battery with connected charger to be able to start a donation. When capacity drops to 20% and the charger is not connected, and an alarm is activated. A started collection can however be completed.

If the Biomixer is to be used stationary the charger is recommended to always be connected to ensure that the battery is always fully charged.

Note! The battery will only be charged when the Biomixer is turned on.

⚠ Do not charge/discharge the Biomixer in temperatures above 40°C.

4.4 Cleaning

The Biomixer is cleaned by using a mild soap solution or another solution that is nonacidic. Bleaching solutions and amine-based cleaners should not be used since this may harm the plastic, making it fragile and start to crack.

The tray should be fixed while cleaning it by holding it firmly but without using any force since this may affect the weighing accuracy. If needed, the tray can be removed by gently sliding it in the direction pointed out by the label on the tray.



4.5 Transport

Always turn the power off during transportation. The Biomixer should be transported in a transport case suitable for BM550. The transport case is available as an option and can be ordered by Ljungberg & Kögel.

⚠ Do not leave the Biomixer's battery close to fire or inside of a car where temperature may be above 60°C.

4.6 Storage

Since the Biomixer contains lithium-ion batteries, it should be stored in a cool, dry place to prevent the battery cells from corroding (see Technical specifications for more details). Also, avoid storing the batteries fully charged for an extended period as they may permanently lose some of their capacity. If the Biomixer is to be stored for an extended period, we recommend that the battery is charged up to 70% of its maximum capacity every six months.

4.7 Recycling

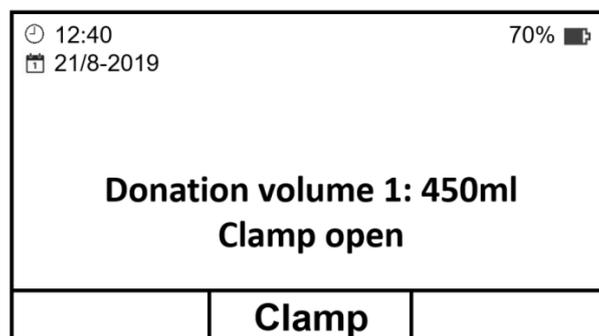
The Biomixer contains lithium-ion batteries. When recycling, the Biomixer should be labeled with "Lithium ion batteries for disposal" or "Lithium batteries for recycling". If they are damaged, make sure that they are labeled with "Damaged / defective lithium-ion batteries".

⚠ A damaged battery must be handled as dangerous goods as there is a risk of leakage. If liquid comes in contact with skin or clothing, rinse immediately with plenty of clean water.

5 Donation

The Biomixer needs at least 20% battery (without connected charger) or 10% battery (with connected charger) to be able to start a donation.

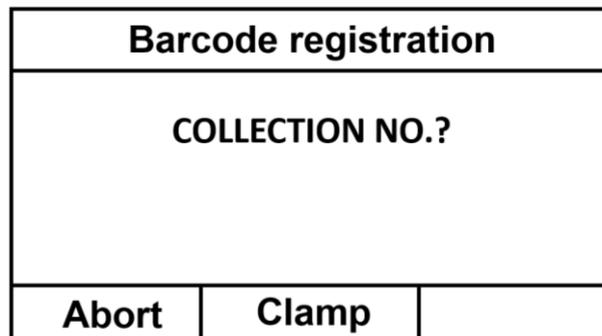
⚠ Keep in mind that if the Biomixer has been kept in a cold environment, it must be allowed to return to normal room temperature before use. It is also recommended to perform a check of calibration for the Biomixer to function properly.



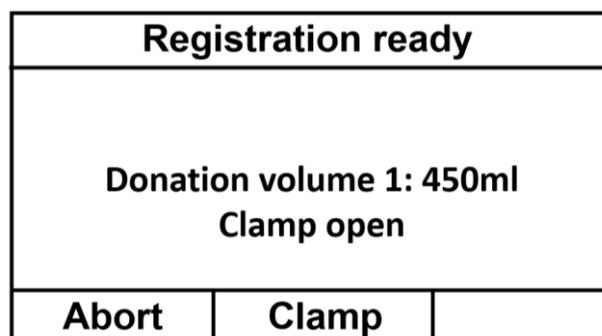
- 1 Start by checking the **Donation volume**. Change the donation volume by using the arrow-buttons on the right. See technical reference manual if new selectable volumes are needed.
- 2 The Biomixer can be configured for scanning barcodes before a donation. If the Biomixer is not configured for scanning barcodes, move on to step 3, else push **Scan**. Please refer to the User's manual for BmCom for information about how to configure the barcodes.



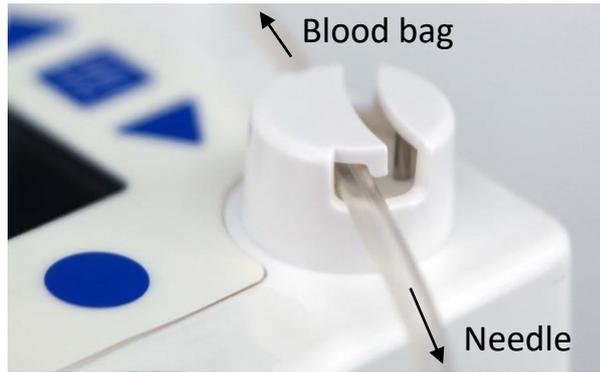
- 2.1 The preprogrammed barcode questions will now be showed on the display one by one. Scan the requested barcodes corresponding to the displayed question text. Use the internal barcode reader (optional feature) located at the front of the Biomixers display or an external barcode reader connected to the Biomixer to the USB outlet. (The text on this part is just an example and may vary depending on the Biomixers preprogrammed questions.).



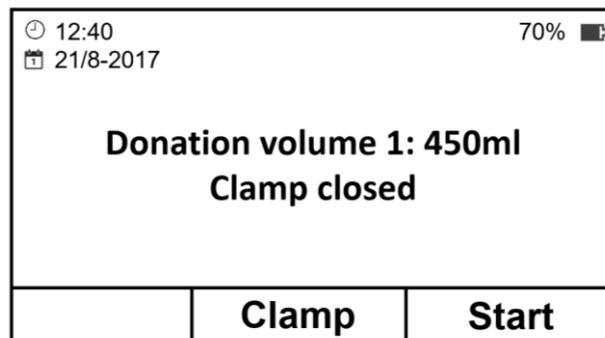
- 2.2 When you have scanned all the barcodes the following information is displayed.



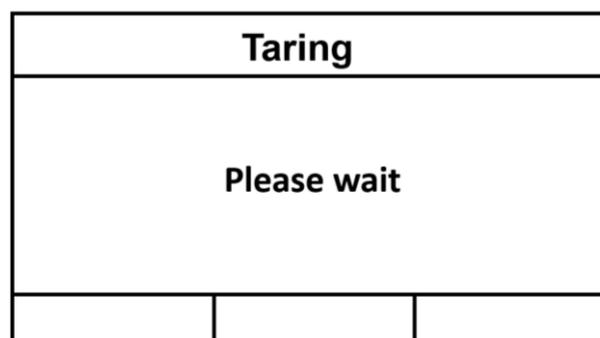
- Place a blood bag on the tray. If a set of bags is being used place the bag, collecting the blood, on top. Do not let any parts of the bags be lying outside of the tray since this may affect the weighing and, in that way, the volume of the donated blood.
- Put the tube in the clamp as shown below. Be careful not letting the tube stretch between the blood bag and the clamp. It is recommended to leave at least 25 cm of tube between the blood bag and the clamp.



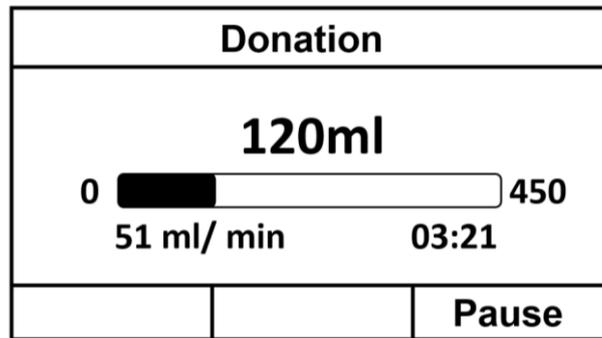
- 5 Close the clamp by pushing **Clamp**. Prepare everything for the donor. If disinfection timer is activated the Biomixer will start the countdown. To abort the donation and open the clamp, push **Clamp** again.



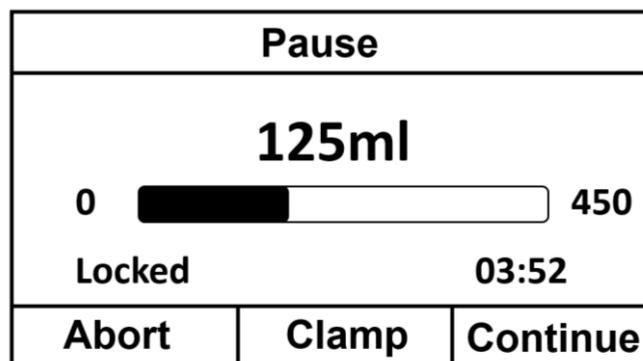
- 6 The blood mixer is now ready to be used. Push **Start** in order to start the donation. The Biomixer will now tare the weight of the blood bag, open the clamp and start the donation.



- 6.1 If the Biomixer is set to store tare weight, follow the instructions on the display.
- 7 The donation can be temporary paused by pushing **Pause**.



- 7.1 During **Pause**, you can operate the clamp or abort the collection. If enabled, you can also change volume by using the arrow-buttons on the right. To continue the donation, push **Continue**. To cancel the donation, push **Abort** and confirm by pushing **Yes**.



- 8 Two different types of alarms can be activated during a donation; time alarm and flow alarm (for more details, see chapter 7 Donation alarms). The alarms are declared by an audio signal and by blinking the corresponding value.

The audio signal can be turned off by pushing the menu-key  to the right.

- 9 When the volume is starting to reach the SET-volume the Biomixer stops moving and waits for the right volume to be reached. When the SET-volume is reached the Biomixer automatically closes the clamp, starts to move continuously and activates an audio signal. Push **Finalize** to turn off the audio signal.

Note! Do not remove the blood bag before the donation data has been sent and the main menu are visible.

Complete		
450ml		
0		450
Locked	08:13	
		Finalize

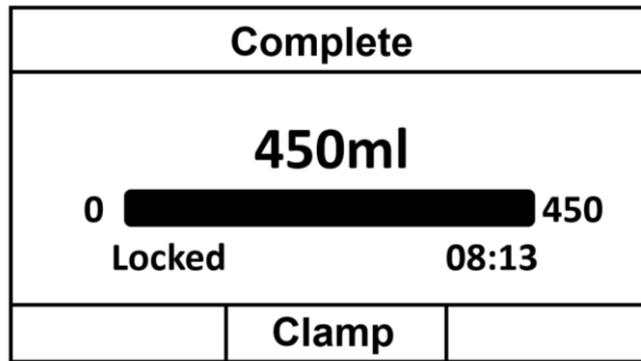
- 9.1 The Biomixer can be configured for scanning barcodes after a donation. (Please refer to the User’s manual for BmCom). The preprogrammed barcode questions will then be showed on the display one by one. Scan the requested barcodes corresponding to the displayed question text. You can use either the internal (optional feature) or external barcode reader connected to the Biomixer’s outlet marked **USB**. (The text on this part is just an example and may vary depending on the Biomixers preprogrammed questions.)

Barcode registration		
51 ml/min	450 ml	03:21
Collection no.?		
Abort		

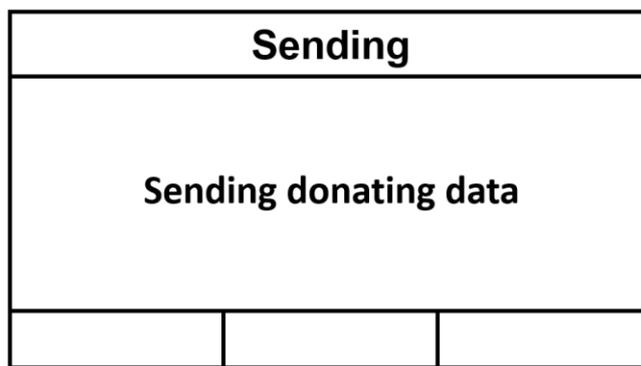
- 9.2 When you have scanned all the barcodes the display goes back to show a status bar.

Complete		
450ml		
0		450
Locked	08:13	
	Clamp	

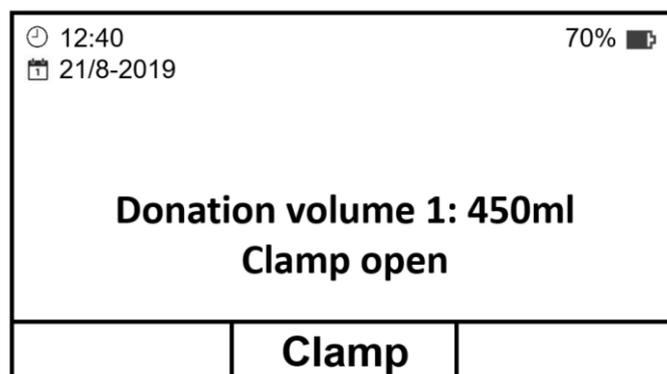
- 10 Push **Clamp** which will open the clamp and end the donation. If you wait longer than 2 minutes to push **Clamp**, the Biomixer will automatically open the clamp, perform a mixing cycle and close the clamp. This is to prevent blood from coagulating in the tube.



10.1 If the Biomixer is preset to send the donation data after the donation, it will start to send it to selected unit.



11 The donation is now complete, and the main menu will be displayed. You may now remove the blood bag from the tray.



6 Function menus

When pushing the menu-key  from the main menu, a selection of functions and settings are available.

6.1 Send buffered donation data

Here you can find the function **Send all donation data**. This function will send all collection data that has been stored in the memory. Note that, only the data in the memory that has not already been sent, will be sent.

6.2 Weighing

The Biomixer operates like a scale when entering this menu, showing the weight placed on tray adjusted for the specific gravity of blood (1ml blood equals 1.06g).

6.3 Calibration control

It is recommended to, on a regular basis check the weighing accuracy of the scale. A sound calibration interval is at least once per week or if the Biomixer is being transported between different type of environments with different type of temperatures.

Select **Calibration control** in the list. The Biomixer enters a weighing state and show both weight in grams and calculated volume in ml (1ml blood weighs 1.06g). Put a reference weight (available by Ljungberg & Kögel) with 450ml (477g) on the tray. The Biomixer should now be showing 450ml +/- 1% (445-455ml). If the calibration is outside these limits, please go to chapter 6.4.

6.4 Calibrate

If the deviation is too big during the calibration control (roughly +/- 5ml) the calibration must be changed. Remove the reference weight and go back to the main menu and select **Calibrate** from the list. Follow the instructions on the display. Always use a reference weight from Ljungberg & Kögel when calibrating.



The reference weight must be 450 ml i.e. 477g. (450mlx1.06g/ml). Reference weights can be ordered from Ljungberg & Kögel AB.

6.5 Setup

This menu can be password protected. Contact authorized personnel if you need to access the settings.

Settings of alarm limits and other functions are done in the **Setup**-menu. The setup-menu is divided into six submenus: **General**, **Donation**, **Donation alarms**, **Donation volumes**, **Advanced** and **Information**. Navigate by using the arrow-buttons to the right and enter a menu by pushing **Select** or the menu-key. The menu-key can always be used as a **Select**-button when you are operating in the setup-menu.

For more information about the settings, see the Technical reference manual.

7 Donation alarms

Three donation alarms can be activated by the Biomixer.

Active alarms will be both audible and visual.

7.1 Flow alarm

Is activated if the blood flow during a donation goes over or under the limits that are preset for the alarm. Both **Flow alarm – Low flow** and **Flow alarm – High flow** can be set in the range 0-500 ml/min.

The alarm is restored automatically when the flow goes back within the preset limits. The audio signal can be turned off by pushing the menu-key  to the right. Please note that if the flow goes back to normal values and then again goes outside of the preset limits the alarm is activated again.

There are two adjustable alarms for the flow. **Flow alarm – Low flow** is activated if the flow rate in ml/min is less than the low flow alarm limit. **Flow alarm – High flow** is activated if the flow rate in ml/min is higher than the high flow alarm limit. Parameter setting **Min volume flow alarm** is used together with the **Flow alarm – Low flow** and **Flow alarm – High flow**. **Flow alarm – Low flow** and **Flow alarm – High flow** are disabled as long as the total volume is below parameter setting **Min volume flow alarm**. This is the donation volume the Biomixer must exceed before **Flow alarm – Low flow** and **Flow alarm – High flow** begin to be monitored.

7.2 Time alarm

Is activated if a donation takes longer than the preselected time limit. Valid limits for this alarm is 0-99 min. The user should adjust the time of blood collection depending on state regulation, norms etc.

The audio signal can be turned off by pushing the menu-key  to the right. If silenced, it will sound again when the time limit is reached once again.

8 Errors and events

Errors and events are shown with a text message on the display and a sound signal. The sound signal is silenced with a press on the menu-key .

8.1 Communication error

There was a communication error when sending data to destination (PC or USB). The data will however still be stored in the internal memory of the mixer. Once the connection is reestablished, the data can be sent.

If you get this error when using a USB memory, check the following:

- Valid USB memory is correctly inserted.
- USB memory is not full.
- USB memory is formatted to FAT32.

If the communication error remains, contact service personnel.

If you get this error when using Ethernet, check the following:

- Ethernet cable is correctly inserted.

- Ethernet settings for the Biomixer are correct and that the same port number is used in BmCom (**IP-server port number** under **Preferences** and **Data collection**).
- Check that path to **Save received data to directory** is correctly entered in BmCom (Under **Settings** and **Data collection**)

If the communication error remains, contact service personnel.

If you get this error when using RS485, check the following:

- RS485 cable is correctly inserted.
- Correct type of cable is used and that the RS485 network is set up correct.
- COM port configuration on the receiving PC is correct.
- Check that path to **Save received data to directory** is correctly entered in BmCom (Under **Settings** and **Data collection**)

If the communication error remains, contact service personnel.

8.2 Motor error

The motor controlling the mixing is either blocked or broken. Check that the tray can move freely and that no components regarding the tray and motor wheel is damaged.

8.3 Tare error

Automatic tare deduction is always done before collection. If this fails an error message is given with an error message and sound. Collection cannot proceed. Check that the tray is in its weighing position and moves freely. Also make sure that a tare calibration has been performed.

8.4 Calibration error

If a calibration has not been made a calibration error is active. If active, a calibration is needed.

8.5 Clock error

The clock error is active when there is an internal communication error in the Biomixer. If you get this error repeatedly, contact service personnel.

8.6 Battery error – Mixer unit



An error has occurred in the Biomixer's mixer battery. This means that the Biomixer will no longer be charged, and the battery will be drained if the power supply is not connected. If activated, contact service personnel.

8.7 Battery low

Is activated if the battery level is lower than 20%. With a battery level below 20%, a new donation can only be started if **Charger 2430** is connected.

8.8 Battery empty

Is activated if the battery level is less than 10 %.

Note! The battery level must be over 10% to be able to start a donation (even with the **Charger 2430** connected).

8.9 Over- or underweight

It may happen that the tray by accident is overloaded with too much weight. If this happens the display will show the text **>999**, which means the volume is more than 999ml.

It may also happen that the tray is loaded with too little weight; for example, if a set of blood bags are removed before the donation is finished. If this happens the display will show a negative volume down to **-99ml**.

If **>999** or **-99ml** is showing on the display when the tray is empty it may be due to the exposure of a heavy weight and the calibration must be checked.

9 Technical specifications

9.1 Technical data

Parameter	Value	Note
Power supply	AC Adapter Charger 2430 , also works as a battery charger and is a part of ME System. Voltage 100-240VAC \pm 10%, Output voltage 24V / 30W Internal battery, Li-Ion, 10.8V/2.6Ah up to 20h battery life during normal use. May only be replaced with the same article (9-55028-00).	
Mains isolation	Isolation from mains through appliance coupler C8 or mains plug.	
Oversvoltage category	II for AC/DC adaptor	
Power consumption	Max 30VA	
Fuses (built in)	PTC (self-recovery for overload protection)	
Collected volume	(Collected blood) 0-999ml	
Accuracy	<1% of max weight \pm 1ml	
Tare range	0-600g	
Mixing cycle	Selectable between 10-20 cycles/min (based on continuous mixing cycles)	
Internal data storage for donations	More than 32.000 characters or a minimum of 80 collections	
External data storage for donations	USB mass storage device. USB Type A. FAT32 Filesystem	USB-memory not included
Tube clamp operation	Tube sensing	
Mixing tray operation	BLDC-motor	
Internal barcode reader	Laser class 2, certified for IEC 60825-1	Optional
PC connection	USB Micro-B for programming	
Network connection	RS485, 6/4 modular or Ethernet	Optional
Barcode reader connection	Internal (laser) or external USB Type A	Optional

Relative humidity incl. storage and transportation	10-95% not condensing	
Operating temperature	+10 - +40°C	
Storage and transportation temperature	-20 - +45°C	
Dimensions	Mixer unit: 320 (L) x 180 (W) x 150 (H) mm Display unit: 145 (L) x 110 (W) + 45 (H) mm	
Weight	2kg	
Mode of operation (according to IEC 60601-1)	Continuous operation	
Ingress protection (according to IEC 60529)	IP20	
Protection against electric shock (according to IEC 60601-1)	Class II	
Isolation (according to IEC 60601-1)	Input-output: 2 MOPP	
Applied parts (according to IEC 60601-1)	None	

Emissions test	Test level
RF emissions CISPR 11	Group 1, Class A 0.15-1GHz 30-230MHz 40dB μ V/m 230-1000MHz 47dB μ V/m.
Conducted emissions CISPR 11	Group 1, Class A Quasi/Average [dB μ V]: 0.15 – 0.50: 79/66 0.5 – 5: 73/60 5-30MHz: 73/60
Harmonic emissions IEC 61000-3-2	Class A
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Class A

Immunity test	Test level
Electrostatic discharge (ESD) SS-EN 61000-4-2 v2 2009-05-25	\pm 8 kV contact \pm 15 kV air
Radiated RF-electromagnetic fields IEC 61000-4-3	3V/m 80MHz – 2.7GHz

V3.2 2010-04	
Proximity fields from RF wireless communications equipment IEC 61000-4-3	380-390MHz 27V/m 430-470 28V/m 704-787 9V/m 800-960 28V/m 1700-1990 28V/m 2400-2570 28V/m 5100-5800 9V/m
Electrical fast transient/burst IEC 61000-4-4 V2.1 2011-03	± 2 kV for input/output Lines, A.C-port
Surge IEC 61000-4-5 V3.0 2014-01	± 2 kV line(s) to earth (for signal input/output, A.C-port)
Conducted RF-fields IEC 61000-4-6 V4.0 2013-10	3V 0.15-80MHz 6V in ISM-bands 80% AM at 1kHz
Voltage dips, short interruptions and voltage variations on power supply input lines SS-EN 61000-4-11 A1	Input AC-port <5 % UT (>95 % dip in UT) for 0,5 cycle 40 % UT (60 % dip in UT) for 5 cycles 70 % UT (30 % dip in UT) for 25 cycles <5 % UT (>95 % dip in UT) for 5 s
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8 V1 2016-04-27	3 A/m
EN 61000-3- 2: 2014 Harmonic	Class A
EN 61000-3-3:2013 Voltage Fluctuations and Flicker	Class A