

# Manual

**BioMixer BM330-1**

**BioMixer BM323-1**

Valid for BioMixer BM330-1 version 6.x

Valid for BioMixer BM323-1 version 7.x

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# 1 Introduction

This manual is valid for both BM330-1 and BM323-1. BM330-1 and BM323-1 is hereinafter called BioMixer if not otherwise noted.

## 1.1 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.

** It is important that the service personnel has been trained and approved by the manufacturer before opening the instrument or making any repair operation, 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 manufacturers 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 technical reference manual.

## 1.2 Target group

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

## 1.3 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](mailto:info@abelko.se)

## 1.4 Contact details

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## 1.5 Version

Version 1	2012-08-01:	First edition of this manual
Version 2	2012-08-02:	Some minor spelling corrections
Version 3	2012-08-22:	More detailed alarm and measure descriptions. Added cleaning chapter 2.5.
Version 4	2012-11-13:	Added Abelko Innovation commitment concerning technical feedback
	2012-11-22:	References to technical reference manual instead of operators and service manual.
Version 5	2013-03-14:	Reference weight shall be 477g, not 447g.
Version 6	2013-11-18:	DoC introduced
Version 7	2014-04-17:	BM323-1 introduced. Note about Biolift 410 and transport case added. Some minor spell corrections.
Version 8	2014-09-02:	Warranty added
Version 9	2015-02-03:	Added note about barcode readers. Technical data added
Version 10	2016-08-23:	Ten SET-volumes
Version 11	2017-11-06:	Page 1: Revision added Page 4, 13: Updated addresses and telephone numbers
Version 12	2018-09-11:	Page 12: Changed tare range

## 2 Installation

**⚠ The BioMixer is a precision weighing instrument for blood. The BioMixer has to be handled with care and the scale should not be exposed to weights over 2000g. The tray should never, under any circumstances, be used for lifting or moving the blood mixer.**

### 2.1 Unpacking

Lift the BioMixer up from the box. The two grey posts on the blood mixers back can be used for lifting. Make sure that the blood mixer is intact and that all parts are well set. It should be possible to wriggle the tray sideways when the blood mixer is observed from the front.

### 2.2 Placement

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.

### 2.3 Connecting

If a BioMixer should be used in a network, connect a network cable to its connector on the BioMixer. Only applies to BM330-1.

If barcodes should be scanned, connect a barcode reader to its port on the BioMixer. Always use barcode readers recommended by the manufacturer. Connection of other barcode readers may damage the reader as well as the mixer. It is possible to use barcode readers of other manufacturers, but it must be confirmed by the manufacturer. This only applies to BM330-1.

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 BM330-1).

If the battery should be used, insert it to the left of the blood mixer and turn the knob located on the blood mixer to secure the battery. The battery is charged as soon as the battery and the charger are connected to the blood mixer. The battery can be left inside when it is fully charged without taking damage. The battery can be charged in a separate charger as well. When the battery is charging the status is always MED and when the battery is fully charged the status turns to HI on the display.

The BioMixer turns on as soon as it is connected either to the charger or to the battery. BioMixer runs a short set-up sequence and when it is finished the main menu is showing on the display.

BM330-1

```
1/8 12:40 BATT=HI
SET=450,CLAMP OPEN
```

BM323-1

```
BATT=HI
SET=450,CLAMP OPEN
```

The BioMixer is now ready to be used.

The BioMixer goes to a resting state when it is not being used for a while (see the Technical reference manual for more information on how to change the settings for the resting state). Press any key to switch it on again from its resting state.

## 2.4 Keyboard

The BioMixer has a set of keys for controlling its functions. The same key can be used for different tasks. Listed below are the most common functions (for more information, see the Technical reference manual).

Key	Function
START	Starts a new blood collection <b>without</b> scanning any barcodes.
NEW	Starts a blood collection where barcodes <b>should</b> be scanned. <b>This key is only available on BM330-1.</b>
PASUE	Used for temporary pausing a blood collection and also for calibration.
CLAMP	Opens and closes the tube clamp. If the clamp is open it will close and vice versa.
SET	Changes the preset SET-volume (target volume). The BioMixer has two preset volumes (from version 6.22 it has ten volumes). The SET-volumes are changed in the SETUP-menu (see the Technical reference manual for more information). In BM323-1: pressing this key together with the PAUSE key sets the mixer in parking position.
SEND	Sends saved donation data to a PC (if the BM330-1 is connected to network, wireless or by wire). <b>This key is only available on BM330-1.</b>
RESET	Cancels a donation if the BM330-1 is in a PAUSE-mode. Cancels an ongoing barcode sequence. Goes to parking position if the blood mixer is in the main menu. <b>This key is only available on BM330-1.</b>
SETUP	Used for changing the setup in the BM330-1 (see the Technical reference manual for more information). <b>This key is only available on BM330-1.</b>
+ and -	Used in the SETUP-menu for changing values. In BM323-1, the “-“-key is used to stop a collection

## 2.5 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 blood mixer is being transported between different type of environments with different type of temperatures.

To check the calibration, push the PAUSE-key. The BioMixer enters a weighing state and show both weight and expected volume (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 deviation is too big (roughly +- 5ml) the calibration can be changed by going back to the main menu (push the RESET-key). Push and hold the PAUSE-key for 3 seconds for entering the calibration

mode (use a reference weight from Ljungberg & Kögel when doing this). Follow the instructions on the display.

## **2.6 Cleaning**

The blood mixer is cleaned by using a mild soap solution or another solution that is non acidic. Bleaching solutions should not be used since this may harm the plastic, making it tender 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.

## **2.7 Transport**

Before transporting the BioMixer, it should be set in parking mode. In the main menu, press the RESET key on the BM330-1 and SET and PAUSE simultaneously on BM323-1. The BioMixer should be transported in a transport case suitable for BM330-1/BM323-1 (available by Ljungberg & Kögel).

### 3 Donation

A donation can be initialized in two ways; either by the START-key or by the NEW-key. The difference is that the NEW-key requires the user to scan barcodes. Note that the NEW-key is not present in BM323-1.

#### 3.1 Donation without barcodes

If the BioMixer is in the resting state, push any key to exit the resting state. The main menu will be showing on the display.

BM330-1

```
1/8 12:40 BATT=HI
SET=450,CLAMP OPEN
```

BM323-1

```
BATT=HI
SET=450,CLAMP OPEN
```

1. 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.
2. Put the tube in the clamp. Be careful not letting the tube stretch between the blood bag and the clamp. It is recommended to leave at least 25cm (10 inches) between the blood bag and the clamp. Close the clamp by pushing the CLAMP-key.

BM30-1

```
1/8 12:40 BATT=HI
SET=450,CLAMP CLOSED
```

BM323-1

```
BATT=HI
SET=450,CLAMP CLOSED
```

3. Choose the right SET-volume by pushing the SET-key.

BM330-1

```
1/8 12:40 BATT=HI
SET=450,CLAMP CLOSED
```

BM323-1

```
BATT=HI
SET=450,CLAMP CLOSED
```

4. The blood mixer is now ready to be used. Push the START-key to start the donation. The BioMixer will now tare the weight of the blood bag, open the clamp and start the donation.

```
VOL SET FLOW TIME
123 (450) 56 03:22
```

5. The donation can be temporary paused by pushing the PAUSE-key.

```
VOL=123 FL=0 03:22
PAUSE,CLAMP OPEN
```



To continue the donation, push the PAUSE-key again.

To cancel the donation, push the RESET-key and confirm by pushing the RESET-key again.

6. Two different types of alarms can be activated during a donation; time alarm and flow alarm. The alarms are declared by an audio signal and with a blinking text on the display. The audio signal can be turned off by pushing the PAUSE AL. OFF-key.

Time alarm: The donation takes longer than the preselected time limit (see the Operator's manual on how to change the settings of the alarm). The alarm will be active during the rest of the donation.

Flow alarm: The blood flow is higher or lower than the preset flow limits. The alarm is deactivated as soon as the flow is within reasonable limits.

7. 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 the PAUSE AL. OFF-key to turn off the alarm.

VOL=450 FL=0 08:13 <b>READY</b> , CLAMP CLOSED
---

8. To end the donation, push the CLAMP-key which will open the clamp.
9. On BM330-1, the BioMixer is now ready to send the stored information to a PC (if the BioMixer is connected to a network).

COLLECTION COMPLETED PRESS SEND
------------------------------------

This menu can vary depending on the settings in the SETUP-menu (see the Operator's manual for more information about different sending options for the data). Push the SEND-key to transfer the data to a PC or push the RESET-key to go back to the main menu.

### 3.2 Donation with barcodes (only available on BM330-1)

The BM330-1 can be configured for scanning barcodes before and/or after a donation. The information that is being scanned can be sent to a PC for further processing.

1. If the BM330-1 is in the resting state, push any key to exit the resting state. The main menu will show on the display.

```
1/8 12:40 BATT=HI  
SET=450,CLAMP OPEN
```

2. Push the NEW-key to start a donation. The BM330-1 will now show the text for the first barcode that should be scanned (see the Technical reference manual and also the manual for the PC-program BCom for more information on how to configure barcodes). In the example used in this manual the first barcode is an operator's ID.

```
OPERATOR ID?
```

3. When the barcode is scanned it appears shortly on the display before the BM330-1 goes on to the next barcode. In this example the user has the signature **ABCD**.

```
OPERATOR ID?  
ABCD
```

4. When all the barcodes have been scanned the following text is appearing.

```
REGISTRATION READY!  
SET=450,CLAMP OPEN
```

5. The donation starts by pushing the START-key and is preceded in the same way as a donation without barcodes (see 3.1 for details).
6. When the donation is done, the text for the first barcode that should be scanned after the donation is being showed. In this example it is the results from the donation that should be scanned.

```
Result?  
OK
```

7. The BM330-1 continues until all barcodes are scanned.

## **4 Alarm**

A couple of alarms can be activated by the BioMixer and the most common ones are listed here. For more information about the different alarms, see the Technical reference manual. Active alarms will be both audible and visual. The audible alarm can be adjusted between 0-70dB.

### **4.1 Battery alarm**

Is activated if the battery voltage is too low for being able to use the BioMixer in a safe way.

Change the battery or connect the charger. New batteries are available by Ljungberg & Kögel.

### **4.2 Flow alarm**

Is activated if the blood flow during a donation goes over or under the limits that are preset for the alarm (see the Technical reference manual for more details on how to change the limits for the alarm). Both high and low flow alarms 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 alarm can be turned off by pushing the PAUSE AL: OFF-key. 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.

### **4.3 Time alarm**

Is activated if a donation takes longer than the preselected time limit (see the Technical reference manual for more details on how to change the settings for the alarm). 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 alarm can be turned off by pushing the PAUSE AL. OFF-key.

### **4.4 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 VOL=EEE.

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 the text VOL=--.

If EEE or --- is showing on the display when the tray is empty it may be due to the exposure of a heavy weight and the calibration has to be checked (for more information, see the Technical reference manual).

## 5 Technical specifications

### 5.1 Technical data

Parameter	Value	Note
<b>Power supply</b>	Mains adaptor, 100-240VAC, BM330-1, 24V/30W (also operates as a battery charger) Internal battery, NiMH, 12V/4Ah for approximately 12 hours operation between charges	
<b>Power consumption</b>	Max 10VA	
<b>Fuses (built in)</b>	PTC (self-recovery for overload protection)	
<b>Collected volume</b>	(Collected blood) 0-999ml	
<b>Accuracy</b>	<1% of max weight $\pm$ 1ml	
<b>Tare range</b>	0-600g (0-800g on request)	
<b>Mixing cycle</b>	Constant at 15 cycles/min (one every 4 second)	
<b>Internal data storage for donations (not SD-card)</b>	32.000 characters or a minimum of 80 collections	BM330-1 only
<b>Tube clamp operation</b>	Linear stepper motor	
<b>Mixing tray operation</b>	AC-driven synchronous motor	
<b>PC connection</b>	RS232 for programming, 9-pole Dsub male or USB type B-connector (serial link)	RS232 for BM330-1 only
<b>Network connection</b>	RS485 (multidrop), 6/4 modular	BM330-1 only
<b>Wireless connection</b>	XBee	BM330-1 only
<b>Barcode reader connection</b>	R232, 9-pole Dsub male (+5V on pin 9)	BM330-1 only
<b>Relative humidity incl. storage and transportation</b>	10-95% not condensing	
<b>Operating temperature</b>	+10 - +40°C.	
<b>Storage and transportation temperature</b>	-40 - +70°C.	
<b>Dimensions</b>	290 (L) x 253 (W) x 185 (H) mm.	
<b>Weight</b>	3.7kg (4.4kg incl. battery)	
<b>Protective classification</b>	Class II, type B 	

**Declaration of Conformity**  
according to the  
**Medical Devices Directive, 93/42/EEC**  
and  
**RoHS directive, 2011/65/EU**

STANDARDS TO WHICH CONFORMITY IS DECLARED:

**EN 60 601-1:2005**

**EN 50581:2012**

**EN 60 601-1-2**

**Including: EN 61000-3-2, EN 61000-3-3, EN 55011 KI B, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4,  
EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11**

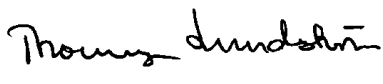
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*Type of Equipment:* Blood mixer  
*Model:* BM330-1 and BM323-1  
*Product class:* Class 1

I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive and Standards.

*Date of issue:* 06 Nov 2017

*Signature:* 

*/ Thommy Lundström*

*Position/title:* CEO

