

## BioShake Series

Shaker and thermal mixer



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Analytik Jena

This documentation describes the state of this product at the time of publishing. It  
need not necessarily agree with future versions of the product.  
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# 1 Introduction

## 1.1 Field of application

The BioShake Series is special designed for precise control of speed and temperature in an apparatus with a footprint not bigger than 2 microplates side-by-side.

The apparatus offer an ultra-efficient, 3-dimensional shaking axis to mix samples in tubes, glass vials or microplates (up to 1536 wells) without the need of spinning down the samples after mixing. Even high density plates or low samples volumes are not a problem for the Shaker.

BioShake mixers have an orbit diameter of 2.0 mm and a high maximum shaking frequency of 3,000 rpm, allowing any model to easily mix standard and low volume samples in tubes, glass vials and 96-well, 384-well or 1536-well microplates.

The apparatus are working very quiet due to a special patent pending dampening system which relies upon ingenious counter-weight symmetry. They shake tubes to mix their content but do not put vibrations on the entire work bench or robotic deck.

Reduced mass sample blocks provide for quick heating and accurate temperature control across the whole block.

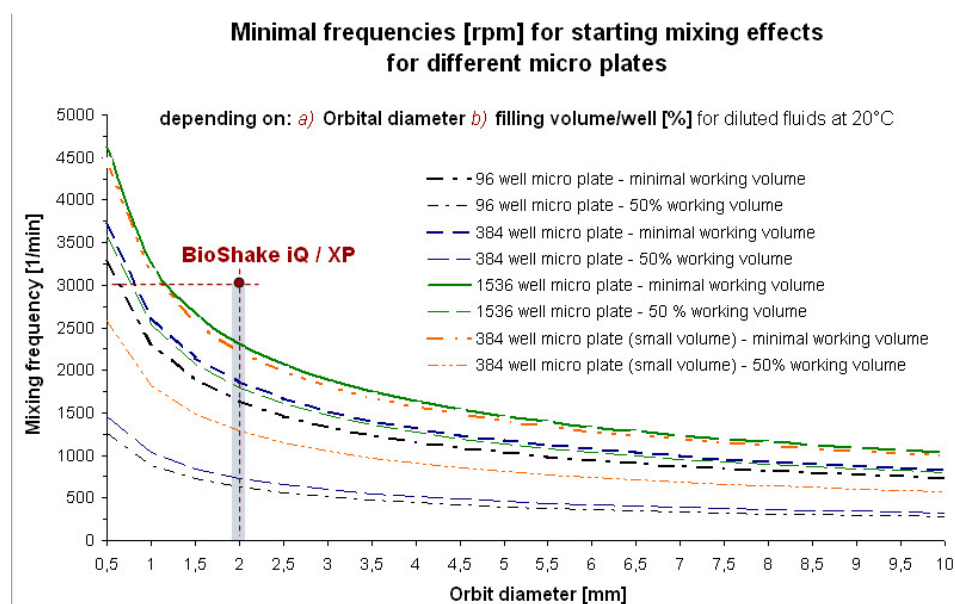


Fig. 1-1 Correlation between mixing frequencies and mixing effects in dependence on the filling level

## 1.2 Information on the use of this manual

The following warning and information symbols are used in this manual:



**Danger! Dangerous touch voltage!**



**Caution!**

Warning messages alert you to a specific procedure or practice which, if not followed correctly, could cause personal injury.



**Caution! Hot surface!**

Contact with the surface can cause burns.



**Attention!**

Caution messages refer you to procedures which, if not observed, could result in damage to the equipment.



**Disconnect mains plug!**



**Note**

This information must be observed to ensure correct function of the device.

The following systematic approach is introduced in the manual:

- The chapters and figures are numbered consecutively.
- Each image has its own caption.
- A cross reference is indicated with an arrow (e.g. → Information on the use of this manual pg. 4).
- Working steps are numbered.

## 2 Safety instructions

Read through this chapter carefully prior to commissioning the BioShake Series for your own safety and for trouble-free operation.

Follow all the safety instructions explained in the manual, as well as all messages and information displayed on the screen by the internal microcomputer.

### 2.1 Warning and safety symbols on the BioShake

The following warning and safety symbols are affixed on the BioShake:



#### **Caution! Hot surface!**

Contact with the surface can cause burns!

This symbol is affixed on the basis unit next to the heating surface of the block (only BioShake iQ).



#### **Disconnect mains plug!**

This symbol is affixed on the rear of the device next to the mains input.

### 2.2 Safety and caution information



1. Do not operate the device in rooms where work is being carried out with explosive substances.
2. Do not use this device to process any explosive, radioactive or highly reactive substances.
3. Do not use this device to process any substances, which could create an explosive atmosphere.
4. **Danger!** Electric shock from damage to device/power cable. **Danger!** Lethal voltages inside the device.
5. **Warning!** General hazard point.
6. **Warning!** Injury from rapidly rotating holder. Injury from rapidly rotating imbalance compensation. Injury from flying tubes and plates.
7. **Warning!** Injury from sample material being flung out. Injury from incorrect vortexing.
8. **Warning!** Damage due to incorrect power supply.

## Safety instructions

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9. **Caution!** Damage to the display from mechanical pressure. Severe vibration.
10. **Caution!** Damage to electronic components caused by spilled liquids. Damage to electronic components from condensation.
11. **Caution!** Poor safety due to missing operating manual. Caution when using aggressive chemicals.
12. Please start even with minimal mixing frequencies to avoid overloading.
13. Only mix in sealed tubes and plates. Sample material can be flung out of open, inadequately sealed or unstable tubes and plates.
14. When working with hazardous, toxic and pathogenic samples, always comply with the nationally specified safety environment.
15. Please use the original power supply delivered by Analytik Jena | Biometra.
16. Please use the original accessories recommended by Analytik Jena | Biometra.

Pay particular attention to personal safety gear (gloves, clothing, glasses etc.), the extraction hood and the safety class of the laboratory.



Read this section carefully and follow the instructions before beginning installation and any procedure.

The unit must be placed on a horizontal solid work space.

The device must be saving from shocks and falling.

The unit must be placed in sufficient distance to heat registers or radiators to ensure ambient temperature conditions in accordance with the technical specifications (section 8.2).



Use the normal care and precaution one would use with any electrical appliance.

Be sure to use a power cord with the same rating and of the same type (three-wire with neutral conductor) as the one supplied with the instrument.

Ensure that voltage and frequency of your power source match the input voltage and frequency inscribed on the electrical rating label of the power supply (AC/DC adaptor) and that the output voltage matches the rating of the equipment. The AC/DC adaptor is designed to work with a single-phase power system having a grounded neutral conductor.

If you are not sure what type of power is supplied to your building contact your facilities manager.

As BioShake is an electrical device do not spill large quantities of liquid onto the device. Do not use it in an explosive atmosphere.

As parts of the device may generate electric, magnetic or electromagnetic fields, keep parts away that may be affected (e.g. data storage units).





BioShake is capable of heating the plate surface up to 100 °C. This temperature is high enough to cause serious burns if touched. Use extreme caution at all times. Never leave your unit accessible to others when it is hot. Never touch the plate surface unless you are sure it is cold. Use oven gloves if necessary.



Do not unscrew any part of BioShake except for the interchangeable power supply, the power cord and different blocks. Do not make any mechanical or electrical modifications to the equipment.

Never do anything else with BioShake as intended in this manual.

Noncompliance of the safety instructions may lead to device damage, loss of warranty and may cause serious personal injury as well as death.

## 2.3 General information



**Warning!** Injury from sample material being flung out.

Sample material can be flung out of open, inadequately sealed or unstable wells, plates and tubes.

- Only mix in sealed tubes and plates
- When working with hazardous, toxic and pathogenic samples, always comply with nationally specified safety environment. Pay particular attention to personal safety gear (gloves, clothing, glasses etc.), the extraction hood and the safety class of the laboratory.

When setting mixing frequency, adhere to the rules outlined in Fig. 6-4 to 6-7.

### 3 Delivery parts

#### 3.1 BioShake iQ

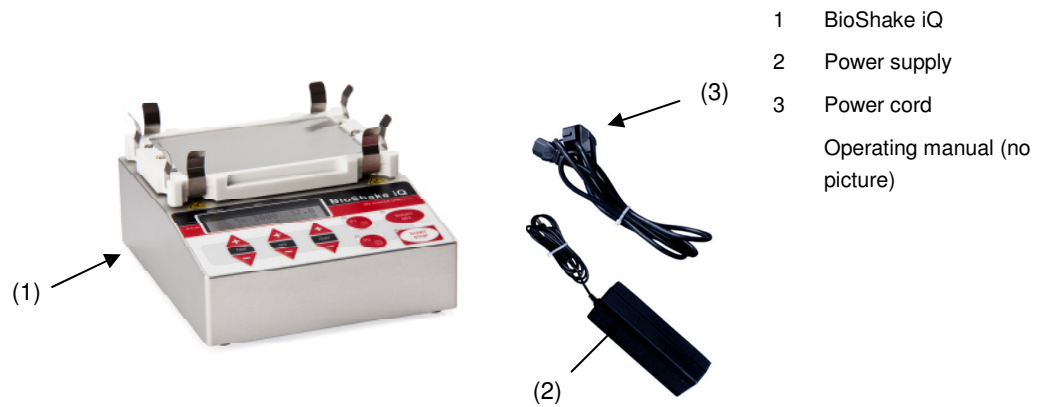


Fig. 3-1 BioShake iQ (1) with power supply (2) and power cord (3)

#### 3.2 BioShake XP

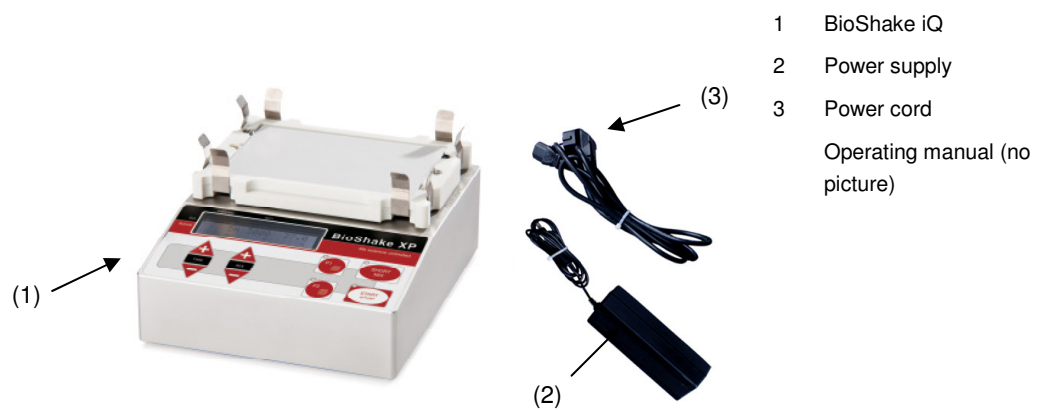


Fig. 3-2 BioShake XP (1) with power supply (2) and power cord (3)

## 4 Installation

Unpack and carefully check the instrument. Report any damage or missing items to your local distributor.

If no damage is found place the device up on a stable horizontal surface.

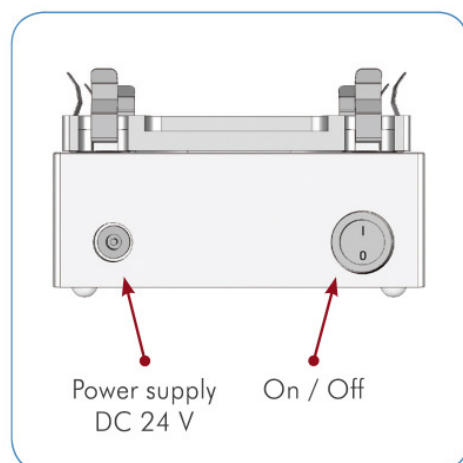


Fig. 4-1 Connections at the rear side of device (BioShake iQ and BioShake XP)

Before starting to work with the BioShake:

**Remove the cover plate before installing an adapter plate:**

Loose the 3 torx screws with the torx screwdriver at the adapter packaging and remove the cover plate.)

If the adapter will not be removed before installing an adapter, the adapter will not be recognized by the device!

Place an adapter on the shaker (chapter 5: Changing of adapter plates).

Plug the external power supply (2) into the 24 V socket at the rear side of the BioShake iQ or BioShake XP.

Plug the power cable (3) into the power supply (2) and into the wall socket.

Turn On the instrument.

It is advisable to carry out a test run at maximum speed to ensure that the device does not move while mixing.

### 5 Changing of adapter plates

To change the adapter plates, please follow the subsequent steps:



**Attention!**

If the security cover plate or an adapter plate already be mounted, please remove it first!

---

1. Turn off the instrument!
2. Remove all sample carriers B-3 (tubes, vials, microplates etc.).
3. Loosen the 3 torx screws A-1, A-2 and A-3 by using the supplied screwdriver (*Torx size 8, rotate left*).
4. Take off the cover plate or adapter plate B-2 straight up and put it on a clean, soft surface.

**Mounting of the new adapter plate:**

1. Please take care to a clean, dirt-free and particle-free operation.
2. Insert the new adapter plate straight into the impression of the plate holder B-1.
3. Check the fixed position.
4. Fix all torx screws A-1, A-2 und A-3 using clockwise rotation. Please take care to uniform controlled tightening of screws to ensure a good fit.
5. Please take care to good and tight fit of sample carriers B-3 (tubes, vials, microplates etc.).
6. Turn on the instrument! BioShake will recognize the different block types. All pending information and indications are shown in the display.

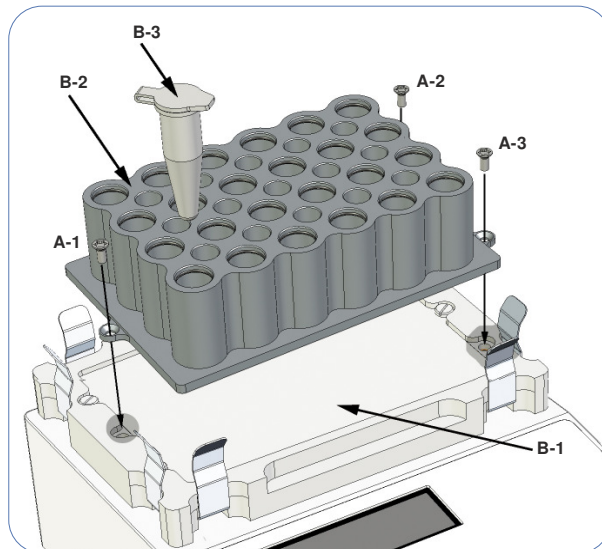


Fig. 5-1 Mounting of adapter plates



**Attention!**

Heavier blocks may limit the shaking speed (see Fig. 6-6 Recommended maximum mixing speeds)

---

## 6 Operation

The BioShake is designed for shaking (BioShake iQ and BioShake XP) and temperature control (BioShake iQ) of liquids in tissue culture plates, microplates, tubes and glass vials. Microplates or tubes have to be placed on the shaker platform of the BioShake. The liquid to be shaken is introduced into the wells or tubes.

The automatic start up function of the unit ensures a gradual start of the shaking process without sample splashing.

The drive is absolutely wear-free and maintenance-free.

### 6.1 Control panel of BioShake XP

The following picture shows the control panel of the BioShake XP.

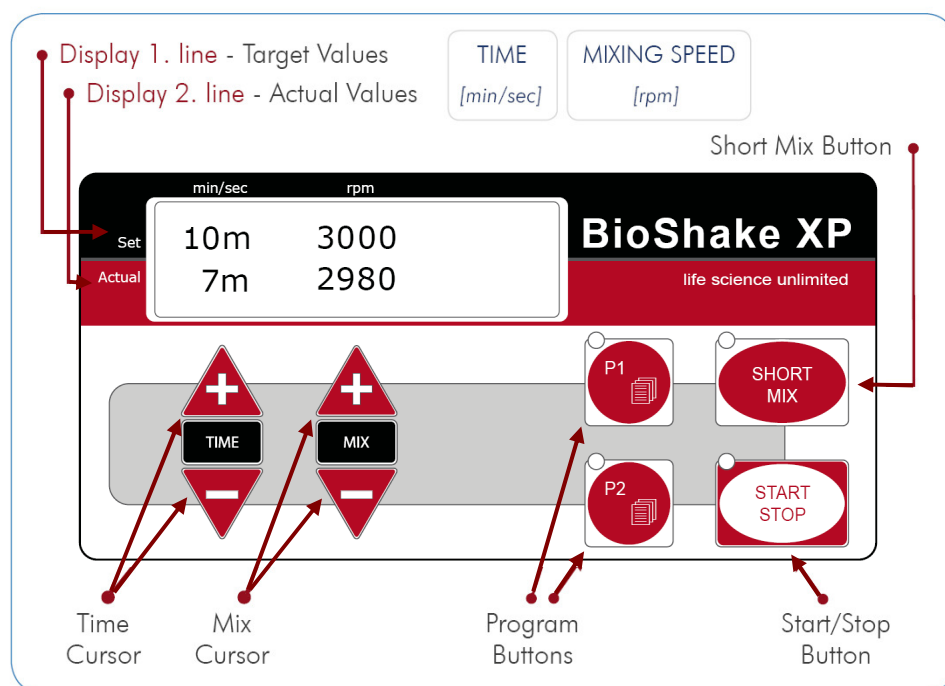


Fig. 6-1 Control panel of BioShake XP

## 6.2 Control panel of BioShake iQ

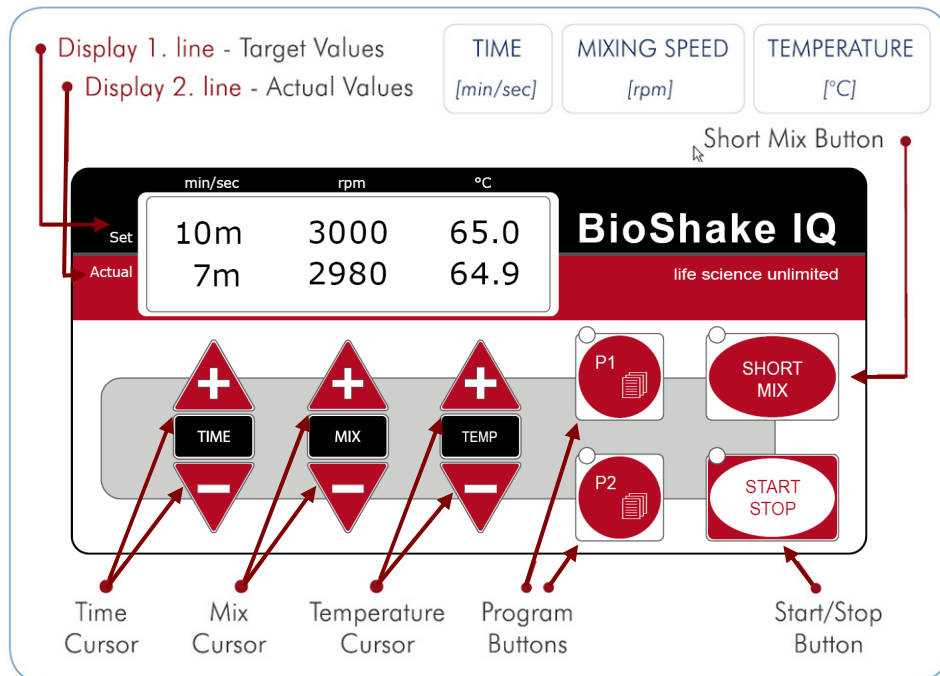


Fig. 6-2 Control panel of BioShake iQ

## 6.3 Standard functions

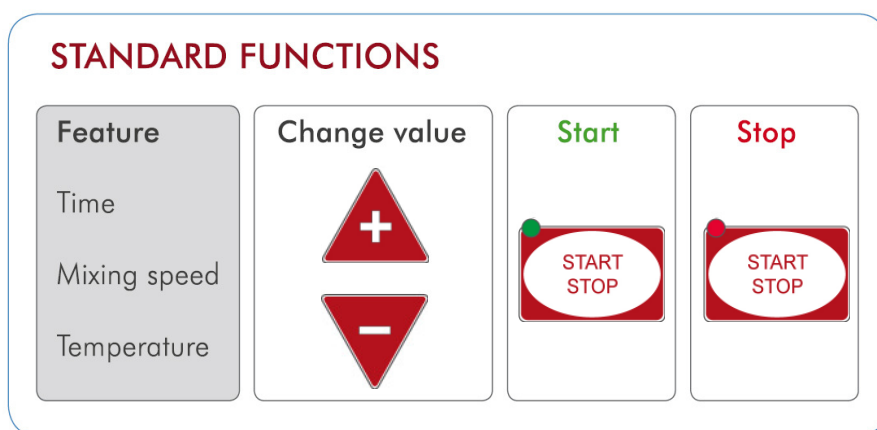


Fig. 6-3 Standard functions (only for BioShake iQ and BioShake XP)

## 6.4 Set up time



Use time cursors to set the required operation time.  
If the timer is not selected, pressing the Start / Stop will cause a continuous operation of the shaker.

## 6.5 Set up mixing speed



It is possible to control mixing speeds from 200 rpm up to 3,000 rpm.  
To set the mixing speeds use the mix buttons.

Required mixing speeds [rpm] for different tubes depending on filling volume [%] for diluted fluids				
Filling volume	0.2 ml tubes	0.5 ml tubes	1.5 ml tubes	2.0 ml tubes
25 %	1400 - 1800	1200 - 1600	1000 - 1300	1000 - 1300
50 %	1200 - 1500	1100 - 1300	1000 - 1200	900 - 1200
75 %	1000 - 1300	1000 - 1200	900 - 1100	900 - 1100

Fig. 6-4 Required mixing speeds depending on filling volume of tubes

Required mixing speeds [rpm] for microplates depending on filling volume/well [%] for diluted fluids				
Filling volume	96-well (standard)	384-well (standard)	384-well (small-vol.)	1536-well (standard)
10 %	1800 - 2200	2200 - 2600	2800 - 3000	2800 - 3000
25 %	1600 - 2000	2000 - 2400	2400 - 3000	2600 - 3000
50 %	1400 - 1800	1800 - 2200	2200 - 2600	2400 - 2600
75 %	1200 - 1600	1600 - 2000	2000 - 2400	2200 - 2600

Fig. 6-5 Required mixing speeds depending on filling volume of microplates

Maximal mixing speeds [rpm] for <b>microplates</b> depending on the weight [g]					
Type	Weight	1,400	2,000	2,500	3,000
Microplate	0 -80 g				x
Deep well plate	0 -120 g			x	
Deep well plate	0 -150 g		x		
Deep well plate	150 -300 g	x			

Fig. 6-6 Recommended maximum mixing speeds

## Adapter categories:

All adapters will be automatically detected while mounting on the instrument. The allocation of the adapter to a particular category determines the properties.

Adapter category	Max. rpm	Available adapters	
		Item no.	Description
Cat 01	3,000	-	A) Without adapter (heating function not available) B) All non classified adapters (heating function not available)
Cat 02	1,800	848-1808-1061	Adapter for 24x 2.0 ml or 15x 0.5 ml tubes
		848-1808-1062	Adapter for 24x 1.5 ml or 15x 0.5 ml tubes
		848-1808-1063	Adapter for 40x 0.5 ml or 28x 0.2 ml tubes
		848-1808-1065	Adapter for 35x 2.0 ml or 24x 0.5 ml tubes
		848-1808-1066	Adapter for 35x 1.5 ml or 24x 0.5 tubes
		848-1808-1067	Adapter for 35x Lysis tubes 0.5 – 2.0 ml
		848-1808-1071	Adapter for 30x 2.0 ml glass vials
		848-1808-1072	Adapter for 20x 4.0 ml glass vials
		848-1808-1121	Deep well plate adapter – 96 well / 1,000 µl (Eppendorf)
848-1808-1131	Deep well plate adapter - 96 well / 500 µl (Eppendorf)		
Cat 03	2,200	848-1808-1041	Microplate adapter - 96 well standard PCR plate, universal
		848-1808-1064	Adapter for 96x 0.2 ml tubes
Cat 04	3,000	848-1808-1021	Microplate adapter - flat bottom
		848-1808-1031	Microplate adapter (universal) - 96 well round bottom
Cat 05	1,000	848-1808-1093	Adapter-Falcon tubes – 4 x 50 ml or 2 x 15 ml
		848-1808-1094	Adapter-Falcon-tubes – 12 x 15 ml
Cat 06	----	Not available at the time	
Cat 07	2,500	848-1808-1022	Microplate adapter - flat bottom, high base
		848-1808-1051	Microplate adapter - 384 well standard PCR plates
Cat 10	OEM	Customer specified	

Fig. 6-7 Mixing speed classification of adapters



All pending information and indications are shown in the display.

Display Line 1  
Display Line 2

<b>Adapter Cat.: 01</b> <b>Max. Speed: 3000</b>
--

## 6.6 Set up temperature



It is possible to control temperature from room temperature up to 99 °C. To set the temperature use the Temp Buttons.



### Attention!

Microplates melt at extremely high temperatures. Only heat microplates made of polystyrene to a maximum of 70 °C

## 6.7 Short mix



By pressing Short Mix, the shaker will start up with the set parameters. Releasing the Short Mix button will stop the shaker.

## 6.8 Start / Stop



By pressing Start / Stop, the shaker will start up with the set parameters. If you press Start / Stop again, the shaker will stop.

## 6.9 Programming

With the BioShake iQ and BioShake XP it is possible to have 2 automatic programs. Both programs can have 3 different steps with different time, speed and temperature settings for each step.

Program the BioShake iQ or BioShake XP with the following steps:

### PROGRAMMING P1 and P2

STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6	STEP 7
To Start press P1 (or P2) and hold for at least 2 sec.	Delete program Yes / No ? Change values with the cursors!	Short press P1 (or P2)	Change values with the cursors as for progr. step I	Short press P1 (or P2) to go forward to the next program step	Repeat STEP 4-5 for program step II and step III	To End press P1 (or P2) and hold for at least 2 sec.

### TO RUN THE PROGRAM

Program P1 (or P2)	activated	START	STOP		deactivate
Short press P1 (or P2)		Short press	Short press	or If you do not press Start/Stop, the program will stop, when it is finished.	Short press P1 (or P2)

Fig. 6-8 Programming BioShake iQ or BioShake XP


## 6.10 Set up the time counting and temperature control mode


The time counting function enables temperature control and/or mixing for a limited period of time. There are two ways to measure the time of the temperature control processes.


**Time control:** Time counting begins immediately when “Start/Stop” is pressed.

**Temp control:** The Temp control mode is the standard mode. Time counting only starts when the nominal temperature value has been reached. To terminate the process earlier, press “Start/Stop” again.

Switch the **TCMo mode** with the following steps:

- 

To start press **Temp(+)** and **P1** and hold for at least 3 seconds.
- 

By pressing **Time(+)** or **Time(-)** the shaker will switch between **Temp mode** or **Time mode**.
- 



To finish press **P1** and **Temp(+)** and hold for at least 3 seconds.

## 6.11 Set up the buzzer and programming control mode


The programming control mode enables buzzer and temperature control at the end of automatic programs. There are two ways to set up the buzzer and temperature control process.



- |                   |                                   |  |
|-------------------|-----------------------------------|--|
| <b>auto mode:</b> | At the end of automatic programs: | <ul style="list-style-type: none"> <li>• 3x short buzzer signals</li> <li>• Mixing is stopped</li> <li>• Temperature control is stopped and switch off</li> </ul>                                    |
| <b>User mode:</b> | At the end of automatic programs: | <ul style="list-style-type: none"> <li>• Short buzzer signal every 10 seconds</li> <li>• Mixing is stopped</li> <li>• Temperature control is enabled and keep target temperature constant</li> </ul> |

Switch the **BMo mode** with the following steps:

1.  +  To start press **Temp(+)** and **P1** and hold for at least 3 seconds.

<i>Display Line 1</i>	<b>TCMo</b> <b>BMo</b> -
<i>Display Line 2</i>	<b>Temp</b> <b>auto</b>

2.  By pressing **Mix(+)** or **Mix(-)** the shaker will switch between **auto mode** or **user mode**.

3.  +  To finish press **P1** and **Temp(+)** and hold for at least 3 seconds.

### 7 Tips for shaker operation

A wide variety of well plates are commercially available.

To ensure that the plates are positioned securely in the plate holder, they must correspond with the *ANIS/SBS Standard for Microplates*.

If the filled plate has a weight of more than 80 g, then the maximum rated shaking frequency of 3,000 rpm may not be attainable with a safety stand. Select a lower shaking frequency in this case. However, there is no risk of damage to the BioShake – even if the weight is too high then the shaking action stops due to excessive weight or excessive shaking frequencies. As soon as you reduce the frequency, the unit will stand firm.

Sir Isaac Newton (anno 1687)

$$\omega = 2\pi f$$

$$F = m\omega^2 r$$

Angular frequency  $\omega$ , orbital mixing radius  $r$  and centripetal force  $F$  are important values for efficient mixing.

#### **Maximum shaker platform load: 500 g (filled well plate).**

The shaker is driven by a maintenance-free brushless motor which enables silent operation and constant shaking speed independent of the load.

#### **IMPORTANT NOTES:**

- Please start even with minimal mixing frequencies to avoid overloading.
- Only mix in sealed tubes and plates. Sample material can be flung out of open, inadequately sealed or unstable tubes and plates.
- When working with hazardous, toxic and pathogenic samples, always comply with the nationally specified safety environment.
- Pay particular attention to personal safety gear (gloves, clothing, glasses etc., the extraction hood and the safety class of the laboratory).

## 8 Specification

### 8.1 Adapter for microplates, tubes and glass vials

Analytik Jena | Biometra offers high precision adapter plates to allow a perfect fit for all kinds of tubes, vials, microplates and other different disposables.

The adapter plates are optimized for an excellent heat transfer to the disposables and enhance the uniformity over all wells and the heat up or cool down time.

The exchange of adapter plates can be performed very easily within one minute.

If you need an adapter plate for specially shaped micro plates, tubes or vials, so please send us additional specific information about your used sample container: manufacturer, description, article number.

You will receive your special formed adapter plate!

### 8.2 Technical specifications

#### BioShake XP, BioShake iQ

	BioShake XP	BioShake iQ
<b>Adapter plates</b>		
Microplates	96-, 384- and 1536-well microplates (deep-well, v-well, square-well and u-well shape)	
Tubes	0.2, 0.5, 1.5 and 2.0 ml tubes, Lysis Tubes 0.5 - 2.0 ml, 15 ml and 50 ml Falcon tubes	
Glass vials	2.0 and 4.0 ml glass vials	
<b>Temperature</b>		
Regulation range	---	RT to 99 °C
Temperature setting	---	0.1 °C increment adjustable from 0 °C to 99 °C
Regulation accuracy	---	± 0.1 °C
Temperature accuracy	---	± 0.5 °C at 45 °C ± 0.7 °C at 75 °C ± 1.0 °C at 95 °C
Heat-up time	---	10 min from RT to 95 °C (approx. 7 °C/min)
Active Cool-down time	---	---
<b>Mixing</b>		
Mixing frequency	200 to 3,000 rpm (microplates) 200 to 1,800 rpm (tubes, glass vials)	
Mixing orbit	Constant 2 mm	
Speed setting resolution	50 rpm increments	
Mixing regulation accuracy	± 25 rpm	
<b>Timer</b>		
Timer setting	1 min - 99 h / with automatic switch to stand-by	
Working / Alarm	Continuous working / audible alarm	

## Specification

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	BioShake XP	BioShake iQ
<b>Programming</b>		
Operation control	Micro controller	
Programs	2 programs / definable buttons P1 and P2	
Program capacity	3 steps / internal memory	
<b>Display</b>		
Display	2 x 16 digits LCD-display with backlight (black)	
Target values/actual values	Time, mixing frequency	Time, mixing frequency, temperature
<b>Electrical</b>		
Operating voltages	24 V DC input / 100 Watt	
Power supply	External power supply unit / 100-240 V AC, 50-60 Hz	
<b>Properties</b>		
Housing material	Aluminum anodized, silver	
Operating range	+5 °C to 45 °C (80 % max. relative humidity)	
Dimensions (WxDxH) [mm]	142 x 170 x 80	
Weight [kg]	2.0	2.7

Technical specifications are subject to change!

## 9 Ordering information

Product	Order – No.
<b>BioShake XP (100 – 240V, EU plug);</b> without adapter plate	848-1808-0505
<b>BioShake XP (100 – 240 V, US plug);</b> without adapter plate	848-1808-0555
<b>BioShake XP (100 – 240 V, Japan plug);</b> without adapter plate	848-1808-0565
<b>BioShake iQ (100 – 240V, EU plug);</b> without adapter plate	848-1808-0506
<b>BioShake iQ (100 – 240 V, US plug);</b> without adapter plate	848-1808-0556
<b>BioShake iQ (100 – 240 V, Japan plug);</b> without adapter plate	848-1808-0566
<b>ADAPTER* for MICROPLATES</b>	
Microplate adapter – Flat bottom	848-1808-1021
Microplate adapter –flat bottom, high base, universal	848-1808-1022
Microplate adapter – 96 well round bottom, universal	848-1808-1031
Microplate adapter – 96 well standard PCR plate, universal	848-1808-1041
Microplate adapter – 384 well standard PCR plate, universal	848-1808-1051
<b>ADAPTER* for DEEP WELL PLATES</b>	
Adapter – Eppendorf deep well plate 96/1000 µl	848-1808-1121
Adapter – Eppendorf Deep well Plate 96/500 µl	848-1808-1131
<b>ADAPTER* for TUBES</b>	
Adapter – 24 x 2.0 ml or 15 x 0.5 ml tubes	848-1808-1061
Adapter – 24 x 1.5 ml or 15 x 0.5 ml tubes	848-1808-1062
Adapter – 40 x 0.5 ml or 28 x 0.2 ml tubes	848-1808-1063
Adapter – 96 x 0.2 ml tubes	848-1808-1064
Adapter – 35 x 2.0 ml or 24 x 0.5 ml tubes	848-1808-1065
Adapter – 35 x 1.5 ml or 24 x 0.5 ml tubes	848-1808-1066
Adapter – 35 x Lysis tubes 0.5 – 2.0 ml	848-1808-1067
<b>ADAPTER* for FALCON TUBES</b>	
Adapter-Falcon tubes – 4 x 50 ml or 2 x 15 ml	848-1808-1093
Adapter-Falcon tubes – 12 x 15 ml	848-1808-1094
<b>ADAPTER* for GLASS VIALS</b>	
Adapter – 30 x 2.0 ml glass vials	848-1808-1071
Adapter – 20 x 4.0 ml glass vials	848-1808-1072
<b>CUSTOMIZED ADAPTERS*</b>	
Customized adapters for specifically shaped microplates, tubes or vials (on request)	848-1808-1000

\* All Adapters are delivered incl. 3 fixation screws and screwdriver

## Ordering information

---

<b>Product</b>	<b>Order – No.</b>
<b>Spare Parts</b>	
Power supply for BioShake XP (100 – 240 V AC, 50 – 60 Hz, 24 V DC, 60 W)	848-1808-9010
Power supply for BioShake iQ (100 – 240 V AC, 50 – 60 Hz, 24 V DC, 108 W)	848-1808-9011
Power cord (Europe)	848-1808-9101
Power cord (USA)	848-1808-9110
Power cord (Japan)	848-1808-9111
Fixation screws for Security Cover Plate or Adapter (3 pcs.)	848-1808-9006
Fixation springs for BioShake XP/iQ (8 pcs.)	848-1808-9007
Security Cover Plate (incl. 3 fixation screws and tool)	848-1808-9008

Please use the original accessories recommended by Analytik Jena | Biometra.

Using spare parts or disposables which we have not recommended can reduce the precision, accuracy and life of the BioShake. We do not honour any warranty or accept any responsibility for damage resulting from such action.



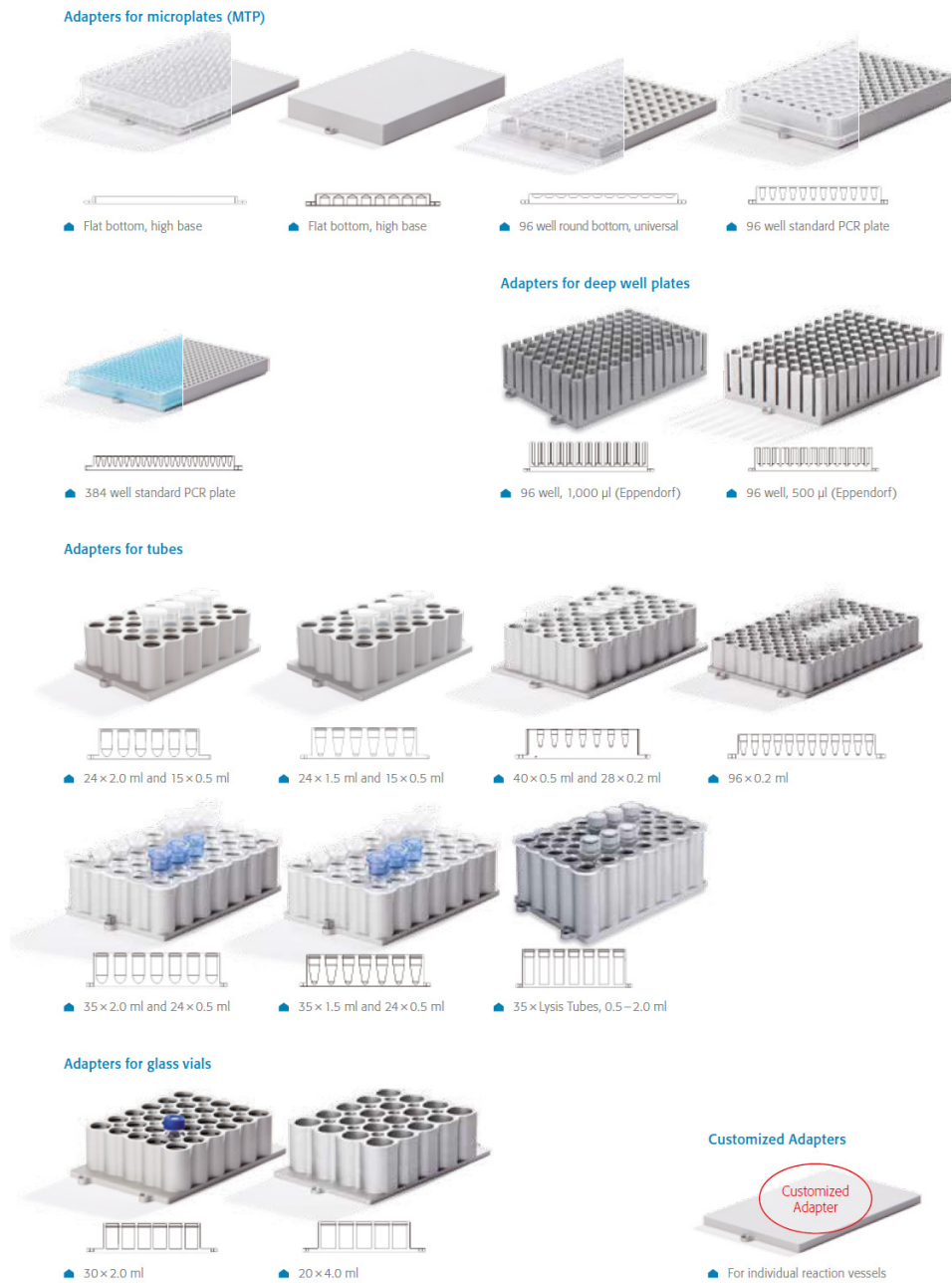


Fig. 9-1 BioShake adapters

## 10 Maintenance and repair

### 10.1 Cleaning and maintenance

The device is maintenance-free. Before cleaning the BioShake, disconnect the power cord and make sure that the temperature at the contact surface is below +40 °C.

If contaminated the device may be cleaned using a mild soap solution and water or an alcohol-based disinfectant.

Do not immerse the unit in liquid.

### 10.2 Servicing

Regular servicing is not necessary. Should it become necessary to repair the equipment, please contact our Service Department.

### 10.3 Replacement of spare parts

Only original spare parts mentioned in these operating instructions are allowed.

### 10.4 Other accessories

There are no accessory parts for this instruments.

---

## 11 Service

Should you have any problems with this unit, please contact our service department or your local Analytik Jena | Biometra distributor.

### Analytik Jena AG

#### Service Department Life Science

Konrad-Zuse-Straße 1

D-07745 Jena

Tel.: +49 (0) 36 41 / 77-94 11

Fax: +49 (0) 36 61 / 77-76 77 76

e-mail: [lifescience@analytik-jena.com](mailto:lifescience@analytik-jena.com)

Internet: [www.bio.analytik-jena.com](http://www.bio.analytik-jena.com)



#### Attention!

If you would like to send the unit back to us, please read the following instructions.

---

### 11.1 Instructions for return shipment

- Return only defective devices. For technical problems which are not definitively recognisable as device faults please contact the technical service department at Analytik Jena Life Science (Tel.: +49 (0) 36 41 / 77-94 11, Fax: +49 (0) 36 61 / 77-76 77 76, e- mail: [lifescience@analytik-jena.com](mailto:lifescience@analytik-jena.com))
- Please contact our service department for providing a **return material authorization number (RMA)**. This number has to be applied clearly visible to the outer box. **Returns without the RMA will be not be accepted!**



#### Important!

Carefully clean all parts of the instrument from residues, and of biologically dangerous, chemical or radioactive contaminants. If an instrument is contaminated, Analytik Jena | Biometra will be forced to refuse to accept the device. The sender of the repair order will be held liable for possible damages and losses resulting from insufficient decontamination of the device.

---

- Please **prepare written confirmation** (use the “**Equipment Decontamination Declaration**” following on the next page) that the device is free of biologically dangerous, chemical or radioactive contaminants. This confirmation must be attached to the outside of the packaging.
- Use the original packing or a similarly robust packing when returning the device. If not available, contact Analytik Jena | Biometra or your local distributor.
- Label the outside of the box with “CAUTION! SENSITIVE INSTRUMENT!” and the RAN number sticker. Attach the Decontamination Declaration!
- Please enclose a note which contains the following:
  - a) Sender’s name and address,
  - b) Name of a contact person for further inquiries with telephone number.
  - c) **Precise description of the fault**, which also reveals during which procedures the fault occurred, if possible.

## 12 Equipment Decontamination Certificate

To enable us to comply with german law (i.e. §71 StrlSchV, §17 GefStoffV and §19 ChemG) and to avoid exposure to hazardous materials during handling or repair, please complete this form, prior to the equipment leaving your laboratory.

COMPANY / INSTITUTE .....

ADRESS .....

PHONE NO. .... FAX NO. ....

E-MAIL .....

EQUIPMENT                      MODEL    SERIAL NO.

.....

.....

.....

If on loan / evaluation    Start date: .....                      Finish date: .....

Hazardous material used with this equipment:

.....

.....

.....

Method of cleaning / decontamination:

.....

.....

.....

The equipment has been cleaned and decontaminated:

Name ..... Position .....

(HEAD OF DIV./ DEP./ INSTITUTE / COMPANY)

SIGNED ..... DATE .....

PLEASE RETURN THIS FORM TO ANALYTIK JENA | BIOMETRA OR YOUR LOCAL  
ANLYTIK JENA | BIOMETRA DISTRIBUTOR TOGETHER WITH THE EQUIPMENT.  
**PLEASE ATTACH THIS CERTIFICATE OUTSIDE THE PACKAGING. INSTRUMENTS  
WITHOUT THIS CERTIFICATE ATTACHED WILL BE RETURNED TO SENDER.**

### General Information for Decontamination:

Please contact your responsible health & safety officer for details.

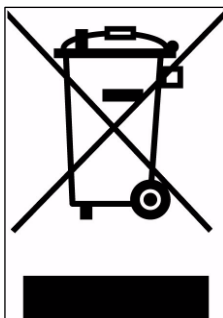
### Use of radioactive substances:

Please contact your responsible person for details.

### Use of genetically change organism or parts of those:

Please contact your responsible person for details.

**13 Note for disposal of electric/electronic waste**



This symbol (the crossed-out wheelie bin) means, that this product should be brought to the return systems and/or separate systems available to end-users according to your country regulations, when this product has reached the end of its lifetime!

For details, please contact your local distributor!

This symbol applies only to the countries within the EEA\*.

\*EEA = European Economic Area, comprising all EU-members plus Norway, Iceland and Liechtenstein.

**14 EC - Declaration of Conformity**  
**EU - Konformitätserklärung**

May 2011

im Sinne der EG-Richtlinie über elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen 2006/95/EG  
*following the EC directive about electrical equipment for use within certain limits of voltage 2006/95/EC*

und / *and*

im Sinne der EG-Richtlinie für die elektromagnetische Verträglichkeit 2004/108/EG.  
*following the EC directive about the electromagnetic compatibility 2004/108/EC.*

Hiermit erklären wir, dass folgende **Shaker**  
*Herewith we declare that the following **Shakers***

Typ / *type*: BioShake XP, BioShake iQ,

Best.-Nr. / *Order No.* 848-1808-0505, 848-1808-0555, 848-1808-0565,  
848-1808-0506, 848-1808-0556, 848-1808-0566

den grundlegenden Anforderungen der  
*corresponds to the basic requirements of*

EG-Niederspannungsrichtlinie 2006/95/EG und der  
*EC low voltage directive 2006/95/EC and the*

EG-Richtlinie über die elektromagnetische Verträglichkeit 2004/108/EG entsprechen.  
*EC directive about the electromagnetic compatibility 2004/108/EC.*

Quality Manager

### 15 Warranty

This laboratory instrument is produced with the highest practical standards of materials, workmanship, and design. The design and manufacture of parts have been conceived with one purpose - to produce units which will give satisfactory service.

Analytik Jena | Biometra guarantees this unit to be free from defects in materials or workmanship under normal use or service for **24 month** from date of shipment.

If, during this time, this unit proves defective in materials or workmanship, Analytik Jena | Biometra will repair or replace it free of charge if returned to us prepaid.

This guarantee does not cover damage in transit, damage caused by carelessness, misuse or neglect, or unsatisfactory performance as a result of conditions beyond our control; or consequential losses as a result of failure of our product.

---

#### **Analytik Jena AG**

##### **Life Science**

Konrad-Zuse-Straße 1

D-07745 Jena

Tel: +49 (0) 36 41 / 77-94 00

Fax: +49 (0) 36 61 / 77-76 77 76

e-mail: [lifescience@analytik-jena.com](mailto:lifescience@analytik-jena.com)

Internet: [www.bio.analytik-jena.com](http://www.bio.analytik-jena.com)

##### **Biometra Service Department**

Rudolf-Wissell-Str. 14-16

D-37079 Göttingen

Tel.: +49 (0)5 51 50 68 6-10 or -12

Fax.: +49 (0)5 51 50 68 6-11

e-mail: [service@biometra.com](mailto:service@biometra.com)

Internet: [www.bio.analytik-jena.com](http://www.bio.analytik-jena.com)





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# 1 Introduction

## 1.1 Field of application

The BioShake Series is special designed for precise control of speed and temperature in an apparatus with a footprint not bigger than 2 microplates side-by-side.

The apparatus offer an ultra-efficient, 3-dimensional shaking axis to mix samples in tubes, glass vials or microplates (up to 1536 wells) without the need of spinning down the samples after mixing. Even high density plates or low samples volumes are not a problem for the Shaker.

BioShake mixers have an orbit diameter of 2.0 mm and a high maximum shaking frequency of 3,000 rpm, allowing any model to easily mix standard and low volume samples in tubes, glass vials and 96-well, 384-well or 1536-well microplates.

The apparatus are working very quiet due to a special patent pending dampening system which relies upon ingenious counter-weight symmetry. They shake tubes to mix their content but do not put vibrations on the entire work bench or robotic deck.

Reduced mass sample blocks provide for quick heating and accurate temperature control across the whole block.

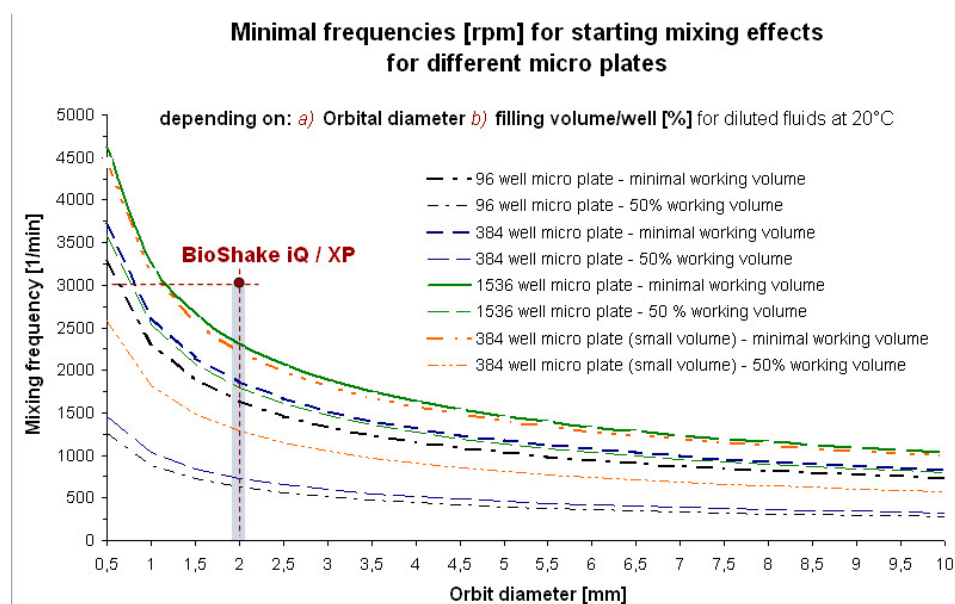


Fig. 1-1 Correlation between mixing frequencies and mixing effects in dependence on the filling level

## 1.2 Information on the use of this manual

The following warning and information symbols are used in this manual:



**Danger! Dangerous touch voltage!**



**Caution!**

Warning messages alert you to a specific procedure or practice which, if not followed correctly, could cause personal injury.



**Caution! Hot surface!**

Contact with the surface can cause burns.



**Attention!**

Caution messages refer you to procedures which, if not observed, could result in damage to the equipment.



**Disconnect mains plug!**



**Note**

This information must be observed to ensure correct function of the device.

The following systematic approach is introduced in the manual:

- The chapters and figures are numbered consecutively.
- Each image has its own caption.
- A cross reference is indicated with an arrow (e.g. → Information on the use of this manual pg. 4).
- Working steps are numbered.

## 2 Safety instructions

Read through this chapter carefully prior to commissioning the BioShake Series for your own safety and for trouble-free operation.

Follow all the safety instructions explained in the manual, as well as all messages and information displayed on the screen by the internal microcomputer.

### 2.1 Warning and safety symbols on the BioShake

The following warning and safety symbols are affixed on the BioShake:



#### **Caution! Hot surface!**

Contact with the surface can cause burns!

This symbol is affixed on the basis unit next to the heating surface of the block (only BioShake iQ).



#### **Disconnect mains plug!**

This symbol is affixed on the rear of the device next to the mains input.

### 2.2 Safety and caution information



1. Do not operate the device in rooms where work is being carried out with explosive substances.
2. Do not use this device to process any explosive, radioactive or highly reactive substances.
3. Do not use this device to process any substances, which could create an explosive atmosphere.
4. **Danger!** Electric shock from damage to device/power cable. **Danger!** Lethal voltages inside the device.
5. **Warning!** General hazard point.
6. **Warning!** Injury from rapidly rotating holder. Injury from rapidly rotating imbalance compensation. Injury from flying tubes and plates.
7. **Warning!** Injury from sample material being flung out. Injury from incorrect vortexing.
8. **Warning!** Damage due to incorrect power supply.

## Safety instructions

---

9. **Caution!** Damage to the display from mechanical pressure. Severe vibration.
10. **Caution!** Damage to electronic components caused by spilled liquids. Damage to electronic components from condensation.
11. **Caution!** Poor safety due to missing operating manual. Caution when using aggressive chemicals.
12. Please start even with minimal mixing frequencies to avoid overloading.
13. Only mix in sealed tubes and plates. Sample material can be flung out of open, inadequately sealed or unstable tubes and plates.
14. When working with hazardous, toxic and pathogenic samples, always comply with the nationally specified safety environment.
15. Please use the original power supply delivered by Analytik Jena | Biometra.
16. Please use the original accessories recommended by Analytik Jena | Biometra.

Pay particular attention to personal safety gear (gloves, clothing, glasses etc.), the extraction hood and the safety class of the laboratory.



Read this section carefully and follow the instructions before beginning installation and any procedure.

The unit must be placed on a horizontal solid work space.

The device must be saving from shocks and falling.

The unit must be placed in sufficient distance to heat registers or radiators to ensure ambient temperature conditions in accordance with the technical specifications (section 8.2).



Use the normal care and precaution one would use with any electrical appliance.

Be sure to use a power cord with the same rating and of the same type (three-wire with neutral conductor) as the one supplied with the instrument.

Ensure that voltage and frequency of your power source match the input voltage and frequency inscribed on the electrical rating label of the power supply (AC/DC adaptor) and that the output voltage matches the rating of the equipment. The AC/DC adaptor is designed to work with a single-phase power system having a grounded neutral conductor.

If you are not sure what type of power is supplied to your building contact your facilities manager.

As BioShake is an electrical device do not spill large quantities of liquid onto the device. Do not use it in an explosive atmosphere.

As parts of the device may generate electric, magnetic or electromagnetic fields, keep parts away that may be affected (e.g. data storage units).



BioShake is capable of heating the plate surface up to 100 °C. This temperature is high enough to cause serious burns if touched. Use extreme caution at all times. Never leave your unit accessible to others when it is hot. Never touch the plate surface unless you are sure it is cold. Use oven gloves if necessary.



Do not unscrew any part of BioShake except for the interchangeable power supply, the power cord and different blocks. Do not make any mechanical or electrical modifications to the equipment.

Never do anything else with BioShake as intended in this manual.

Noncompliance of the safety instructions may lead to device damage, loss of warranty and may cause serious personal injury as well as death.

## 2.3 General information



**Warning!** Injury from sample material being flung out.

Sample material can be flung out of open, inadequately sealed or unstable wells, plates and tubes.

- Only mix in sealed tubes and plates
- When working with hazardous, toxic and pathogenic samples, always comply with nationally specified safety environment. Pay particular attention to personal safety gear (gloves, clothing, glasses etc.), the extraction hood and the safety class of the laboratory.

When setting mixing frequency, adhere to the rules outlined in Fig. 6-4 to 6-7.



### 3 Delivery parts

#### 3.1 BioShake iQ

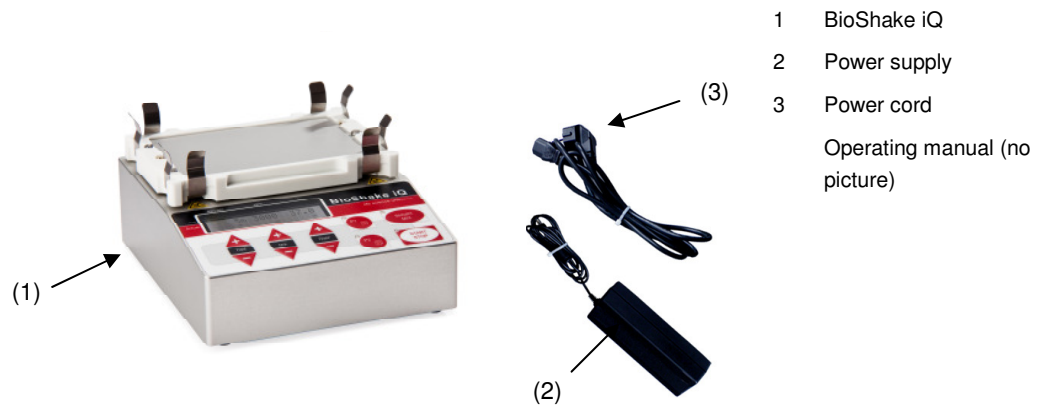


Fig. 3-1 BioShake iQ (1) with power supply (2) and power cord (3)

#### 3.2 BioShake XP

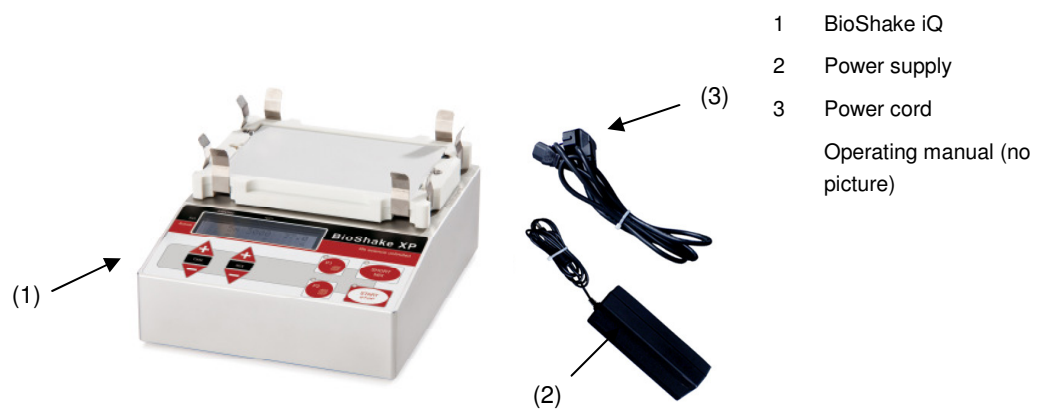


Fig. 3-2 BioShake XP (1) with power supply (2) and power cord (3)

## 4 Installation

Unpack and carefully check the instrument. Report any damage or missing items to your local distributor.

If no damage is found place the device up on a stable horizontal surface.

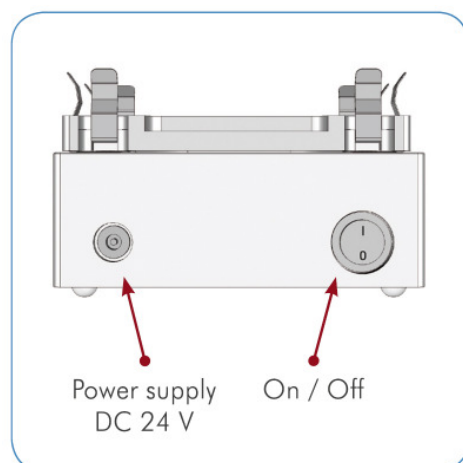


Fig. 4-1 Connections at the rear side of device (BioShake iQ and BioShake XP)

Before starting to work with the BioShake:

**Remove the cover plate before installing an adapter plate:**

Loose the 3 torx screws with the torx screwdriver at the adapter packaging and remove the cover plate.)

If the adapter will not be removed before installing an adapter, the adapter will not be recognized by the device!

Place an adapter on the shaker (chapter 5: Changing of adapter plates).

Plug the external power supply (2) into the 24 V socket at the rear side of the BioShake iQ or BioShake XP.

Plug the power cable (3) into the power supply (2) and into the wall socket.

Turn On the instrument.

It is advisable to carry out a test run at maximum speed to ensure that the device does not move while mixing.

### 5 Changing of adapter plates

To change the adapter plates, please follow the subsequent steps:



**Attention!**

If the security cover plate or an adapter plate already be mounted, please remove it first!

---

1. Turn off the instrument!
2. Remove all sample carriers B-3 (tubes, vials, microplates etc.).
3. Loosen the 3 torx screws A-1, A-2 and A-3 by using the supplied screwdriver (*Torx size 8, rotate left*).
4. Take off the cover plate or adapter plate B-2 straight up and put it on a clean, soft surface.

**Mounting of the new adapter plate:**

1. Please take care to a clean, dirt-free and particle-free operation.
2. Insert the new adapter plate straight into the impression of the plate holder B-1.
3. Check the fixed position.
4. Fix all torx screws A-1, A-2 und A-3 using clockwise rotation. Please take care to uniform controlled tightening of screws to ensure a good fit.
5. Please take care to good and tight fit of sample carriers B-3 (tubes, vials, microplates etc.).
6. Turn on the instrument! BioShake will recognize the different block types. All pending information and indications are shown in the display.

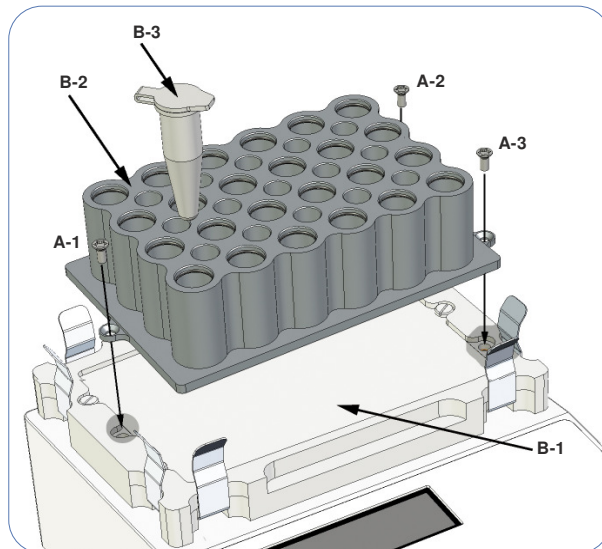


Fig. 5-1 Mounting of adapter plates



**Attention!**

Heavier blocks may limit the shaking speed (see Fig. 6-6 Recommended maximum mixing speeds)

---

## 6 Operation

The BioShake is designed for shaking (BioShake iQ and BioShake XP) and temperature control (BioShake iQ) of liquids in tissue culture plates, microplates, tubes and glass vials. Microplates or tubes have to be placed on the shaker platform of the BioShake. The liquid to be shaken is introduced into the wells or tubes.

The automatic start up function of the unit ensures a gradual start of the shaking process without sample splashing.

The drive is absolutely wear-free and maintenance-free.

### 6.1 Control panel of BioShake XP

The following picture shows the control panel of the BioShake XP.

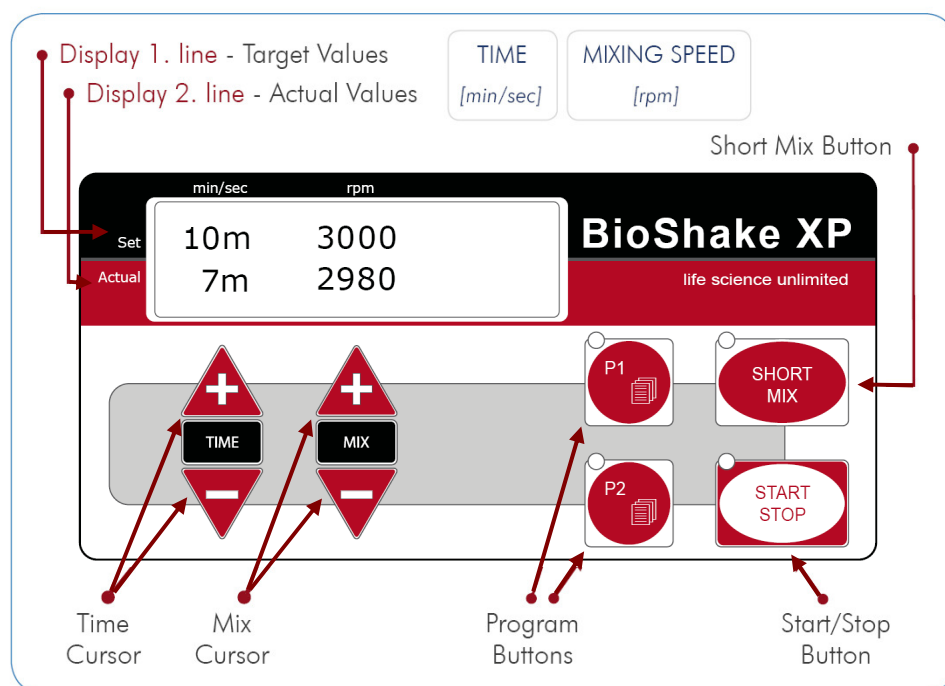


Fig. 6-1 Control panel of BioShake XP

## 6.2 Control panel of BioShake iQ

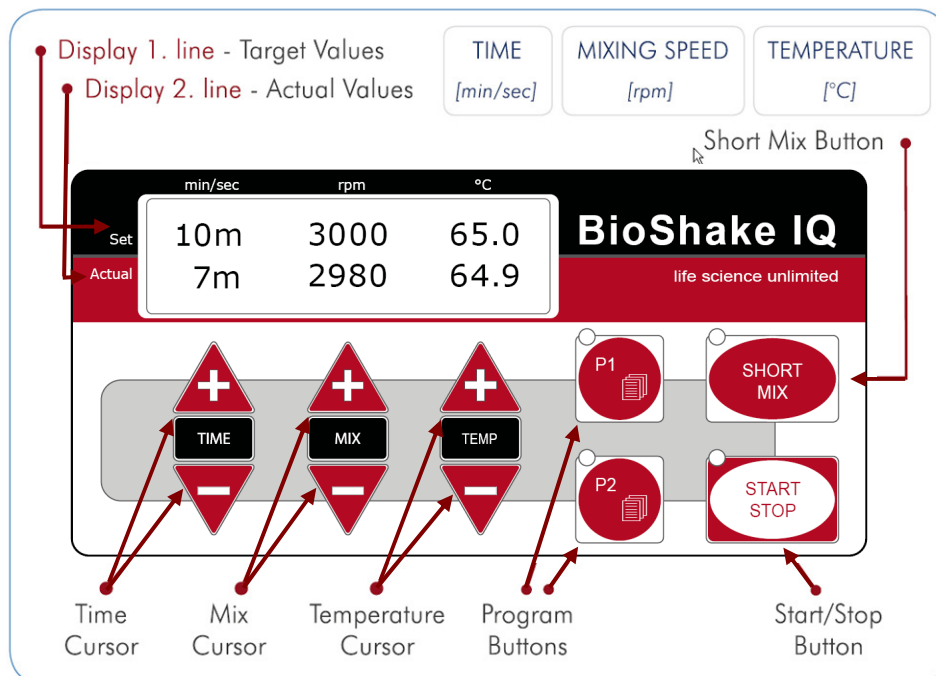


Fig. 6-2 Control panel of BioShake iQ

## 6.3 Standard functions

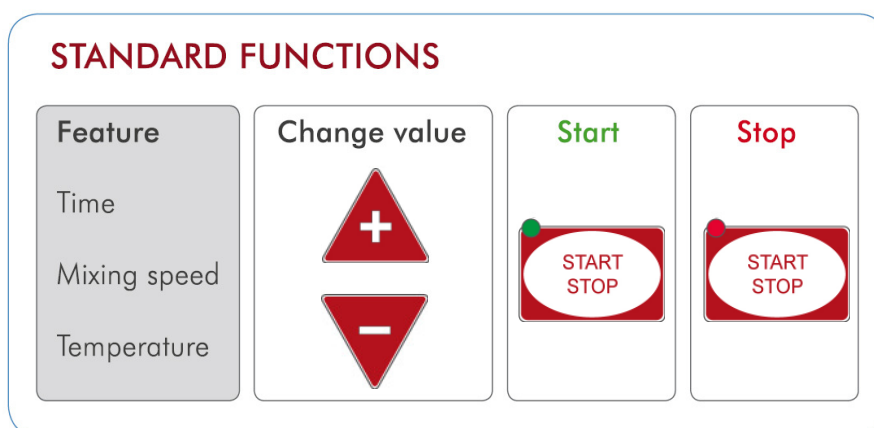


Fig. 6-3 Standard functions (only for BioShake iQ and BioShake XP)

## 6.4 Set up time



Use time cursors to set the required operation time.  
If the timer is not selected, pressing the Start / Stop will cause a continuous operation of the shaker.

## 6.5 Set up mixing speed



It is possible to control mixing speeds from 200 rpm up to 3,000 rpm.  
To set the mixing speeds use the mix buttons.

Required mixing speeds [rpm] for different tubes depending on filling volume [%] for diluted fluids				
Filling volume	0.2 ml tubes	0.5 ml tubes	1.5 ml tubes	2.0 ml tubes
25 %	1400 - 1800	1200 - 1600	1000 - 1300	1000 - 1300
50 %	1200 - 1500	1100 - 1300	1000 - 1200	900 - 1200
75 %	1000 - 1300	1000 - 1200	900 - 1100	900 - 1100

Fig. 6-4 Required mixing speeds depending on filling volume of tubes

Required mixing speeds [rpm] for microplates depending on filling volume/well [%] for diluted fluids				
Filling volume	96-well (standard)	384-well (standard)	384-well (small-vol.)	1536-well (standard)
10 %	1800 - 2200	2200 - 2600	2800 - 3000	2800 - 3000
25 %	1600 - 2000	2000 - 2400	2400 - 3000	2600 - 3000
50 %	1400 - 1800	1800 - 2200	2200 - 2600	2400 - 2600
75 %	1200 - 1600	1600 - 2000	2000 - 2400	2200 - 2600

Fig. 6-5 Required mixing speeds depending on filling volume of microplates

Maximal mixing speeds [rpm] for <b>microplates</b> depending on the weight [g]					
Type	Weight	1,400	2,000	2,500	3,000
Microplate	0 -80 g				x
Deep well plate	0 -120 g			x	
Deep well plate	0 -150 g		x		
Deep well plate	150 -300 g	x			

Fig. 6-6 Recommended maximum mixing speeds

## Adapter categories:

All adapters will be automatically detected while mounting on the instrument. The allocation of the adapter to a particular category determines the properties.

Adapter category	Max. rpm	Available adapters	
		Item no.	Description
Cat 01	3,000	-	A) Without adapter (heating function not available) B) All non classified adapters (heating function not available)
Cat 02	1,800	848-1808-1061	Adapter for 24x 2.0 ml or 15x 0.5 ml tubes
		848-1808-1062	Adapter for 24x 1.5 ml or 15x 0.5 ml tubes
		848-1808-1063	Adapter for 40x 0.5 ml or 28x 0.2 ml tubes
		848-1808-1065	Adapter for 35x 2.0 ml or 24x 0.5 ml tubes
		848-1808-1066	Adapter for 35x 1.5 ml or 24x 0.5 tubes
		848-1808-1067	Adapter for 35x Lysis tubes 0.5 – 2.0 ml
		848-1808-1071	Adapter for 30x 2.0 ml glass vials
		848-1808-1072	Adapter for 20x 4.0 ml glass vials
		848-1808-1121	Deep well plate adapter – 96 well / 1,000 µl (Eppendorf)
848-1808-1131	Deep well plate adapter - 96 well / 500 µl (Eppendorf)		
Cat 03	2,200	848-1808-1041	Microplate adapter - 96 well standard PCR plate, universal
		848-1808-1064	Adapter for 96x 0.2 ml tubes
Cat 04	3,000	848-1808-1021	Microplate adapter - flat bottom
		848-1808-1031	Microplate adapter (universal) - 96 well round bottom
Cat 05	1,000	848-1808-1093	Adapter-Falcon tubes – 4 x 50 ml or 2 x 15 ml
		848-1808-1094	Adapter-Falcon-tubes – 12 x 15 ml
Cat 06	----	Not available at the time	
Cat 07	2,500	848-1808-1022	Microplate adapter - flat bottom, high base
		848-1808-1051	Microplate adapter - 384 well standard PCR plates
Cat 10	OEM	Customer specified	

Fig. 6-7 Mixing speed classification of adapters

All pending information and indications are shown in the display.

Display Line 1  
Display Line 2

<b>Adapter Cat.: 01</b> <b>Max. Speed: 3000</b>
--

## 6.6 Set up temperature



It is possible to control temperature from room temperature up to 99 °C. To set the temperature use the Temp Buttons.



### Attention!

Microplates melt at extremely high temperatures. Only heat microplates made of polystyrene to a maximum of 70 °C

## 6.7 Short mix



By pressing Short Mix, the shaker will start up with the set parameters. Releasing the Short Mix button will stop the shaker.

## 6.8 Start / Stop



By pressing Start / Stop, the shaker will start up with the set parameters. If you press Start / Stop again, the shaker will stop.

## 6.9 Programming

With the BioShake iQ and BioShake XP it is possible to have 2 automatic programs. Both programs can have 3 different steps with different time, speed and temperature settings for each step.



Program the BioShake iQ or BioShake XP with the following steps:

**PROGRAMMING P1 and P2**

STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6	STEP 7
To Start press P1 (or P2) and hold for at least 2 sec.	Delete program Yes / No ? Change values with the cursors!	Short press P1 (or P2)	Change values with the cursors as for progr. step I	Short press P1 (or P2) to go forward to the next program step	Repeat STEP 4-5 for program step II and step III	To End press P1 (or P2) and hold for at least 2 sec.

**TO RUN THE PROGRAM**

Program P1 (or P2)	activated	START	STOP		deactivate
Short press P1 (or P2)		Short press	Short press	or If you do not press Start/Stop, the program will stop, when it is finished.	Short press P1 (or P2)



Fig. 6-8 Programming BioShake iQ or BioShake XP

**6.10 Set up the time counting and temperature control mode**




The time counting function enables temperature control and/or mixing for a limited period of time. There are two ways to measure the time of the temperature control processes.

- Time control:** Time counting begins immediately when “Start/Stop” is pressed.
- Temp control:** The Temp control mode is the standard mode. Time counting only starts when the nominal temperature value has been reached. To terminate the process earlier, press “Start/Stop” again.

Switch the **TCMo mode** with the following steps:

-  +  To start press **Temp(+)** and **P1** and hold for at least 3 seconds.
 

Display Line 1
TCMo BMo -



Display Line 2
Temp auto
-  By pressing **Time(+)** or **Time(-)** the shaker will switch between **Temp mode** or **Time mode**.
-  +  To finish press **P1** and **Temp(+)** and hold for at least 3 seconds.

## 6.11 Set up the buzzer and programming control mode


The programming control mode enables buzzer and temperature control at the end of automatic programs. There are two ways to set up the buzzer and temperature control process.



- |                   |                                   |  |
|-------------------|-----------------------------------|--|
| <b>auto mode:</b> | At the end of automatic programs: | <ul style="list-style-type: none"> <li>• 3x short buzzer signals</li> <li>• Mixing is stopped</li> <li>• Temperature control is stopped and switch off</li> </ul>                                    |
| <b>User mode:</b> | At the end of automatic programs: | <ul style="list-style-type: none"> <li>• Short buzzer signal every 10 seconds</li> <li>• Mixing is stopped</li> <li>• Temperature control is enabled and keep target temperature constant</li> </ul> |

Switch the **BMo mode** with the following steps:

1.  +  To start press **Temp(+)** and **P1** and hold for at least 3 seconds.

<i>Display Line 1</i>	<b>TCMo BMo -</b>
<i>Display Line 2</i>	<b>Temp auto</b>

2.  By pressing **Mix(+)** or **Mix(-)** the shaker will switch between **auto mode** or **user mode**.

3.  +  To finish press **P1** and **Temp(+)** and hold for at least 3 seconds.

### 7 Tips for shaker operation

A wide variety of well plates are commercially available.

To ensure that the plates are positioned securely in the plate holder, they must correspond with the *ANIS/SBS Standard for Microplates*.

If the filled plate has a weight of more than 80 g, then the maximum rated shaking frequency of 3,000 rpm may not be attainable with a safety stand. Select a lower shaking frequency in this case. However, there is no risk of damage to the BioShake – even if the weight is too high then the shaking action stops due to excessive weight or excessive shaking frequencies. As soon as you reduce the frequency, the unit will stand firm.

Sir Isaac Newton (anno 1687)

$$\omega = 2\pi f$$

$$F = m\omega^2 r$$

Angular frequency  $\omega$ , orbital mixing radius  $r$  and centripetal force  $F$  are important values for efficient mixing.

#### **Maximum shaker platform load: 500 g (filled well plate).**

The shaker is driven by a maintenance-free brushless motor which enables silent operation and constant shaking speed independent of the load.

#### **IMPORTANT NOTES:**

- Please start even with minimal mixing frequencies to avoid overloading.
- Only mix in sealed tubes and plates. Sample material can be flung out of open, inadequately sealed or unstable tubes and plates.
- When working with hazardous, toxic and pathogenic samples, always comply with the nationally specified safety environment.
- Pay particular attention to personal safety gear (gloves, clothing, glasses etc.), the extraction hood and the safety class of the laboratory.

## 8 Specification

### 8.1 Adapter for microplates, tubes and glass vials

Analytik Jena | Biometra offers high precision adapter plates to allow a perfect fit for all kinds of tubes, vials, microplates and other different disposables.

The adapter plates are optimized for an excellent heat transfer to the disposables and enhance the uniformity over all wells and the heat up or cool down time.

The exchange of adapter plates can be performed very easily within one minute.

If you need an adapter plate for specially shaped micro plates, tubes or vials, so please send us additional specific information about your used sample container: manufacturer, description, article number.

You will receive your special formed adapter plate!

### 8.2 Technical specifications

#### BioShake XP, BioShake iQ

	BioShake XP	BioShake iQ
<b>Adapter plates</b>		
Microplates	96-, 384- and 1536-well microplates (deep-well, v-well, square-well and u-well shape)	
Tubes	0.2, 0.5, 1.5 and 2.0 ml tubes, Lysis Tubes 0.5 - 2.0 ml, 15 ml and 50 ml Falcon tubes	
Glass vials	2.0 and 4.0 ml glass vials	
<b>Temperature</b>		
Regulation range	---	RT to 99 °C
Temperature setting	---	0.1 °C increment adjustable from 0 °C to 99 °C
Regulation accuracy	---	± 0.1 °C
Temperature accuracy	---	± 0.5 °C at 45 °C ± 0.7 °C at 75 °C ± 1.0 °C at 95 °C
Heat-up time	---	10 min from RT to 95 °C (approx. 7 °C/min)
Active Cool-down time	---	---
<b>Mixing</b>		
Mixing frequency	200 to 3,000 rpm (microplates) 200 to 1,800 rpm (tubes, glass vials)	
Mixing orbit	Constant 2 mm	
Speed setting resolution	50 rpm increments	
Mixing regulation accuracy	± 25 rpm	
<b>Timer</b>		
Timer setting	1 min - 99 h / with automatic switch to stand-by	
Working / Alarm	Continuous working / audible alarm	

## Specification

---

	BioShake XP	BioShake iQ
<b>Programming</b>		
Operation control	Micro controller	
Programs	2 programs / definable buttons P1 and P2	
Program capacity	3 steps / internal memory	
<b>Display</b>		
Display	2 x 16 digits LCD-display with backlight (black)	
Target values/actual values	Time, mixing frequency	Time, mixing frequency, temperature
<b>Electrical</b>		
Operating voltages	24 V DC input / 100 Watt	
Power supply	External power supply unit / 100-240 V AC, 50-60 Hz	
<b>Properties</b>		
Housing material	Aluminum anodized, silver	
Operating range	+5 °C to 45 °C (80 % max. relative humidity)	
Dimensions (WxDxH) [mm]	142 x 170 x 80	
Weight [kg]	2.0	2.7

Technical specifications are subject to change!

## 9 Ordering information

Product	Order – No.
<b>BioShake XP (100 – 240V, EU plug);</b> without adapter plate	848-1808-0505
<b>BioShake XP (100 – 240 V, US plug);</b> without adapter plate	848-1808-0555
<b>BioShake XP (100 – 240 V, Japan plug);</b> without adapter plate	848-1808-0565
<b>BioShake iQ (100 – 240V, EU plug);</b> without adapter plate	848-1808-0506
<b>BioShake iQ (100 – 240 V, US plug);</b> without adapter plate	848-1808-0556
<b>BioShake iQ (100 – 240 V, Japan plug);</b> without adapter plate	848-1808-0566
<b>ADAPTER* for MICROPLATES</b>	
Microplate adapter – Flat bottom	848-1808-1021
Microplate adapter –flat bottom, high base, universal	848-1808-1022
Microplate adapter – 96 well round bottom, universal	848-1808-1031
Microplate adapter – 96 well standard PCR plate, universal	848-1808-1041
Microplate adapter – 384 well standard PCR plate, universal	848-1808-1051
<b>ADAPTER* for DEEP WELL PLATES</b>	
Adapter – Eppendorf deep well plate 96/1000 µl	848-1808-1121
Adapter – Eppendorf Deep well Plate 96/500 µl	848-1808-1131
<b>ADAPTER* for TUBES</b>	
Adapter – 24 x 2.0 ml or 15 x 0.5 ml tubes	848-1808-1061
Adapter – 24 x 1.5 ml or 15 x 0.5 ml tubes	848-1808-1062
Adapter – 40 x 0.5 ml or 28 x 0.2 ml tubes	848-1808-1063
Adapter – 96 x 0.2 ml tubes	848-1808-1064
Adapter – 35 x 2.0 ml or 24 x 0.5 ml tubes	848-1808-1065
Adapter – 35 x 1.5 ml or 24 x 0.5 ml tubes	848-1808-1066
Adapter – 35 x Lysis tubes 0.5 – 2.0 ml	848-1808-1067
<b>ADAPTER* for FALCON TUBES</b>	
Adapter-Falcon tubes – 4 x 50 ml or 2 x 15 ml	848-1808-1093
Adapter-Falcon tubes – 12 x 15 ml	848-1808-1094
<b>ADAPTER* for GLASS VIALS</b>	
Adapter – 30 x 2.0 ml glass vials	848-1808-1071
Adapter – 20 x 4.0 ml glass vials	848-1808-1072
<b>CUSTOMIZED ADAPTERS*</b>	
Customized adapters for specifically shaped microplates, tubes or vials (on request)	848-1808-1000

\* All Adapters are delivered incl. 3 fixation screws and screwdriver

## Ordering information

---

<b>Product</b>	<b>Order – No.</b>
<b>Spare Parts</b>	
Power supply for BioShake XP (100 – 240 V AC, 50 – 60 Hz, 24 V DC, 60 W)	848-1808-9010
Power supply for BioShake iQ (100 – 240 V AC, 50 – 60 Hz, 24 V DC, 108 W)	848-1808-9011
Power cord (Europe)	848-1808-9101
Power cord (USA)	848-1808-9110
Power cord (Japan)	848-1808-9111
Fixation screws for Security Cover Plate or Adapter (3 pcs.)	848-1808-9006
Fixation springs for BioShake XP/iQ (8 pcs.)	848-1808-9007
Security Cover Plate (incl. 3 fixation screws and tool)	848-1808-9008

Please use the original accessories recommended by Analytik Jena | Biometra.

Using spare parts or disposables which we have not recommended can reduce the precision, accuracy and life of the BioShake. We do not honour any warranty or accept any responsibility for damage resulting from such action.

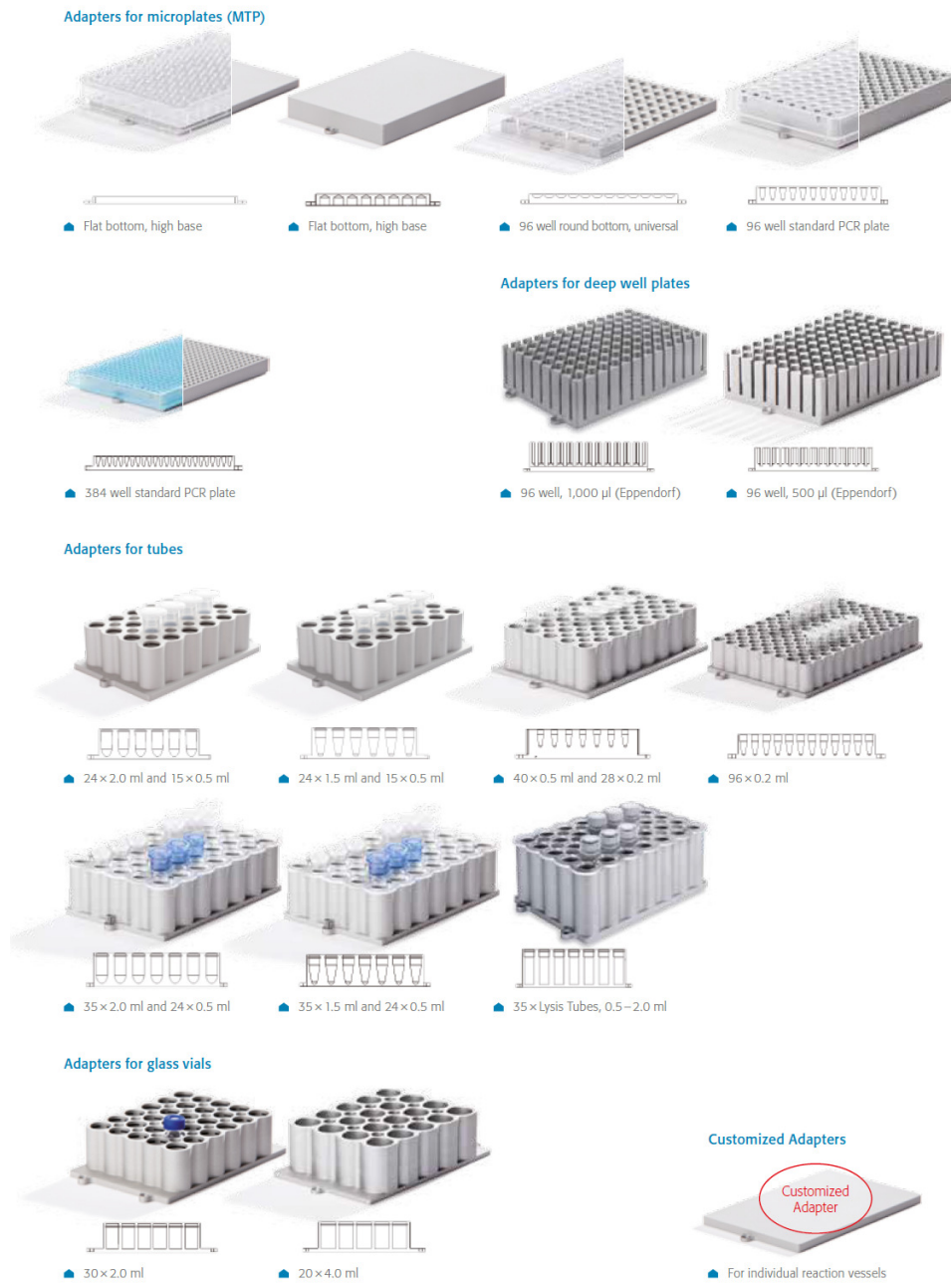


Fig. 9-1 BioShake adapters



## 10 Maintenance and repair

### 10.1 Cleaning and maintenance

The device is maintenance-free. Before cleaning the BioShake, disconnect the power cord and make sure that the temperature at the contact surface is below +40 °C.

If contaminated the device may be cleaned using a mild soap solution and water or an alcohol-based disinfectant.

Do not immerse the unit in liquid.

### 10.2 Servicing

Regular servicing is not necessary. Should it become necessary to repair the equipment, please contact our Service Department.

### 10.3 Replacement of spare parts

Only original spare parts mentioned in these operating instructions are allowed.

### 10.4 Other accessories

There are no accessory parts for this instruments.

---

## 11 Service

Should you have any problems with this unit, please contact our service department or your local Analytik Jena | Biometra distributor.

### Analytik Jena AG

#### Service Department Life Science

Konrad-Zuse-Straße 1

D-07745 Jena

Tel.: +49 (0) 36 41 / 77-94 11

Fax: +49 (0) 36 61 / 77-76 77 76

e-mail: [lifescience@analytik-jena.com](mailto:lifescience@analytik-jena.com)

Internet: [www.bio.analytik-jena.com](http://www.bio.analytik-jena.com)



#### Attention!

If you would like to send the unit back to us, please read the following instructions.

---

### 11.1 Instructions for return shipment

- Return only defective devices. For technical problems which are not definitively recognisable as device faults please contact the technical service department at Analytik Jena Life Science (Tel.: +49 (0) 36 41 / 77-94 11, Fax: +49 (0) 36 61 / 77-76 77 76, e- mail: [lifescience@analytik-jena.com](mailto:lifescience@analytik-jena.com))
- Please contact our service department for providing a **return material authorization number (RMA)**. This number has to be applied clearly visible to the outer box. **Returns without the RMA will be not be accepted!**



#### Important!

Carefully clean all parts of the instrument from residues, and of biologically dangerous, chemical or radioactive contaminants. If an instrument is contaminated, Analytik Jena | Biometra will be forced to refuse to accept the device. The sender of the repair order will be held liable for possible damages and losses resulting from insufficient decontamination of the device.

---

- Please **prepare written confirmation** (use the “**Equipment Decontamination Declaration**” following on the next page) that the device is free of biologically dangerous, chemical or radioactive contaminants. This confirmation must be attached to the outside of the packaging.
- Use the original packing or a similarly robust packing when returning the device. If not available, contact Analytik Jena | Biometra or your local distributor.
- Label the outside of the box with “CAUTION! SENSITIVE INSTRUMENT!” and the RAN number sticker. Attach the Decontamination Declaration!
- Please enclose a note which contains the following:
  - a) Sender’s name and address,
  - b) Name of a contact person for further inquiries with telephone number.
  - c) **Precise description of the fault**, which also reveals during which procedures the fault occurred, if possible.

## 12 Equipment Decontamination Certificate

To enable us to comply with german law (i.e. §71 StrlSchV, §17 GefStoffV and §19 ChemG) and to avoid exposure to hazardous materials during handling or repair, please complete this form, prior to the equipment leaving your laboratory.

COMPANY / INSTITUTE .....

ADRESS .....

PHONE NO. .... FAX NO. ....

E-MAIL .....

EQUIPMENT                      MODEL    SERIAL NO.

.....

.....

.....

If on loan / evaluation    Start date: .....                      Finish date: .....

Hazardous material used with this equipment:

.....

.....

.....

Method of cleaning / decontamination:

.....

.....

.....

The equipment has been cleaned and decontaminated:

Name ..... Position .....

(HEAD OF DIV./ DEP./ INSTITUTE / COMPANY)

SIGNED ..... DATE .....

PLEASE RETURN THIS FORM TO ANALYTIK JENA | BIOMETRA OR YOUR LOCAL  
ANLYTIK JENA | BIOMETRA DISTRIBUTOR TOGETHER WITH THE EQUIPMENT.  
**PLEASE ATTACH THIS CERTIFICATE OUTSIDE THE PACKAGING. INSTRUMENTS  
WITHOUT THIS CERTIFICATE ATTACHED WILL BE RETURNED TO SENDER.**

### General Information for Decontamination:

Please contact your responsible health & safety officer for details.

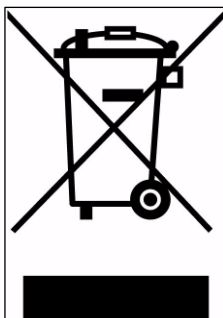
### Use of radioactive substances:

Please contact your responsible person for details.

### Use of genetically change organism or parts of those:

Please contact your responsible person for details.

**13 Note for disposal of electric/electronic waste**



This symbol (the crossed-out wheelie bin) means, that this product should be brought to the return systems and/or separate systems available to end-users according to your country regulations, when this product has reached the end of its lifetime!

For details, please contact your local distributor!

This symbol applies only to the countries within the EEA\*.

\*EEA = European Economic Area, comprising all EU-members plus Norway, Iceland and Liechtenstein.

**14 EC - Declaration of Conformity**  
**EU - Konformitätserklärung**

May 2011

im Sinne der EG-Richtlinie über elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen 2006/95/EG  
*following the EC directive about electrical equipment for use within certain limits of voltage 2006/95/EC*

und / *and*

im Sinne der EG-Richtlinie für die elektromagnetische Verträglichkeit 2004/108/EG.  
*following the EC directive about the electromagnetic compatibility 2004/108/EC.*

Hiermit erklären wir, dass folgende **Shaker**  
*Herewith we declare that the following **Shakers***

Typ / *type*: BioShake XP, BioShake iQ,

Best.-Nr. / *Order No.* 848-1808-0505, 848-1808-0555, 848-1808-0565,  
848-1808-0506, 848-1808-0556, 848-1808-0566

den grundlegenden Anforderungen der  
*corresponds to the basic requirements of*

EG-Niederspannungsrichtlinie 2006/95/EG und der  
*EC low voltage directive 2006/95/EC and the*

EG-Richtlinie über die elektromagnetische Verträglichkeit 2004/108/EG entsprechen.  
*EC directive about the electromagnetic compatibility 2004/108/EC.*

Quality Manager

### 15 Warranty

This laboratory instrument is produced with the highest practical standards of materials, workmanship, and design. The design and manufacture of parts have been conceived with one purpose - to produce units which will give satisfactory service.

Analytik Jena | Biometra guarantees this unit to be free from defects in materials or workmanship under normal use or service for **24 month** from date of shipment.

If, during this time, this unit proves defective in materials or workmanship, Analytik Jena | Biometra will repair or replace it free of charge if returned to us prepaid.

This guarantee does not cover damage in transit, damage caused by carelessness, misuse or neglect, or unsatisfactory performance as a result of conditions beyond our control; or consequential losses as a result of failure of our product.

---

#### **Analytik Jena AG**

##### **Life Science**

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D-07745 Jena

Tel: +49 (0) 36 41 / 77-94 00

Fax: +49 (0) 36 61 / 77-76 77 76

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##### **Biometra Service Department**

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Tel.: +49 (0)5 51 50 68 6-10 or -12

Fax.: +49 (0)5 51 50 68 6-11

e-mail: [service@biometra.com](mailto:service@biometra.com)

Internet: [www.bio.analytik-jena.com](http://www.bio.analytik-jena.com)



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