

BioShake iQ

Operating Manual



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1 SAFETY

Safety of the user and ease of use are clearly a priority for us.

Independent investigations from TÜV services and CE certifications guarantee the highest security standards.

The following symbols mean:















Caution: Read these operating instructions fully before use and pay particular attention to sections containing this symbol!














Caution: Surfaces can become hot during use!

Always observe the following safety precautions:





GENERAL SAFETY

-  Use only as specified in the operating instructions provided.
-  The unit is an electrical device
-  The unit must be stored and transported in a horizontal position (see package label).
-  After transport or storage allow the unit to dry out (2-3 hrs) before connecting it to the supply voltage. During drying out the intrinsic protection may be impaired.
-  The unit should be placed on a horizontal solid work space.
-  The unit should be saved from shocks or drops.
-  The unit should be placed in sufficient distance to heat registers or radiators to ensure ambient temperature conditions in accordance with the technical specifications.
-  Use only standard qualitative tubes, microplates or vials
-  Before using any cleaning or decontamination method except those recommended by the manufacturer, check with the manufacturer that the proposed method will not damage the equipment. Clean the unit only with a damp cloth, do not use chemical cleaning agents.
-  Do not make any mechanical or electrical modifications to the design of the unit.
-  Never do anything else with the unit 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.
-  Please use the original accessories recommended by QInstruments.



ELECTRICAL SAFETY

-  Use the normal care and precaution one would use with any electrical appliance.
Danger! Electric shock from damage to power supply / power cable.
-  Caution: Please keep all electrical installation away from hot surfaces.
-  Connect only to a power supply with a voltage corresponding to that on the serial number label.
-  Connect only to a power supply, which provides a safety earth (ground) terminal.
-  Ensure that the mains switch and external power supply are easily accessible during use.
-  Do not plug the unit into the mains outlet without grounding, and do not use extension lead without grounding.
-  Before moving the unit, disconnect it from the power supply socket or mains outlet.
-  To turn off the unit, disconnect the external power supply from the mains outlet.
-  Caution! Damage to electronic components caused by spilled liquids. Damage to electronic components from condensation.
-  If liquid is spilt inside the unit, disconnect it from the external power supply and have it checked by a competent person.
-  As parts of the device may generate electric, magnetic or electromagnetic fields, keep parts away that may be affected (e.g. data storage units).












ENVIRONMENTAL SAFETY

-  Do not use the unit in an explosive atmosphere.
-  Do not operate the unit in environments with aggressive or explosive chemical substances or mixtures.
-  Danger! Do not use this device to process any flammable, aggressive, explosive, radioactive or highly reactive substances.
-  Danger! Do not use this device to process any substances, which could create an flammable, implosive or explosive atmosphere.







POWER FAILURE SAFETY

-  In case of a power failure during reprogramming of the device or any other unexpected incidents, that invalidates the running program, the BioShake unit stops without any delay.
-  In case of unintended power on, the BioShake unit will perform its reboot routine, and switch into standby mode awaiting the users interactions.

OPERATION SAFETY

-  Use extreme caution at all times.
-  Do not leave the operating unit unattended.
-  Do not impede the platform motion during operation.
-  Do not operate the unit if it is faulty or been incorrectly installed.
-  For indoor use only. Do not use outside laboratory rooms.
-  Use extreme caution at all times.
-  Caution: Surfaces can become hot during use.
-  Never leave your unit accessible to others when it is hot.
-  Caution! Injury from rapidly rotating holder. Injury from rapidly rotating imbalance compensation. Injury from flying tubes and plates. As the unit is producing shaking or rotational movement, be aware of the surface that the unit will be placed upon.
-  When setting mixing frequency, start mixing from slower to faster speed settings 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.

BIOLOGICAL SAFETY

-  It is the user's responsibility to carry out appropriate decontamination if hazardous material is spilt on or inside the equipment.
-  Caution! Injury from sample material being flung out. Injury from incorrect vortexing.
-  Caution! Poor safety due to missing operating manual. Caution when using aggressive chemicals.
-  Danger!! General hazard point. It is the user's responsibility to carry out appropriate decontamination if hazardous material is spilt on or inside the equipment.
-  Danger! 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.

2 GENERAL INFORMATION

A scientific innovation for smart laboratories

Compact and stylish designed, the BioShake iQ high-speed thermoshaker lets you perform all your standard runs with a minimum of adjustments, and offers outstanding performance to handle a wide range of applications across biotechnology, pharmaceutical and academic research. By combining the mixing operation with the incubation phase, reaction process times and operator workload are reduced, and efficiency of many procedures is increased, resulting in a higher throughput.

Universal spring clamps for microplates

The Bioshake iQ come with universal spring clamps as standard. In the corners eight spring clamps are inserted for easy fixation of microplates, deep well plates and PCR plates in SBS format 127.7 x 85.5 mm without an attached adapter. The spring clamps lock the micro plate quickly and safely, even at the highest mixing frequencies. Fast mixing processes with frequent plate changes can be performed in the routine as easy and safe. Users have to install an adapter only for heating processes.

Gentle mixing of samples by planar orbital motion

German designed and manufactured, the BioShake iQ offer an ultra-efficient, 2-dimensional shaking axis so that samples mix completely in a fraction of the time of competing systems. The mixing orbit of 2.0 mm is always constant. The orbital shaking is precisely controlled, in fact, that you need never spin down your plates after mixing. Even tubes, vials, high density plates, or low sample volumes, offer no obstacle for these precision tools. Fully adjustable between 200 rpm and 3,000 rpm, well beyond the speeds of most other brands, guarantees fast, splatter-free, mixing for tubes, glass vials or across an entire 384-well microplate.

Homogeneous and accurate temperature control

Within the BioShake iQ thinnest, large-area heating elements and sensors are integrated. The heat output of 75 W can be adjusted seamlessly from room temperature to 99°C. The equipment is fitted with a new and very reliable electronic temperature control which ensuring optimum warming of samples. During the heat up time the special electronic control system guarantees the same temperature for all vessels with minimal deviations. Precisely machined adapter plates allow an individual adaptation to the used sample holder.

Exchangeable adapters

The BioShake iQ comes with a variety of standardized and specific adapter plates. Perfect shaped adapters allow an optimal fit for standard tubes, lysis tubes, microplates, glass vials and other sample vessels. An excellent temperature uniformity and homogeneity is guaranteed for all samples. The replacement of the adapters is very simple.

Stylish aluminium housing

The first-class finished aluminium housing gives the BioShake iQ its essential functionality. It provides a high amount of security, device stability and ensures a long service life.

Advanced technology for advanced applications

The above-mentioned operating functions of heating and mixing can be performed according to the user requirements both simultaneously and independently. Therefore, the BioShake unit is highly recommended for the use in DNA analysis sample preparation, for extraction of proteins, polysaccharides, lipids and other cellular components. It supports applications like DNA-, RNA analysis, DNA-, RNA extraction, Biochemical study of enzymatic reactions and processes, extraction of metabolites from cellular material.



YEARS OF TROUBLE-FREE OPERATION

The sealed housing to protect mechanical and electronic components increases the lifespan of many years on average of well-maintained equipment.

All units are designed for continuous 24-hour operation when utilizing sound scientific methods.

To prevent laboratory fires, all units feature an over temperature circuit which switches off if an over temperature situation occurs.

Thermal damage to any unit is minimized or prevented, as all models come with a fire-resistant aluminum housing.

3 WARRANTY

QInstruments warrants products manufactured by it to be free from defects in material or workmanship under normal use and service for a period of 2 years from date of shipment.

This warranty is specifically limited to the replacement or repair of any such warrantable defects, without charge, when the complete product is returned to QInstruments, freight prepaid, at the address shown above. Contact the factory at the address above for a Return Material Authorization (RMA) number before returning the product.

QInstruments shall be the sole judge of the warrant ability of alleged product defects. Products that are returned for warranty examination and that are found to be non-warrantable are chargeable and are returned freight collect. A copy of a purchase order with the amount of the charge must be received by QInstruments, either by mail or by FAX, before any equipment is returned. Warrantable products are repaired or replaced at no charge and returned freight prepaid.

THIS EXPRESS WARRANTY EXCLUDES ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PURPOSE. QInstruments GmbH SHALL NOT BE LIABLE FOR WARRANTY IN ANY AMOUNT EXCEEDING THE PURCHASE PRICE OF THE GOODS. QINSTRUMENTS SHALL NOT BE LIABLE FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, WHETHER IN CONTRACT, TORT, OR OTHERWISE.

The buyer acknowledges that he/she is not relying on the seller's skill or judgment to select or furnish goods suitable for any particular purpose and that there are no warranties that extend beyond the description on the face hereof.

This warranty extends only to the original purchaser, and shall not apply to any products or parts that have been subject to misuse, neglect, accident, or abnormal conditions or operations. Claims for damage in transit are directed to the freight carrier upon receipt.

4 DELIVERY PARTS



- Part 1 | BioShake iQ
- Part 2 | Power supply (IEC/EN60320-1 C14)
- Part 3 | Power cords (IEC/EN60320-1 C13), *EU and US plug in*
- Part 4 | Operating manual, calibration certificate (no picture)

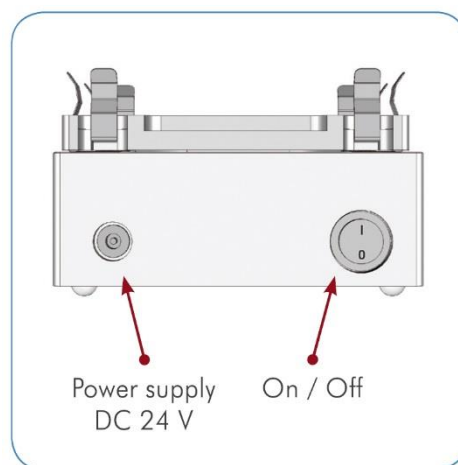
5 INSTALLATION

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

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

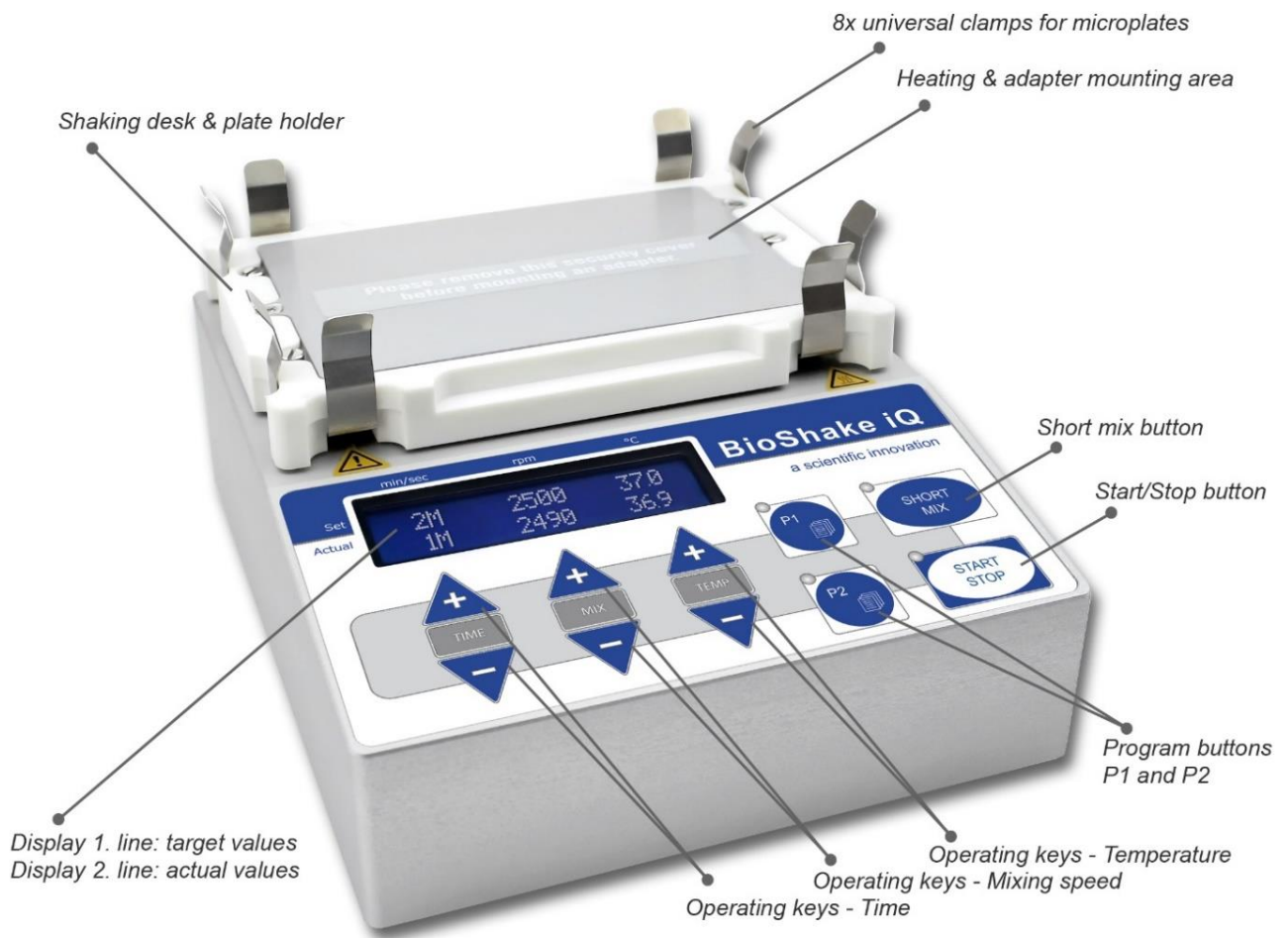


6 OPERATION

Programming the BioShake iQ works via direct touch buttons. In addition two buttons for start and storage of time and mixing modes enable the instrument to run complex applications.

The short mix button allows short and fast mixing in between.

The two-line LCD display guarantees simultaneous and safe reading of all programmed and measured parameters as time, mixing frequency and temperature.



6.1 SETTING UP THE TIME



Use the **TIME** operating keys to set the required operation time.
If the timer is not selected, pressing the **START/STOP** will cause a continuous operation of the shaker.

6.2 SETTING UP THE TIME UNIT

The time unit can be set to minutes or seconds.

OPEN MENU		To start press TEMP(+) and P1 and hold for at least 3 seconds.	<table border="1"> <tr><td>T</td><td>C</td><td>M</td><td>o</td><td></td><td></td><td></td><td></td><td></td><td></td><td>T</td><td>U</td><td>n</td><td>i</td><td>t</td></tr> <tr><td>T</td><td>e</td><td>m</td><td>p</td><td></td><td></td><td></td><td></td><td></td><td></td><td>m</td><td>i</td><td>n</td><td></td><td></td></tr> </table>	T	C	M	o							T	U	n	i	t	T	e	m	p							m	i	n																																
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CHANGE VALUE		By pressing TEMP(+) or TEMP(-) the TUnit value of the shaker will switch between min and sec .	<table border="1"> <tr><td>T</td><td>C</td><td>M</td><td>o</td><td></td><td></td><td></td><td></td><td></td><td></td><td>T</td><td>U</td><td>n</td><td>i</td><td>t</td></tr> <tr><td>T</td><td>e</td><td>m</td><td>p</td><td></td><td></td><td></td><td></td><td></td><td></td><td>m</td><td>i</td><td>n</td><td></td><td></td></tr> </table> <table border="1"> <tr><td>T</td><td>C</td><td>M</td><td>o</td><td></td><td></td><td></td><td></td><td></td><td></td><td>T</td><td>U</td><td>n</td><td>i</td><td>t</td></tr> <tr><td>T</td><td>e</td><td>m</td><td>p</td><td></td><td></td><td></td><td></td><td></td><td></td><td>s</td><td>e</td><td>c</td><td></td><td></td></tr> </table>	T	C	M	o							T	U	n	i	t	T	e	m	p							m	i	n			T	C	M	o							T	U	n	i	t	T	e	m	p							s	e	c		
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SAVE & EXIT MENU		To finish press P1 and TEMP(+) and hold for at least 3 seconds.	<table border="1"> <tr><td></td><td></td><td></td><td></td><td>0</td><td>s</td><td></td><td></td><td></td><td></td><td>0</td><td></td><td>2</td><td>5</td><td>.0</td></tr> <tr><td></td><td></td><td></td><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td><td>-</td><td></td><td>2</td><td>4</td><td>.1</td></tr> </table>					0	s					0		2	5	.0					-						-		2	4	.1																														
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Caution! After the time unit was changed it is necessary to newly define every existing program.

6.3 SETTING UP THE TEMPERATURE



It is possible to control temperature from room temperature up to 99 °C.
To set the temperature values use the **TEMP** operating keys.



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

6.4 SETTING UP THE MIXING SPEED



It is possible to control mixing speeds from 200 rpm up to 3,000 rpm. To set the mixing speed values use the **MIX** operating keys.

Recommended maximum mixing speeds

Type of micro well plate	Weight	Maximal mixing speed [rpm]			
		1,800	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			

Automatic classification & adjustment of mixing speed limits

All adapters will be automatically detected while mounting on the instrument. The allocation of the adapter to a particular category determines the properties. All pending information and indications are shown in the display.

Display Line 1 **A D A P T E R C A T . : 0 1**
 Display Line 2 **M A X . S P E E D : 3 0 0 0**

Adapter Category	Max mixing speed [rpm]	Available adapters	
		Item no.	Description
Cat 01	3,000 rpm		A) Without adapter (<i>heating function not available</i>) B) All non classified adapters (<i>heating function not available</i>)
Cat 02	1,800 rpm	1808-1061 1808-1062 1808-1063 1808-1067 1808-1069 1808-1071 1808-1072 1808-1073 1808-1074 1808-1085 1808-1121 1808-1131 1808-1141 1808-1151 1808-1161 1808-1171 1808-1181 1808-1191 1808-1201 1808-1211	Adapter for tubes - 24x 2.0 ml or 15x 0.5 ml Adapter for tubes - 24x 1.5 ml or 15x 0.5 ml Adapter for tubes - 40x 0.5 ml or 28x 0.2 ml Adapter for lysis vials - 35x 0.5-2.0 ml Adapter for cylindrical vials - 35x 2.0 ml Ø 10.8 mm Adapter for cylindrical vials - 30x 2.0 ml Ø 12 mm Adapter for cylindrical vials - 20x 4.0 ml Ø 15 mm Adapter for cylindrical vials - 20x 4.0 ml Ø 17 mm Adapter for cylindrical vials - 20x 6.0 ml Ø 19 mm Adapter - 24x Alere® ArrayTubes 1.5 ml Adapter for Deep Well Plate . Eppendorf® 96/1000 µl Adapter for Deep Well Plate . Eppendorf® 96/500 µl Adapter for Deep Well Plate . BRAND® 96/1100 µl U-bottom Adapter for Deep Well Plate . NUNC® Axygen® 96/2000 µl Adapter for Deep Well Plate . Axygen® 96/0.6 ml, 96/2 ml Adapter for Storage Plate . Abgene® 96/2.2 ml, 96/0.8 ml Adapter for Mega Block . Sarstedt® Megablock 96/2.2 ml Adapter for Storage Plate . HJ-Bioanalytik® 96/1.2 ml low profile Adapter for Storage Plate . Corning® 96/320 µl V-bottom Adapter for Masterblock . Greiner® 96/1.0 ml U-bottom
Cat 03	2,200 rpm	1808-1041 1808-1064	Microplate adapter - 96 well standard PCR plate, universal Adapter for tubes - 96x 0.2 ml

Adapter Category	Max mixing speed [rpm]	Available adapters	
		Item no.	Description
Cat 04	3,000 rpm	1808-1021	Microplate adapter - Flat bottom standard
		1808-1022	Microplate adapter - Flat bottom High Base
		1808-1024	Microplate adapter - Flat bottom Low Base
		1808-1023	Adapter - Alere ArrayStrip (12 stripes), flat bottom
		1808-1031	Microplate adapter - 96 well round bottom, type 1
		1808-1032	Microplate adapter - 96 well round bottom, type 2
Cat 05	1,000 rpm	1808-1093	Adapter for Falcon® tubes . 4x 50 ml
		1808-1094	Adapter for Falcon® tubes . 12x 15 ml
Cat 06	----	not available	
Cat 07	2,500 rpm	1808-1051	Microplate adapter - 384 well standard PCR plate, universal
Cat 08	----	-----	
Cat 09	-----	-----	
Cat 10	1,800 rpm	1808-1081	Adapter - Alere ArrayStrip (5 stripes)

6.5 SHORT MIX



By pressing **SHORT MIX**, the shaker will start up with the set parameters. Releasing the **SHORT MIX** button will stop the shaker.

6.6 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.

If a time was set, the shaker will mix and heat for the defined time. The behavior at the end of the run is set on page 2 in step 1 in program 1 (see 6.8 for further information). The concatenation value that is selected there, will be used. The value needs to be confirmed by starting one run of program P1.

The continuous mode () will result in 3 buzzer signals at the end. The mixing is stopped and temperature control is deactivated. This is the default setting.

The interactive mode () will lead to a status where mixing stops, the temperature control stays active and every 10 s a buzzer signal is produced. The user needs to press the **START/STOP** key to stop.

If no time is set the shaker will operate continuously.

See 6.7 for further information on changing the time controlled operation of the shaker.

6.7 SETTING UP THE TIME COUNTING MODE

The time counting mode defines when the countdown of the time, that is defined in a program or set for the START/STOP operation, starts. Two time counting modes are available.




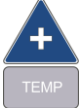
Time mode Time counting begins immediately when **START/STOP** is pressed, respectively a step of a program starts.

Temp mode The Temp control mode is the standard mode. Time counting starts when the nominal temperature value has been reached.
To terminate the process earlier, press **START/STOP** again.



Caution! After the time counting mode was changed it is necessary to newly define every existing program.

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

OPEN MENU	 + 	To start press TEMP(+) and P1 and hold for at least 3 seconds.	<table border="1"> <tr><td>T</td><td>C</td><td>M</td><td>o</td><td></td><td></td><td></td><td></td><td>T</td><td>U</td><td>n</td><td>i</td><td>t</td></tr> <tr><td>T</td><td>e</td><td>m</td><td>p</td><td></td><td></td><td></td><td></td><td>m</td><td>i</td><td>n</td><td></td><td></td></tr> </table>	T	C	M	o					T	U	n	i	t	T	e	m	p					m	i	n																												
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6.8 PROGRAMMING P1 / P2

With the BioShake it is possible to define two programs that run automatically. The features of both programs are the same.

The menu for defining a program is opened by pressing and holding the P1/P2 (Px) button for 2 seconds. The menu has 8 pages. By pressing Px the next page opens.

A program has three steps. Each step has 6 parameters which are defined in two successive pages. On the first page the time, mix speed and temperature are set. On the second page, the mix and pause time for the mix interval feature and the concatenation mode to the next step are set.

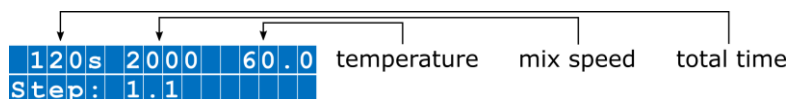


It is important to keep in mind that while the BioShake executes the program it **will always go through all 3 steps**. If time is set to 0, no shaking or heating will happen in this step but the chosen **concatenation mode will always be executed**.

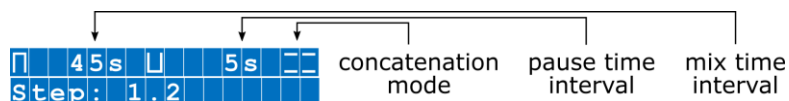
PROGRAM 1

STEP 1

PAGE 1.1



PAGE 1.2



STEP 2

PAGE 2.1 ...

...

After the pages for the three steps another page (Step: 4.1.) with two further parameter opens. The program end mode and the cycle counter define what happens after the 3 steps.

It is possible to repeat all three steps of the program with the cycle counter parameter. If the cycle counter is set to 1, the program is executed once. Any other number will result in the successive execution of the program accordingly to the set amount.

The program end mode is comparable to the concatenation mode; however, it defines the device behavior at the end of the program and not the transition between two steps.



No configuration can be done in step 4.2.

Mix interval
(pause time interval, mix time interval)

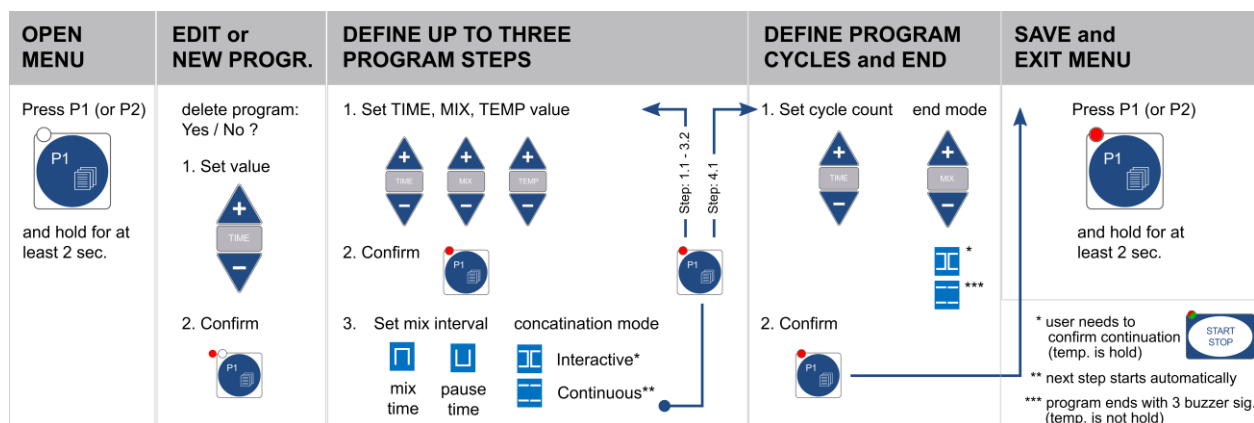
The mix interval feature provides the option to apply an additional alternation, between mixing and pause, during the total time span of one step. Therefore, the mix time (□) defines the time for the mixing activity, which is followed by a period of non-mixing, defined by the pause time (□).

Concatenation mode/ Program end mode The BioShake iQ offers two concatenation modes. The modes define how to transition from one step to the next. The program end mode has the same two modes and defines how the device behaves when the program ends.

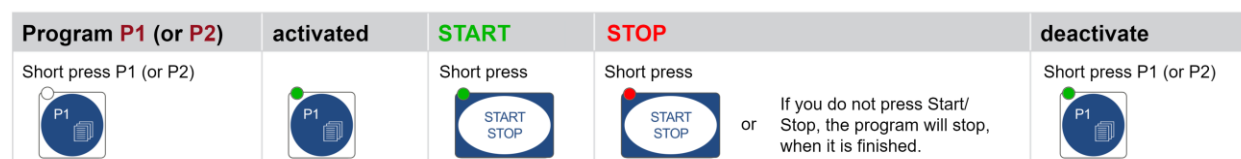
Interactive mode
The user needs to interact with the Shaker by pressing the START/STOP button before the next step is started respectively the program comes to an end. The temperature control stays active while waiting. The necessary interaction is indicated by a buzzer signal every 10s.

Continuous mode
The next step starts respectively the program ends automatically. No buzzer signal between transition of steps however, 3 buzzer signals are triggered at the end of the program.

Overview of steps for setting up the P1 and P2 program on the BioShake

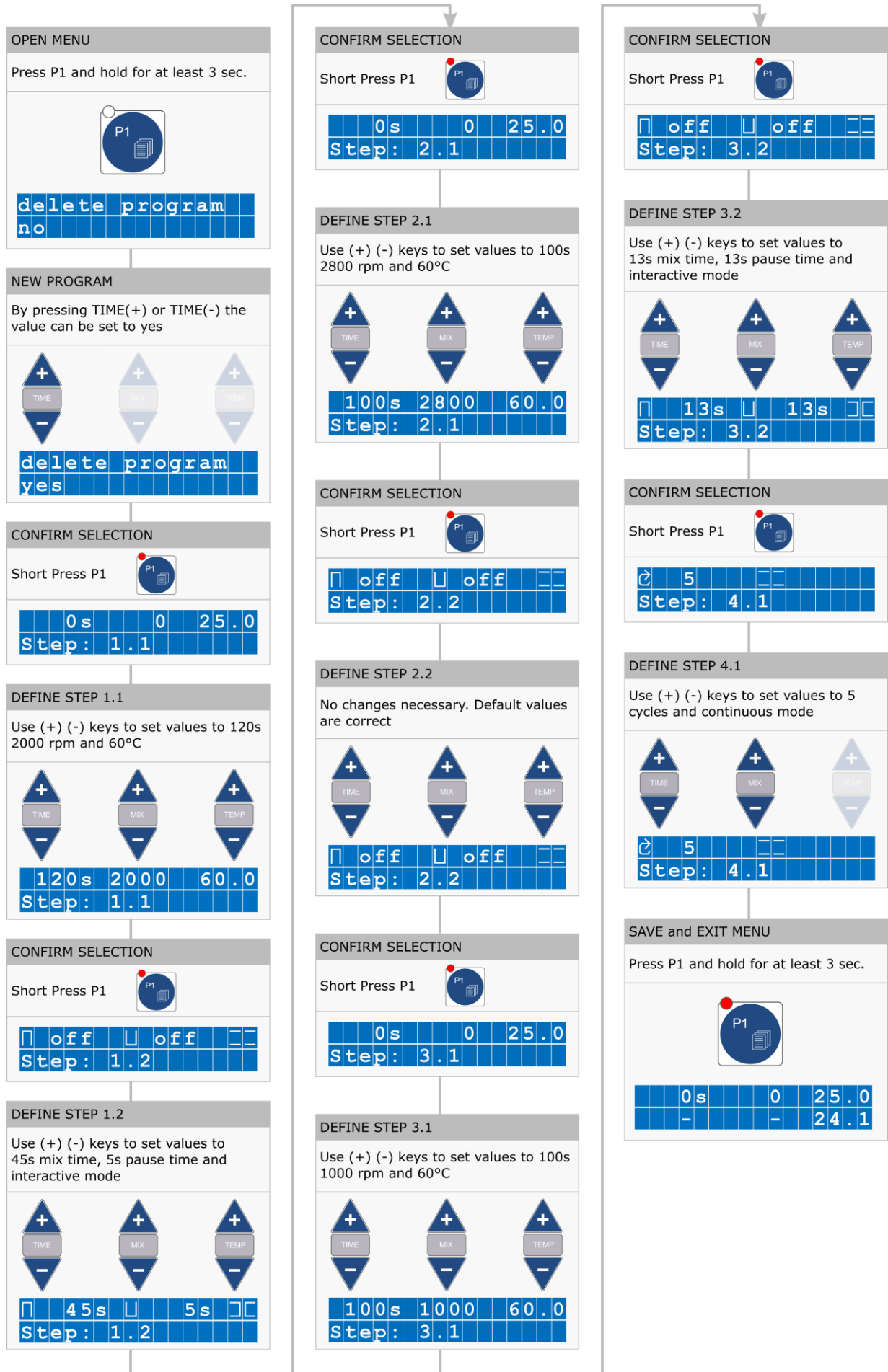


Steps to start a program



Detailed example for setting up a P1 program

In the following step-by-step description, a P1 program with three steps is created. The first step will take 120 s and mix with 2000 rpm at 60 °C. During the 120 s mixing period the mixing will switch on and off. 45 s on at 2000 rpm followed by a 5 s pause without mixing. After step one the user needs to confirm continuation to proceed with step two. The second step will take 100 s and mix with 2800 rpm at 60 °C. Without interruption the third step will be carried out. The third step will also take 100 s with a mix interval of 13 s mix time and 13 s pause time. The mixing speed is set to 1000 rpm and the temperature keeps 60°C. These 3 steps should run 5 times. After each run the user will need to confirm to start the next run. After the 5 runs the program will end without user interaction and will not hold the temperature.



In a schematic overview the program will result in the following process.

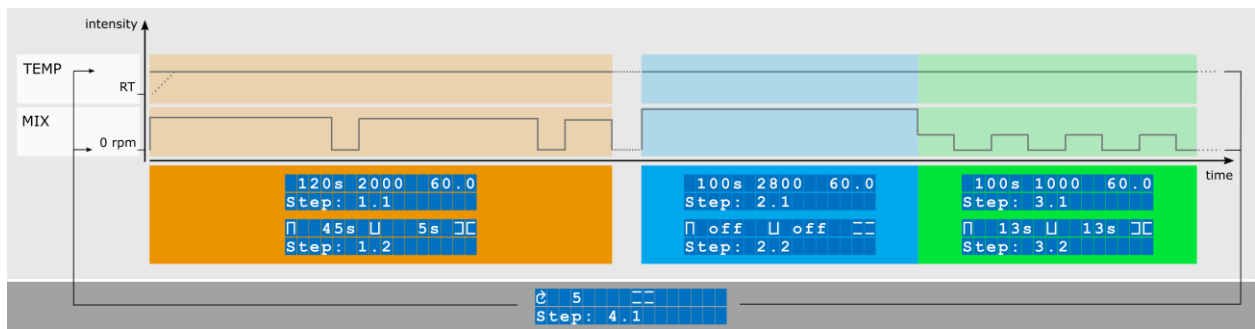


Figure 1: A diagram that illustrates the program process in relation to the program settings

7 CHANGING OF ADAPTER PLATES



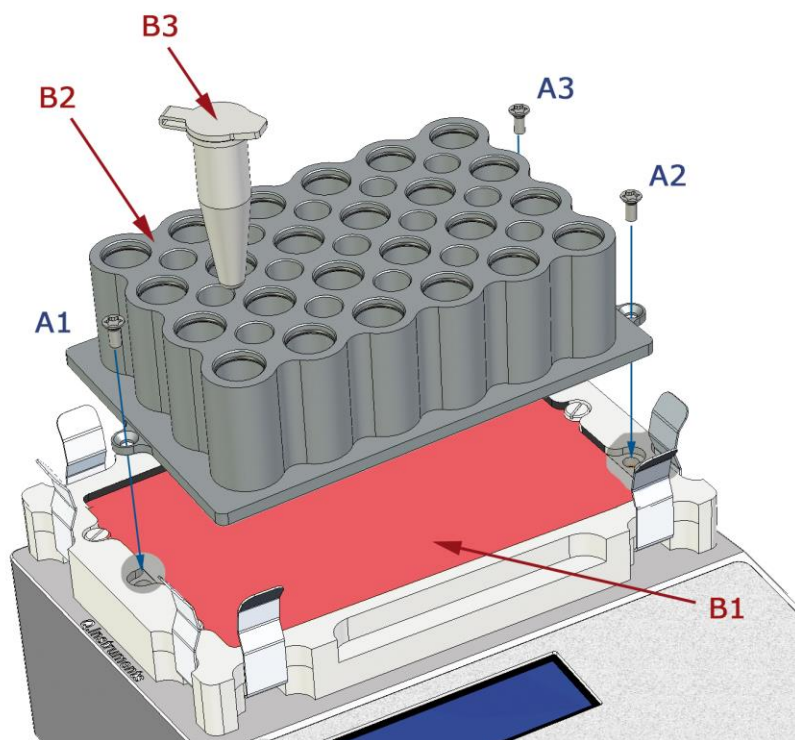
To change the adapter plate, please follow the subsequent steps.

At first, please remove the 2.0 mm thick safety cover or the existing adapter:

1. Turn Off the instrument!
2. Remove all sample carriers B3.
3. Loosen the 3 torx screws A1, A2 and A3 by using the supplied screwdriver (Torx size 8, rotate left).
4. Take off the 2 mm thick safety cover or the existing adapter B2 straight up and keep it into a clean storage box.

Now you can mount the right adapter:

5. Please take care to a clean, dirt-free & particle-free operation.
6. Insert the new adapter straight into the impression into the plate holder B1. Check the fixed position.
7. Fix all torx screws A1, A2 und A3 using clockwise rotation
8. Please take care to uniform controlled tightening of screws to ensure a good fit.
9. Please take care to good and tight fit of sample carriers B3.
10. Turn On the instrument!
11. The BioShake will recognize the different block types.
All pending information are shown in the display.



Heavier blocks may limit the shaking speed.
(see chapter 6.4, automatic adjustment of mixing speed limits)

8 ERROR HANDLING

All BioShake devices have internal algorithms and sensors for monitoring operating parameters and error detection.

After switching on the BioShake unit is performing predefined numerous self-check routines to guarantee its system integrity.

Any errors are sending out to the LCD display as your communication interface. Those are easier to detect and localize.

9 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 ω , 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.

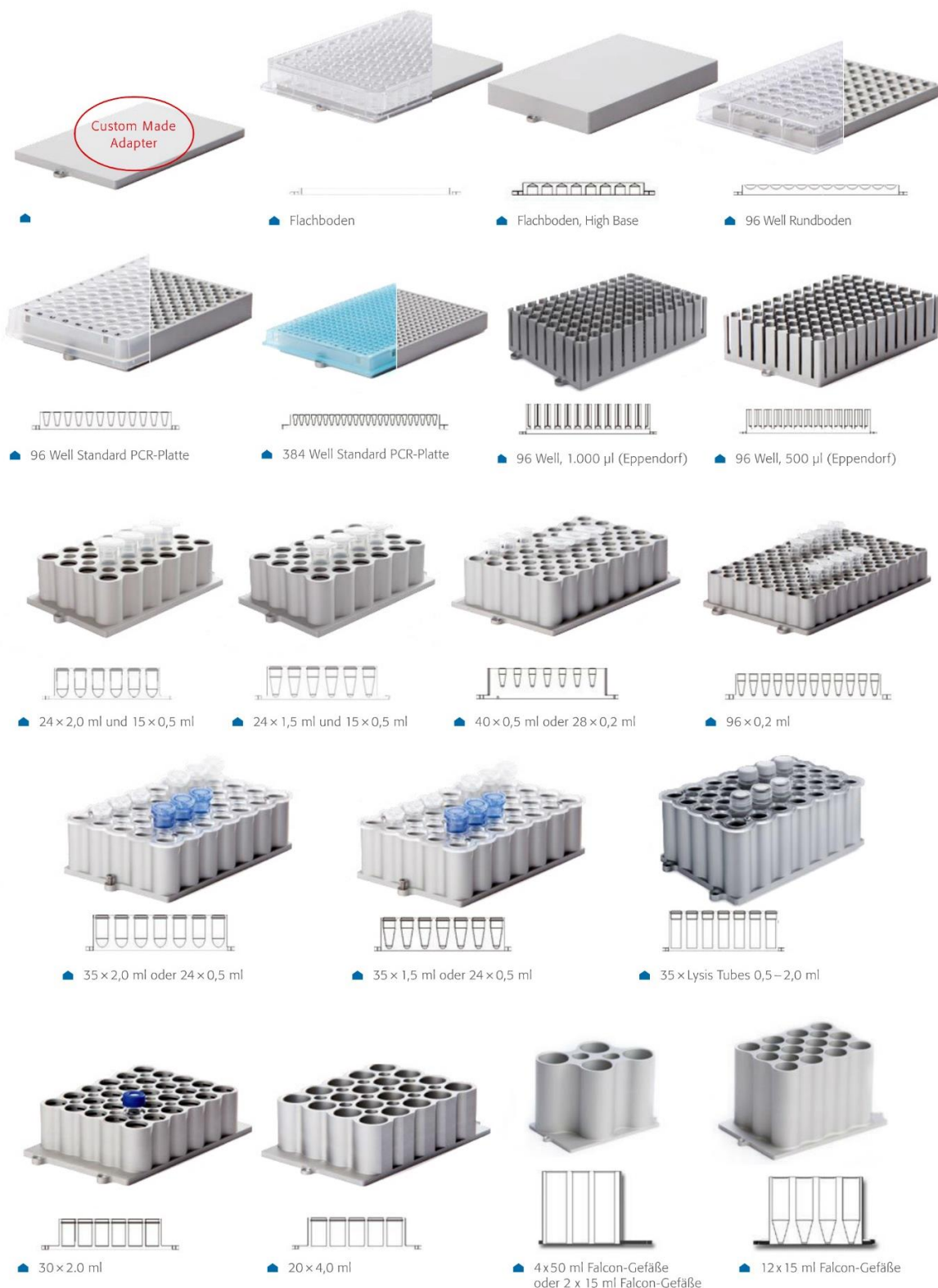
Only mix in sealed tubes and plates. Sample material can be flung out of open, inadequately sealed or unstable tubes and plates.

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).

10 ADAPTER FOR MICROPLATES, TUBES AND VIALS

For all BioShake units QInstruments 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. Ask us about tailor-made solutions for your requirements.



11 TECHNICAL SPECIFICATION

Adapter Plates	
Microplates	96-, 384-, and 1536-well microplates, Deep well plates, PCR plates
Tubes	0.2 / 0.5 / 1.5 / 2.0 ml standard microcentrifuge tubes
Glass vials	2.0 / 4.0 / 6.0 ml glass vials
others	on request
Temperature control	
Temperature range	ambient to 99°C (<i>no active cooling</i>)
Temperature setting	0.5°C or 1°C increment adjustable from 0°C to 99°C
Temperature accuracy	±0.1°C
Temperature uniformity	±0.5°C at 45°C / ±0.7°C at 75°C / ±1.0°C at 95°C
Heat-up time	ca. 7-10°C/min (<i>depend on the adapter plate</i>) ca. 10-20 min from ambient to 95°C
Mixing	
Mixing frequency	Microplates: 200 to 3,000 rpm (<i>depend on the adapter plate</i>) Tubes, glass vials: 200 to 1,800 rpm
Mixing orbit	Constant 2 mm
Speed setting resolution	50 rpm increments
Mixing regulation accuracy	± 25 rpm
Short-Mix function	Yes
Timer	
Timer setting	1 sec - 99 h with automatic switch to stand-by
Timer setting resolution	1 min / 1 sec; time unit is adjustable
Readability	Minutes, Seconds
Continuous working	Yes
Audible Alarm	Yes
Programming	
Programs stored	2
Definable buttons	P1 and P2
Individual program capacity	3 steps
Internal memory	Yes
Display	
Display	2 x 16 digits LCD-display with backlight (blue)
Target values	Time, Mixing frequency, Temperature
Actual values	Time, Mixing frequency, Temperature
Electrical	
Controller	Micro controller
Power switch	Yes
Operating Voltages	24 V DC input . I_{max} 4,5 A . P_{max} 108 Watt
Properties	
Housing Material	Aluminum anodized
Environment operating range	+5°C to 45°C (80 % max. relative humidity)
Dimensions (W x D x H)	142 mm x 170 mm x 80 mm (5.59 in x 6.69 in x 3.14 inches)
Weight	2.8 kg (6.2 lbs)

Special requirements on a power supply unit

Electrical	
Power supply	External power supply 24VDC 120W (CE/UL/CSA approved, 85-264 VAC, 47-63 Hz, IEC/EN60320-1 C14)
Operating Voltages	24 V DC output . I_{max} 5.0 A . P_{max} 120 Watt
Degree of protection	IP 20



Technical specifications subject to change at any time without notice!

12 EUROPEAN DECLARATION OF CONFORMITY

In accordance with 2004/108/EC

Manufacturer name: QInstruments GmbH
Address: Loebstedter Str. 101 . 07749 Jena . Germany

Hereby we explain that those corresponds to below designated products in its conception and design as well as in circulation the execution the fundamental safety and health requirements of the Community directive low-voltage brought by us. In the case of a change of the product not coordinated with us this explanation loses its validity.

Product type: Heater shaker for lab bench
Product name: BioShake iQ **with part no:** 1808-0506

In accordance with relevant EC directives/standards:

2014/30/EU – The Electromagnetic Compatibility Directive
2011/65/EU – Restriction of Hazardous Substances Directive
2015/863/EU amending Annex II to Directive 2011/65/EU
EN 61326-1:2013-07
DIN EN 61010-1:2020-03
DIN EN 61010-2-010:2015-05
DIN EN 61010-2-051:2016-02
EN 55011:2017-03
EN 50581:2013-02 (based on)

CE was at first applied: 2011

Date of issue: June 1th, 2021
Place of issue: Jena, Germany



The CE certified instrument **BioShake iQ** and **BioShake XP** are identical in development and construction.

13 MAINTENANCE AND CLEANING

The device is maintenance-free for standard use purposes.

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 use another cleaning solution!

If you have any questions about cleaning please contact your distributor or directly QInstruments.

Should it become necessary to repair the equipment, it should be returned to an authorized servicing agent. The equipment must be clean and free from harmful substances. Always ship the shaker well-packed, preferably in the original shipping container in order to avoid damages.



For more details how to service the device, please refer to the document “**Service Manual**”.

14 ORDERING INFORMATION

Order no.	Description
1808-0506	BioShake iQ



Description: *High-speed thermoshaker
For universal using with microplates, tube, glass vials or others
Mixing from 0 - 3,000 rpm, Heating and temperature control from RT- 99°C*

Scope of delivery*: *1x BioShake iQ, 1x power supply 110-240 VAC / 24 VDC,
1x power cord Europe, 1x power cord country specific version,
1x documentation, 1x calibration certificate*

* Adapters are not included in delivery and should to be ordered separately.

Adapter (only for using with BioShake XP, BioShake iQ)

Order no.	Description
Thermo adapter for micro well plates & PCR plates	
1808-1021	Adapter for micro well plate . Flat bottom standard . e.g. Nunc® #269620, Greiner® #781101
1808-1022	Adapter for micro well plate . Flat bottom High Base . e.g. Greiner® HiBase #78407x, 78410
1808-1024	Adapter for micro well plate . Flat bottom Low Base . e.g. Aurora® storage plate, Alere ArrayStrip®
1808-1032	Adapter for micro well plate . 96 well round bottom . e.g. Greiner®, NUNC®, Matrix® plates
1808-1041	Adapter for PCR Plate . 96 well . e.g. Eppendorf twin.tec® #0030-128.672
1808-1051	Adapter for PCR Plate . 384 well . e.g. Eppendorf twin.tec® #0030-128.532
Thermo adapter for deep well plates & storage plates	
1808-1121	Adapter for Deep Well Plate . Eppendorf® 96/1000 µl . #0030-503.209
1808-1131	Adapter for Deep Well Plate . Eppendorf® 96/500 µl . #0030-501.101
1808-1141	Adapter for Deep Well Plate . BRAND® 96/1100 µl U-bottom . #701350
1808-1151	Adapter for Deep Well Plate . NUNC® 96/2000 µl . #278743, 278752 Adapter for Deep Well Plate . Axygen® 96/2.0 ml round bottom . #P-DW-20-C
1808-1161	Adapter for Deep Well Plate . Axygen® 96/0.6 ml V-bottom . #P-DW-500-C
1808-1171	Adapter for Storage Plate . Abgene® 96/2.2 ml MARK II square well . #AB-09032
1808-1172	Adapter for Storage Plate . Abgene® 96/0.8 ml round well . #AB-0765, AB-0859 . Adapter for Storage Plate . HJ-Bioanalytik® 96/1.2 ml riplate low profile . #750289
1808-1181	Adapter for Mega Block . Sarstedt® Megablock 96/2.2 ml . #82.1972.002
1808-1201	Adapter for Storage Plate . Corning® 96/320 µl V-bottom . #3342, 3347, 3357, 3363, 3894-3898
1808-1211	Adapter for Masterblock . Greiner® 96/1.0 ml U-bottom . #78020x, 78026x

Order no.	Description
Thermo adapter for centrifuge tubes with conical shape	
1808-1060	Adapter for tubes . 15x 5.0 ml
1808-1061	Adapter for tubes . 24x 2.0 ml or 15x 0.5 ml
1808-1062	Adapter for tubes . 24x 1.5 ml or 15x 0.5 ml
1808-1063	Adapter for tubes . 40x 0.5 ml or 28x 0.2 ml
1808-1064	Adapter for tubes . 96x 0.2 ml
1808-1067	Adapter for lysis tubes . 35x 0.5-2.0 ml, Ø 10.2 mm
1808-1093	Adapter for FALCON® tubes . 4x 50 ml or 2x 15 ml
1808-1094	Adapter for FALCON® tubes . 12x 15 ml

Order no.	Description
Thermo adapter for tubes/vials with cylindrical shape	
1808-1069	Adapter for glass vials . 35x 2.0 ml, Ø 10.8 mm
1808-1071	Adapter for glass vials . 30x 2.0 ml, Ø 12 mm
1808-1072	Adapter for glass vials . 20x 4.0 ml, Ø 15 mm
1808-1073	Adapter for glass vials . 20x 4.0 ml, Ø 17 mm
1808-1074	Adapter for glass vials . 20x 6.0 ml Ø 19 mm
Adapter for Alere ArrayStrip (AS) and ArrayTube (AT)	
1808-1081	Adapter for Alere® ArrayStrip (5 stripes)
1808-1085	Adapter for 24x Alere® ArrayTubes 1.5 ml
Customized adapters	
1808-1000	<p>Customized adapters are available on request</p> <p><i>You need a suitable adapter for your application? Enjoy a convenient development and design of your own adapter according to your sample carrier and specification. An accepted specification needs to contain the following complete information: name of the sample container, name of the manufacturer, article number, and a general description of the area of application.</i></p>

Service material and spare parts

Order no.	Description
Power parts	
2016-9011	External power supply 24VDC 120W (CE/UL/CSA approved, 85-264 VAC, 47-63 Hz, IEC/EN60320-1 C14)
2016-9101	Power cord Europe (IEC/EN 60320-1 C13)
2016-9102	Power cord Switzerland (IEC/EN 60320-1 C13)
2016-9103	Power cord United Kingdom (IEC/EN 60320-1 C13)
2016-9104	Power cord Italy (IEC/EN 60320-1 C13)
2016-9110	Power cord USA (IEC/EN 60320-1 C13)
2016-9111	Power cord Japan (IEC/EN 60320-1 C13)
2016-9112	Power cord China/Australia (IEC/EN 60320-1 C13)
2016-9113	Power cord South Korea (IEC/EN 60320-1 C13)
2016-9115	Power cord South Africa (IEC/EN 60320-1 C13)



Please use the original accessories recommended by QInstruments.
Please use the original power supply recommended by QInstruments.
Using spare parts or disposables which we have not recommended can reduce the precision, accuracy and life of the BioShake.
QInstruments do not honour any warranty or accept any responsibility for damage resulting from such action.

15 SUPPORT

We provide a range of technical material (e.g. application notes, bulletins, instruction manuals, and selection and use guides) that support our products and key applications.

All of our technical documents can be viewed and printed. Many documents are available as pdf files, which can be downloaded from our homepage.

Please contact QInstruments for additional information and availability about the BioShake. For this please use our online contact form or contact us directly via phone or email.

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WO2008135565, US8323588, EP2144716: Sample handling device for and methods of handling a sample

WO2011113858, US9126162, EP2547431: Positioning unit for a functional unit

WO2013113847, US10052598, EP2809436: Cog-based mechanism for generating an orbital shaking motion

WO2013113849, US9371889, EP2809435: Mechanism for generating an orbital motion or a rotation motion by inverting a drive direction of a drive unit

WO2014207243, US20160368003, EP3013480: Application-specific sample processing by modules surrounding a rotor mechanism for sample mixing and sample separation

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Notes

Notes