

ES-20/60

Orbital Shaker-incubator



Operating Manual
Certificate

for versions
V.2AD
V.2AE

Contents

1.	Safety precautions	3
2.	General Information	4
3.	Getting started.....	4
4.	Operation	6
5.	Specifications	8
6.	Maintenance.....	9
7.	Warranty and Claims.....	10
8.	EU Declaration of Conformity.....	11

1. Safety precautions

The following symbols mean:



Caution!

Make sure you have fully read and understood the present Manual before using the equipment. Please pay special attention to sections marked by this symbol.

GENERAL SAFETY

- Use only as specified in the Operating Manual provided.
- Do not use a dropped or damaged unit.
- Store and transport the unit in a horizontal position (see package label).
- After transportation or storage and before connecting to electric circuit, keep the unit under room temperature for 2-3 h.
- Before using any cleaning or decontamination methods except those recommended by the manufacturer, check with the manufacturer that the proposed method will not damage the equipment.
- Do not make modifications in design of the unit.

ELECTRICAL SAFETY

- Connect only to electric circuit with voltage corresponding to that on the serial number label.
- Do not plug the unit into an ungrounded power socket, and do not use an ungrounded extension lead.
- Ensure that the power switch and plug are easily accessible during use.
- Disconnect the unit from the electric circuit before moving.
- Disconnect the plug from power socket to turn off the unit.
- If liquid penetrates into the unit, disconnect it from the electric circuit and have it checked by a repair and maintenance technician.
- Do not operate the unit in premises where condensation can form. Operating conditions of the unit are defined in the Specification section.

DURING OPERATION

- Do not impede the platform motion.
- Make sure that all sample vessels are tightly sealed. Humidity caused by evaporation from unsealed vessels inside the incubator will damage the unit.
- Do not operate the unit in premises with aggressive or explosive chemical mixtures. Please contact manufacturer for possibility of unit operation in specific atmosphere.
- Do not use outside laboratory rooms.
- Do not place a load exceeding the maximum load value mentioned in the Specifications section of this Manual.
- Do not operate the unit if it is faulty or has been installed incorrectly.

BIOLOGICAL SAFETY

- It is the user's responsibility to carry out appropriate decontamination if hazardous material is spilt on or penetrates into the equipment.

2. General Information

ES-20/60 Orbital Shaker-incubator for biotechnological and pharmaceutical laboratories is a professional category equipment designed for cultivation of micro organisms cells and eukaryotic cells, including animal, plant and insect cells. Shaker is equipped with a direct-drive mechanism for platform motion. It provides reliable and stable operation for the long term experiments needed for cell cultivation.

ES-20/60 Orbital Shaker-incubator provides smooth (or intensive) mixing in flasks installed on the platform. Built-in thermoresistant brushless fan provides precise temperature distribution inside the chamber (from 10°C above ambient up to +80°C). The inner chamber is made of stainless steel. State-of-the-art motor, newest thermal insulation materials used, program provided soft start of the platform motion and temperature regulation PID-control decrease the energy consumption and make the shaker-incubator highly energy efficient despite its relatively large size.

3. Getting started

3.1. Unpacking

Remove packing materials carefully and retain them for future shipment or storage of the unit. Examine the unit carefully for any damage incurred during transit. The warranty does not cover in-transit damage. Warranty covers only the units transported in the original package.



Caution! Due to its size and weight (41 kg), the unit requires two people to lift or move it.

3.2. Complete set. Package contents:

Standard set

- ES-20/60 Orbital Shaker-Incubator 1 piece
- power cord 1 piece
- spare fuse (inside fuse holder) 1 piece
- four screws and a wrench 1 set
- Operating Manual; Certificate 1 copy

Optional accessories

- P-30/100 platform ❶on request
- P-16/250 platform ❷on request
- P-9/500 platform ❸on request
- P-6/1000 platform ❹on request
- PP-400 platform ❺on request
- UP-168 universal platform ❻on request
- FC-100, FC-250, FC-500, FC-1000 clamps for UP-168on request



1



2



3



4



5



6

3.3. Setup:

- place the unit upon even horizontal non-flammable surface at least 30 cm away from any flammable materials;



Note!

Ensure that the unit is placed on solid, level surface, which is able to support its weight.

- remove protective film from the display;
- plug the power cord into the socket on the rear, and position the unit so that there is easy access to the power switch and plug.

3.4. Platform installation:

- remove the silicone mat from the platform;
- secure the platform on the stands on top of the unit with the four screws using the provided hex driver and cover the platform with the silicone mat.

4. Operation

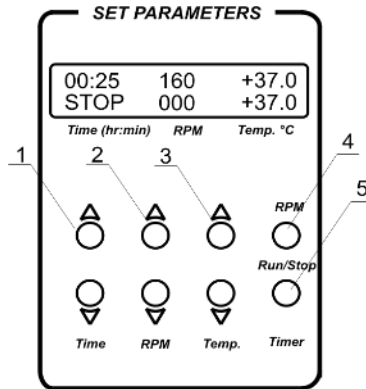


Fig.1. Control panel

- 4.1. Connect the unit to a grounded power socket. Set the **Power** switch on the front side to position I (ON).
- 4.2. The display will turn on with the upper line showing the previously set time, speed and temperature and the lower line showing current readings of the same parameters (chamber temperature °C, which automatically starts rising according to the temperature set in the upper line).
- 4.3. **Setting the parameters.** Use the readings in the upper line of the display, while setting the parameters required. The set parameters can also be changed during operation.
 - 4.3.1. **Setting time (Time).** Using the ▲ and ▼ **Time** keys (Fig. 1/1) set the required working time interval in hours and minutes (increment 1 min). Pressing the key for more than 3 s will increase the increment.
 - 4.3.2. **Speed set (RPM).** Using the ▲ and ▼ **RPM** keys (Fig. 1/2) set the required shaking intensity in revolutions per minute (increment 10 rpm). Pressing the key for more than 3 s will increase the increment.
 - 4.3.3. **Temperature set (Temp.°C).** Using the ▲ and ▼ **Temp.** keys (Fig. 1/3) set the required temperature (increment 0.1°C). Pressing the key for more than 3 s will increase the increment.



Caution: The chamber heating can be turned off only by setting the temperature value below 25 °C.

4.4. Program execution.

4.4.1. Open the door and place the samples on the platform. Close the door.



Caution!

Please make sure that all vessels are tightly sealed. Humidity caused by evaporation from unsealed vessels inside the incubator will damage the unit!

4.4.2. Press the **RPM-Run/Stop** key (Fig. 1/4). The platform will start rotating and the timer indicator will start counting the time interval (with 1 min precision).



Note:

If the speed is set to zero, pressing the **RPM-Run/Stop** key will start the timer, but the platform will not move.

4.4.3. After finishing the program (after the set time elapses), the platform motion will stop and the timer will be showing the flashing reading STOP accompanied by the repetitive sound signal until the **RPM-Run/Stop** key is pressed.

4.4.4. If the working time is not set (the timer indicator in the upper line shows 00:00), pressing the **RPM-Run/Stop** key will start continuous operation of the unit (with countdown timer in the lower line and indication OFF in the upper line) until the **RPM-Run/Stop** key is pressed again.



Caution:

At the end of the set time, the platform movement is stopped automatically, but the heating can be stopped ONLY manually by reducing the temperature using the ▼ **Temp.** key (Fig. 1/3 - lower key) till the OFF sign appears in the upper line of the display.

4.4.5. The timer can be restarted during the unit operation if necessary. Press the **Timer-Run/Stop** key once (Fig. 1/5) to stop the timer. Press the **Timer-Run/Stop** key again to restart the timer.

4.4.6. The platform motion can be stopped at any time by pressing the **RPM-Run/Stop** key. In this case, the program realisation and the platform motion will stop and the timer will switch into the STOP mode saving previously set time. Press the **RPM-Run/Stop** key to repeat the operation with the same time and speed.

4.5. At the end of operation set the **Power** switch in position O (Off). Disconnect the power cord from electric circuit.

5. Specifications

The unit is designed for operation in cold rooms, incubators and closed laboratory rooms at ambient temperature from +4°C to +40°C in non-condensing atmosphere and maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C.

5.1. Temperature specification

Setting range+25°C ... +80 °C (increment 0.1°C)
 Control range 10°C above ambient ... +80°C
 Stability.....±0.5°C
 Heat up time to maximum temperature inside the flasks 90 min

5.2. General specification

Speed control range 50 - 250 rpm (increment 10 rpm)
 Digital time setting 1 min - 96 hrs (increment 1 min) / non-stop
 Maximum continuous operation time 30 days
 Recommended interval between operation sessions not less than 8 hours
 Maximum load 8 kg
 Orbit 20 mm
 Display 2x16 signs, LCD
 Dimensions 590x525x510 mm
 Dimensions of the inner chamber 460x350x400 mm
 Operating voltage/ power consumption 230 V, 50/60 Hz / 450 W (2 A) or
 120 V, 50/60 Hz / 450 W (4,5 A)
 Weight* 41.1 kg

Optional accessories	Description	Catalogue number
P-30/100	Platform with clamps for 30 flasks of 100 ml (360x400 mm)	BS-010135-BK
P-16/250	Platform with clamps for 30 flasks of 100 ml (360x400 mm)	BS-010135-CK
P-9/500	Platform with clamps for 30 flasks of 100 ml (360x400 mm)	BS-010135-AK
P-6/1000	Platform with clamps for 30 flasks of 100 ml (360x400 mm)	BS-010135-DK
PP-400	Flat platform with non-slip silicone mat (360x400 mm)	BS-010135-FK
UP-168	Universal platform for different flasks	BS-010135-JK
FC-100	Clamp for 100 ml flask for UP-168 platform (ø 65 mm)	BS-010126-HK
FC-250	Clamp for 250 ml flask for UP-168 platform (ø 85 mm)	BS-010126-JK
FC-500	Clamp for 500 ml flask for UP-168 platform (ø 105 mm)	BS-010126-LK
FC-1000	Clamp for 1000 ml flask for UP-168 platform (ø 130 mm)	BS-010126-İK

Biosan is committed to a continuous programme of improvement and reserves the right to alter design and specifications of the equipment without additional notice.

* Accurate within ±10%.

6. Maintenance

- 6.1. If the unit requires maintenance, disconnect the unit from the electric circuit and contact Biosan or your local Biosan representative.
- 6.2. All maintenance and repair operations must be performed only by qualified and specially trained personnel.
- 6.3. Care and Cleaning
 - 6.3.1. Standard ethanol (75%) or other cleaning agents recommended for cleaning and decontamination of the stainless steel surfaces.
 - 6.3.2. For decontamination, it is recommended to use a special DNA/RNA removing solution (e.g. DNA-Exitus Plus™, RNase-Exitus Plus™).
- 6.4. Fuse replacement.

Disconnect the power cord from electric circuit. Disconnect the power cable from the socket on the rear of the shaker-incubator. Open the fuse holder. Check and replace with the correct fuse if necessary: for 230 V, M 3.15 A or for 120 V, M 5.0 A (type **M** - time lag: **Medium**).

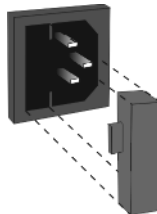


Fig. 2. Fuse replacement

7. Warranty and Claims

- 7.1. The Manufacturer guarantees the compliance of the unit with the requirements of Specifications, provided the Customer follows the operation, storage and transportation instructions.
- 7.2. The warranted service life of the unit from the date of its delivery to the Customer is 24 months, excluding optional accessories, see table in the **Specifications** section. For extended warranty register the unit, see p. 7.5.
- 7.3. Warranty covers only the units transported in the original package.
- 7.4. If any manufacturing defects are discovered by the Customer, an unsatisfactory equipment claim shall be compiled, certified and sent to the local distributor address. To obtain the claim form, visit section **Technical support** on our website at link below.
- 7.5. Extended warranty. For **ES-20/60**, a *Premium* class model, one year of extended warranty is available free of charge after registration, during 6 months from the date of sale. Online registration form can be found in section **Warranty registration** on our website at the link below.
- 7.6. Description of the classes of our products is available in the **Product class description** section on our website at the link below.

Technical support



biosan.lv/en/support

Warranty registration



biosan.lv/register-en

Product class description



biosan.lv/classes-en

- 7.7. The following information will be required in the event that warranty or post-warranty service comes necessary. Complete the table below and retain for your records.

Model	ES-20/60 Orbital Shaker-incubator
Serial number	
Date of sale	

8. EU Declaration of Conformity

EU Declaration of Conformity

Unit type	Shakers-incubators
Models	ES-20, ES-20/60
Serial number	14 digits styled XXXXXYYMMZZZZ, where XXXXXX is model code, YY and MM – year and month of production, ZZZZ – unit number.
Manufacturer	SIA BIOSAN Latvia, LV-1067, Riga, Ratsupites str. 7/2
Applicable Directives	EMC Directive 2014/30/EU LVD Directive 2014/35/EU RoHS2 2011/65/EU WEEE 2012/19/EU
Applicable Standards	<u>LVS EN 61326-1: 2013</u> Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements. <u>LVS EN 61010-1: 2011</u> Safety requirements for electrical equipment for measurement, control, and laboratory use. General requirements. <u>LVS EN 61010-2-010: 2015</u> Particular requirements for laboratory equipment for the heating of materials. <u>LVS EN 61010-2-051: 2015</u> Particular requirements for laboratory equipment for mixing and stirring.

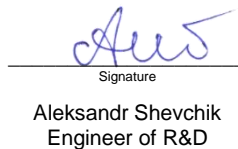
We declare that this product conforms to the requirements of the above Directives



Signature
Svetlana Bankovska
Managing director

19.07.2016.

Date



Signature
Aleksandr Shevchik
Engineer of R&D

19.07.2016

Date

HOW TO CHOOSE

A PROPER SHAKER, ROCKER, VORTEX

Sample volume $10^3 \dots 10^2$ ml

Erlenmeyer flasks and
Cultivation flasks



Sample volume 10^1 ml

Petri dishes, vacutainers
and tubes up to 50 ml



Sample volume $10^0 \dots 10^{-3}$ ml

PCR plates, microtest plates
and Eppendorf type tubes



PSU-20i, Orbital Shaker



ES-20/60, Orbital
Shaker-Incubator



PSU-10i,
Orbital Shaker



ES-20, Orbital
Shaker-Incubator



MR-12,
Rocker-Shaker



Multi RS-60,
Programmable rotator

Bio RS-24,
Mini-Rotator



Multi Bio RS-24,
Programmable
rotator



V-1 plus,
Vortex



NEW
RTS-1 and RTS-1C,
Personal bioreactors



MR-1,
Mini Rocker-Shaker



Multi Bio 3D, Mini Shaker



MSV-3500,
Multi Speed Vortex

Applications:
Microbiology
Extraction
Cell cultivation

Applications:
Microbiology
Extraction
Cell cultivation
Hematology

Applications:
Nucleic acid Analysis
Molecular Analysis
Protein Analysis
Genomic Analysis

Applications:
Agglutination
Gel staining/
destaining

Applications:
Agglutination
Extraction
Blot hybridisation
Gel staining/destaining



PST-60HL-4,
Thermo-Shaker

PST-60HL,
Thermo-Shaker



PST-100HL,
Thermo-Shaker

TS-DW, Thermo-
Shaker for deep
well plates



MPS-1,
Multi Plate Shaker



PSU-2T,
Mini-Shaker

Applications:
ELISA Analysis
Genomic Analysis
Hybridization
Immunology



CVP-2, Centrifuge
vortex for PCR
plates



TS-100, TS-100C, Thermo-Shakers



V-32, Multi-Vortex