Grant bio

Orbital Shaker-Incubator ES-80

Operating instructions

For versions: V.2GD
V.2GE

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1. Safety

The following symbol means:

Caution! Read this operating instruction fully before use and pay particular attention to sections containing this symbol.

GENERAL SAFETY

- Operation of the unit must be carried out according to the given operating manual.
- The unit should not be used if dropped or damaged.
- The unit must be stored and transported only in a vertical position (see marking on the package).
- After transport or storage in humid conditions dry out the unit (2-3 hrs) before connecting it to the supply voltage.
- Before using any cleaning or decontamination method except those recommended by the manufacturer, user should check with the manufacturer that the proposed method will not damage the equipment.
- Do not attempt to modify the unit.

ELECTRICAL SAFETY

- Connect only to the mains with voltage corresponding to that on the serial number label.
- Do not plug the unit into the mains outlet without grounding, and do not use extension lead without grounding.
- Ensure that the mains switch and plug are easily accessible during use.
- Before moving, disconnect the unit from the mains outlet.
- To turn off the unit, disconnect the power plug from the mains outlet.
- If liquid is spilled inside the unit, disconnect it from the mains and have it checked by a competent person.

DURING OPERATION

- Do not impede the platform motion during operation.
- Do not operate the unit if you think it may have been incorrectly installed or repaired.
- For indoor use only.
- Do not use outside laboratory rooms.
- Do not place a load exceeding maximum loading mentioned in ref p 8 Specifications.
- Do not operate the unit if it is faulty or been incorrectly installed.

BIOLOGICAL SAFETY

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

2. General Information

Orbital Shaker-Incubator ES-80 for biotechnological and pharmaceutical laboratories is a professional category equipment designed for the cultivation of micro organisms, cells and eukaryotic cells including animal, plant and insect cells. The 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 growth.

Orbital Shaker-Incubator ES-80 provides even (or vigorous) mixing in flasks installed on the platform. A built-in thermoresistant brushless fan provides precise temperature distribution inside the chamber (adjustable from +10°C above room temperature up to +80°C). The chamber inside is made of stainless steel. A state-of-the-art motor, latest thermal insulation materials, soft-start of the platform motion and temperature 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 packaging carefully, and retain for future shipment or storage of the unit.

Caution! Due to its size and weight (43 kg) the unit requires two people to lift or move it.

3.2. The ES-80 set includes

- Orbital Shaker-Incubator ES-80 .....1 piece
- Power cord .....1 piece
- Spare fuse (inside fuse holder) .....1 piece
- Four screws and a hex key .....1 set
- Operating Instructions; Declaration of Conformity.....1 copy

Optional accessories:

- Platform P30-100 ❶ .....on request
- Platform P16-250 ❷ .....on request
- Platform P9-500 ❸ .....on request
- Platform P6-1000 ❹ .....on request
- Platform PP-400 ❺ .....on request

❶ ❷ ❸ ❹ ❺

3.3. Set up:

- place the unit on an even horizontal non-flammable surface away from any flammable materials (not less than 30 cm);

Note! Ensure that the unit is placed on solid, level surface, which is able to support it's weight.

- plug the mains cable into the socket on the rear, and position the unit so that there is easy access to the power switch and plug.

4. Operation of ES-80

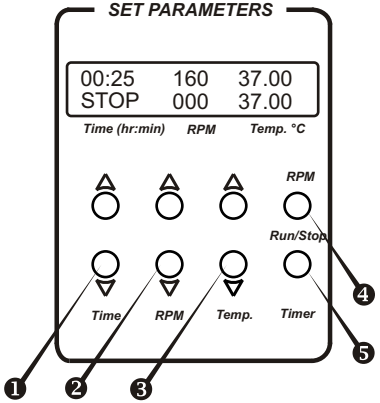

Fig.1 Control panel

4.1. Connect the power cord to the mains outlet which provides a safety earth (ground) terminal. Set the **Power** switch in position I (ON) on the front side.

4.2. The display will turn on with the upper line showing time, speed and temperature set earlier and the lower line showing current readings of the same parameters (thermoblock temperature °C, which automatically starts rising according to the temperature set in the upper line).

How to set the necessary parameters

Use the readings in the upper line of the display, while setting the necessary parameters.

Time set (Time)

4.3. With the help of "▲" and "▼" **Time** keys (Fig. 1/❶) set the required working time interval in hours and minutes (increment 1 min). If the key is pressed more than 2 sec the increment becomes bigger.

Speed set (RPM)

4.4. With the help of "▲" and "▼" **RPM** keys (Fig. 1/❷) set the required shaking intensity in revolutions per minute (increment 10 RPM). If the key is pressed more than 2 sec the increment becomes bigger.

Temperature set (Temp.)

4.5. With the help of "▲" and "▼" **Temp.** keys (Fig. 1/❸) set the necessary temperature (increment 0.1ºC). If the key is pressed more than 2 sec the increment becomes bigger.
The set parameters can also be changed during operation.

Caution: It is possible to turn off heating only by setting the required temperature below 25°C.

Program execution

4.6. Fix the vessels on the platform.

4.7. Press the **RPM-Run/Stop** key (Fig. 1/❹). The platform will start rotation and the timer indicator will start counting up the time interval (with 1 min precision).
Please note: If the speed is set to zero, pressing **RPM-Run/Stop** key starts the timer, but the platform does not move.

4.8. At the end of the program (after the set time elapses) the platform motion stops and the timer shows the flashing reading STOP accompanied by the repetitive sound signal until the **RPM-Run/Stop** key is pressed.

4.9. If the working time is not set (or deleted) and the timer indicator in the upper line shows 00:00, pressing the **Timer-Run/Stop** key cause the unit to operate continuously until the **Timer-Run/Stop** key is pressed again.

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

4.10. If required, it is a possibility to restart the timer when it is running. Press the **Timer-Run/Stop** key once (Fig. 1/❺) to stop the timer. Press the **Timer-Run/Stop** key again to restart the timer.

4.11. The platform motion can be stopped at any time by pressing the **RPM-Run/Stop** key. In this case the program and the platform motion stops and timer is set back to zero switching into the STOP mode. Press the **RPM-Run/Stop** key to repeat the operation with the same time and speed.

4.12. At the end of operation set the **Power** switch in position O (Off). Disconnect the power cord from the mains outlet.

5. Specifications

The product is designed for operation indoors in a laboratory at altitudes up to 2000 m, with ambient temperature from +4°C to +40°C and maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C.

5.1. Temperature specification

- Temperature regulation range .....+25°C ... +80 °C* (increment 0.1°C)
- Temperature control range .....10°C above ambient ... +80°C
- Temperature stability .....±0.5°C
- Heat up time till max. temperature inside the flasks .....90 min

5.2. General specification

- Speed setting 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 loading .....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 w-out platform, not more .....43 kg

Optional accessories	Description
P30-100	Platform with clamps for 30x100 ml flasks, working dimensions 360x400 mm
P16-250	Platform with clamps for 16x250 ml flasks, working dimensions 360x400 mm
P9-500	Platform with clamps for 9x500 ml flasks, working dimensions 360x400 mm
P6-1000	Platform with clamps for 6x1000 ml flasks, working dimensions 360x400 mm
PP-400*	Flat platform with non-slip rubber mat, working dimensions 360x400 mm

* Do not use rubber mat on the PP-400 at temperatures above 42 °C.

Grant is committed to a continuous programme of improvement, specifications may be changed without notice.

6. Guarantee and Service

6.1. Guarantee

When used in laboratory conditions and according to these working instructions, this product is guaranteed for TWO YEARS against faulty materials or workmanship.

6.2. Service

There are no user-serviceable parts inside the unit. For all maintenance and repairs (except as defined below) return to our service department in the UK or in other countries, our distributor.

Cleaning

Standard ethanol (75%) or other cleaning agents recommended for cleaning and disinfection of the stainless steel surfaces.

The door's window is made of of organic glass (poly (methyl methacrylate) Plexiglass®) and is prone to scuffing and scratches if improperly cleaned. Care during cleaning of the door's window is recommended to reduce wear of the Plexiglass surface.

Caution! Clean the door's window with a mild detergent; never use organic based compounds, pure alcohol, alcohol-containing cleaners (more than 15 %) or Ammonia containing cleaners for Plexiglass! Do not use abrasive pads or cleansers.

For decontamination, it is recommended to use a special DNA/RNA removing solution (e.g. DNA-Exitus PlusTM, RNase-Exitus PlusTM).

The table below shows the interreaction of Plexiglass with ethyl alcohol and other solutions.

Liquid	Interreaction with Plexiglass
DNA-Exitus PlusTM	No reaction.
RNase-Exitus PlusTM	No reaction.
Ethyl alcohol 10-15 %	No reaction.
Ethyl alcohol 30 %	Limited reaction.
Ethyl alcohol Pure	Full reaction. Do not use!
H_2O_2 6%	No reaction.

Standard ethanol (75%) or other cleaning agents recommended for cleaning and disinfection of the stainless steel surfaces.

Fuse replacement

Disconnect the device from the mains power supply. Disconnect the power cable from the socket on the rear of the shaker-incubator. Open the fuse holder. Replace with the correct fuse (for 230 V, 50/60 Hz - T3.15 A, for 115 V, 50/60 Hz - T6.3 A).

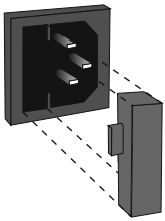

Fig.2 Fuse replacement

6.3. Routine safety tests

If routine tests are to be made, we recommend a test of the integrity of the protective earth conductor and an insulation test at 500 Vdc. Routine flash tests are not recommended for any electrical equipment, because repeated high voltage tests degrade insulation materials.

Declaration of Conformity

Manufacturer:	BIOSAN SIA Ratsupites 7, build.2, Riga, LV-1067, Latvia
Equipment name/type number:	ES-80
Description of Equipment:	Orbital Shaker-Incubator
Directive:	EMC Directive 2004/108/EC Low Voltage Directive 2006/95/EC

Applied Standards Harmonized Standards:	**EN 61326-1:** Electrical equipment for measurement, control and laboratory use EMC requirements. General requirements **EN 61010-1:** Safety requirements for electrical equipment for measurement, control and laboratory use. General requirements **EN 61010-2-010:** Particular requirements for laboratory equipment for the heating of materials **EN 61010-2-051:** Particular requirements for laboratory equipment for mixing and stirring

We declare that this product conforms to the requirements of the above Directive(s)

Signature

Svetlana Bankovska
Managing director

23.11.2012
Date

Signature

Aleksandr Shevchik
Engineer of R&D

23.11.2012
Date

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Environmental Shaker-Incubator/ES-80/2.01