Medical–Biological
Research & Technologies

MSH-300

Magnetic stirrer with hot plate

Operating Manual
Certificate

for versions:
V.4AA
V.4AC

Contents

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.

Caution! Surfaces can become hot during use.

Attention Magnetism! Effects of a strong magnetic field on the biological systems have to be taken in to account. Magnetic fields can affect heart pacemakers, data carriers, etc.

GENERAL SAFETY

- Use only as specified in the operating manual provided.
- The unit should not be used if dropped or damaged.
- After transportation or storage keep the unit at room temperature for 2-3 hours before connecting it to the electric circuit.
- Use only cleaning and decontamination methods recommended by the manufacturer.
- Do not make modifications to the 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 plug is easily accessible during use.
- Disconnect the power cord plug from the power socket before moving.
- 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 Specifications section.

DURING OPERATION

- Do not start operation at maximum speed.
- Do not operate the unit in environments with aggressive or explosive chemical mixtures. Please contact manufacturer for possibility of operation of the unit in specific atmosphere.
- Do not operate the unit if it is faulty or has been installed incorrectly.
- Do not leave the operating unit unattended.
- Do not use outside laboratory rooms.
- Avoid spilling alkaline solutions on an aluminum surface. Alkali can damage aluminum surfaces.

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

MSH-300 magnetic stirrer with hot plate is designed for simultaneous stirring and heating of different viscosity liquids.

The unit is designed for operation with different size magnetic stirring elements (10-50 mm long). It provides liquid stirring with the rotation speed of magnetic element up to 1250 rpm (max. speed depends on the magnetic element size, stirred volume, viscosity, glassware shape, etc.).

Application fields:

CHEMISTRY:	stirring reaction ingredients during fine organic synthesis, research in the organic catalysis field, different viscosity chemical reagents dissolving.
BIOCHEMISTRY:	solutions preparation, dialysis, salt and alcohol sedimentation of macromolecules, gradient forming in the column chromatography, etc.
SOIL SCIENCE:	biological and chemical substances and samples extraction, research of the soil and ground chemical and biochemical compounds.
BIOTECHNOLOGY:	using as a minireactor in the micro-organism cells cultivation, culture medium preparation, titration, etc.

MSH-300 is equipped with an attachable stand SR-1 that allows inserting different sensors (temperature, pH etc.) inside the liquid.

The unit is equipped with the samples overheat protection providing an automatic switch-off of the device when overheating for the set temperature difference occur (over 30°C).

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.

3.2. Complete set. Package contents:

- MSH-300 magnetic stirrer with hot plate .....1 pce.
- magnetic stirring element* .....1 pce.
- SR-1 attachable stand.....1 pce.
- spare fuse .....1 pce.
- Operating manual, Certificate .....1 copy

* Multi-purpose cylindrical magnetic stirring element (6x25 mm), encapsulated in PTFE.

3.3 Set up:

- place the unit upon even horizontal non-flammable surface at least 30 cm away from any flammable materials;
- position the unit so that there is easily accessible to the plug during use.

3.4. SR-1 stand installation

- Remove the screw on the fixing socket at the stirrer back (fig.1/1) and retain for future.
- Screw the part of the stand with the counter-nut into the fixing socket and secure with the counter-nut.
- Screw in the second part of the stand into the attached first part.

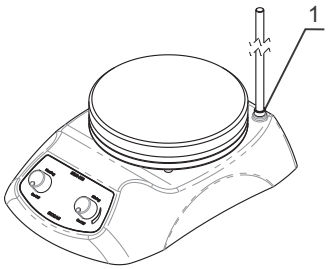

Fig. 1 Stand installation

4. Operation

Recommendation during operation

- Using the unit for the first time or after storage, set heating temperature to ~100°C (Heating knob - 3 position) and preheat the plate during 30 min, it will help to reduce moisture inside the unit.

4.1. Connect the unit to a properly grounded power socket.

4.2. Place a glass or another chemical vessel with liquid on the working plate and place magnetic stirring element in it.

Note! Vessel must be flat-bottomed and fit tightly to the working surface of a magnetic stirrer.

4.3. Using the **Mixing** knob (Fig. 2/1) switch the mixing mode **On** and set the required speed. Mixing indicator brightness (Fig. 2/3) increases at higher speed settings.

4.4. Using the **Heating** knob (Fig. 2/2) switch the heating **On** (the heating indicator (Fig. 2/4) will light up) and set the required temperature. The heating indicator will be constantly on until the set temperature is reached and will start blinking when the set temperature is achieved.

Caution! Do not touch surfaces which become hot during operation to avoid burns.

Note! The heating will be switched off when the actual temperature exceeds the set temperature over 30°C. Heating indicator will start flashing (4 times per second) until reaches the set temperature.

4.5. After finishing the operation switch **Off** the **Mixing** and **Heating** knobs.

4.6. Disconnect the unit from electric circuit.

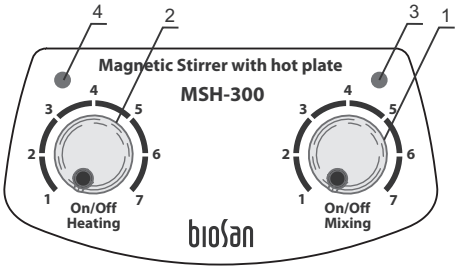

Fig. 2 Control panel

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 a non-condensing atmosphere and maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C.

- Speed regulation range .....250–1250 rpm
  (max. speed depends on the magnetic element size, stirred volume, viscosity, glassware shape, etc.)
- Plate temperature regulation range .....+30°C ... +330°C
- Uniformity on the plate.....±3°C
- Working plate heating time till max. .....15 min
- Maximal continuous operation time .....168 hours
- Max. stirring volume.....15 l
- Operation with magnetic stirring elements of length ..... from 10 to 50 mm
- Max. stirring liquid viscosity up to .....1170 mPa·s
- Plate material.....aluminium alloy
- Fault indication.....Outputs sound signal and turns off heating
- Working plate size..... Ø160 mm
- SR-1 attachable stand size .....Ø8x320 mm
- Dimensions .....190x270x100 mm
- Max. consumed power (heating mode) .....550 W
- Max. consumed power (mixing mode) .....8.5 W
- Working voltage .....230 V; 50/60 Hz or 120 V; 50/60 Hz
- Weight* .....2.9 kg

* Accurate within ±10%.

Repacement parts	Description	Catalogue number
SR-1	Attachable stand	BS-010302-AK
Magnetic stirring element	Cylinder-shaped magnetic stirring element (6x25mm) for universal use, encapsulated in PTFE	BS-010302-S12

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

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. If the unit emits repetitive sound signal, possible cause is – plate internal temperature sensor fault. Switch off the unit and have unit checked by a competent person.

6.4. Standard ethanol (75%) or other cleaning agents recommended for cleaning of laboratory equipment can be used for cleaning and decontamination of the unit.

6.5. Fuse replacement. Disconnect the unit from electric circuit. Open the fuse holder located on rear side of the unit unscrewing its cover counter-clockwise. Replace with the correct fuse, M 3.15 A for 230 V or M 6.3 A for 120 V, (type **M** - time lag: **M**edium).

6.6. Improper magnetic stirring elements storage (storing several elements together, which causes unpredictable magnetic domain disorientation) is one of the reasons of the elements' magnetic properties deterioration. The other reason is working at temperatures close to Curie point temperature of these elements, which is 200°C. Place the element to the unit working surface exactly in the center and in conformity with the poles and leave for 8-12 hours to have it reagained its initial characteristics.

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 unit from date of delivery to the Customer is 24 months. Contact your local distributor to check availability of extended warranty.

7.3. If any manufacturing defects are discovered by the Customer, an unsatisfactory equipment claim shall be compiled, certified and sent to the local distributor address. Please visit www.biosan.lv, Technical support section to obtain the claim form.

7.4. 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	MSH-300 Magnetic Stirrer with hot plate
Serial number	
Date of sale	

8. Declaration of Conformity

Declaration of Conformity

Equipment name:	**MSH-300**
Type of equipment:	Magnetic stirrer with hot plate
Directive:	EMC Directive 2004/108/EC Low Voltage Directive 2006/95/EC RoHS 2011/65/EC WEEE 2002/96/EC & 2012/19/EU
Manufacturer:	SIA BIOSAN Ratsupites 7, build.2, Riga, LV-1067, Latvia
Applied 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	Signature
Svetlana Bankovska Managing director	Aleksandr Shevchik Engineer of R&D
12.06.2013 Date	12.06.2013 Date

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