

MSH-300

Magnetic Stirrer with hot plate



**Operating Manual
Certificate**

for versions:
V.4AA
V.4AB
V.4AC

Contents

1.	Safety Precautions	4
2.	General Information	5
3.	Getting started.....	6
4.	Operation	7
6.	Specifications	8
7.	Maintenance.....	9
8.	Warranty and Claims.....	10
9.	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.



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 pacemaker, data carriers, etc.

GENERAL SAFETY

- Use only as specified in the Operating Manual provided.
- Save the unit from shocks or falling.
- After transportation or storage, keep the unit under room temperature for 2-3 hrs before connecting it to the electric circuit.
- 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 to the design of the unit.

ELECTRICAL SAFETY

- Connect only to the mains with voltage corresponding to the serial number label.
- Do not plug the unit into an ungrounded power socket, and do not use an ungrounded extension lead.
- Ensure that power switch and plug are easily accessible during use.
- Disconnect the power cable 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 possible operation of the unit in specific atmospheres.
- 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 aluminium surface. Alkali can damage aluminium 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

Intelli-Stirrer MSH-300i magnetic stirrer with hot plate is designed for simultaneous stirring and heating of different reagents.

The unit is designed for operation with different size magnetic stirring elements (10-50 mm long). It provides liquid stirring with the magnetic element rotation speed 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 bio-chemical 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 sample overheat protection, providing an automatic switch-off of the device when overheating (30°C over the set temperature).

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.

3.2. Complete set. Package contents:

Standard set

- MSH-300 magnetic stirrer with hot plate 1 pce
- Magnetic stirring element* 1 pce
- SR-1 attachable stand 1 pce
- Power cable 1 pce
- Spare fuse (inside fuse holder) 1 pce
- Operating manual, Certificate 1 copy

3.3. Setup:

- Place the unit upon even horizontal non-flammable surface at least 30 cm away from any flammable materials;
- Plug the power cable into the socket on the rear, and position the unit so that the power switch and the plug are easily accessible.

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.

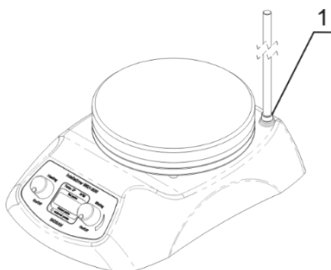


Fig. 1 Stand installation

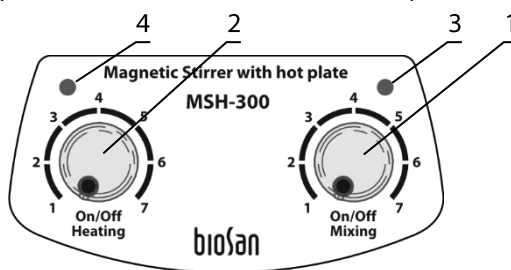


Fig. 2. Control panel

* Multipurpose cylinder-shaped magnetic stirring element (6x25 mm), encapsulated in PTFE.

4. Operation

Recommendation during operation

- Using the unit for the first time or after storage, set heating temperature to 100°C 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 dip magnetic stirrer element in it.



Note!

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



- 4.3. Plate temperature control. Using the **Heating** knob (fig. 2/2), switch the heating **on** and set the required temperature (linearly, in the 30 to 330°C range). Heating indicator starts flashing (4 times per second) until the unit reaches the set temperature.



Note!

The heating switches off when the plate temperature exceeds the set temperature for over 30°C.



Caution!

Surfaces become hot during operation. Do not touch to avoid burns.

- 4.4. Using the **Mixing** knob (fig. 2/1), switch the mixing mode **on** and set the required speed.
- 4.5. After finishing the operation switch **off** the **Mixing** and **Heating** knobs.
- 4.6. Disconnect the unit from electric circuit.

6. Specifications

The unit is designed for operation in cold rooms, incubators (except CO₂ 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.

6.1. Temperature specification

Setting range+30°C ... +330°C
 Uniformity±3°C
 Working plate heat time until maximum..... 15 min

6.2. General specification

Speed setting range 250 - 1250 rpm
(max. speed depends on the magnetic element size, stirred volume, viscosity, glassware shape, etc.)
 Maximum continuous stirring time 168 hours (7 days)
 Maximum stirring volume..... 15 l
 Operation with magnetic stirring elements of length 10 - 50 mm
 Maximum viscosity of stirring liquid 1170 mPa·s
 Plate material aluminium alloy
 Working plate size Ø160 mm
 SR-1 attachable stand size..... Ø8x320 mm
 Dimensions 190x270x100 mm
 Maximum consumed power (heating mode) 550 W
 Maximum consumed power (mixing mode) 8.5 W
 Working voltage 230 V; 50/60 Hz / 120 V; 50/60 Hz
 Weight* 2.9 kg

Replacement parts	Description	Catalogue number
SR-1 stand	detachable, height 320 mm	BS-010302-AK
Magnetic stirring element	cylinder-shaped (6x25 mm), encapsulated in PTFE	BS-010302-S12

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

* Accurate up to ±10%.

7. Maintenance

- 7.1. If the unit requires maintenance, disconnect the unit from the electric circuit and contact Biosan or your local Biosan representative.
- 7.2. All maintenance and repair operations (such as fuse replacement) must be performed only by qualified and specially trained personnel.
- 7.3. Standard ethanol (75%) or other cleaning agents recommended for cleaning of laboratory equipment can be used for cleaning and decontamination of the unit.
- 7.4. Improper magnetic stirring elements storage (storing several elements together, which causes unpredictable magnetic domain disorientation) is one of the reasons for deterioration of magnetic properties of the stirring element. The other reason is working at temperatures close to Curie point temperature of the elements, which is 200°C. Place the element on the working surface exactly in the centre in conformity with the poles. Leave the element for 8-12 hours for it to regain its initial characteristics.

8. Warranty and Claims

- 8.1. The Manufacturer guarantees the compliance of the unit with the requirements of Specifications, provided the Customer follows the operation, storage and transportation instructions.
- 8.2. 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.
- 8.3. Warranty covers only the units transported in the original package.
- 8.4. If any manufacturing defects are discovered by the Customer, an unsatisfactory equipment claim shall be compiled, certified and sent to the local distributor address. Please visit www.biosan.lv, Technical support section to obtain the claim form.
- 8.5. 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	

9. EU Declaration of Conformity

EU Declaration of Conformity

Unit type	Magnetic stirrers with heating
Models	MSH-300, MSH-300i
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/EC LVD Directive 2014/35/EC RoHS2 2011/65/EC 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.

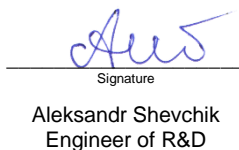
We declare that this product conforms to the requirements of the above Directives



Signature
Svetlana Bankovska
Managing director

19.07.2016.

Date



Signature
Aleksandr Shevchik
Engineer of R&D

19.07.2016

Date

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