



Medical–Biological
Research & Technologies

MSV-3500

Multi Speed Vortex



**Operating Manual
Certificate**

for version
V.3AW

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1. Safety Precautions

The following symbol means:



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.
- ♦ The unit should be saved from shocks or falling.
- ♦ After transportation or storage keep the unit under room temperature for 2-3hrs 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 the external power supply unit with voltage corresponding to that on the serial number label.
- ♦ Use only the external power supply unit provided with this product.
- ♦ Ensure that the power switch and external power supply are easily accessible during use.
- ♦ Disconnect the unit from electric circuit before moving.
- ♦ Disconnect the external power supply unit from power socket to turn off the unit.
- ♦ If liquid penetrates into the unit, disconnect it from the external power supply unit and have it checked by a repair and maintenance technician.

DURING OPERATION

- ♦ Do not impede the platform motion.
- ♦ Do not operate the unit in environments with aggressive or explosive chemical mixtures.
- ♦ Do not operate the unit if it is faulty or has been installed incorrectly.

- ♦ Do not use outside laboratory rooms.
- ♦ Do not place a load exceeding maximum load value mentioned in the Specifications section of this Manual.

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

MSV-3500 Multi Speed Vortex is designed for soft or intensive mixing of reagents in different size and type plastic tubes.

It is designed for operation in life-science laboratories working in the fields of biochemistry, cell and molecular biology.

Unit has four types of interchangeable platforms: for Eppendorf type microtest tubes, 10/15/50 ml tubes (diameter 12/16/30 mm). Platforms can be ordered separately or as one set with MSV-3500.

Speed and time are under microprocessor control. LCD display indicates two lines of values: the set and actual values of speed and time.

Unit provides high maximum speed of platform rotation efficiently mixing microvolumes (less than 5 ml) of samples.

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.



Caution! Automatic balancing system in this product produces a light metal-like noise when moving the unit which is likely to be heard during unpacking and also during operation (acceleration/deceleration of the platform). It is a normal occurrence and does not indicate a fault or a loose part.

3.2. Complete set. Package contents:

Standard set

MSV-3500 Multi Speed Vortex	1 piece
external power supply unit.....	1 piece

spare gasket2 pieces
 Operating Manual, certificate1 copy

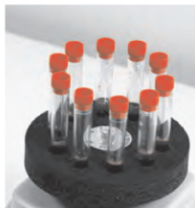
Optional accessories

SV-16/8 platform ❶on request
 SV-10/10 platform ❷on request
 SV-8/15 platform ❸on request
 SV-4/30 platform ❹on request

❶ SV-16/8



❷ SV-10/10



❸ SV-8/15



❹ SV-4/30



3.3. Set up:

place the unit on the clean, even, horizontal, working area;



Caution! Regularly clean support suction feet for improvement of their adhesion with desk surface.

remove protective film from the display;

plug the external power supply unit into the 12 V socket at the rear side of the unit.

3.4. Platform installation or replacement.

To install the tube mixing platform:

release the screw turning counter-clockwise on the top of the tube mixing platform;

install or lift and replace the tube mixing platform;

fix the screw tightly. screwing it with the hand clockwise as far as it will go.



Caution! Improper fixation may cause platform rotation and noise from trembling at fixation point.

4. Operation

Recommendations during operation



Always load the unit evenly. To keep the unit balanced insert **EVEN** number of tubes in the opposite sockets on the platform. The opposite tubes must be filled up equally.

- ♦ For efficient mixing it is recommended to fill test tubes up to the volume values mentioned in the 5th chapter table 1.

- 4.1. Connect external power supply unit to a power socket and switch ON (I position) the power switch located on the rear panel of the unit.
- 4.2. The unit will turn on and the following readouts will be shown on the display:
previously set time and speed in the upper line (**Set**);
timer mode indication (STOP/RUN) and current speed in the lower line (**Actual**).
- 4.3. Place **EVEN** number of tubes filled up equally in the opposite sockets on the platform.
- 4.4. Use the **+** and **- Speed** keys (Fig. 1/7) to set the required speed (increment - 100 rpm). Pressing the key down for more than 2 sec will increase the increment. The set value is displayed in the upper line of the display (Fig. 1/3).
- 4.5. Use the **+** and **- Time** keys (Fig. 1/5) to set the required working time interval in min & sec (increment - 1 min). Pressing the key down for more than 2 sec will increase the increment. The set value is displayed in the upper line of the display (Fig. 1/1).
- 4.6. Press the **Start/Stop** key (Fig. 1/6). The platform will start vortexing and the timer indicator will start counting up the time interval in the lower line of the display - **Actual** (fig.1/2).

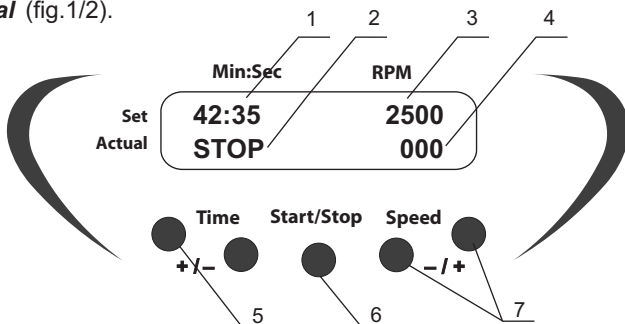


fig.1 Control panel

- 4.7. If the working time is not set (or is reset) and the display shows 00:00, pressing the **Start/Stop** key will cause the unit to operate continuously until the **Start/Stop** key is pressed. Actual value of the platform speed is displayed in the lower line of the display (fig. 1/4)
- 4.8. After finishing of the program (after the set time elapses) the platform motion will stop and flashing reading "STOP" will appear in the lower line of the display accompanied by the repetitive sound signal until the **Start/Stop** (fig. 1/7) key is pressed.
- 4.9. The platform motion can be stopped at any time by pressing the **Start/Stop** key.
- 4.10. After finishing the operation turn the unit OFF by switching the power switch at the rear panel to O position and disconnect the external power supply unit 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 and maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C.

- 5.1. Speed control range300–3500 rpm (increment 100 rpm)
maximal speed depends on load see table 2.
- 5.2. Orbit4 mm
- 5.3. Digital time setting0–60 min / non-stop
- 5.4. Maximum continuous operation time8 hrs
- 5.5. DisplayLCD, 2 x 16 signs
- 5.6. Maximum load0.2 kg
- 5.7. Dimensions180x170x145 mm
- 5.8. Input current/power consumption12 V, 1 A/ 12 W
- 5.9. External power supply unit input AC 100–240 V 50/60 Hz, output DC 12 V
- 5.10. Weight*2.6 kg

Table1. Replacement parts and Accessories

Accessories					
Platform	Capacity	Rated tube volume, ml	Recommended volume, ml	Tube diameter, mm	Catalogue number
SV-4/30	4	50	20 - 25	30	BS-010210-AK
SV-10/10	10	10	5 - 6	12	BS-010210-BK
SV-16/8	16 / 8 / 8	1.5 / 0.5 / 0.2	Half of the rated volume	11 / 8 / 6	BS-010210-CK
SV-8/15	8	15	6 - 8	16	BS-010210-DK
Replacement parts					
Gasket					BS-010210-S10

Table 2. Max. speed depending on load

Platform	Tube loading volume			RPM
	25 %	50%	75%	
SV-16/8 loaded 0.5 and 0.2 ml tubes loaded 1.5 ml tubes loaded 2 ml tubes all tubes loaded	3500			
	3500	3500	3400**	
SV-10/10	3500	3300	3300	
SV-8/15	3500	2900	2700	
SV-4/30	2500	2200	do not use	

* Accurate within $\pm 10\%$.

** Immerse the tubes (2 ml, 75% volume) into the platform SV-16/8 to the level they are filled.

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

Regularly clean support suction feet for improvement of their adhesion with desk surface.

to clean the support suction feet and desk surface use mild soap and water with a soft cloth or sponge.

wipe excess water from support suction feet and desk surface with an absorbent soft cloth or sponge.

6.4. Gasket replacement

Disconnect the unit from the external power supply unit.

Hold the platform with one hand and turn the fixing screw counter clockwise to set platform free.

Remove the platform.

Unscrew the two screws (fig.2/1) on the distancer

Remove the platform adapter (fig.2/2).

Remove the rubber gasket.

Install the new one, matching inside gasket edge into the distancer groove (fig.2/4).

Install outside gasket groove (fig.2/3) on the plastic body edge.

Reassemble the unit.

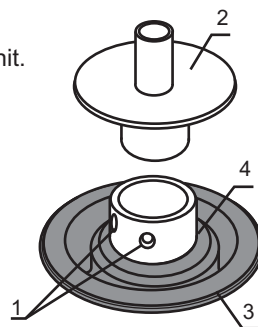


fig.2 Gasket replacement

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 (exclude gasket and platforms mentioned in table 1). 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	MSV-3500 Multi Speed Vortex
Serial number	
Date of sale	

8. Declaration of Conformity

Declaration of Conformity

Equipment name:	MSV-3500
Type of equipment:	Multi Speed Vortex
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:	<u>EN 61326-1:</u> Electrical equipment for measurement, control and laboratory use EMC requirements. General requirements <u>EN 61010-1:</u> Safety requirements for electrical equipment for measurement, control and laboratory use. General requirements <u>EN 61010-2-051:</u> 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

12.06.2013

Date



Signature
Aleksandr Shevchik
Engineer of R&D

12.06.2013

Date

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Version 3.02 - October 2013