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Высокоскоростные магнитные мешалки MS-3000, MMS-3000



High speed magnetic stirrers MS-3000, MMS-3000

Operating Manual

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1. About this edition of the manual

1.1. The current edition of the manual applies to the following models and versions:

Model	Version
MS-3000 , high speed magnetic stirrer	V.2GW
MMS-3000 , high speed magnetic stirrer	V.3GW

2. Safety precautions



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!

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

2.1. General safety

- The protection provided can be ineffective if the operation of the appliance does not comply with the manufacturer's requirements.
- The unit should be saved from shocks or falling.
- After transportation or storage, keep the unit under room temperature for 2-3hrs before connecting to electric circuit.
- Store and transport the unit at ambient temperatures between -20°C and +60°C and maximum relative humidity of 80%.
- 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.

2.2. Electrical safety

- Connect only to the mains with voltage corresponding to that on the serial number label.
- Use only the external power supply provided with this product.
- Ensure that the switch and external power supply unit are easily accessible during use.
- Disconnect the external power supply unit from electric circuit before moving 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.
- Do not operate the unit in premises where condensation can form. Operating conditions of the unit are defined in the **Specifications** section.

2.3. 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 use outside laboratory rooms.

2.4. Biological safety

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

3. General information.

MMS-3000 Magnetic Stirrer is designed for effective stirring of different viscosity liquids.

MMS-3000 is a compact magnetic stirrer with the stainless steel working surface. It provides liquid stirring with the magnetic element rotation speed up to 3000 rpm (max. speed depends on the magnetic element size, stirred volume, viscosity, glassware shape, etc.).

The unit is designed for operation with different size magnetic stirring elements (20-70 mm long). Other size magnetic elements may not provide appropriate operation.

MMS-3000 is equipped with an attachable stand that allows inserting different sensors (temperature, pH etc.) inside the liquid.

Application fields:

Chemistry	Stirring reaction ingredients during the fine organic synthesis, research in the organic catalysis field, different viscosity chemical reagents dissolving.
Biochemistry	Solutions preparation, dialyze, 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.

4. Getting started

- 4.1. **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.
- 4.2. **Complete set.** Package contents:
- 4.2.1. MS-3000
- MS-3000, high speed magnetic stirrer 1 pce.
 - Magnetic stirring element 1 pce.
 - External power supply 1 pce.
 - Operating manual, declaration of conformity 1 copy
- 4.2.2. MMS-3000
- MMS-3000, high speed magnetic stirrer 1 pce
 - Magnetic stirring element 1 pce
 - SR-1 attachable stand 1 pce
 - External power supply unit..... 1 pce
 - Operating manual, declaration of conformity..... 1 copy
- 4.3. **Setup.** Place the unit on the horizontal even working surface. Plug the external power supply unit into the 12 V socket at the rear side of the unit.
- 4.4. **Detachable stand installation (MMS-3000).** Remove the screw on the fixing socket at the stirrer back (fig. 1/1) and retain for future use. 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.

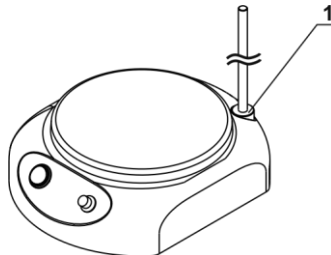


Figure 1. Detachable stand for MMS-3000

5. Operation

- 5.1. Connect the external power supply to the mains.
- 5.2. Place a glass or another chemical vessel with liquid with magnetic stirrer bar in it at the centre of the working plate.



Caution!

Vessel must be with flat bottom that tightly fits onto the working surface of the magnetic stirrer (see figure 2).



Figure 2.

- 5.3. Turn the **Power** switch (fig. 3/1 or 3/3) into the position **I** (On).
- 5.4. Set the required speed using the **Speed** knob (fig. 3/2 or 3/4). Increase the speed smoothly.



Note.

The maximum efficient speed is shown in **Table 1** for different stirring element lengths and mixing volumes. Beyond these numbers, mixing might be unstable.



Note.

In **MMS-3000**, if the stirring element loses positioning, the motor drops the speed, positions the element and slowly picks up the speed. If mixing is still unstable due to high viscosity or large mixing volume, consider lowering mixing speed.

- 5.5. After finishing the operation decrease the rotation speed to the minimum and turn the **Power** switch into position **O** (Off).
- 5.6. Unplug the external power supply unit from electric circuit.

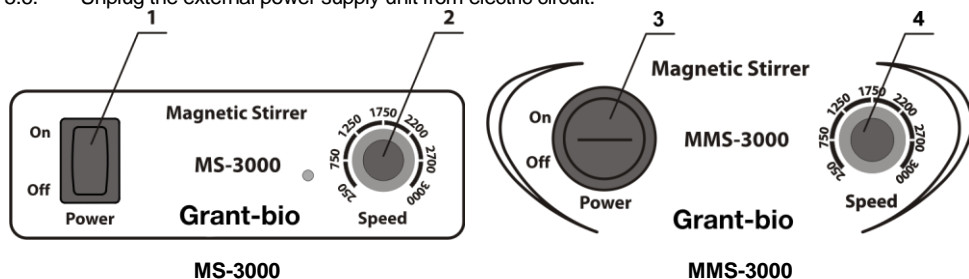


Figure 3. Control panel

6. 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.

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

	MS-3000	MMS-3000
Speed control range	0–3000 rpm	
Maximum stirring volume (H ₂ O)	5 L	20 L
Working surface dimensions	110x110 mm	Ø160 mm
Working surface material	Stainless steel	
SR-1 detachable stand size	—	Ø8x320 mm
Maximum length of magnetic stirring element	50 mm	70 mm
Maximum stirred liquid viscosity	Up to 1170 mPa*s	
Maximum continuous operation time	24 h	



Note. Maintain at least a 1 hour long pause between prolonged continuous operations.

Working current / Power consumption	220 mA / 2.6 W	250 mA / 3 W
External power supply	in 100–240 V~, 50/60 Hz, out 12 V=	
Weight, accurate within ±10%	0.8 kg	1.5 kg
Dimensions	120x150x65 mm	185x230x75 mm

Table 1. MS-3000 and MMS-3000 maximal speed in RPM, depending on H₂O volume and magnetic element length

Magnetic element length, mm	MS-3000		MMS-3000			
	2 L	5 L	2 L	5 L	15 L	20 L
25	3000	2400	3000	2800	2650	2600
50	700	700	1700	1500	1300	1250
70	–	–	620	530	440	360

7. Ordering information

7.1. Model and version available:


Model	Version
MS-3000	V.2GW
MMS-3000	V.3GW

7.2. To inquire about or order the replacement parts, contact Grant or your local Grant representative.

7.2.1. Replacement parts

Replacement parts	Description
SR-1	Detachable stand for MMS-3000
Magnetic stirring element	Cylindrical shape (6x25 mm) and PTFE encapsulated

8. Guarantee and service

- 8.1. **Guarantee.** When used in laboratory conditions and according to this operating manual, this product is guaranteed for TWO YEARS against faulty materials or workmanship.
- 8.2. **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.
- 8.3. **Cleaning and disinfection.**
- 8.3.1. **Cleaning the outside parts.** Use mild soap and water with a soft cloth or sponge for cleaning the exterior. Rinse remaining washing solution with distilled water. Wipe dry the excess water with clean, soft cloth or sponge.
- 8.3.2. **Disinfecting the exterior plastic and metal parts.** Use 75% ethanol or DNA/RNA removing solution (e.g., PDS-250). After disinfecting it is necessary to wipe the surfaces dry.
- 8.4.  Improper magnetic stirring elements storage (storing several elements together, which causes unpredictable magnetic domain disorientation) is one of the reasons of the magnetic properties' deterioration of the element. The other reason is working at temperatures close to Curie point temperature of these elements, which is 200°C. Place the element on the unit working surface exactly in the centre and in conformity with the poles and leave for 8-12 hours to have it regained its initial characteristics.

9. Compliance

EU Declaration of Conformity

All the products covered by this Manual comply with the requirements of the EU harmonised legislation verified using the following standards

Low Voltage Directive (2014/35/EC) for Electrical safety.	LVS EN 61010 Part 1 LVS EN 61010 Part 2-051
EMC directive (2014/30/EC) for Electromagnetic compatibility	LVS EN 61326-1
RoHS Directive (Directive 2011/65/EC including 2015/863) for Hazardous substances	LVS EN IEC 63000:2019

UK Declaration of Conformity

All the products covered by this Manual comply with the requirements of UK statutory requirements verified using the following standards.

Electrical Equipment (Safety) Regulations 2016	BS EN 61010 Part 1 BS EN 61010 Part 2-051
Electromagnetic Compatibility Regulations 2016	BS EN 61326-1
The Restriction of the Use of Certain Substances in Electrical and Electronic equipment Regulations 2012	BS EN 63000:2018

Waste Electrical and Electronic Equipment (WEEE)



All the products covered by this Manual are marked with the crossed-out wheeled bin symbol indicating they must not be disposed of with unsorted waste. Safe recycling of WEEE helps conserve natural resources and protect human health.

Grant Instruments complies fully with the UK Waste Electrical & Electronic Equipment (WEEE) regulations 2013. We are a member of the B2B compliance scheme (Scheme Approval Number WEE/MP3338PT/SCH), which handle our WEEE obligations on our behalf. Grant Instruments have been issued with a unique registration number by the Environmental Agency, this reference number is WEE/GA0048TZ.

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