

# Operation Manual

English



**maxMIX**

**Order no.: 30501**

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## **Includes:**

Quick Start  
Operation Manual  
Technical Documentation  
Specifications

## **Thank you for your confidence shown in us!**

Congratulations to the purchase of your new product.

For any enquiries, questions or suggestions please do not hesitate to contact us at [info@2mag.de](mailto:info@2mag.de).

## **2mag**

Main competence of **2mag** is based upon mixing, tempering and measuring/controlling. In these fields we are offering support with our products to the modern laboratory within the standardized daily business as well as for the implementation of highly complex processes in the state-of-the-art research. Due to the fact that **2mag** is developing according to customer's needs, is manufacturing self-contained and under permanent quality control and is also selling on-site together with competent contact persons, we can guarantee our customer an outstanding quality and product performance.

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# A Quick start

## 1. Overview of your product

### Magnetic stirrer maxMIX



Image 1: Magnetic stirrer maxMIX

Your product contains at despatch:

- A modern motor-driven magnetic stirring system (**maxMIX**) consisting of a stainless steel stirring plate with 1 stirring point.
- An external power supply unit (Input: 100-240 V / 50-60 Hz / 4.2 A; Output: 24 V / 100 W) with fixed cable for connecting the magnetic stirrer and pluggable power cable (country-specific).

## 2. Application fields

### 2.1 Operator

The maintenance-free magnetic stirrer **maxMIX** are used in the fields of chemistry, medicine, pharmacy, microbiology and biotechnology.

The operators are generally working in research and development, production and quality assurance, where magnetic stirrers with high power are needed for e.g. large volume (up to 250 litres) or highly viscous media or for the stirring over long distances (up to 60mm).

### 2.2 Basic functions

Basic function is stirring of liquids in suitable and chemically resistible vessels as well as in fermenter systems.

The stirrer housing is tightly closed and can be cleaned under running water.

The maximum ambient temperature is +50°C in air.

### 2.3 Product combinations

In addition to the use at the conventional laboratory desk our products have also been tested for the application in

- Laminar flow devices
- Safety cabinets
- Safety cabins

### 2.4 Application not for the intended use

The magnetic stirrer **maxMIX** are **explicitly not intended** for the application of:



- Stirring and warming of flammable liquids
- Warming of pressure-tight closed and NOT pressure-resistant vessels or glasses (e.g. Erlenmeyer flasks, lab flasks)
- At general danger of explosion
- Using immersed in water or oil baths
- Using in incubators (lost heat of the stirrer)

The **2mag** is offering special products for the just mentioned application combinations. More information for this can be found at [www.2mag.de](http://www.2mag.de) or at [info@2mag.de](mailto:info@2mag.de)

## 2.5 Vessels

Please only use round, chemical resistant and, where required, heat-resistant vessels made of glass or non-magnetic metal.

The vessels should have a thin, even wall thickness. Flat glass bottoms (without any curve to the inside) and smooth surfaces will improve the operating characteristic of the magnetic stirring bar.

Uneven surfaces would reduce the stirring power and would cause reaming up of the stirring bar's gliding surface.



**Please always place the flasks in the magnetic centre of the magnetic stirrer. This will ensure the optimum stirring effect!**



**Do never use any pressure-tight closed flasks.**

**RISK OF BURSTING!**

## 2.6 Stirring bars

In general, all stirring bars length and diameter can be used. But we recommend using the commercial stirring bars with Samarium Cobalt magnetic core (SmCo). By using this highly energetic magnetic material the maximum stirring power of the magnetic stirrer can be achieved, especially when mixing viscous media.

## 2.7 Tips and hints to the topic stirring

The mixing flasks should be filled max. up to the middle (high speed range) resp. up to  $\frac{3}{4}$  (low speed range).



**Never throw the stirring bar into the flask!**

**BURSTING RISK of the flask!**  
**BURSTING RISK of the stirring bar's magnetic core!**

**At first, if applicable within your process, fill up your flask.  
The liquid will cushion the sliding of the stirring bar.**

**Then, let the stirring bar carefully slide along the inner side of the bent flask onto the flask's bottom.**

**You will avoid possible glass breakage as well as non-visible breakage of the stirring bar's magnetic core by doing this!**

Place the stirring flasks right in the centre of the stirring point.

**In case the magnetic stirring bar won't start running:**

The magnetic interaction between the magnetic field and the magnetic stirring bar might be too big. There will be high friction forces caused by high magnetic attractions which avoid the running of the stirring bar.

- Increase the distance between the flask and the magnetic stirring drive by placing a non-magnetic plate (attention: also do not use any aluminium!) between the magnetic stirring drive and the flask.

**In case the magnetic stirring bar will not be centred or leaves the centre permanently:**

The interaction between the alternating magnetic field and the magnetic stirring bar is too low.

Or the stirring bar has a bottom that is uneven or too thick-walled.

Move the flask slightly back and for and centre it again onto the stirring point of the stirrer surface.

- Reduce the speed or use a longer magnetic stirring bar or one with a larger diameter or
- Use a smaller flask with a thin-walled, even bottom or
- Reduce the filling amount in the flasks or
- Increase the stirring speed.
- Decrease/reduce, if possible, the distance between the flask and the magnetic stirrer or

**In case the stirring activity is too weak:**

- Use commercial magnetic stirring bars with SamariumCobalt-core.
- Use a longer stirring bar or a stirring flask with smaller diameter.

### 3. Installation

#### 3.1 Safety advice

Please ensure the following basic conditions prior to installation:



The magnetic stirrer maxMIX works with extremely powerful permanent magnets.

**Cardiac pacemakers, data storage mediums, magnetic cards and other devices**, which can be affected by magnetic fields, have to be kept away from the fields of the stirring unit as well as from the stirring bars.



The device must not be used in explosive rooms.  
The control unit and the stirrer must not be dipped in water or any cleaning solutions.



Your supply voltage has to comply with the label of the power supply unit. The **power supply unit** has to be **switched off** before any power connection or power disconnection.



To increase the operation safety, the control unit should be placed apart from chemical materials and reactions as well as away from thermal influences.  
For special requirements please contact [info@2mag.de](mailto:info@2mag.de).



#### **ATTENTION!**

**The magnetic stirrer has to be switched off, BEFORE you connect or disconnect the plugs.**



**Always turn off the power switch (5) first before handling the connection cables.**



### 3.2 Installation, connection to the power supply unit

#### Step by step instruction (please also see image 2)



- Take the smaller wire (2) of the power supply unit (1) and connect the round plug (3) with the socket (4) at the backside of the magnetic stirrer (7).
- Connect the power cable (5) to the power supply unit (1) and afterwards to the power plug.
- The magnetic stirrer is now connected to the power supply unit and ready for operation.

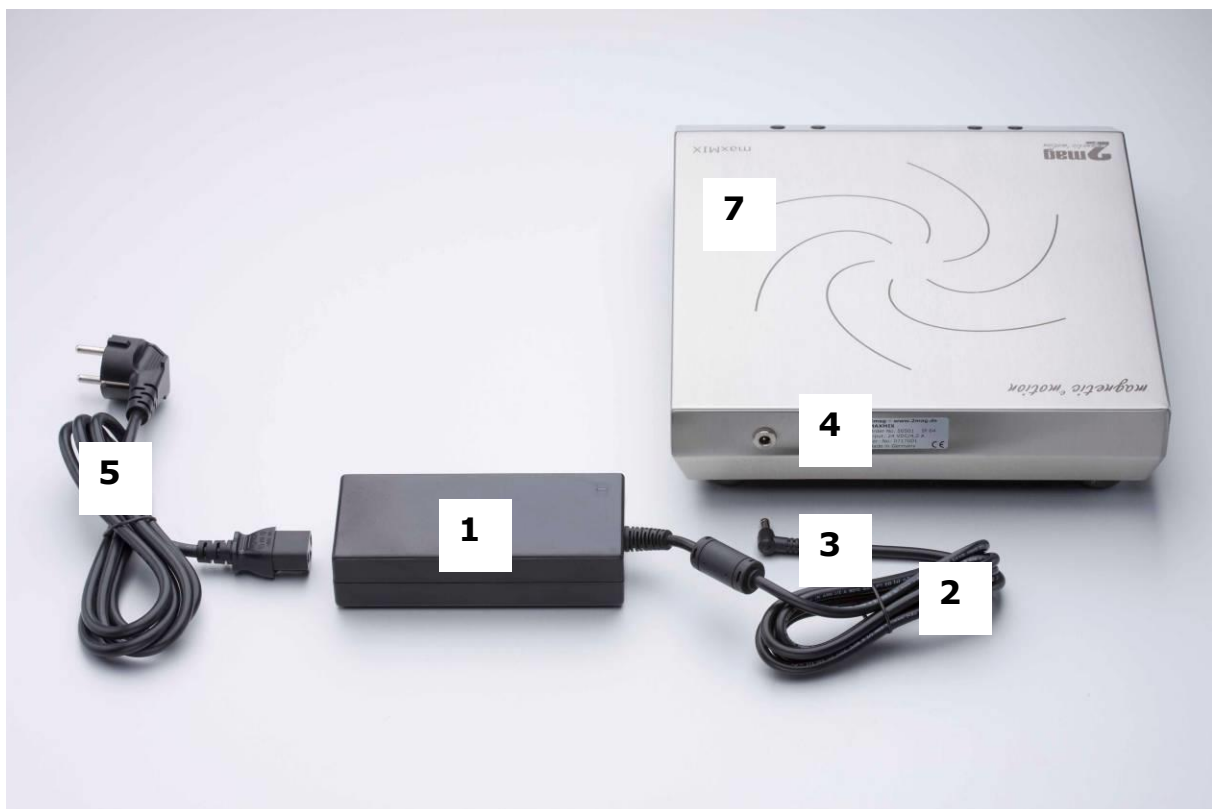


Image 2: Installation, rear side of the magnetic stirrer maxMIX

#### Description functional elements of magnetic stirrer - backside

- 1 Power supply unit (100-240 volts)
- 2 Low voltage cable between power supply unit and magnetic stirrer
- 3 Low voltage plug
- 4 Low voltage socket at magnetic stirrer
- 5 Power cord
- 7 Magnetic stirrer maxMIX

## 4. Operating of the magnetic stirrer

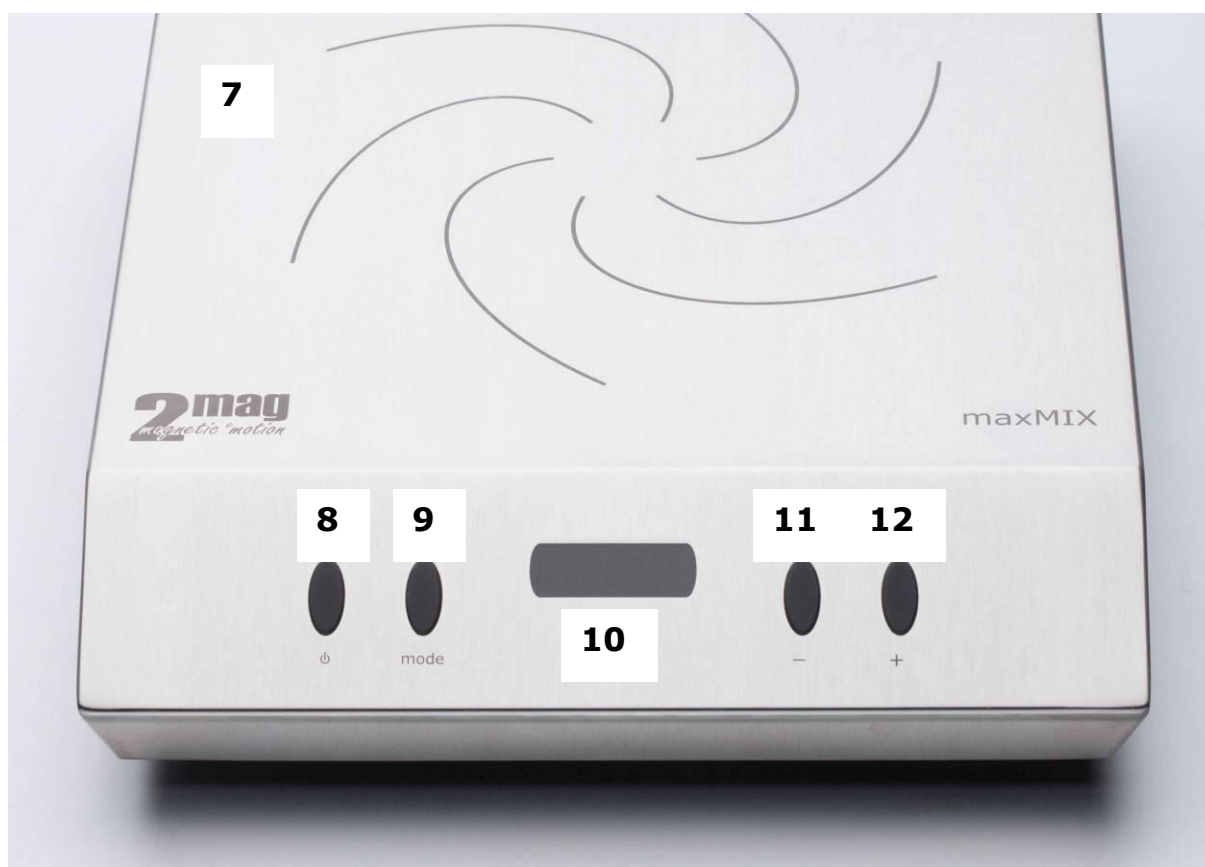


Image 3: Magnetic stirrer maxMIX

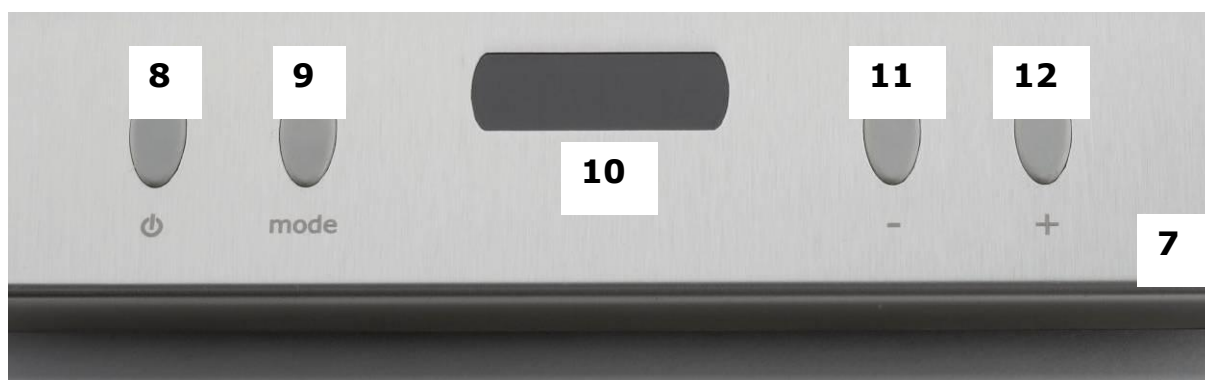


Image 3: Close-up, operating elements, magnetic stirrer maxMIX

### 4.1 Description operating elements

7 Magnetic stirrer maxMIX

#### Stirrer control

- 8 ON/OFF key for magnetic stirrer
- 9 MODE-key (M) for acceleration adjustment of the magnetic stirrer
- 10 Display for speed indicator and acceleration indicator
- 11 MINUS-key (-) for reduction of stirrer speed
- 12 PLUS-key (+) for increase of the stirrer speed

## **Operating of the Magnetrührers maxMIX**

After the cables have been installed correctly according to **Installation, connection to the magnetic stirrer**, the magnetic stirrer **maxMIX** will be ready for operation.

### **4.2 Stirring operation and stirrer control**

#### **Turning On and Off**

Please press the On/OFF-key (8) once. The magnetic stirrer will be switched on by that. The current stirring speed will be shown in the display (10).

By pressing the ON/OFF-key (8) once more, the magnetic stirrer will be switched off again. The display indicator (10) expires.

#### **SoftStart**

After turning on the magnetic stirrer, the stirring bar will be, to increase the operating safety, defined first and then smoothly accelerated to the set speed.

The accelerating phase will be shown by the illumination of a dot at the right segment of the LED-display (10).

#### **Stirrer speed adjustment**

The speed of the magnetic stirrer can be adjusted by pressing the MINUS- (11) resp. the PLUS-key (12).

The adjusted speed will be shown in the display (10) when the magnetic stirrer is switched on. The speed range can be adjusted between 100 and 1.200 rpm in steps by 10.

By constantly pressing the MINUS- resp. the PLUS-keys, an accelerated adjustment of the speed can be achieved.

#### **QuickSet**

To enter the start- respectively maximum speed directly and quickly there is the Quickset-function available.

The use of the following described keys will be made with the stirrer turned on.

##### **Setting the Start Speed**

Press the MINUS-key (11) permanently and press shortly the ON/OFF-key (8) afterwards. The start speed "100" will be set.

##### **Setting the Maximum Speed**

Press the PLUS-key (12) permanently and press shortly the ON/OFF-key (8) afterwards. The maximum speed "1200" will be set.

##### **Acceleration adjustment – Variable SoftStart**

A newly developed and extremely efficient magnetic stirrer will come into operation.

To raise the operation safety the acceleration of the magnetic stirrer can be set in steps by seconds from 20 to 99 seconds.

The indication of e.g. 20 sec. refers to the time period from the moment of switching on until the max. speed is reached.

A **fast acceleration** of the stirrer is recommended for small stirring amounts as well as aqueous media.

A **slow acceleration** is recommended for a safe increase of the stirrer's running with regard to large volume, highly viscous media and stirring over far distances. With this setting the possibility of a separation of the magnetic coupling during the acceleration phase is minimized.

The acceleration can be adjusted in four steps by using the MODE-key (9). The acceleration can be set in steps by seconds from 20 to 99 seconds by pressing the MINUS- (11) resp. PLUS-key (12) afterwards.

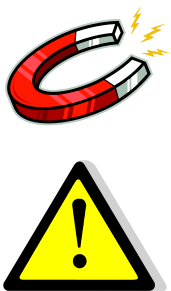
The current value is now shown on the display (10). "Ac 20" is the quickest acceleration, "Ac 99" is the slowest acceleration. The display (10) will turn back to the current speed indicator after approx. 5 seconds. The acceleration adjustment is finished again at the time the speed range is shown.

The acceleration adjustment can also be finished immediately by pressing the MODE-key (9) again.

### Display, Magnetic Stirrer

The display (10) provides as described above a description of:

- Current stirring speed (always with switched on magnetic stirrer)
- Set acceleration (after pressing the MODE-key (9))
- For checking, if the magnetic stirrer is switched on. The display will not be illuminated in case the stirrer is switched off.



The magnetic stirrer works with extremely strong permanent magnets.

**Cardiac pacemakers, data storage mediums, magnetic cards and other devices**, which can be affected by magnetic fields, have to be kept away from the fields of the stirring unit as well as from the stirring bars.

### 4.3 Warning notices



Please note the **maximum operation temperature +50 °C** in air.

Operation in higher ambient temperatures can damage the stirring drive.



**The magnetic stirrer maxMIX is not suitable for using in water baths, incubators, ovens and humid atmosphere.**



**Please ensure BEFORE you connect the power supply unit again that the socket is 100% dried!**

## B Maintenance, Cleaning and Care



Do not use any cleaning agent or cleaning rag that is based on chlorine with metallic components or ammoniac. These agents may harm the surface.



The control unit must not be dipped in water or any cleaning solutions.

**2mag** devices are generally maintenance-free.

Due to their construction the **2mag** devices are very robust and designed for the professional daily use.

We recommend cleaning the devices' surfaces with e.g. cleaning agents containing tensides or isopropyl alcohol regularly.

**BEFORE** cleaning the surfaces, switch off the device with the power switch and pull off the power cable afterwards.

## C Service case and customer service



**During service, the device may only be opened by an authorized customer service.**

In case of any defect on the device, please make sure to contact us first. We will be ready to offer help quickly and straightforward.

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### **Warranty:**

Due to their construction, the **2mag** devices are very robust and designed for the professional daily use.

Should in any case, despite our strict quality control, a system part not work without any fault, it can be repaired or exchanged by our customer service without any problems.

**We grant 3 years warranty on all material and manufacturing defects.**

## D Errors

### **The magnetic stirring bar is turning in an unbalanced way:**

There is no denying that magnetic stirring bars are aging in the course of time. This may happen by e.g. sterilizing, usage at high temperatures or causing stress (dropping down). The magnetism can be decreased by this. Furthermore, large stirring bars can be demagnetized accidentally by unfavourable magnetic alternating fields.

This will result in the stirring bars' magnetic total losses.

Separate out these stirring bars and exchange them by new ones.

### **The magnetic stirring bar won't start running:**

The electromagnetic interaction between the magnetic field and the magnetic stirring bar is too big. There will be high friction forces caused by high magnetic attractions which avoid the running of the stirring bar. Increase the distance between the flask and the magnetic stirring drive by placing a non-magnetic plate (attention: also do not use any aluminium!) between the magnetic stirring drive and the flask.

### **The magnetic stirrer is not ready for operation despite the power connection has been made and the power switch had been turned on:**

Please get into contact with us.

In general, we are ready to help you in case of problems.

For any enquiries, questions or suggestions please do not hesitate to contact us at [info@2mag.de](mailto:info@2mag.de)



## E Technical details

### Magnetic stirrer maxMIX

	<b>maxMIX</b>
Order no.	30501
Stirring points	1
Stirring volume/point	1 – 150 liters
Stirring power (max.)	40 watts
Speed range	100 – 1,200 rpm
Acceleration	variable, 20 - 99 s
Material housing	stainless-steel
Material sealing	PUR
Permitted operation conditions (air)	-10 up to +50 °C (at 95% humidity)
Measurement (WxDxH)	265 x 320 x 68 mm
Weight (gross)	approx. 10 kg
Permitted storage conditions	-40 °C up to +70 °C, 10 – 95 %, 500 - 1060 hPa
Protection category	IP64
Operating voltage (max.)	24 VDC
Electrical data	100-240 V / 50-60 Hz / 4.2 A

## Accessories – Stirring bar SATELLITE 140

	<b>SATELLITE 140</b>
Form	round, tripod
(Cover ) Material	ZEDEX
Dimensions D x L	Ø 32 x 140 mm
Diameter tripod construction	Ø 227 mm
Weight	approx. 0.46 kg
Order no:	44900



Image 5: Stirring bar SATELLITE 140

## Accessory Magnetic Stirring Bar ASTEROID 70

	<b>ASTEROID 70</b>
Order no.	44070
Shape	triangle, convex
Material	PTFE
Measurement (HxL, D)	39 x 70 mm, Ø 45 mm
Weight (gross)	approx. 0.36 kg



Image 6: Stirring bar ASTEROID 70

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# **EU-DECLARATION OF CONFORMITY FOR TECHNICAL DEVICES**

(acc. to EU-guideline of the electromagnetic compatibility 2014/30/EU and the low voltage directive 2014/35/EU)

**2mag AG**  
Schragenhofstraße 35 J  
DE-80992 Muenchen  
GERMANY

Hereby declares that the product

**maxMIX**

is conform to the appropriate regulations of the EU-guideline of the electromagnetic compatibility (EU-guideline 2014/30/EU) as well as the low voltage directive (2014/35/EU) incl. their changes and the laws for the realization of the guideline into national law.

The declaration is valid under the following conditions:  
The ambient conditions being stated in the operation manuals have to be adhered to.  
This mainly applies to the supply with electric energy.

The following norms/standards were chosen to evaluate the finished products with regard to electromagnetic compatibility:

- DIN EN 61000-3-2
- DIN EN 61000-3-3
- DIN EN 61326-1
- DIN EN 60529

The following norms/standards were chosen to evaluate the finished products with regard to low voltage directive:

- DIN EN 61010-1
- DIN EN 61010-2-51

Muenchen, 20.04.2016

Signature: \_\_\_\_\_



Dr. Klaus Kaufmann (CTO)