

# IKA

designed for scientists

**IKA KMO 3 basic**

ENGLISH

## EU Declaration of conformity

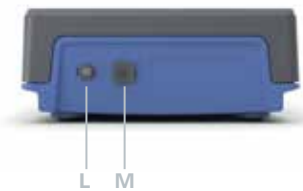
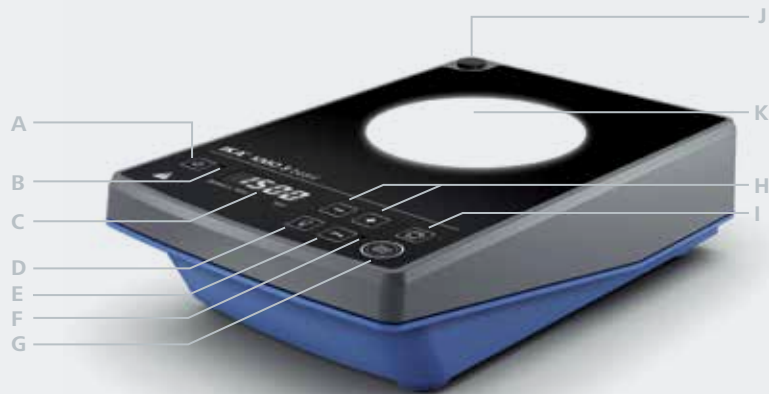
We declare under our sole responsibility that this product corresponds to the directives 2014/35/EU, 2006/42/EC, 2014/30/EU and 2011/65/EU and conforms with the following standards or normative documents: EN 61010-1, EN 61010-2-051, EN 61326-1, EN 60529 and EN ISO 12100.

A copy of the complete EU Declaration of Conformity can be requested at [sales@ika.com](mailto:sales@ika.com).

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# Device setup

/// KMO 3 basic



### Explication of symbols

**A** "Power" button

**B** Standby LED

**C** Display

**D** "Set-up plate illuminated" button

**E** "Lock" button

**F** "Lock" LED

**G** "Start / Stop" button

**H** "+ / -" button

**I** "Reverse rotation" button

**J** Threaded hole for stand

**K** Set-up plate

**L** Power connection

**M** Interface USB

# Safety instructions

/// About our warning symbols



Indicates an imminently hazardous situation, which, if not avoided, **will result in death, serious injury.**



Indicates a potentially hazardous situation, which, if not avoided, **can result in death, serious injury.**



Indicates a potentially hazardous situation, which, if not avoided, **can result in injury.**



Indicates handling, which, if not avoided, **can result in equipment damage.**



**Attention!**  
Indicates the risks of magnetism.

### /// General information

- › **Read the operating manual in its entirety before using the KMO 3 basic and follow the safety instructions.**
- › Keep the operating manual in a location that is easily accessible by everyone in the laboratory.
- › Ensure that only trained staff operates the device.
- › Follow the safety instructions, (laboratory) guidelines, occupational health and safety and accident prevention regulations (OSHA).

#### **Attention – Magnetism!** (📍)

Effects of the magnetic field have to be taken into account (e.g. data storage media, cardiac pacemakers ...).

### /// Device design

#### **Danger!** (⚡)

- › Set up the device in a spacious area on an even, stable, clean, non-slip, dry and fireproof surface.
- › The feet of the device must be clean and undamaged.
- › Check the device and accessories for damage before each use. Do not use damaged components.

#### **Caution!** (🚫)

Device surface is partially made of glass!

- › Glass surface can be damaged by impact.
- › If glass surface is damaged it could cause injury, don't use the device anymore and contact your IKA Service team.

### /// Permissible medium / contaminants / side reactions

#### **Warning!** (!)

Beware of hazards due to:

- › glass breakage.
- › incorrect container size.
- › overfilling of media.
- › unsafe condition of container.

Process pathogenic materials only in closed vessels under a suitable fume hood.

**Please contact IKA if you have any questions.**

#### **Danger!** (⚡)

- › Only process media that will not react dangerously to the extra energy produced through processing. This also applies to any extra energy produced in other ways, e.g. through light irradiation.
- › Please consider any possible contaminations and unwanted chemical reactions.
- › It may be possible for wear debris from rotating accessory parts to reach the material being processed.
- › When using PTFE-coated magnetic bars, the following has to be noted: Chemical reactions of PTFE occur in contact with molten or solute alkali metals and alkaline earth metals, as well as with fine powders of metals in groups 2 and 3 of the periodic system at temperatures above 300 °C – 400 °C. Only elementary fluorine, chlorotrifluoride and alkali metals attack it; halogenated hydrocarbons have a reversible swelling effect.

*(Source: Römpps Chemie-Lexikon and "Ulmann", Volume 19)*

### /// Procedures during sample runs

#### **Warning! (!)**

Wear your personal protective equipment in accordance with the hazard category of the media to be processed. There may be a risk from:

- › splashing and evaporation of liquids.
- › ejection of parts.
- › release of toxic or combustible gases.

Reduce speed if:

- › medium splashes out of vessel because the speed is too high.
- › device is not running smoothly.
- › container moves on the working plate.
- › an error occurs.

### /// Accessories

- › Safe operation is guaranteed only with the use of original IKA accessories.
- › Always disconnect the power before attaching accessories.
- › Observe the operating instructions of the accessories.
- › Accessories must be securely attached to the device so that they cannot come off by themselves. The centre of gravity of the assembly must lie within the surface on which it is set up.

### /// Power supply / Switching off

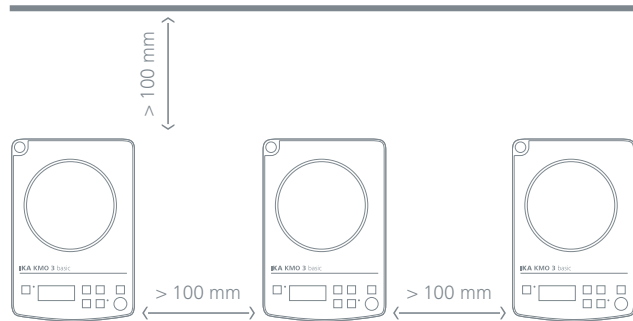
- › Place the power supply outside the working area of the device.
- › The voltage stated on the ratings plate must correspond to the mains voltage.
- › The outlet for the power supply must be easily accessible.
- › The device can only be disconnected from the mains supply by pulling out the mains plug or the connector plug.

#### **Warning! (▲)**

- › The device will automatically restart in **mode b** following any interruption to the power supply.

### /// About protecting your device

- › The device may only be opened by qualified and IKA approved technicians.
- › Do not cover the device, even partially e.g. with metallic plates or film. This may result in overheating.
- › Protect the device and accessories from bumps and impacts.
- › Keep base plate clean.
- › Observe the minimum distances:
  - between devices min. 100 mm,
  - between device and wall min. 100 mm,
  - above the device min. 800 mm.



## Intended use

### /// Use

- › The magnetic stirrer is suitable for mixing substances.

### /// Area of use

**Indoor environments similar to that a laboratory of research, teaching, trade or industry area.**

#### **The safety of the user cannot be guaranteed**

- › if the device is operated with accessories that are not supplied or recommended by the manufacturer.
- › if the device is operated improperly or contrary to the manufacturer's specifications.
- › if the device or the printed circuit board are modified by third parties.

# Unpacking

## /// Unpacking

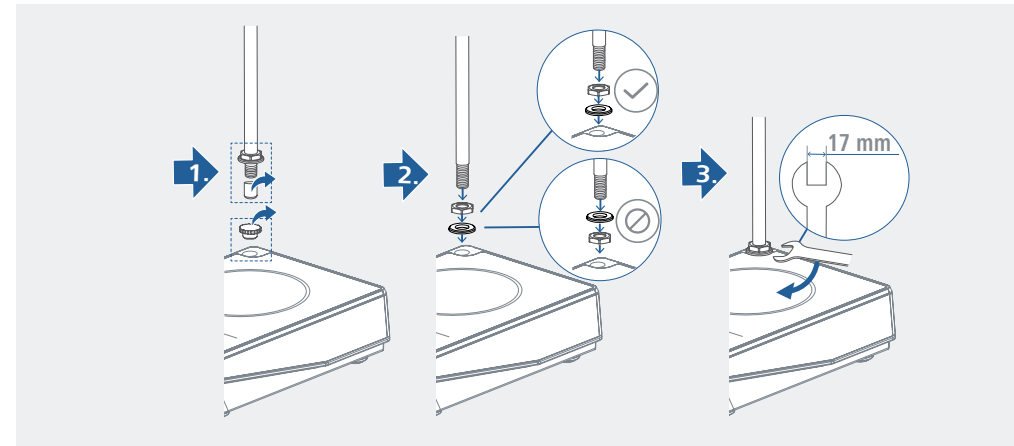
- › Unpack the device carefully. Any damage should immediately be reported to the carrier (mail, rail or freight forwarding company).

## /// Scope of delivery

- › KMO 3 basic magnetic stirrer
- › Magnetic stirring bar: IKAFLON 30 and 40 mm
- › Multi power supply (Euro, USA, UK, CH & AUS)
- › USB cable
- › User guide
- › Warranty card

# Assembly

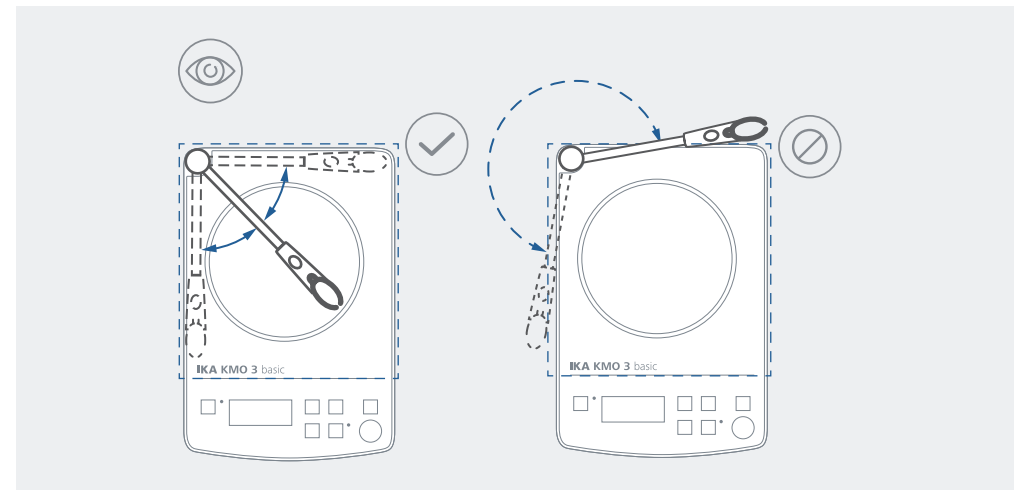
## /// Assembling support rod



- › Review the mounting and safety instructions of the IKA boss head clamp prior to using it. (see "Accessories")
- › The device must not be suspended from the support rod!

### Warning! (⚠)

- › Risk of tipping! Make sure that the center of mass of the attached device does not protrude over the safe area indicated below with a dotted rectangle.





# Operation

## /// Start-up

Check whether the voltage given on the ratings plate corresponds to the available mains voltage. If these conditions have been met, the device is ready for operation when the power supply is plugged in. If these conditions are not met, safe operation is not guaranteed and the device could be damaged. Observe the ambient conditions (temperature, humidity, etc.) listed under "Technical data".

### General power supply information

When the power supply adapter is connected to the device, the device changes to the standby mode, the red LED "Standby" **(B)** is on and the display **(C)** will not show any information.

A display self-test will be performed following any interruption to the power supply. The display cycles through the following information:

1. All segments light up.
2. Software version.
3. The selected operating mode.
4. If the drive has not been started the display reads "OFF".
5. If the drive has been started the selected speed is displayed (only in operating mode b).

### Power-up

1. Insert the power supply adapter into the power outlet **(L)**.
2. The device is switched on and off via the "Power" button **(A)**.

### Stirring

1. The stirring function is started and stopped by pressing the "Start / Stop" button **(G)**.
2. Increase or reduce the speed from 0 rpm to 1,500 rpm (in 10 rpm steps) by pressing the "+ / -" buttons **(H)**. Press and hold the "+ / -" button **(H)** may quicken the adjustment of the speed.  
› *The display **(C)** will only show the set value. If the actual speed is lower than the set speed, the set value on the display will be flashing. The set value on the display will stop flashing once the actual speed reaches the set speed.*

## /// Operating mode

To toggle between operating modes, press the "Reverse rotation" button **(I)** for 2 seconds when the device is powered on.

› Factory setting: mode A

### Operating mode A

All settings will be stored if the device is disconnected from the power supply. The agitation and "Set-up plate illuminated" functions will be set to "OFF" when the device is powered on. The "Start / Stop" button **(G)** starts the device with the set parameters.

### Operating mode b

All settings will be stored if the device is disconnected from the power supply. The agitation and "Set-up plate illuminated" functions will be set to "ON" or "OFF" when the device is powered on, depending on the previous status of the device.

### /// Automatic reverse rotation

To activate the "Reverse rotation" function, press the "Reverse rotation" button **(I)**. When the "Reverse rotation" function is switched on, a decimal point appears on the LCD display.



The running time (30, 60, 90 or 120 sec) is set by pressing the "Reverse rotation" button **(I)** followed by the "+ / -" buttons **(H)**.



After the preset running time, the drive is switched off and restarted in the opposite direction.

#### Note! (⚠)

The activation and deactivation of the „Reverse rotation“ is only possible if the drive is switched off.

### /// Set-up plate illuminated

The illumination brightness can be adjusted by pressing the "Set-up plate illuminated" button **(D)**. After adjustment the brightness value will be shown on the display for 2 seconds.

› Factory setting: Off

Button pressing time	Set-up plate illuminated	Illumination brightness value *
1 x	On	50 %
2 x	On	75 %
3 x	On	100 %
4 x	Off	0 %

\* Sequence 50 – 75 – 100 – 0 – 50 – 75 – 100 – 0 – 50 – etc.

### /// Lock

The "Lock" button **(E)** allows the user to lock or unlock the other control buttons (including buttons **D**, **G**, **H** and **I**) of the device.

- › Press the "Lock" button **(E)** for 2 seconds to activate or deactivate the "lock" function.
- › When the "Lock" function is activated, the green LED "Lock" **(F)** is on.
- › When the "Lock" function is deactivated, the green LED "Lock" **(F)** is off.

The device keeps the status of "unlock" or "lock" when the power is switched off and switched on again, which is important for operating mode "b".

# Interfaces and outputs

The device can be operated by computer via an USB interface using the laboratory software Labworldsoft®.

**Note:** Please comply with the system requirements together with the operating instructions and help section included with the software.

## /// USB interface

The connected devices and their properties are detected automatically. The USB interface is used in conjunction with software control for “remote” operation and can also be used for software update of the device.

## /// USB device drivers

First, download the latest driver for IKA devices with USB interface from:

<http://www.ika.com/ika/lws/download/usb-driver.zip>

Install the driver by running the setup file. Then connect the IKA device to the PC via the USB data cable and follow the instructions.

The data communication is via a virtual COM port.

## /// Command syntax and format

The following applies to the command set:

- › Commands are generally sent from the computer (Master) to the device (Slave).
- › The device sends only at the computer’s request. Even fault indications cannot be sent spontaneously from the device to the computer (automation system).
- › Commands are transmitted in capital letters.
- › Commands and parameters including successive parameters are separated by at least one space (Code: hex 0x20).
- › Each individual command (incl. parameters and data) and each response are terminated with Blank CR LF (Code: hex 0x20 hex 0x0d hex 0x20 hex 0x0A) and have a maximum length of 80 characters.
- › The decimal separator in a number is a dot (Code: hex 0x2E).

The above details correspond as far as possible to the recommendations of the NAMUR working party (NAMUR recommendations for the design of electrical plug connections for analogue and digital signal transmission on individual items of laboratory control equipment, rev. 1.1).

The NAMUR commands and the additional specific IKA commands commissioning serve only as low level commands for communication between the device and the PC. With a suitable terminal or communications program these commands can be transmitted directly to the device. The IKA software package, Labworldsoft®, provides a convenient tool for controlling device and collecting data under MS Windows, and includes graphical entry features, for motor speed ramps for example.

NAMUR Commands	Function
IN_NAME	Read the device name
IN_PV_4	Read stirring speed value
IN_SP_4	Read rated speed value
OUT_SP_4	Adjust the rated speed value
START_4	Start the motor
STOP_4	Stop the motor
LIGHT_x: x=0 x=50 x=75 x=100	Set-up plate illuminated OFF Brightness value 50% Brightness value 75% Brightness value 100%

## /// USB cable A - B

This cable is used to connect the USB interface to a PC.



## Maintenance and cleaning

- › The device is maintenance-free. It is only subject to the natural wear and tear of components and their statistical failure rate.

### /// Cleaning

- › For cleaning disconnect the mains plug!
- › Use only cleaning agents which have been approved by IKA to clean IKA devices.  
These are water (with tenside) and isopropanol.
- › Wear protective gloves during cleaning the devices.
- › Electrical devices may not be placed in the cleansing agent for the purpose of cleaning.
- › Do not allow moisture to get into the device when cleaning.
- › Before using another than the recommended method for cleaning or decontamination, the user must ascertain with IKA that this method does not destroy the device.

### /// Spare parts order

- › When ordering spare parts, please give:
  - device type.
  - serial number, see type plate.
  - position number and description of spare part, see [www.ika.com](http://www.ika.com).
  - software version.

### /// Repair

- › Please only send devices in for repair that have been cleaned and are free of materials which might present health hazards.
- › For repair, please request the “**Safety Declaration (Decontamination Certificate)**” from IKA or use the download printout of it from IKA website at [www.ika.com](http://www.ika.com).
- › If your appliance requires repair, return it in its original packaging. Storage packaging is not sufficient when sending the device - also use appropriate transport packaging.

## Accessories

- › Magnetic rods
  - Min: 20 x 8 mm (L x Ø)
  - Max: 50 x 8 mm (L x Ø)
- › RS 1 Set of magnetic stirring bars
- › RSE Stirring bar remover
- › H 1000 Beaker 1 l
- › H 1500 Beaker 1.5 l
- › H 3000 Beaker 3 l
- › H 5000 Beaker 5 l
- › H 16 V Support rod
- › H 38 Holding rod
- › H 44 Cross sleeve

For further accessories see [www.ika.com](http://www.ika.com).

## Error codes

- › The fault is shown by an error code on the display as following if the error occurs.  
Proceed as follows in such cases:
  - Switch the device off with mains switch.
  - Carry out corrective measures.
  - Restart the device.

### Er4 - Motor control is unavailable

Causes	› motor blocked or overloaded
Effect	› motor switched off
Solutions	› reduce load torque or use smaller magnetic rods › reduce target speed

- › If the actions described fails to resolve the fault or another error code is displayed then take one of the following steps:
  - Contact the service department.
  - Send the device for repair, including a short description of the fault.

# Technical data

## /// KMO 3 basic

<b>KMO 3 basic</b>	
Nominal voltage	DC 24 / 500 mA
Power input	13 W
Power input standby	0.8 W
Number of stirring positions	1
Stirring quantity max. (H <sub>2</sub> O)	5 l
Motor rating output	9 W
Direction of rotation	right / left
Speed display set-value	LED
Speed control	button
Speed range	0 / 10 – 1500 rpm
Setting accuracy speed	10 rpm
Speed variation (no load, nominal voltage, at 1500 rpm, RT: + 25 °C)	± 2 %
Stirring bar length	20 – 80 mm
Self-heating of the plate by max. stirring (RT: + 22 °C / duration: 1 h)	+2 K
Set-up plate material	glass
Set-up plate dimensions	140 × 120 mm
Automatic reverse rotation	yes
Set-up plate illuminated	yes
Dimensions (W × H × D)	153 × 62.5 × 227 mm
Weight	1.2 kg
Permissible ambient temperature	5 – 40 °C
Permissible relative humidity	80 %
Protection class according to DIN EN 60529	IP 42
USB interface	yes

<b>Power supply</b>	
Input	AC 100 – 240 V 0.6 A 50 / 60 Hz
Output	24 V DC 36 W LPS (Limited Power Source)
Protection class	II (double insulated)

*Subject to technical changes!*

## Warranty

- › In accordance with IKA warranty conditions, the warranty period is 24 months. For claims under the warranty please contact your local dealer. You may also send the device direct to our factory, enclosing the delivery invoice and giving reasons for the claim. You will be liable for freight costs.
- › The warranty does not cover worn out parts, nor does it apply to faults resulting from improper use, insufficient care or maintenance not carried out in accordance with the instructions in this operating manual.



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Technical specifications may be changed without prior notice.