

# IKA

designed for scientists

**IKA C-MAG HS 4 digital**  
**IKA C-MAG HS 7 digital**  
**IKA C-MAG HS10 digital**



C-MAG HS 7 digital

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## Safety instructions



### /// General information

- › **Read the operating instructions in its entirety before using the device and follow the safety instructions.**
- › Keep the operating instructions in a place where it can be accessed by everyone.
- › Ensure that only trained staff work with the device.
- › Follow the safety instructions, guidelines, occupational health and safety and accident prevention regulations.
- › Electrical outlet must be grounded (protective ground contact).
- › **Attention – Magnetism!** Effects of the magnetic field have to be taken into account (e.g. data storage media, cardiac pacemakers ...).
- › **Risk of burns!** Exercise caution when touching parts of the housing and the heating plate.
- › The heating plate can reach dangerous temperatures. Pay attention to the residual heat on the heating plate after switching off the stirrer.

### /// Device design

- › **Danger!** Do not use the device in explosive atmospheres, it is not EX-protected.
- › With substances capable of forming an explosive mixture, appropriate

safety measures must be applied, e.g. working under a fume hood.

- › To avoid body injury and property damage, observe the relevant safety and accident prevention measures when processing hazardous materials.
- › Notice! 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.
- › Ensure that the power cord set / temperature sensor cable does not touch the heating plate.
- › Check the device and accessories for damage before each use. Do not use damaged components.

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

- › **Warning!** 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.
- › Beware of hazards due to:
  - flammable materials,
  - glass breakage,
  - incorrect container size,
  - overfilling of media,
  - unsafe condition of container.
- › Process pathogenic materials only in closed vessels under a suitable fume hood.
- › **Warning!**

The safety temperature must be set in accordance with EN 61010-2-010 Chapter "Requirements for devices containing or using flammable liquids".

- The surface temperature of the flammable medium that is exposed to air may not exceed its flash point.  
A danger usually arises if a medium is heated in open vessels.
- The surface temperature of the heating device (e.g. the mounting plate) may not exceed the value of  $(t - 25) \text{ }^\circ\text{C}$  (= set value of the safety circuit) on the surface of the flammable medium and in contact with air, whereby  $t$  is the fire point of the liquid.  
A danger usually arises if a medium is heated in glass vessels (glass breakage).

If a setting made by the user (medium temperature or safety temperature) could bring a flammable medium into a state in which the conditions mentioned above could be exceeded, additional measures must be introduced that will protect the user from this danger.

- › The heating plate can heat up due to the action of the magnets at high motor speeds, even if the heater is switched off.
- › 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 "Ullmann", Volume 19)

### /// Procedures during sample runs

- › **Caution!** 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.
- › Position the knob at the left stop before starting up. Gradually increase the speed.
- › Reduce speed if:
  - medium splashes out of vessel because the speed is too high,
  - device is not running smoothly,
  - container moves on the base plate.

### /// Accessories

- › Safe operation is guaranteed only with the use of original IKA accessories.
- › Ensure that the external temperature sensor is inserted into the medium to a depth of at least 20 mm when connected.
- › Always disconnect the plug before attaching accessories.
- › Accessories must be securely attached to the device and cannot come off by themselves. The centre of gravity of the assembly must lie within the surface on which it is set up.
- › Observe the operating instructions of the accessories.

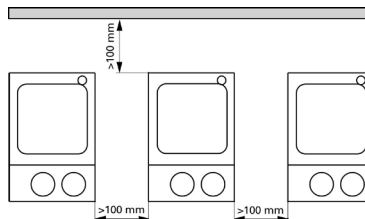
### /// Power supply / Switching off the device

- › **Warning!** The device will automatically restart in mode B/C following any interruption to the power supply.
- › The voltage stated on the type plate must correspond to the mains voltage.
- › The outlet for the mains plug must be easily accessible.
- › The device can only be disconnected from the mains supply by pulling out the mains plug or the connector plug.

### /// For protection of the equipment

- › The device may only be opened by qualified and IKA approved experts.
- › 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 the 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.



## Unpacking

- **Unpacking**
  - Please unpack the device carefully
  - In the case of any damage a fact report must be set immediately (post, rail or forwarder)
- **Delivery scope**
  - Heating magnetic stirrer    - PT 1000
  - Mains cable                      - Operating instructions

## Intended use

- **Use**
  - For mixing and/or heating liquids
- **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.

## Setting operating mode

Operating the device in mode A, B or C  
The mode selected will be shown on the display (J).

### Operating mode A

The target temperature selected will be reset to 0 °C if the device is switched off or disconnected from the power supply. The heating function will be set to OFF when the device is powered on.

- Heating is only possible in connection with the temperature sensor PT 1000.
- Setting the HI TEMP-function is possible.

*Factory setting: mode A*

### Operating mode B

All settings will be stored if the device is switched off or disconnected from the power supply.

- Heating is possible without the temperature sensor PT 1000. The target temperature selected corresponds to the heating plate temperature.
- Setting the HI TEMP - function is **not** possible.

### Operating mode C

All settings will be stored if the device is switched off or disconnected from the power supply.

Functions see mode B.

The settings are preset and not changeable.

For changing the settings select the operating mode A or B.

### Changing the operating mode

The operating modes can only be selected successively!

- Put device switch (A) in the OFF position
- Press and hold the rotating knob (B)
- Put device switch (A) in the ON position
- Release the rotating knob (B) when fig. 1 is indicated on the display
- Sequence A-B-C-A-B-C-A etc.

## Safe temperature limit

The temperature set for the heating plate (maximum 500 °C) will be limited by a preset safe temperature limiter. The heating function will be set to OFF if this temperature limit is reached.



**Warning! The safety temperature limit must always be set at least 25 °C lower than the fire point of the media to be processed!**

## Setting HI TEMP

HI TEMP limits the adjustable target temperature .

After switching on the device the display indicates the value 500 °C instead of the actual temperature (K) and the blinking signal SET next to the symbol HI TEMP (N).

The target temperature max. (L) can be set in the range of 0 - 500 °C by turning the rotating knob TEMP as long as the signal SET blinks.

## Warranty

In accordance with IKA Terms and Conditions of Sale, the warranty period is 24 months. For claims under the warranty please contact your local dealer. You may also send the machine direct to our works, enclosing the delivery invoice and giving reasons for the claim. You will be liable for freight costs.

The warranty does not cover wearing parts, nor does it apply to faults resulting from improper use or insufficient care and maintenance contrary to the instructions in this operating manual.

## Commissioning

**Commissioning** Put device switch (A) in the OFF position  
 Plug in (G) mains cable  
 Once connected to the power supply the device is in "stand-by" mode

**Stirring** Put device switch (A) in the ON position  
 Set the engine speed with the operating button (MOT)  
 Any set values are retained when device is switched off and even after the device is disconnected from the power!

### Heating

**with external temperature sensor (direct temperature control in the medium)** --- Put device switch (A) in the OFF position  
 Plug in the PT 1000 sensor into the socket (I)  
 Put device switch (A) in the ON position  
 Adjust the set-point temperature with the operating button (TEMP)

- LED (F) lights up
- the instantaneous temperature (K) is indicated on the display (corresponds sensor- and/or medium temperature)
- indicated set point temperature (L) corresponds the desired medium temperature
- LED (E) lights up and the symbol for energy input (M) is indicated on the display (with the heating is switched on)
- indicate HOT (D) on the display with over 50 °C on the heating plate (in the agitating and stand-by-mode)

**without external temperature sensor (not in operating mode A)** --- Put device switch (A) in the ON position  
 Set the operating mode (see capture "Operating modes")  
 Adjust the set-point temperature with the operating button (TEMP) (only be set in operating mode B)

- indicate the adjusted set point temperature on the LCD display (D) position (L)
- indicated the set point temperature corresponds the heating plate temperature
- LED (E) lights up and the symbol for energy input (M) is indicated on the display (with the heating is switched on)

- indicate HOT (D) on the display with over 50 °C on the heating plate (in the agitating and stand-by-mode)

## Error codes

Any malfunctions during operation will be identified by an error message on the display (D).

Proceed as follows in such cases:

- Switch off device using the main switch (A)
- Carry out corrective measures
- Restart device

Error code	Cause	Solution
E1	Sensor not connected (operating mode A)	<ul style="list-style-type: none"> <li>• Connect sensor</li> <li>• Change operating mode</li> </ul>
E3	Temperature inside device too high	<ul style="list-style-type: none"> <li>• Switch off device and allow to cool down</li> </ul>
E5	Sensor not in media	<ul style="list-style-type: none"> <li>• Sensor in medium immerse</li> </ul>
E6	Sensor defectively	<ul style="list-style-type: none"> <li>• Exchange the sensor</li> </ul>
E7	Hi-Temp temperature border exceeded	<ul style="list-style-type: none"> <li>• Medium to cool down</li> </ul>
E9	Initializations error	<ul style="list-style-type: none"> <li>• Switch off/on the device</li> </ul>
E11	Motor blocks	<ul style="list-style-type: none"> <li>• use other stirring bar</li> <li>• reduce viscosity</li> </ul>

If the actions described fail 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.

## Accessories

### Stirring organs

stirring bars:	Ø 6 mm, length to 15 mm
	Ø 8 mm, length to 50 mm
	Ø10 mm, length to 80 mm

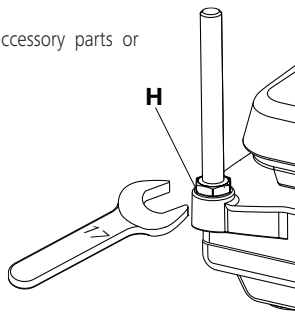
### Any other accessories

RSE	stirring bar remover
RS1	stirring bar set
H15	bath top
H28	bath top
H16V	support rod
H38	holding rod
H44	cross sleeve

## Assembling the support rod

The support rod is attached using the threaded support bore (H).

- Screw nut M10 on to the support rod as far as the stop
- Screw on the support rod as far as the stop by hand
- Tighten the support rod and nut M10 using a flat wrench (SW17).
- Use bossheads to assemble accessory parts or accessory devices.



## Maintenance and Cleaning

The appliance is maintenance-free.

### Cleaning

For cleaning disconnect the mains plug!

Use only cleaning agents which have been approved by IKA to clean IKA devices.

These are: water (containing surfactant) and isopropyl alcohol.

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).

### 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.

## Technical data

### Temperature control in the medium with PT 1000 temperature sensor

Minimum depth of immersion sensor	<b>mm</b>	20
Measuring accuracy	<b>K</b>	± 0,2 + sensor tolerance DIN IEC 751 class A
Setting accuracy	<b>K</b>	1
Resolution - display	<b>K</b>	0,1
Standard tolerance	<b>K</b>	± 0,5
Control system		PID
Operating voltage	<b>VAC</b>	220 - 230 ±10%
	<b>VAC</b>	120 ±10%
	<b>VAC</b>	100 ±10%
Nominal voltage	<b>VAC</b>	230 / 50 Hz
	<b>VAC</b>	115 / 60 Hz
	<b>VAC</b>	100 / 60 Hz
Design frequency	<b>Hz</b>	50 / 60
Input power max. at 230 and 115 VAC 100 VAC	<b>W</b> <b>W</b>	270 <b>HS 4</b> 270 <b>HS 4</b>
Input power max. at 230 and 115 VAC 100 VAC	<b>W</b> <b>W</b>	1020 <b>HS 7</b> 1020 <b>HS 7</b>
Input power max. at 230 and 115 VAC 100 VAC	<b>W</b> <b>W</b>	1520 <b>HS 10</b> 1070 <b>HS 10</b>
Power consumption in stand-by mode	<b>W</b>	2,5
Self-heating of the set-up plate by max. stirring (RT: 22 °C / duration: 1 h)	<b>K</b>	+2
Perm. duration of operation	<b>%</b>	100
Perm. ambient temperature	<b>°C</b>	+5...+40
Perm. relative humidity	<b>%</b>	80
Protection type acc. to DIN EN 60529		IP 21
Protection class		I

Overvoltage category		II
Contamination level		2
Operation at a terrestrial altitude	<b>m</b>	max. 2000
Dimensions (W x D x H)	<b>HS 4</b> <b>HS 7</b> <b>HS 10</b>	<b>mm</b> <b>mm</b> <b>mm</b>
		150 x 260 x 105 220 x 330 x 105 300 x 415 x 105
Weight	<b>HS 4</b> <b>HS 7</b> <b>HS 10</b>	<b>kg</b> <b>kg</b> <b>kg</b>
		3 5 6

### Motor

Speed range (infinitely)	<b>rpm</b>	0/100 - 1500
Speed display		Scale
Power consumption	<b>W</b>	15
Power output	<b>W</b>	1,5
Max. stirring quantity (water)	<b>HS 4</b> <b>HS 7</b> <b>HS 10</b>	<b>ltr</b> <b>ltr</b> <b>ltr</b>
		5 10 15

### Heating plate

Heating plate-/ Setting up plate dimensions	<b>mm</b> <b>mm</b> <b>mm</b>	120 x 120 <b>HS 4</b> 200 x 200 <b>HS 7</b> 280 x 280 <b>HS 10</b>
Heating power (±10%) at 230 and 115 VAC at 100 VAC	<b>W</b> <b>W</b>	250 <b>HS 4</b> 250 <b>HS 4</b>
Heating power (±10%) at 230 and 115 VAC at 100 VAC	<b>W</b> <b>W</b>	1000 <b>HS 7</b> 1000 <b>HS 7</b>
Heating power (±10%) at 230 and 115 VAC at 100 VAC	<b>W</b> <b>W</b>	1500 <b>HS 10</b> 1050 <b>HS 10</b>
Surface temperature Room temperature at	<b>°C</b>	500
Temperature fluctuation	<b>K</b>	± 5
Limit of safety temperature (firmly adjusted)	<b>°C</b>	550
Range of adjustment Hi-Temp	<b>°C</b>	0 - 500

*Subject to technical changes!*