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# IKA

EUROSTAR 400 digital\_062019

## IKA EUROSTAR 400 digital



Operating instructions

EN



IKA-Werke, Germany  
Reg. No. 004343

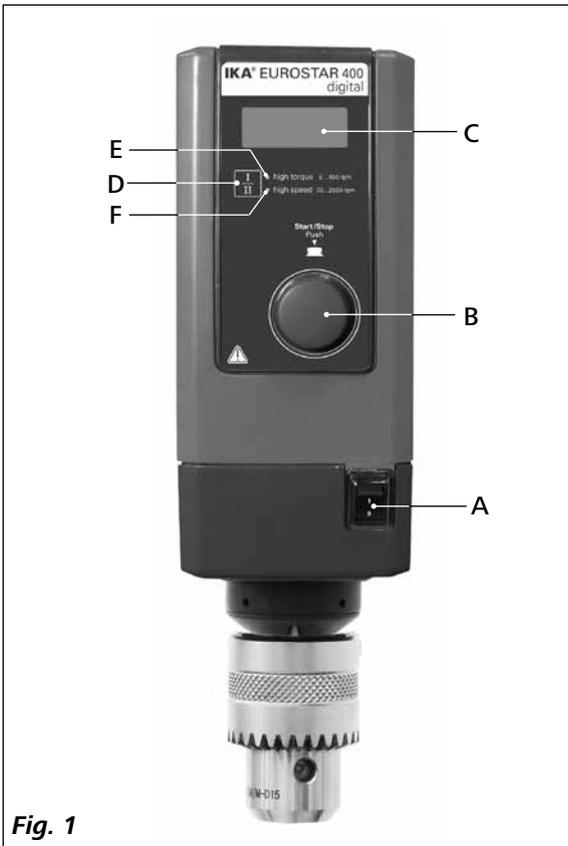


Fig. 1

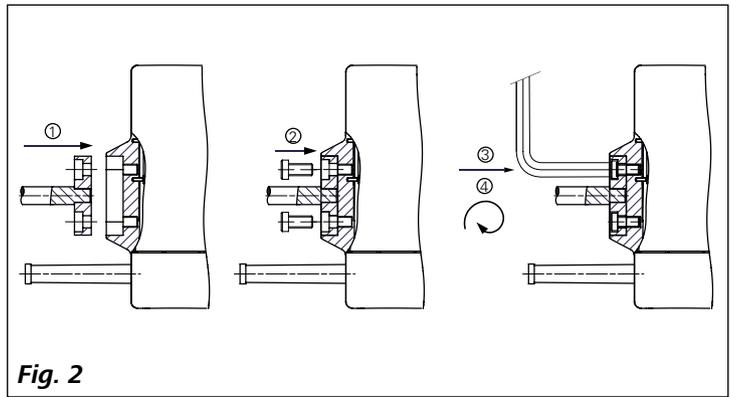


Fig. 2

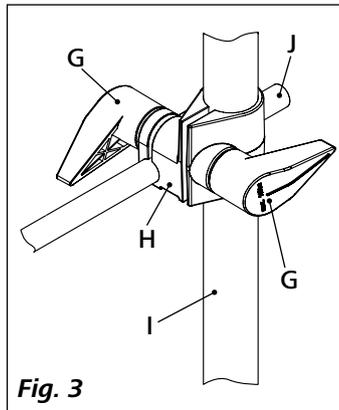


Fig. 3

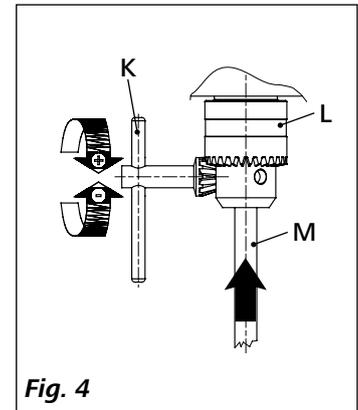


Fig. 4

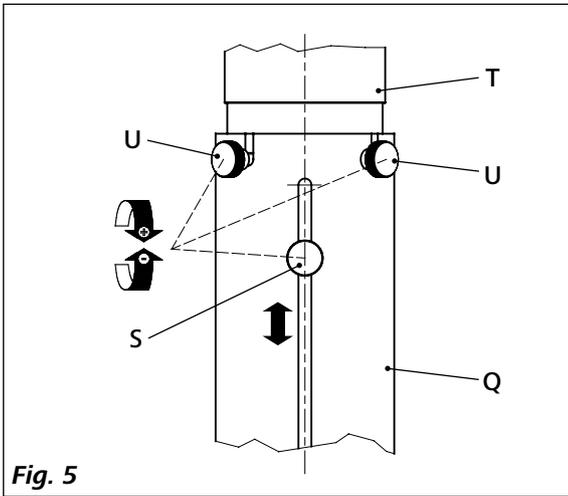


Fig. 5

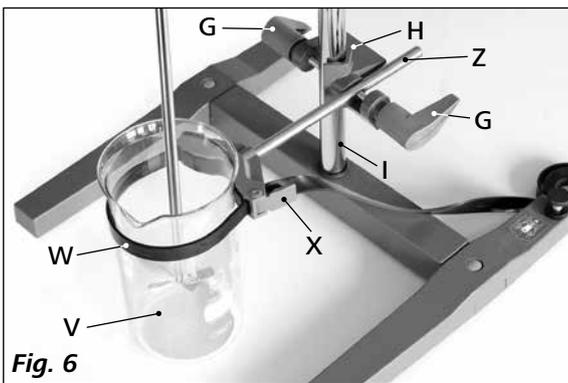


Fig. 6

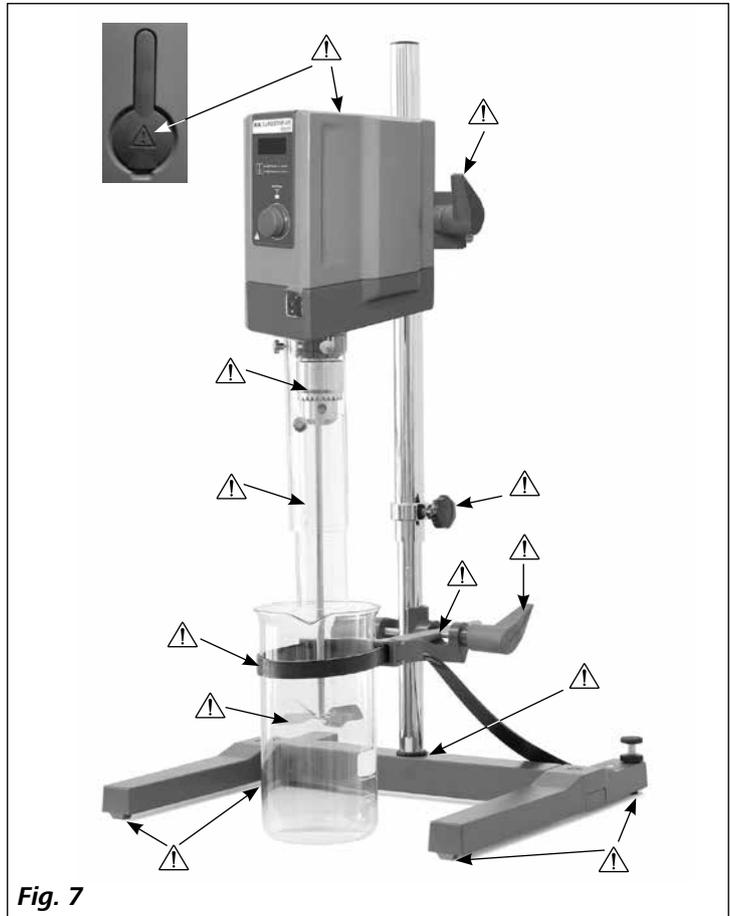


Fig. 7

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## 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).

## Explication of warning symbols



Indicates an (extreme) hazardous situation, which, if not avoided, will result in death, serious injury.



Indicates a 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 practices which, if not avoided, can result in equipment damage.

## Safety instructions

- **Read the operating instructions in full before starting up 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 instrument.
- Follow the safety instructions, guidelines, occupational health and safety and accident prevention regulations.
- Because the options for combining products, tools, stirring vessel, experiment and medium are nearly endless, user safety cannot be ensured simply with design requirements on the part of the product. For this reason, it may become necessary for users to take other precautionary safety measures. For example, glass device or other stirring vessels that are sensitive to mechanical stress can be damaged or shattered by an imbalance, increasing the speed too quickly or too little distance between the stirring element and the stirring vessel. Users can suffer serious injury from glass breakage or from the freely rotating stirring element.
- Uncontrolled reactions can be triggered by mixing the heated material insufficiently or by the energy generated by selecting a speed that is too high. In case of these and other increased operational hazards, users must take additional appropriate safety precautions (e.g. shatter protection). In any case, when using critical or hazardous materials in your processes, **IKA** recommends to use additional appropriate measures to ensure safety in the experiment. For example, users can implement measures that inhibit fire or explosions or comprehensive monitoring equipment. Furthermore, users must make sure that the **OFF** switch of the **IKA** product can be accessed immediately, directly and without risk at any time.

### CAUTION

If mains switch cannot ensure this access at all times, an additional **EMERGENCY STOP** switch that can be easily accessed must be installed in the work area.

- 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.
- Do not operate the instrument in explosive atmospheres, with hazardous substances or under water.
- Process pathogenic materials only in closed vessels under a suitable fume hood. Please contact **IKA** application support if you have any question.
- The instrument is not suitable for manual operation.
- The high torque developed by the **EUROSTAR** requires particular care in the choice of stand, cross sleeve and anti-rotation element for the agitating vessel.
- Set up the stand in a spacious area on an even, stable, clean, non-slip, dry and fireproof surface.

- You must ensure that the stirring element is securely clamped in the chuck!

### WARNING

Remove the chuck key from the chuck before you switch on the device.

- Use stirring shaft protective equipment!
- The agitated vessels used for stirring have to be secured. Consider on a good stability of the entire structure.

### NOTICE

Please pay attention to the dangerous parts of the equipment in **Fig. 7**.

- Protect the instrument and accessories from bumping and impacting.
- Check the instrument and accessories beforehand for damage each time when you use them. Do not use damaged components.
- Safe operation is only guaranteed with the accessories described in the "**Accessories**" section.
- Always switch the main switch in the **OFF** position or disconnect the power before changing stirring element and fitting allowed accessories.
- The instrument can only be disconnected from the mains supply by pulling out the mains plug or the connector plug.
- The socket for the mains cord must be easily accessible.
- Socket must be earthed (protective ground contact).
- The voltage stated on the type plate must correspond to the mains voltage.
- Please observe the permitted speed for the stirring element. Never set higher speed.
- Make certain that the unit is set at the lowest speed before commissioning; otherwise, the unit will begin running at the speed set in last operation. Gradually increase the speed.
- Pay attention when setting the speed to any imbalance of the stirrer tools and possible spraying of the medium to be stirred.

### WARNING

Never operate the instrument with the stirrer tools rotating freely. Ensure that parts of the body, hair, jewelry or items of clothing cannot be trapped by the rotating parts.

### WARNING

The operation of a free rotating shaft end is dangerous. Therefore, for safety reason, only insert through the stirring tool over the upper edge of housing at standstill.

 **WARNING**

Wear your personal protective equipment in accordance with the hazard category of the medium to be processed, there is a risk of:

- splashing of liquids
- projectile parts
- body parts, hair, clothing and jewelry getting caught.

 **WARNING**

Beware of the risk of:

- flammable materials
- glass breakage as a result of mechanical shaking power.

 **NOTICE**

Reduce the speed if:

- the medium splashes out of the vessel because the speed is too high
- the instrument is not running smoothly
- the instrument begins to move around because of dynamic forces
- an error occurs.

 **WARNING**

**Do not touch rotating parts during operation!**

- There may be electrostatic activity between the medium and the output shaft which could cause a direct danger.
- After an interruption in the power supply or a mechanical interruption during a stirring process, the unit does not restart automatically.

- It is important to note that the surfaces of the motor (cooling fins) and certain parts of the bearing may get very hot during operation.
- Never cover the ventilation slots or cooling fins on the motor or on the instrument.
- Avoid knocking and impacting on the lower end of the shaft and the chuck gear teeth. Even minor, invisible damage can lead to imbalance and uneven shaft action.
- Ensure that the stand does not start to move.
- Imbalance of the output shaft, the chuck and in particular the stirring tools can lead to uncontrolled resonant vibrational behavior of the instrument and the whole assembly. Glass apparatus and stirrer containers can be damaged or shattered by this. It can cause injury to the operator, also can damage the rotating stirring tool. In this case exchange the stirring tool for one without imbalance or remedy the cause of the imbalance. If there is still imbalance, return it to the dealer or the manufacturer along with a description of the fault.
- If the instrument is operated too long in overload or if the ambient temperature is too high, the instrument switches off permanently.
- The machine must only be opened by trained specialists, even during repair. The instrument must be unplugged from the power supply before opening. Live parts inside the instrument may still be live for some time after unplugging from the power supply.

 **NOTICE**

Covering or parts that are capable of being removed from the unit without accessory equipment have to be reattached to the unit for safe operation in order to prevent, for example, the ingress of fluids, foreign matter, etc..

## Intended use

• **Use:**

For mixing/stirring liquids with low to high viscosities by various stirring tools.

Intended use: Stand device (chuck points down)

• **Range of use:**

Indoor environments similar to that a laboratory of industry area.

The safety of the user cannot be guaranteed:

- If the instrument is operated with accessories that are not supplied or recommended by the manufacturer.
- If the instrument is operated improperly contrary to the manufacturer's specifications.
- If the instrument is operated improperly contrary to the manufacturer's specifications.

## Unpacking

### • Unpacking:

- Please unpack the device carefully
- In the case of any damage a detailed report must be sent immediately (post, rail or forwarder).

### • Delivery scope:

- EUROSTAR 400 digital overhead stirrer
- extension arm
- 2 hexagonal socket screws
- hexagon socket offset screw key
- chuck key
- user guide
- warranty card.

## Drive

The speed can be adjusted continuously over two speed range (speed range I, speed range II) with the knob (B, see Fig. 1).

## Motor protection

The stirring instrument is suitable for continuous operation. The motor current is limited electronically. The instrument has an anti-stall and anti-overload system.

If a fault occurs, a safety circuit immediately switches off the motor permanently through a relay in the power board. A fault occurs if the safe functioning of the instrument is compromised.

## Speed – normal operation

### ***Speed - regulated (no variation in speed):***

The speed is monitored and regulated by processor controlled. The target speed is constantly compared with the actual rotation speed value of the output shaft and variations corrected. This guarantees a constant speed even if the viscosity of the substance being stirred changes. Fluctuations in mains voltage within the permitted tolerance range have no effect on the quality of regulation and constancy of speed.

The speed is set using the front knob (B, see Fig. 1). During normal operations the speed value on the display (C, see Fig. 1) corresponds to the speed of the output shaft in revolutions per minute (rpm).

## Speed – overload operation

The stirrer can deliver double output for a short time to even out load peaks which could occur, for instance, if solid or semi-pourable agents are added. If the operation is in the overload range (e.g. process-related increase in viscosity), the actual speed is reduced until the stirrer torque corresponds to the nominal torque of the machine, and the target speed blinks. The possible speed is continually adapted to operating conditions, guaranteeing that speed is as close as possible to the target speed set. To protect the machine from overloading, the speed is reduced if the machine has been operated in overload mode. The target speed set then does not correspond to the actual speed of the output shaft. This condition is indicated by blinking of the target speed (overload operation).

### **Overload status 1:**

The machine is already running in the overload range, the target speed does not yet correspond to the actual speed. This condition is maintained as long as neither the motor current nor the temperature exceeds the permitted limit values.

Display symbol: **blinking of the target speed.**

When the load goes back to the normal range, the target speed stop blinking and correspond to the actual speed.

### **Overload status 2:**

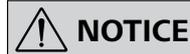
When the machine meet a fluctuating load which is over double of the nominal torque, the actual speed of the stirrer shaft will go down quickly to stop.

Display symbol: **Er 4** (see section "Error codes").

## Output shaft

The clamping chuck and output shaft permit clamping IKA recommend stirrer tools (see “**Permitted IKA Stirrer tools**” section). The output shaft is designed as a hollow shaft, and the opening on the top side of the housing is closed with a stirrer cover. When open the stirrer cover, it is possible for stirring shafts to push out over the top edge of the housing at **standstill**, e.g. during change container.

For safety reason, the the plastic cover must be pushed back into the opening of the housing so that this is properly closed. This is the only way to ensure that working with the unit is safe and that media cannot enter the instrument.



**Please see section “Safety instructions”!**

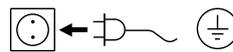
## Speed display

The rotation speed is adjusted with the rotary knob (**B**, see **Fig. 1**) on the front of the overhead stirrer. The rotational speed is displayed directly in revolutions per minute (rpm) on the LED display (**C**, see **Fig. 1**).

## Commissioning

Assemble the overhead stirrer and all necessary accessories on a stable, even, non-slip surface. The **EUROSTAR 400 digital** overhead stirrer must be secured to a stable stand (e.g. **R 2722** or **R 2723**) with a cross-sleeve (e.g. **R 271**). The stirring vessel must always be securely fixed for safety reasons. You must also ensure that the mounting device (stand) is set up in such a way that it is not liable to topple and does not start to move during the stirring procedure.

Accessories must be assembled according to the following assembly instructions (**Fig. 2** to **Fig. 6**).



If above conditions are met, the instrument is ready for operation after plugging in the mains plug.

## Securing

### Securing the extension arm to the overhead stirrer

Diagram (see **Fig. 2**)

Ensure that the extension is fitted securely. Vibration may cause the screw to become loose. It is therefore necessary for safe use to occasionally check that the extension arm is attached securely. Tighten the hexangular bolt as if required.

### Securing the overhead stirrer to the stand

Diagram (see **Fig. 3**)

First secure the cross sleeve (**H**) to the stand (**I**). Then secure the extension arm (**J**) of the stirrer in the open side of the cross sleeve which is facing upwards. Once you have set the position required for the stirring procedure, firmly tighten the two clamping bolts (**G**).

Check that the stirrer is held in position firmly prior to each use and also at regular intervals. The position of the stirrer must only be adjusted when the equipment is stationary and the power supply is disconnected.

### Securing the stirring element using the chuck

Diagram (see **Fig. 4**)

Slide the stirring element (**M**) into the chuck (**L**). Tighten the chuck firmly using the chuck key (**K**).

The stirring element must only be changed when the equipment is stationary and the power supply is disconnected.

### Securing the stirring shaft protector

Diagram (see **Fig. 5**)

Use a stirring shaft protector (**Q**), e.g. **R 301**, to provide protection against injury when working with the instrument.

Use the bolts (**U**) to attach the plastic half-shell pieces to the stirrer (**T**), as shown in **Fig. 5**. The screw (**S**) can be used to adjust the length of the stirring shaft protector.

Check that the stirring shaft protector is held in position securely prior to each use and also at regular intervals. The position of the stirring shaft protector must only be adjusted when the equipment is stationary and the power supply is disconnected.

### Securing the mixing vessel to the stand

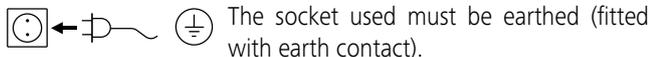
Diagram (see **Fig. 6**)

First fix the cross sleeve (**H**) to the stand (**I**). Then attach the bracket (**Z**) of the strap clamp in the open side of the cross sleeve which is facing upwards according to the position of stirrer and the mixing vessel (**V**), firmly tighten the two clamping bolts (**G**).

Clamp the mixing vessel (**V**) with the flexible clamping band (**W**) and secure the flexible band (**W**) by means of the clamping lever (**X**).

## Switching on the instrument

Check whether the voltage given on the type plate corresponds to the available mains voltage.



The socket used must be earthed (fitted with earth contact).

If these conditions have been met, the machine is ready to operate when the mains plug is plugged in.

If these conditions are not met, safe operation is not guaranteed and the machine could be damaged.

After switch on the main switch (**A**) as show in **Fig. 1**, the display (**C**) will display a software version number, and then display the speed setting in last operation after a few second. LED (**E**) or LED (**F**) indicate the speed range setting in last operation. Ensure the speed set is suitable for the test medium selected. If in doubt, set the speed adjust knob (**B**) to the lowest speed (left hand position). Press the knob (**B**) to start or stop the stirring.

By pressing speed range key (**D**), the unit could be switch to different modes between high torque and high speed modes.

### • **Speed setting:**

Before start the unit, you could preselected required speed with speed adjust knob (**B**). Then push down knob (**B**), the unit will speed up to your desired speed. When speed is changed, nominal speed will be displayed on the display (**C**).

At standstill, speed can be changed between two speed ranges (**I** or **II**) by pressing key (**D**). In standby mode, the display (**C**) shows the set speed value.

This stirrer has two different speed ranges:

**Range I:** low speed/high torque (LED (**E**))

**Range II:** high speed/lower torque (LED (**F**))

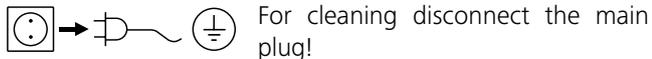
### • **Correct step to change Speed Range:**

- Turn off the unit with knob (**B**)
- Change speed range with key (**D**)
- Change speed with knob (**B**)
- Turn on unit with knob (**B**)
- The speed can be changed at any time during operation
- Speed appears in display (**C**).

## 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 main plug!

Use only cleaning agents which have been approved by **IKA** to clean the 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:

- machine type
- manufacturing number, see type plate
- item and designation of the spare part, see [www.ika.com](http://www.ika.com), spare parts diagram and spare parts list
- Softwareversion.

### **Repair:**

**Please send in device for repair only after it has been cleaned and is free from any materials which may constitute a health hazard.**

For repair, please request the "Decontamination Certificate" form **IKA** or use the download printout of it from **IKA** website: [www.ika.com](http://www.ika.com).

If you require servicing, return the device in its original packaging. Storage packaging is not sufficient. Please also use suitable transport packaging.

## Error codes

The fault is shown by an error code in the display (C) as following if the error occurs, e.g. **Er 4**.

Proceed as follows in such cases:

- ☞ Switch the device switch (A) off.
- ☞ Remove the stirrer tool and remove the instrument from the assembly.
- ☞ Reduce the speed and switch on (instrument switch (A)) the device without the stirrer tool.

Error code	Cause	Effect	Solution
<b>Er 2</b>	Motor current sensor fault	motor off	- Switch off the instrument
<b>Er 3</b>	Temperature inside instrument is too high	motor off	- Switch off the instrument and allow it to cool down
<b>Er 4</b>	Motor blockage or overload	motor off	- Switch off the instrument - Decrease the load on the motor and restart again
<b>Er 8</b>	Speed sensor fault or overload	motor off	- Switch off the instrument
<b>Er 21</b>	Safety relay fault	motor off	- Switch off the instrument

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 instrument for repair, including a short description of the fault.

## 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 machine 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.

## Accessories

<b>R 2722</b>	H-stand	<b>RH 5</b>	Strap clamp
<b>R 2723</b>	Telescopic stand	<b>R 301</b>	Stirrer shaft protection
<b>R 2850</b>	Floor stand	<b>R 301.1</b>	Support holder
<b>R 271</b>	Cross sleeve		

See more accessories on [www.ika.com](http://www.ika.com).

## Permitted IKA stirrer tools

	<i>Max. speed (rpm)</i>		<i>Max. speed (rpm)</i>
<b>R 1342</b>	Propeller stirrer	<b>R 1355</b>	Centrifugal stirrer
<b>R 1345</b>	Propeller stirrer	<b>R 1375</b>	Paddle stirrer
<b>R 1381</b>	Propeller stirrer	<b>R 1376</b>	Paddle stirrer
<b>R 1382</b>	Propeller stirrer	<b>R 2311</b>	Paddle stirrer
<b>R 1385</b>	Propeller stirrer	<b>R 1330</b>	Anchor stirrer
<b>R 1388</b>	Propeller stirrer	<b>R 1331</b>	Anchor stirrer
<b>R 1389</b>	Propeller stirrer, PTFE	<b>R 1333</b>	Anchor stirrer
<b>R 2302</b>	Propeller stirrer	<b>R 3000.1</b>	Moebius stirrer
<b>R 1311</b>	Turbine stirrer	<b>R 3001.1</b>	Moebius stirrer
<b>R 1312</b>	Turbine stirrer	<b>R 3003</b>	Spiral stirrer
<b>R 1313</b>	Turbine stirrer	<b>R 3003.1</b>	Spiral stirrer
<b>R 1300</b>	Dissolver stirrer	<b>R 3003.2</b>	Spiral stirrer
<b>R 1302</b>	Dissolver stirrer	<b>R 3004</b>	Blade stirrer
<b>R 1303</b>	Dissolver stirrer	<b>R 3004.1</b>	Blade stirrer
<b>R 1352</b>	Centrifugal stirrer	<b>R 3004.2</b>	Blade stirrer

See more permitted stirrer tools on [www.ika.com](http://www.ika.com).

## Technical data

Speed range <b>I</b> (high torque) Speed range <b>II</b> (high speed)	<b>rpm</b>	0 / 6 ... 400 0 / 30 ... 2000
Speed setting		Stepless
Speed display		7-Segment LEDs
Speed setting accuracy	<b>rpm</b>	± 1
Speed measurement deviation		Speed < 300 rpm: ± 3 rpm Speed > 300 rpm: ± 1 %
Max. torque at stirrer shaft	<b>Ncm</b>	Range <b>I</b> : 400 Ncm Range <b>II</b> : 80 Ncm
Max. stirring quantity (water)	<b>ltr</b>	150
Max. viscosity	<b>mPas</b>	100000
Permitted on time	<b>%</b>	100
Operating voltage	<b>VAC</b>	230 ± 10 % 115 ± 10 % 100 ± 10 %
Frequency	<b>Hz</b>	50 / 60
Max. input power	<b>W</b>	226
Max. output power at stirring shaft	<b>W</b>	167
Protection type acc. to EN 60529		IP 40
Protection class		I
Excess voltage category		II
Contamination level		2
Protection at overload		Yes / motor current limitation
Ambient temperature	<b>°C</b>	+ 5 ... + 40
Ambient humidity (rel.)	<b>%</b>	80
Drive		Brushless motor
Clamping chuck – clamping range	<b>mm</b>	3 ... 16
Hollow shaft internal diameter	<b>mm</b>	10.3
Extension arm (Ø x L)	<b>mm</b>	16 x 160
Housing		Coated aluminium casting and thermoplastic plastic
Dimensions (W x D x H) (without extension arm)	<b>mm</b>	114 x 245 x 325
Weight (with extension arm and clamping chuck)	<b>kg</b>	8.4
Operation at a terrestrial altitude	<b>m</b>	max. 2000

*Subject to technical changes!*

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