



# RET<sup>®</sup> control-visc

The Magnetic Stirrer for Scientists



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Ph.D.

Recipient of MacArthur  
Genius Grant



Baran  
uses IKA<sup>®</sup>  
equipment



designed  
to work perfectly

**The RET® control-visc is the safest, strongest and most intelligent magnetic stirrer in its class.**

The RET® control-visc is a magnetic stirrer whose remarkable technical functions have been developed for demanding applications. The unit mainly focuses on three core competences:  
1. Safety, 2. Power, 3. Intelligence.

This is made possible by  
> using high performance electronic components,  
> intelligent heating technology,  
> a motor designed specifically for a variety of applications (including high-viscous fluids) and  
> high quality standards applied during the production process.

### Insulated composite heating plate

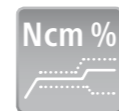
With the unique structure of the composite heating plate, the RET® control-visc minimizes the loss through eddy currents when heating and stirring. The integrated high-tech insulation optimizes the heat transfer into the medium by minimizing thermal losses. The built-in heating foil ensures an even temperature allocation on the heating plate.



**Sealed housing**  
to protect motor and display



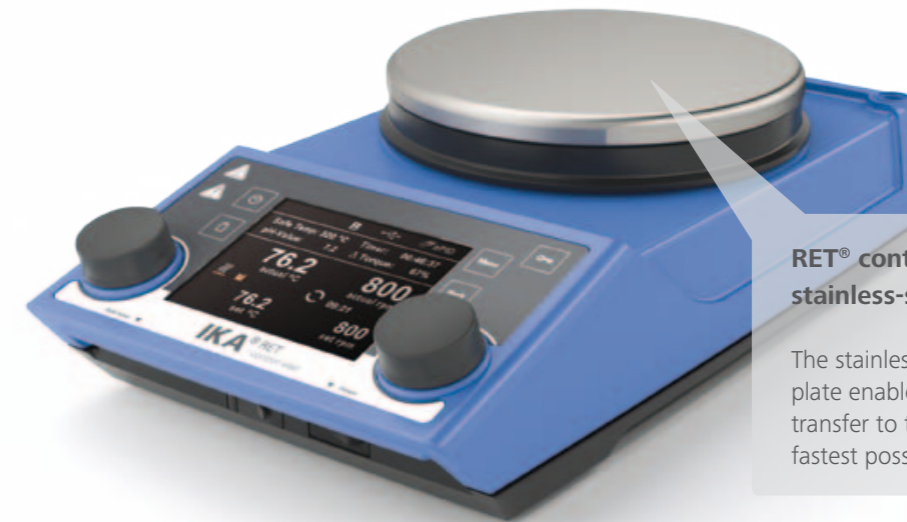
**An integrated and patented weighing function** allows the user to measure weight changes of up to 5,000 g



**Torque trend measurement**  
Viscosity changes in the medium can be measured by using a torque measurement device. The results can be depicted on the display

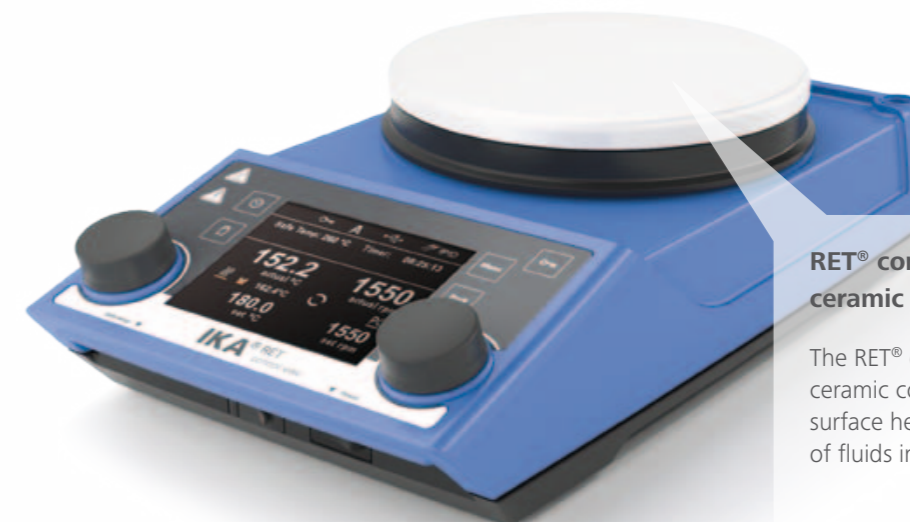
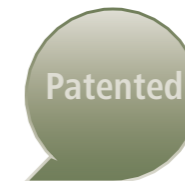


**An RS 232 and USB interface** enable connecting the unit to a PC for operating and updating the device



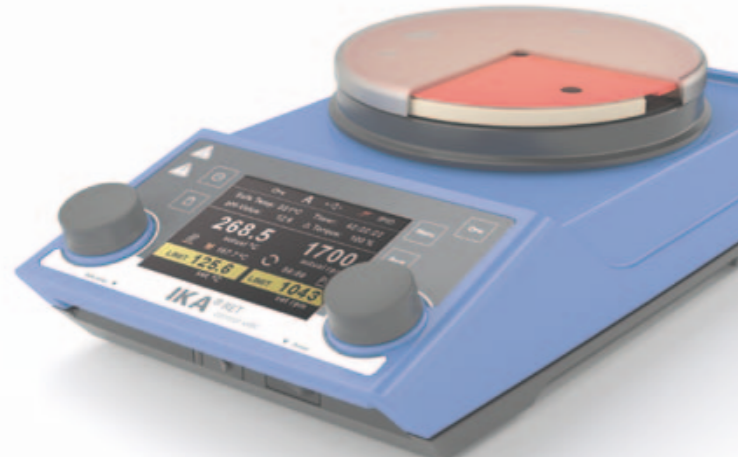
**RET® control-visc with high-quality stainless-steel heating plate surface**

The stainless steel surface of the composite plate enables the most efficient heat transfer to the medium and results in the fastest possible heating of the medium.



**RET® control-visc white with ceramic coated heating plate**

The RET® control-visc white offers a ceramic coated heating plate. The white surface helps to recognize color changes of fluids in a glass vessel.



> The RET® control-visc offers excellent safety

The device comes with a coated and sealed housing which protects liquids from entering into the magnetic stirrer. Overheating is prevented by several integrated technical features. In the case of a malfunction, the device shuts down automatically and shows the error code on the TFT display. The integrated safety features also allow for an unsupervised operation of the RET® control-visc.

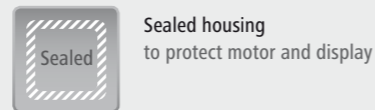


> Sealed housing



In case of a liquid overflow a built-in drainage protects the electronic components of the device.

- > Liquids cannot get inside the unit
- > Components are safe
- > Isolated drain



> Three temperature safety protection features

“Safety Temperature”

is an adjustable temperature safety circuit that prevents from exceeding a specified set temperature. The safety temperature can be adjusted by using a special tool included in the product delivery



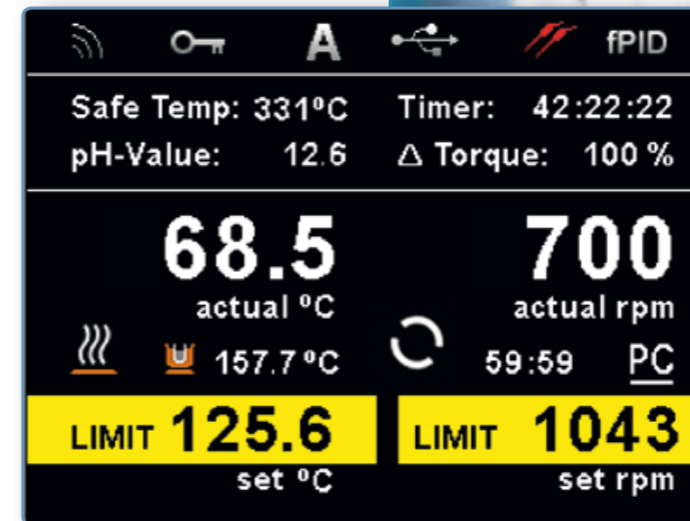
“Set temperature”

can be adjusted easily. It is used to safely heat the medium until the set temperature is reached



“Overheating protection”

Should the internal temperature of the RET® control-visc exceed the permissible temperature that would damage the internal electronic components, the heating power is reduced automatically.



> Safe operation

Operating modes

The unit is equipped with three operating modes:

**A Mode:** regular operation, all values can be directly changed  
**B Mode:** all settings are stored when the device is switched off or loses power, functions are restored when the unit is powered ON again.

**C Mode:** If operating in C-Mode the set values are not changeable. When restarting the device these values are still fixed. In order to change the parameters, the software mode has to be changed to A or B through the display menu.



Password protection

Menu access can be password protected. If enabled, users cannot change any settings without password.

Adjustable limits

Limits can be set for speed and temperature. It is possible to set a minimum value for each parameter.

Lock button protects set parameters

YOUR BENEFITS

Coated and sealed housing

- > Liquids can not get inside the unit
- > Components are safe
- > Isolated drain
- > Protection class IP42

Three temperature safety protection features

- > Highest possible safety especially when working with easily flammable liquids
- > Manually adjustable safety circuit
- > Overheating protection for electronic components

C Mode advantages

- > Protected against changes to set values
- > Values are still fixed after restarting the device, suitable for serial testing
- > Automated restart after power outage to operating mode and set values



> RET® control-visc is the strongest magnetic stirrer in its class

Three components provide for an extraordinarily powerful magnetic stirrer:

1. high performance EC motor with 12W output
2. high performance internal transformer providing efficient power
3. composite heating plate with minimal eddy current losses

The unique structure of the insulated heating plate results in faster heating than other magnetic stirrers.

> Stirring performance

**Powerful EC motor with high performance internal transformer**



Compact and closed composite heating plate, combined with an advanced heating foil and engineered insulation, ensures an even temperature distribution on the heating plate.

**YOUR BENEFITS**

**Highly powerful and energy efficient**

- > High stirring speed stability
- > Fast heating times
- > High temperature stability
- > Motor/transformator/composite heating plate = high performance of stirring and heating
- > Engineered heating plate insulation
- > Optimized heating through intelligent product design



> Heating performance  
**powerful and efficient heat transfer into the sample**

Heating rate  
7 K/min for 1l H<sub>2</sub>O at 600 W

> Easy operation with user-friendly display

The RET® control-visc continues the user-friendly tradition of operating the unit with two rotating knobs. They enable the easy and direct change of the most important parameters on the display menu.

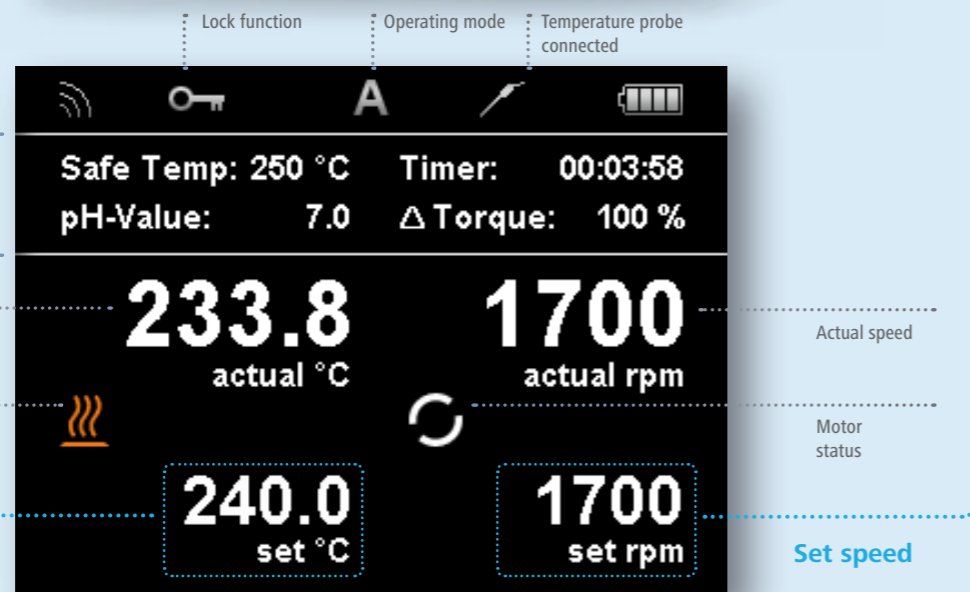
The high-resolution display has easy to understand icons that allow for simple navigation through the menu, as well as allow for adjusting display settings, using the weighing or torque trend measurement functions, or changing the display language.

Easy operation and display of all relevant information at one glance



Set temperature

Set speed

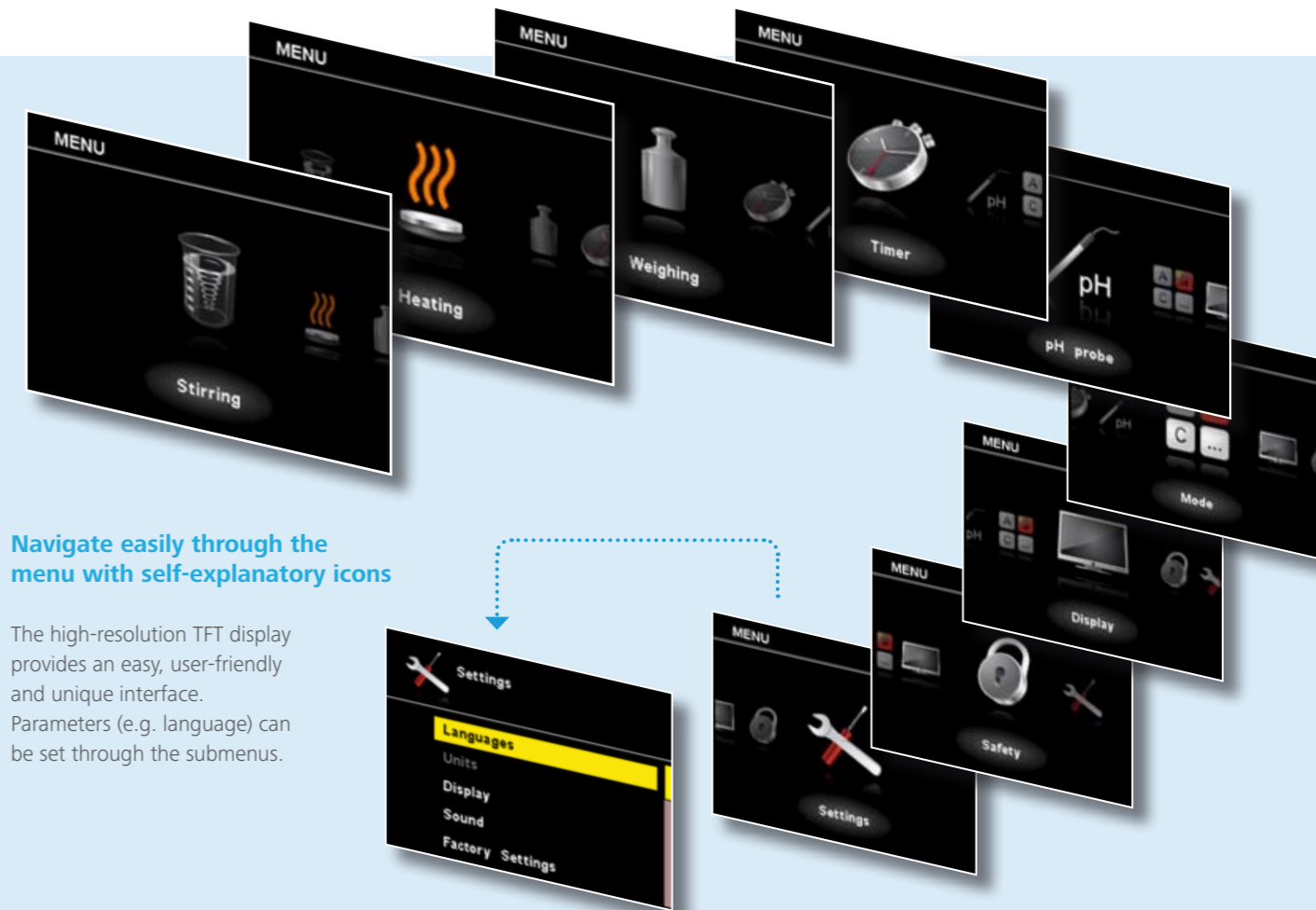


> IKA® Magnetic Stirrer with Scientists

The Scripps Research Institute (TSRI) is a nonprofit research institution whose philosophy emphasizes the creation of basic knowledge in the biosciences for its application in medicine, the pursuit of fundamental scientific advances through inter-disciplinary programs and collaborations, and the education and training of researchers preparing to meet the scientific challenges of the future.

For more information on The Scripps Research Institute, see: [www.scripps.edu](http://www.scripps.edu)

For more information on Phil S. Baran and the Baran Laboratory, see: [www.scripps.edu/baran](http://www.scripps.edu/baran)



Navigate easily through the menu with self-explanatory icons

The high-resolution TFT display provides an easy, user-friendly and unique interface. Parameters (e.g. language) can be set through the submenus.



The heart of the RET® control-visc is the ARM-based microcontroller which is also used in smart phones and tablets. The use of the ARM-based microcontroller technology provides the intelligence of simple navigation, firmware update possibility, weighing and torque trend measurement.

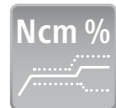
> Intelligent features



**Integrated and patented weighing function**

Perform simple weighing tasks without taking the sample off the device.

Measure weight changes of up to 5,000g	
tolerance	<500 g : +/-1g
	>500 g : +/-5g



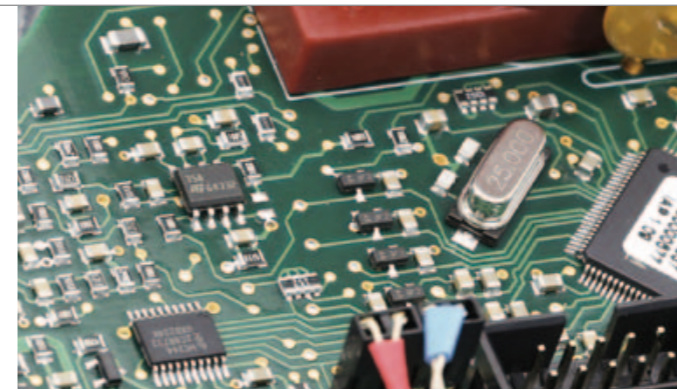
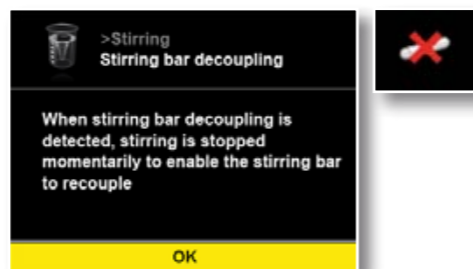
**Torque trend measurement**

Relative viscosity changes can be measured with this feature by using a torque trend measurement device. Results can be depicted on the display. Useful for long term studies, test results can be documented through labworldsoft®. Reproducibility with max. deviation of +/-1%.



**Stirring bar decoupling detection**

The stirring function stops briefly when a decoupling occurs. It will automatically resume to the previously set speed when the stir bar is recoupled. Useful for long-term studies and when working with non-transparent fluids.



> Advanced technology

**Integrated ARM-based microcontroller**

The RET® control-visc uses technology which is used in smart phones or tablets. Two integrated ARM-based microcontroller along with a graphic controller are the base for all intelligent functions within the RET® control-visc. They provide for speed, energy efficiency and powerful performance. When selecting components, the IKA® engineers focus on quality, safety and reliability.

**Firmware update tool**

- > Keep your device up-to-date
- > Software upgrade features

**The RET® control-visc has various interfaces: USB, RS 232 and Bluetooth**



Firmware update tool



Interface

The RET® control-visc has an RS232 and USB interface, connect the unit to a PC for controlling and updating the device

YOUR BENEFITS

**Intelligent solutions**

- > User-friendly
- > Simple navigation and easy operation
- > Multilingual task menu
- > User-defined display settings
- > Integrated patented weighing function
- > Unique torque trend measurement
- > Stirring bar decoupling detection
- > Firmware update tool
- > labworldsoft® compatible



# Integrated features

## Safety



- > **Sealed housing**  
The housing is sealed to protect electronic components inside the device. Protection class IP 42.
- > **Three temperature safety protection features**  
Set temperature for sample heating, adjustable safety circuit to avoid overheating of the heating plate, and overheating protection of internal components.
- > **Three different operating modes**  
A Mode for regular operation, B Mode maintains preset parameters by the user from last operation when unit is powered on, C Mode for automatic restart after power outage to resume operation at preset settings.
- > **Password protection**  
Menu access can be password protected. If enabled, users cannot change any settings without password.
- > **Lock function**  
"Key" lock to prevent changes of set values.
- > **Optional safety-temperature confirmation**  
Safety temperature has to be confirmed when starting the device (this confirmation function is optional and can be turned off through the task menu).
- > **Adjustable limits**  
Limits can be set for speed and temperature. It is possible to set a minimum and/ or maximum value for each parameter.

## Power



- > **Outstanding motor performance**  
enables more stirring power (motor rating output: RH basic = 2 W, RCT basic = 9 W, RET® control-visc = 12 W)
- > **Innovative heating plate**  
Insulated composite heating plate results in efficient heating of the sample with minimal eddy current losses.
- > **High-efficient motor power**  
More stirring power through high-efficient motor.
- > **Heating plate with stainless steel surface**  
enables quickest and safest heating of the sample.
- > **Heating plate with white ceramic coating**  
allows for excellent chemical resistance.
- > **Temperature control with dual temperature sensor**  
Simultaneous control of the temperature of the heating plate and the sample.
- > **Three different temperature control modes**  
aPID (PID\*): slow, but accurate heating of the medium; no overshooting of the temperature  
fPID: rapid heating and high control accuracy, minor overshooting is possible  
2-pt: faster than aPID, overshooting of sample temperature of up to 10 °C  
\* PID: a proportional- integral-derivative controller

## Intelligence



- > **Integrated weighing function**  
Perform simple weighing tasks without taking the sample off the device.
- > **High-resolution TFT display**  
Lets the user see all relevant data clearly and simultaneously.
- > **Bluetooth interface**  
Integrated Bluetooth interface (to use with labworldsoft® and PC connection)
- > **Torque trend measurement**  
Relative viscosity changes can be measured with this feature.
- > **Multilingual menu**  
The user can change the display language, there are 9 languages to choose from.
- > **"HOT" warning**  
When the device is off and the heating plate is hot, the display shows the warning "HOT" and the current heating plate temperature. The display turns off completely when the temperature of the heating plate drops below 50 °C.
- > **Stirring bar decoupling detection**  
The stirring function stops briefly when a decoupling occurs. It will automatically resume to the previously set speed when the stir bar is recoupled.
- > **Display view**  
can be modified by the user, certain values can be shown or hidden.
- > **Interval mode**  
The stirring function can be programmed to stop and automatically restart in intervals adjustable by the user.
- > **pH measurement**  
Measuring pH values is possible with pH sensors (BNC-connector); available through IKA® or other manufacturers.
- > **Error code display**  
When an error occurs, the code is shown on the display. Please refer to the manual for further details.
- > **Sensor calibration**  
Temperature and pH sensors can be calibrated through the RET® control-visc against a known calibrated source (i. e. temperature device and pH buffer solution respectively).
- > **Labworldsoft®**  
Specifically designed and developed by IKA®, this software allows for the RET® control-visc and other lab equipment from other manufacturers to be operated. For more information, please go to <http://www.ika.com>.
- > **Reset**  
The device can be reset to factory defaults.
- > **Timer function**  
Stop the heating process automatically after a specified time (max. 99:59:59)
- > **Software update**  
Keep your device software up-to-date with the integrated firmware update function. You can update through the USB interface of the stirrer and your PC.

# Technical data

Technical data	RET® control-visc   RET® control-visc white
Max. stirring quantity (H <sub>2</sub> O)	20 l
Motor rating input / output	22 / 12 W
Speed range	50 – 1700 rpm
Heat output	600 W
Temperature range	RT – 340 °C
Adjustable safety circuit	50 – 380 °C
Control accuracy with sensor	PT 100: ± 0.2 K
Heating plate material	stainless steel 1.4301   white ceramic
Heating plate dimensions	Ø 135 mm
Dimensions (W x D x H)	160 x 270 x 85 mm
Weight	3 kg
Permissible ambient temperature	5 – 40 °C
<b>Price</b>	<b>1.043,- EUR   1.066,- EUR</b>
	Ident. No. 0005020000   0005030000

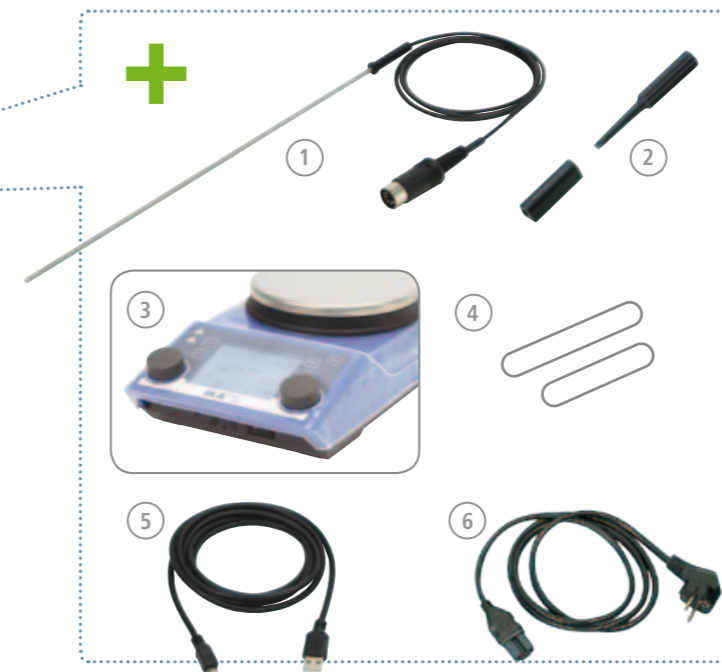
Protection class according to DIN EN 60529



**3** Year warranty\* **CE**

\* 2+1 years after registering at [www.ika.com/register](http://www.ika.com/register), glassware and wearing parts excluded

Protection class according to DIN EN 60529: IP 42



The RET® control-visc comes with the following accessories

- 1 PT 100.70 temperature sensor  
Temperature sensor, stainless steel
- 2 Safety circuit tool  
Tool to adjust safety circuit
- 3 H 104 protective cover (transparent)  
Cover for RET® control-visc
- 4 Magnetic stirring bars  
IKAFLON® 30 round PTFE-coated  
IKAFLON® 40 round PTFE-coated
- 5 USB Cable
- 6 Power plug H 11  
Mains cable, plug depending on region

## Overview IKA® magnetic stirrers

IKA® offers a wide range of magnetic stirrers. Compare the following IKA® hotplate stirrers to help you find the most suitable unit for your application.



Technical data	RH basic 2	RH basic	RH digital
Display	Scale	Scale	LED
Max. heating plate temperature	320°C	320°C	320°C
Heat output	400 W	600 W	600 W
Max. stirring quantity (H <sub>2</sub> O)	10 l	15 l	15 l
Heating plate material	stainless steel	stainless steel - composite / white ceramic	stainless steel - composite / white ceramic
Connection for ext. temp. sensor	–	ETS-D x ✓	ETS-D x ✓
Integrated temperature regulation	–	–	–
Control accuracy with integrated temperature regulation	–	–	–
Interface for external control > labworldsoft	–	–	–
Weighing, torque trend, pH	–	–	–
Firmware update tool	–	–	–
Protection class according to DIN EN 60529	IP 21	IP 21	IP 21

Basic stirring and heating functionality.

Basic stirring and heating functionality with composite heating plate in stainless steel or white ceramic coated. External temperature control possible by connecting a contact thermometer (only ETS-D series)

Basic stirring and heating functionality with composite heating plate in stainless steel or white ceramic coated. External temperature control is possible by connecting a contact thermometer (only ETS-D series). Digital LED display for speed and temperature.

Technical data	C-MAG HS 7	C-MAG 7 digital	RCT basic	RET® basic	RET® control-visc
Display	LED / Scale	LCD/ Scale	LED	LED	high-res TFT
Max. heating plate temperature	500°C	500°C	310°C	340°C	340°C
Heat output	1000 W	1000 W	600 W	600 W	600 W
Max. stirring quantity (H <sub>2</sub> O)	15 l	15 l	20 l	20 l	20 l
Heating plate material	white ceramic	white ceramic	aluminum alloy	stainless steel - composite	stainless steel - composite / white ceramic
Connection for ext. temp. sensor	ETS-D x ✓	PT 1000 ✓ precise ✓ +/- 0.5 K	PT 1000 ✓ yes ✓ +/- 1 K	PT 1000 ✓ yes ✓ +/- 1 K	PT 100 ✓ high-precision ✓ +/- 0.2 K
Integrated temperature regulation	–	–	–	–	–
Control accuracy with integrated temperature regulation	–	–	–	–	–
Interface for external control > labworldsoft	–	–	–	–	RS 232/ USB ✓
Weighing, torque trend, pH	–	–	–	–	yes ✓
Firmware update tool	–	–	–	–	yes ✓
Protection class according to DIN EN 60529	IP 21	IP 21	IP 42	IP 42	IP 42

Basic stirring and heating functionality with full-ceramic square plate to achieve higher temperatures. External temperature control is possible by connecting a contact thermometer with precise control accuracy (ETS-D series). Digital LED display for heating plate temperature.

Basic stirring and heating functionality with full-ceramic square plate to realize higher temperatures. External temperature control is possible by connecting the included temperature sensor (PT 1000) to have precise temperature control accuracy of up to +/- 0.5K. Digital LCD display for set and actual heating plate temperature.

Extended stirring and heating performance with aluminum alloy heating plate. External temperature control is possible by connecting the included temperature sensor (PT 1000). Digital LED display for speed and temperature.

Optimized stirring and extended heating performance with composite stainless steel heating plate. External temperature control is possible by connecting the included temperature sensor. Digital LED display for speed and temperature.

Optimized stirring and heating performance with composite heating plate in stainless steel or white ceramic coated. External temperature control is possible by connecting the included temperature sensor (PT 1000); the unit is capable of high-precision temperature control (+/- 0.2K). High-resolution TFT display enables easy operation.



Please visit [www.ika.com](http://www.ika.com) for more information on IKA's magnetic stirrers and accessories





IKA® offers more

Modern  
manufactu-  
ring

Application  
Support

Worldwide  
service  
network

Customizing  
Center

### Modern manufacturing

During manufacturing, IKA® focuses on high quality, not only with well-trained and experienced personnel, but also with standardized processes and quality checks.

The assembly of the printed circuit boards is fully automated and includes an automated 100% quality control check of every PCB.



### Customizing Center

It is important that IKA products work for your application. We are introducing a new program: product solutions tailored to your needs.

Should you not find the appropriate device in our standard product range, please send us your requested specifications through the online form. Our team will determine its feasibility and offer a solution to you.

Please visit [www.ika.com/customizingcenter](http://www.ika.com/customizingcenter) to review already implemented product modifications.

### Worldwide service network – direct contact in your region

Our dedicated team of engineers provides comprehensive worldwide technical service. Please feel free to contact IKA® directly or your dealer in case of any service questions.

For spare parts IKA® guarantees 10 years of availability. In the event of an equipment malfunction or technical questions regarding devices, maintenance and spare parts, please call us at 00 8000 4524357 (00 8000 IKAHELP) or send an email to [service@ika.com](mailto:service@ika.com)



### IKA® Application Support

Our Application Center spans 400sqm and offers modern facilities for presenting and testing lab devices and processes. This brings us even closer to our customers and improves our service. Here, prospective buyers and customers can test processes that involve stirring, shaking, dispersing, grinding, heating, analyzing and distilling.

Call us at 00 8000 4522777 (00 8000 IKAAPPS) or send an email to [applicationsupport@ika.com](mailto:applicationsupport@ika.com) or visit our website at [www.ika.com/applicationsupport](http://www.ika.com/applicationsupport)



Prices valid until December 31st, 2014  
Subject to technical changes and  
alteration of prices

**IKA®+**

**Ordering made easy!**

For more information about  
our products and to place  
your order, please visit:

[www.ika.com](http://www.ika.com)

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Safety  
Power  
Intelligence



[www.facebook.com/IKAworldwide](http://www.facebook.com/IKAworldwide)

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