RET® control-visc
The Magnetic Stirrer for Scientists

Phil S. Baran
Ph.D.
Recipient of MacArthur Genius Grant

Baran uses IKA® 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.

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.

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

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.

“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.

“The RET® control-visc offers excellent safety”

Three temperature safety protection features

- “Safety Temperature”
- “Set temperature”
- Overheating protection

Your benefits

- Sealed housing to protect motor and display
- Lock button protects set parameters

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

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
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.

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

Your benefits:
- Highly powerful and energy efficient
- High stirring speed stability
- Fast heating times
- High temperature stability
- Motor/transformer/composite heating plate = high performance of stirring and heating
- Engineered heating plate insulation
- Optimized heating through intelligent product design

> Stirring performance
Powerful EC motor with high performance internal transformer

> Heating performance
Powerful and efficient heat transfer into the sample

Heating rate
7 K/min for 1 l H2O 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

> 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

For more information on Phil S. Baran and the Baran Laboratory, see: 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 smartphones 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.

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.

> 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

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

labworldsoft® ready

Download the IKA® Firmware Update Tool

labworldsoft®

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

> 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.

> Three different temperature control modes
aPID (PID®): slow, but accurate heating of the medium; no overshooting of the temperature.
PID: 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

Power

> Outstanding motor performance
More stirring power through high-efficient motor.

> Heating plate with white ceramic coating
Allows for excellent chemical resistance.

> High-efficient motor power
More stirring power through high-efficient motor.

> Heating plate with stainless steel surface
Enables quietest and safest heating of the sample.

< Three different temperature control modes
aPID (PID®): slow, but accurate heating of the medium; no overshooting of the temperature.
PID: 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

> Innovative heating plate
Insulated composite heating plate results in efficient heating of the sample with minimal eddy current losses.

> Torque trend measurement
Relative viscosity changes can be measured with this feature.

> Heating plate with stainless steel surface
Enables quietest and safest heating of the sample.

> Temperature control with dual temperature sensor
Simultaneous control of the temperature of the heating plate and the sample.

> 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)

> "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.

> Interval mode
The stirring function can be programmed to stop and automatically restart in intervals adjustable by the user.

> 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.

> Multilingual menu
The user can change the display language, there are 9 languages to choose from.

> Display view
Can be modified by the user; certain values can be shown or hidden.

> Error code display
When an error occurs, the code is shown on the display. Please refer to the manual for further details.

> "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.

> Sensor calibration
Temperature and pH sensors can be calibrated through the RET® control-visc against a known calibrated source (e.g. temperature device and pH buffer solution respectively).

> 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.
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

<table>
<thead>
<tr>
<th>RET® control-visc</th>
<th>RET® control-visc white</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Max. stirring quantity (H₂O)</strong></td>
<td>20 l</td>
</tr>
<tr>
<td><strong>Motor rating input / output</strong></td>
<td>22 / 12 W</td>
</tr>
<tr>
<td><strong>Speed range</strong></td>
<td>50 – 1700 rpm</td>
</tr>
<tr>
<td><strong>Heat output</strong></td>
<td>600 W</td>
</tr>
<tr>
<td><strong>Temperature range</strong></td>
<td>57 – 340 °C</td>
</tr>
<tr>
<td><strong>Adjustable safety circuit</strong></td>
<td>yes</td>
</tr>
<tr>
<td><strong>Control accuracy with sensor</strong></td>
<td>±0.2 K</td>
</tr>
<tr>
<td><strong>Heating plate material</strong></td>
<td>stainless steel or white ceramic coated.</td>
</tr>
<tr>
<td><strong>Heating plate dimensions</strong></td>
<td>Ø 135 mm</td>
</tr>
<tr>
<td><strong>Dimensions (W x D x H)</strong></td>
<td>160 x 270 x 85 mm</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>3.3 kg</td>
</tr>
<tr>
<td><strong>Permissible ambient temperature</strong></td>
<td>5 – 40 °C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RET® basic</th>
<th>RET® basic</th>
<th>RH digital</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Display</strong></td>
<td>Scale</td>
<td>Scale</td>
</tr>
<tr>
<td><strong>Max. heating plate temperature</strong></td>
<td>320 °C</td>
<td>320 °C</td>
</tr>
<tr>
<td><strong>Max. stirring quantity (H₂O)</strong></td>
<td>10 l</td>
<td>10 l</td>
</tr>
<tr>
<td><strong>Heating plate material</strong></td>
<td>stainless steel</td>
<td>stainless steel</td>
</tr>
<tr>
<td><strong>Connection for ext. temp. sensor</strong></td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Control accuracy with integrated temperature regulation</strong></td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Interface for external control + labworldsoft</strong></td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Washing, torque head, pH</strong></td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Firmware update tool</strong></td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Protection class according to DIN EN 60529</strong></td>
<td>IP 21</td>
<td>IP 21</td>
</tr>
</tbody>
</table>

**Technical data**

- **Mains cable, plug depending on region**
- **Power plug H 11**
- **USB Cable**
- **Mains plug H 11**
- **H 104 protective cover (transparent)**
- **Cover for RET® control-visc**
- **Cable to connect to magnetic stirrer**
- **PT 100 temperature sensor**
- **Temperature sensor, stainless steel**
- **Temperature sensor, composite stainless steel**
- **Temperature sensor**
- **Digital LED display**
- **Digital LED Display for heating plate temperature**
- **Digital LED display for speed and temperature**

**RET® control-visc**

- **PT 100-70 temperature sensor**
- **Temperature sensor, stainless steel**
- **Safety circuit tool**
- **Tool to adjust safety circuit**
- **Magnetic stirring bars**
- **IKAFUNK® 30 round PTFE-coated**
- **IKAFUNK® 40 round PTFE-coated**
- **USB Cable**
- **Power plug H 11**

**RET® control-visc white**

- **PT 100 temperature sensor**
- **Temperature sensor, stainless steel**
- **Safety circuit tool**
- **Tool to adjust safety circuit**
- **Magnetic stirring bars**
- **IKAFUNK® 30 round PTFE-coated**
- **IKAFUNK® 40 round PTFE-coated**
- **USB Cable**
- **Power plug H 11**

**RET® control-visc white**

- **PT 100 temperature sensor**
- **Temperature sensor, stainless steel**
- **Safety circuit tool**
- **Tool to adjust safety circuit**
- **Magnetic stirring bars**
- **IKAFUNK® 30 round PTFE-coated**
- **IKAFUNK® 40 round PTFE-coated**
- **USB Cable**
- **Power plug H 11**

**RET® control-visc white (with the following accessories)**

- **PT 100-70 temperature sensor**
- **Temperature sensor, stainless steel**
- **Safety circuit tool**
- **Tool to adjust safety circuit**
- **Magnetic stirring bars**
- **IKAFUNK® 30 round PTFE-coated**
- **IKAFUNK® 40 round PTFE-coated**
- **USB Cable**
- **Power plug H 11**

Please visit [www.ika.com](http://www.ika.com) for more information on IKA’s magnetic stirrers and accessories.
IKA stainless steel vessels ensure:
> Optimized heat transfer
> Outstanding magnetic adhesion and
> Fits securely on the heating plate

**YOUR BENEFITS**

<table>
<thead>
<tr>
<th>Dual sensors (PT 1000.50, PT 1000.51, PT 1000.53)</th>
<th>Can be connected</th>
</tr>
</thead>
</table>
| ➤ Precision temperature control

1. **Sensors**
   - IKA FLON® round
   - IKA FLON® 15 Set (5) Pcs round PTFE coated (ID 36066600, 36066601, 36066602)
   - IKA FLON® 15 Set (5) Pcs round PTFE coated (ID 36066600, 36066601, 36066602)
   - IKA FLON® 15 Set (5) Pcs round PTFE coated (ID 36066600, 36066601, 36066602)
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   - IKA FLON® 15 Set (5) Pcs round PTFE coated (ID 36066600, 36066601, 36066602)

2. **Lifts**
   - Manual silo lift
   - LIFT m
   - LAB LIFT

<table>
<thead>
<tr>
<th>Other accessories Name</th>
<th>Ident. No.</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual silo lift</td>
<td>0001545100</td>
<td>47,50 EUR</td>
</tr>
<tr>
<td>Support rod, Ø 10 mm, 450 mm length</td>
<td>0005005000</td>
<td>12,80 EUR</td>
</tr>
<tr>
<td>Extension for support rod</td>
<td>0002437700</td>
<td>21, EUR</td>
</tr>
<tr>
<td>Boss head clamp</td>
<td>0003547700</td>
<td>21, EUR</td>
</tr>
<tr>
<td>Holding rod</td>
<td>0003547700</td>
<td>21, EUR</td>
</tr>
</tbody>
</table>

3. **Stainless steel vessels**
   - IKA FLON® bone
   - IKA FLON® 3 Set (5) Pcs bone PTFE coated (ID 36066620, 36066621, 36066622)
   - IKA FLON® 5 Set (5) Pcs bone PTFE coated (ID 36066620, 36066621, 36066622)
   - IKA FLON® 15 Set (5) Pcs bone PTFE coated (ID 36066620, 36066621, 36066622)
   - IKA FLON® 25 Set (5) Pcs bone PTFE coated (ID 36066620, 36066621, 36066622)
   - IKA FLON® 35 Set (5) Pcs bone PTFE coated (ID 36066620, 36066621, 36066622)

4. **Lifts**
   - Manual silo lift
   - Manual silo lift
   - LIFT m

5. **Other accessories**
   - Manual silo lift
   - Support rod, Ø 10 mm, 450 mm length
   - Extension for support rod
   - Boss head clamp
   - Holding rod
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.

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

IKA® Application Support

Our Application Center spans 400 sqm 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 or visit our website at www.ika.com/applicationsupport

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 to review already implemented product modifications.

IKA® offers more

Modern manufacturing

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Ordering made easy!
For more information about our products and to place your order, please visit:

www.ika.com

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