

IKA

designed for scientists

RO 5/10/15



RT 5/10/15



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Technische Daten

RO

Steckernetzteil

Input	V 100 - 240
	A 1,67
	Hz 50/60
Output	Vdc 24; 40 W.LPS; (limited power source)
Schutzklasse	2 (doppelt isoliert) 

Betriebsspannung	Vdc 24
	<i>RO 5</i> <i>RO 10</i> <i>RO 15</i>
Leistungsaufnahme (max.)	A 0,5 1,0 1,5
Leistungsaufnahme Standby-Betrieb	W 12 24 36
Geräteabgabeleistung	W 2
Drehzahlbereiche P50, P70, P100, ---- ECO-Mode	W 17
	rpm 0 - 1200 in 10 rpm-Stufen einstellbar
	rpm 0 - 600 in 10 rpm-Stufen einstellbar
	<i>RO 5</i> <i>RO 10</i> <i>RO 15</i>
Aufstellfläche	mm 120 x 450 180 x 450 270 x 450
Geräte-Abmessung:	mm 120 x 570 x 60 190 x 570 x 60 280 x 570 x 60
Gewicht:	kg 3,0 4,0 7,0

RT

Gerät

Betriebsspannungsbereich	Vac 230 ± 10%
	Vac 115 ± 10%
Frequenz	Hz 50 / 60
Drehzahlbereiche P50, P70, P100, ---- ECO-Mode	rpm 0 - 1000 in 10 rpm-Stufen einstellbar
	rpm 0 - 600 in 10 rpm-Stufen einstellbar

	<i>RT 5</i> <i>RT 10</i> <i>RT 15</i>
Leistungsaufnahme max.	W 185 395 600
Aufstellfläche	mm 110 x 495 180 x 495 270 x 495
Geräte-Abmessung:	mm 120 x 610 x 60 190 x 610 x 60 280 x 610 x 60
Gewicht:	kg 4,0 6,5 9,4
Einstell- und Anzeigauflösung	K 1
Oberflächentemperatur max.	°C 120*

Temperaturbegrenzung (einstellbar)	°C 50 - 150
------------------------------------	--------------------

RO/RT

Einstellgenauigkeit	rpm ±5
Abweichung zu den einzelnen Rührstellen	% 0
Zul. Einschaltdauer	% 100
Zul. Umgebungstemperatur	°C +5 bis +40
Zul. relative Feuchte	% 80
Schutzart nach DIN EN 60529	IP 40
Geräteinsatz über NN	m max. 2000
max. Rührmenge (Wasser)	400 ml pro Rührstelle im 600 ml-Becherglas

	<i>RO/RT 5</i> <i>RO/RT 10</i> <i>RO/RT 15</i>
bei anderen Gefäßen	ltr 2 4 6
Rührstellen	5 10 15
Rührstellenabstand	mm 90 90 x 90 90 x 90



* **Achtung!** Die angegebene maximale Heizplattentemperatur bezieht sich auf komplett beladene Geräte. In unbeladenem Zustand kann die Aufstellplattentemperatur 130 °C (+10 °C / -5 °C) erreichen. Beladung zur Ermittlung der angegebenen Werte: 250 ml Erlenmeyerkolben befüllt mit 200 ml Wasser.

Technische Änderungen vorbehalten!

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EN

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EU Declaration of conformity

We declare under our sole responsibility that this product is in compliance with the regulations 2014/35/EU, 2014/30/EU and 2011/65/EU and conforms to the standards or normative documents: EN 61010-1, EN 61010-2-010 (only RT series), EN 61010-2-051, EN 61326-1, EN 60529 and EN ISO 12100.

A copy of the complete EU Declaration of Conformity or further declarations of conformity can be requested at sales@ika.com.

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.

Explication of warning symbols



General hazard.



This symbol identifies information **that is of absolute importance to ensure health and safety**. Failure to observe this information may be detrimental to health or may result in injuries.



This symbol indicates information **which is important for ensuring that the appliance functions without any technical problems**. Failure to observe this information could damage the appliance.



This symbol indicates information **which is important for proper use of the appliance and / or ensuring that the appliance functions correctly**. Failure to observe this information can lead to inaccurate results.



ATTENTION - Risk of damage due to magnetism.



DANGER - Reference to the endangerment by a hot surface

Safety instructions

For your protection

- Read the operating instructions completely 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 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.



RT

Ensure that the power cord set / temperature sensor cable does not touch the heating plate.

- 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.
- Set up the appliance 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.
- Gradually increase the speed.
- Reduce the speed if
 - medium splashes out of vessel because the speed is too high,
 - device is not running smoothly,
 - container moves on the base plate.



RT

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.



Beware of hazards due to:

- flammable materials,
- combustible media with a low boiling temperature,
- glass breakage,
- incorrect container size,
- overfilling of media,
- unsafe condition of container.

- The appliance may heat up when in use.
- The base plate can heat up due to the action of the drive magnets at high motor speeds, even if the heater is not operational.
- Process pathogenic materials only in closed vessels under a suitable extractor hood. Please contact **IKA** if you have any questions.



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.



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 observe the operating instructions for any accessories.
- Safe operation is guaranteed only with the use of original IKA 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.
- Always disconnect the plug before fitting accessories.
- The appliance 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.
- 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 so-lute 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 alkalimetals attack it; halogenated hydrocarbons have a reversible swelling effect.
(Source: Römpps Chemie-Lexikon and „Ullmann“ Volume 19)

For protection of the equipment

- The appliance may only be opened by experts.
- The voltage stated on the type plate must correspond to the mains voltage.
- Do not cover the device, even partially e.g. with metallic plates or film. This results in overheating.
- Protect the appliance and accessories from bumps and impacts.
- Ensure that the base plate is kept clean.
- Observe the minimum distances between the devices, between device and wall and minimum distances (min. 800 mm) above the assembly, see Fig. 2.

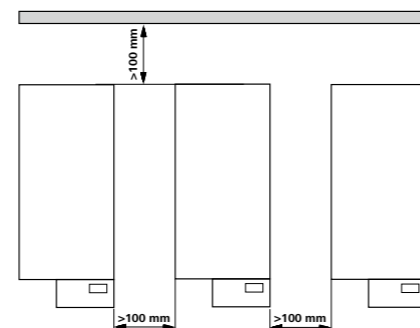


Fig. 2

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

RO

- Magnetic stirrer RO 5/10 or 15
- power supply unit
- operating instruction

RT

- Heating magnetic-stirrer RT 5/10 or 15
- mains cable
- operating instruction

Correct use

• Use

- For mixing and / or heating liquids

• Range 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 manufacture's specifications,
- if the device or the printed circuit board are modified by third parties.

Commissioning

RO/RT

Observe the ambient conditions (temperature, humidity, etc.) listed under Technical Data.

The device is switched on and off via the switch (A) located on the right-hand side of the device. On the front panel a small arrow labelled Power above the display (B) indicates the location of the switch.

After the device is switched on a display self-test is performed. The display cycles through the following information:

- All segments light up
- The software version and the selected mode are displayed
- The selected "Eco Mode" is displayed (E when ECO mode is active)
- If the drive has not been started the display reads „OFF“. If the drive has been started the selected speed is displayed.

Temperature limit

RT

The max. achievable hotplate temperature is limited to 150 °C due to the design. Once this limit has been attained, the device switches off the heating.



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

Setting the temperature limit

RT

The temperature limit is set as follows:

Switch the device on using the On/Off switch on the right side of the device. As soon as the display shows SAFE, press and hold down the Temp membrane key and use

the +/- membrane keys (**H** or **I**) to set the desired temperature limit.

The set temperature limit is displayed.

Once the Temp membrane key is released, the temperature limit is saved.

Stirring function

RO/RT

The stirring function is started and stopped by pressing the „Start/Stop“ button (**C**). Pressing the +/- buttons (**E or D**) increases or reduces the speed.

ECO mode

RO/RT

The heat generated in the device can be reduced by lowering the power of the input coils.

Pressing the "ECO Mode" (F) key to reduce the current power setting. ECO mode is indicated by an "E" preceding the speed. When the power is set to ECO mode, the speed is limited to 600 rpm.

To make the stirring power more independent from the speed range, press the "ECO Mode" membrane key (F) and then select one of the following setting options.

- P50 (Stirring power 50% independent of the speed range)
- P75 (Stirring power 75% independent of the speed range)
- P100 (Stirring power 100% independent of the speed range)
- (Standard stirring performance with the stirring power regulated by the speed)

Operating modes

RO/RT

To toggle between modes, press the Start/Stop key (C) when switching on.

Operating Mode "A"

All the parameter settings are retained when the device is switched off or disconnected from the mains.

The "Start/Stop" (C) key starts the device with the set parameters.

Operating Mode "B"

All parameter settings, including "Start/Stop", are saved when the device is switched off.

Operating Mode "D"

In the D mode the device operates as per the A mode but with the following exception:

- Switch on and then press the "Temp" membrane key to confirm the safety temperature.
- The value flashes until it is confirmed.

Factory setting: mode A

Direction of rotation reversal

RO/RT

The (G) key activates the "Reverse Rotation" function.

When the "Reverse Rotation" function is switched on, a decimal point (K) appears in the LCD display.

The running time (30, 60, 90 or 120sec) is set by pressing the (G) key followed by the +/- keys.

After the preset running time, the drive is switched off and restarted at minimum speed in the opposite direction after a pause specific to the speed.

In this way the magnetic rod is captured and any liquid still rotating is gradually slowed down. Then the drive accelerates to the target speed.

Note: If the "Reverse Rotation" key (G) is pressed again, the drive will keep rotating in the same direction.

When the device is started up again, the drive will rotate in the direction last set.

Function Heating

RT

The heating function is started and stopped by pressing the "Temp" button (J).

Pressing the +/- buttons (H or I) increases or reduces the temperature.

Maintenance and cleaning

The equipment 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 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.

Ordering spare parts

When ordering spare parts, please give:

- Device type
- Manufacturing number, see type plate
- Software version
- Item number and designation of the spare part, see www.ika.com.

Repair

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

For this you should request the "Safety Declaration (Decontamination Certificate)" from IKA, or use the download printout of it from the IKA website www.ika.com.

Return the instrument in its original packaging. Storage packaging is not sufficient. Also, please use suitable shipping package materials.

Error Codes (RT 5/10/15)

Error code	Cause	Effect	Solution
Er03	Temperature inside device is too high	Heating off	- Switch off device and allow to cool down
Er21	Safety relay doesn't open during test	Heating off	- Switch off device - <i>Warning! Only to be carried out by authorised service personnel: Check PCB</i>
Er22	Safety temperature is too low during test	Heating off	- Switch off device - <i>Warning! Only to be carried out by authorised service personnel: Check PCB and safety temperature sensor</i>
Er25	Heating and switching element monitoring	Heating off	- Check the external temperature controller - Switch off device - <i>Warning! Only to be carried out by authorised service personnel: Carry out an internal test on the device to check the plug-in connector for the heating element, the safety temperature sensor or the PCB</i>
Er26	Difference between temperature of safety sensor and temperature of control sensor: control temperature > (safety temperature + 40 K)	Heating off	- Switch off device - <i>Warning! Only to be carried out by authorised service personnel: Carry out an internal test on the device to check the plug-in connector for the temperature sensor</i>
Er31	Triac error detection doesn't work	Heating off	- Switch off device - <i>Warning! Only to be carried out by authorised service personnel: Check PCB</i>
Er46	Difference between temperature of safety sensor and temperature of control sensor: safety temperature > (control temperature + 40 K)	Heating off	- Switch off device - <i>Warning! Only to be carried out by authorised service personnel: Carry out an internal test on the device to check the plug-in connector for the temperature sensor</i>

If the actions described fail to resolve the fault or another error code is displayed then take one of the following steps:

- Please contact the service department;
- Send the device for repair, including a short description of the fault.

Accessories

- Stirring bar: ∅ 8 mm; length 30 mm
- RSE Stirring bar remover

Technical data

RO

Power supply unit

Input **V** 100 - 240
A 1,67

Output **Vdc** 24; 40 W.LPS; (limited power source)

Protection class **Hz** 50/60
2 (double insulated) 

Operating voltage **Vdc** 24

	RO 5	RO 10	RO 15
A	0,5	1,0	1,5
W	12	24	36

Power consumption (max.) **W** 2

Power consumption, standby operation **W** 17

Power output **rpm** 0 - 1200 in 10 rpm-steps adjustable

Speed ranges P50, P70, P100, ---- **rpm** 0 - 600 in 10 rpm-steps adjustable
ECO-Mode

	RO 5	RO 10	RO 15
mm	120 x 450	180 x 450	270 x 450
mm	120 x 570 x 60	190 x 570 x 60	280 x 570 x 60
kg	3,0	4,0	7,0

Set-up surface **mm** 120 x 450

Dimension: **mm** 120 x 570 x 60

Weight: **kg** 3,0

RT

Unit

Operating voltage **Vac** 230 ± 10%
Vac 115 ± 10%

Frequency **Hz** 50 / 60

Speed ranges P50, P70, P100, ---- **rpm** 0 - 1000 in 10 rpm-steps adjustable
ECO-Mode **rpm** 0 - 600 in 10 rpm-steps adjustable

	RT 5	RT 10	RT 15
W	185	395	600
mm	110 x 495	180 x 495	270 x 495
mm	120 x 610 x 60	190 x 610 x 60	280 x 610 x 60
kg	4,0	6,5	9,4

Power consumption (max.) **W** 185

Set-up surface **mm** 110 x 495

Dimension: **mm** 120 x 610 x 60

Weight: **kg** 4,0

Adjustment and display resolution **K** 1

Surface temperature **°C** 120*

Temperature limit (adjustable) **°C** 50 - 150

RO/RT

Setting resolution **rpm** ±5

Deviation between the stirrer points **%** 0

Permissible duration of operation **%** 100

Permissible ambient temperature **°C** +5 to +40

Permissible relative humidity **%** 80

EN 60529 protection class IP 40

Operation at a terrestrial altitude **m** max. 2000

Stirred quantity max. (water) 400 ml per stirrer point in the 600 ml beaker glass

	RO/RT 5	RO/RT 10	RO/RT 15
ltr	2	4	6
mm	5	10	15
mm	90	90 x 90	90 x 90

in other vessels **ltr** 2

Stirrer points **mm** 5

Distance from stirrer point to stirrer point **mm** 90



***Caution! The specified maximum hotplate temperature refers to instruments with a full load. Without a load, the (setup) plate temperature can reach 130 °C (+10 °C / -5 °C). Load to determine the specified values: 250 ml Erlenmeyer flask filled with 200 ml water.**

Subject to technical changes!

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FR

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Déclaration UE de conformité

Nous déclarons sous notre seule responsabilité que le présent produit est conforme aux prescriptions des directives 2014/35/UE, 2014/30/UE et 2011/65/UE, ainsi qu'aux normes et documents normatifs suivants: EN 61010-1, EN 61010-2-010 (série RT uniquement), EN 61010-2-051, EN 61326-1, EN 60529 et EN ISO 12100.

Une copie de la déclaration de conformité UE complète peut être demandée en adressant un courriel à l'adresse sales@ika.com.

Garantie

En conformité avec les conditions de vente et de livraison d'IKA, la garantie sur cet appareil est de 24 mois. En cas de problème entrant dans le cadre de la garantie, veuillez contacter votre revendeur spécialisé. Mais vous pouvez également envoyer directement l'appareil accompagné du bon de livraison et un descriptif de votre réclamation à notre usine. Les frais de transport restent alors à votre charge.

La garantie ne s'étend pas aux pièces d'usure et n'est pas valable en cas de défauts dus à une utilisation non conforme et un soin et un entretien insuffisants, allant à l'encontre des recommandations du présent mode d'emploi.

Explication des symboles



Remarque générale sur un danger.



Le présent symbole signale des informations **cruciales pour la sécurité de votre santé**. Un non-respect peut provoquer des problèmes de santé ou des blessures.



Le présent symbole signale des informations importantes **pour le bon fonctionnement technique de l'appareil**. Le non-respect de ces indications peut endommager l'appareil.



Le présent symbole signale des informations importantes **pour le bon fonctionnement de l'appareil et pour sa manipulation**. Le non-respect peut avoir pour conséquence des résultats de mesure imprécis.



ATTENTION - remarque sur une mise en danger en raison du magnétisme.



DANGER - remarque sur une mise en danger en raison du surface chaude.