



Asynt Hotplate Manual



Source language: German

EN

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Safety instructions

For your protection

- **Read the operation instructions in full before starting up and follow the safety instructions.**
- Keep the operation instructions in a place where they can be accessed by everyone.
- Ensure that only trained staff work with the appliance.
- Follow the safety instructions, guidelines, occupational health and safety and accident prevention regulations.

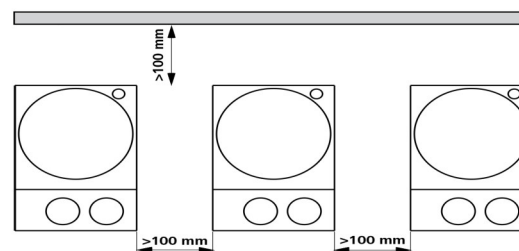
- Socket must be earthed (protective ground contact). Before starting the device for the first time, ensure that the connector cable is suitable for the type of socket used and that a safe protective earth connection is assured.
- **Caution - Magnetism!** Effects of the magnetic field have to be taken into account (e.g. data storage media, cardiac pacemakers ...).
- Risk of burns! Exercise caution when touching the housing parts and the heating plate. The heating plate can reach temperatures in excess of 310 °C. Pay attention to the residual heat after switching off.
- Ensure that the mains power supply cable does not touch the heating base plate.
- Wear your personal protective equipment in accordance with the hazard category of the media to be processed. Otherwise there is 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 appliance must be clean and undamaged.
- Check the appliance and accessories beforehand for damage each time you use them. Do not use damaged components.
- Gradually increase the speed.
- Reduce the speed if:
 - the medium splashes out of the vessel because the speed is too high
 - the appliance is not running smoothly
 - the container moves on the base plate.
- **Caution!** Only process and heat up any media that has a flash point higher than the adjusted safe temperature limit that has been set (50 to 360 °C). The safe temperature limit must always be set to at least 25 °C lower than the fire point of the media used.

- 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 operate the appliance in explosive atmospheres, with hazardous substances or under water.
- 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 used.
- Ensure that the external temperature sensor (PT 1000, ETS-D...) is inserted in the media to a depth of at least 20 mm.
- The PT 1000 external temperature sensor must always be inserted in the media when connected.
- Safe operation is only guaranteed with the accessories described in the "Accessories" chapter.
- Accessories must be securely attached to the device and cannot come off by themselves. The center 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.
- The device will automatically restart in mode B following any interruption to the power supply.
- It may be possible for wear debris from rotating accessory parts to reach the material being processed.

- When using PTFE-coated magnetic bars, the following has to be noted: *Chemical reactions of PTFE occur in contact with molten or solute alkali metals and alkaline earth metals, as well as with fine powders of metals in groups 2 and 3 of the periodic system at temperatures above 300 °C - 400 °C. Only elementary fluorine, chlorotrifluoride and alkali metals attack it; halogenated hydrocarbons have a reversible swelling effect.*
(Source: Römpps Chemie-Lexikon and "Ulmann", 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.
- Ensure that the base plate is kept clean.
- Protect the appliance and accessories from bumps and impacts.
- Observe the minimum distances between the devices, between the device and the wall and above the assembly (min. 800 mm).



Unpacking

• Unpacking

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

• Contents of package

- Heating magnetic stirrer
- Mains cable
- Operating instructions
- Screwdriver
- Protection cover
- Temperature sensor PT 1000

Correct use

• Use

- For mixing and / or heating liquids

• Range of use

- Laboratories
- Pharmacies
- Schools
- Universities

This device is suitable for use in all areas, except industrial areas.

The safety of the user cannot be guaranteed if the appliance is operated with accessories that are not supplied or recommended by the manufacturer or if the appliance is operated improperly contrary to the manufacturer's specifications or if the appliance or the printed circuit board are modified by third parties.

Assembling the stand

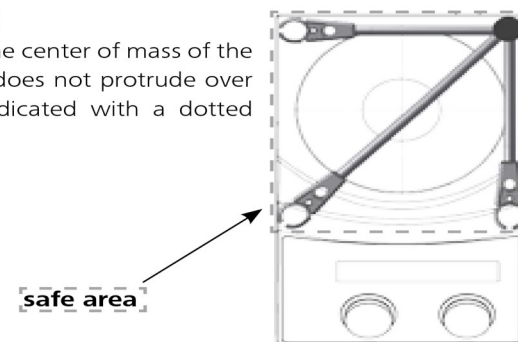
- ☞ Remove screw plugs (M)
- ☞ Remove the protective cap from the support rod
- ☞ Put the washer between housing and nut
- ☞ Screw the support rod onto the device by hand until the end stop is reached
- ☞ Use an A/f 17 spanner to tighten the M10 nut
- ☞ Accessories should be attached using cross sleeves



Note: When using bath attachments with a diameter over 180 mm, please use support rod in conjunction with an extension. (See "Accessories")

Risk of tipping!

Make sure that the center of mass of the attached device does not protrude over the safe area indicated with a dotted rectangle.



Operation

Ensure that the protective film is removed from the base plate before use !

Commissioning	<ul style="list-style-type: none"> ☞ Move device switch (A) to the OFF position ☞ Insert the mains power cable into the power socket (K) ☞ Move device switch (A) to the ON position ⇒ The unit will be set to factory setting mode A (see "Operating modes") 	
Stirring	<ul style="list-style-type: none"> ☞ Adjust the motor speed using the rotary knob (D) ⇒ The value selected will be shown on the display (F) ☞ Set the start point for the agitation function by pressing the rotary knob (D) 	
Heating	<ul style="list-style-type: none"> ☞ Set the safe temperature limit (see "Setting the safe temperature limit for RCT") ☞ Adjust the set-point temperature using the rotary knob (C) ⇒ The value selected will be shown on the display (E) ☞ Set the temperature control mode (see "Setting the temperature control mode for RCT") ☞ Set the start point for the heating function by pressing the rotary knob (C), also on use of a contact thermometer 	
Heating	①	<p style="text-align: center;">The set point and actual temperatures will be shown alternately on the display (E)</p> <p>⇒ When the heating is switched on, the LED "Heating plate" (G) and the LED "Set point value" (I) will be lit</p> <p style="text-align: center;">The maximum temperature that can be set for the heating plate is 310 °C</p>
Heating	①	<p>⇒ During agitation and standby operation, the display (E) will show HOT if the plate temperature is above 50 °C</p>
Connecting external thermometers <i>(direct temperature control in the media)</i>	<ul style="list-style-type: none"> ☞ Move device switch (A) to the OFF position ☞ Detach contact plug (L) ☞ Attach a DIN 12878 (Class 2) compliant safety contact thermometer or a PT 1000 temperature sensor to the socket (L) ☞ Move device switch (A) to the ON position 	
Connecting external thermometers <i>(direct temperature control in the media)</i>	①	<p>Temperature sensor PT 1000 ⇒ The actual temperature for the temperature sensor shown on display (E) will correspond to the temperature of the media. The LED "external temperature sensor" (H) will be lit.</p>
Connecting external thermometers <i>(direct temperature control in the media)</i>	①	<p>Contact thermometer e.g. ETS-D5 ⇒ Follow the operating instructions for the contact thermometer</p> <p style="text-align: center;">The LED "decimal point for the temperature display" (J) will be lit</p> <p>⇒ When a contact thermometer is connected, the display (E) will only show the set-point temperature that has been set</p>

Setting operation mode

Operating the device in mode A, B or D

Mode A

All settings will be stored if the device is switched off or disconnected from the power supply. The agitation and heating functions will be set to OFF when the device is powered on.

Mode B

All settings will be stored if the device is switched off or disconnected from the power supply. The agitation and heating functions will be set to ON or OFF when the device is powered on, depending on the previous status of the device.

Mode D

In Mode D the device behaves the same as in Mode A with the exception that:

- The temperature setting must be confirmed by pressing the temperature knob. To change the temperature setting, turn the temperature knob until the desired value appears.
- The new value flashes for 5 seconds on the display. Confirm the new temperature setting by pressing the temperature knob, otherwise the temperature setting value will skip back to its previous value.

Factory setting: mode A

The mode selected will be shown on the display when the device is started up.



Change the mode

- ☞ Move device switch (A) to the OFF position
- ☞ Press and hold rotary knobs (C and D)
- ☞ Move device switch (A) to the ON position
- ☞ Release rotating knobs (C and D)
- ⇒ The set value is indicated on the display (F)



Note: Mode D is available from software version 40

Er 5

The time is taken to recognise that the sensor has not been placed in the medium when the heating is switched on.

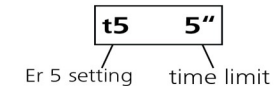
Note: The user can set a value from 1 to 30 min for this time limit depending on the application.
If time limit is set to 0 min, the Error 5 detection is disabled.

This function will only be active if:

- Sensor temperature is $< 50\text{ }^{\circ}\text{C}$
- Difference target temperature / sensor temperature $> 5\text{ K}$

Factory setting: 5 min

The time selected will be shown on the display when the device is started up if the sensor is connected.



Changing the Error 5 settings

- ☞ Set target temperature to $5\text{ }^{\circ}\text{C}$
- ☞ Switch off device
- ☞ Hold down temp knob
- ☞ Switch on device
- ☞ Select time value from 0...30 min (in 1 min steps) by turning the speed knob
- ☞ Release the temp knob

Note: Er 5 is available from software version 40

Setting the safe temperature limit

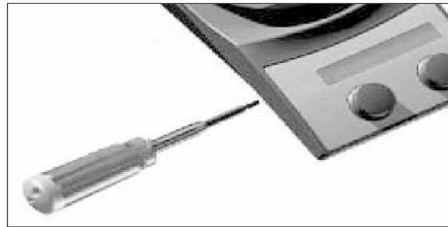
The maximum achievable heating plate temperature is restricted by an adjustable safety temperature limit. Once this limit has been reached, the device stops heating.

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

The adjustable maximum heating plate temperature is at least 10 °C under the set safety temperature limit.

Setting range: [50 °C] to [max. SET temperature + 50 °C]

Factory setting: [max. SET temperature + 50 °C]



Setting the safety temperature limit

After switching on the device, the safety temperature limit can be adjusted using a screwdriver.

Do not turn the setting screw beyond the clockwise or anticlockwise stop. This will cause irreparable damage to the potentiometer.

- Set the main switch to the ON position
- Using the screwdriver supplied, turn the "Safe Temp" setting screw to the clockwise stop.
- Use the temperature rotary knob to set the target temperature to the desired "Safe Temperature" and wait until the temperature is achieved.
- Turn the "Safe Temperature" setting screw slowly anticlockwise until the heating function switches off and the display shows Er 25.
- The "Safe Temp" value is displayed on the screen.

Setting the safety temperature limit as to be done as described. The value "Safe Temperature" shown on the display only serves for visualization.

Functional test: safety circuit switch-off

- Heat the device to a temperature of over 50 °C.
- Set the safety temperature limit as far to the left as possible (50 °C) and set the mains switch to the ON position.
- The display will show: Er 25

Controlling the Medium temperature limit via ETS-D or Contact Thermometer

The preferable method for controlling the average temperature is with the ETS-D or contact thermometer. After the set point temperature has been adjusted, this results in a short heating-up time, practically no temperature drift and only minor fluctuation in temperature.

In addition to precise control function, the adjustable "MAX-TEMP" function makes the ETS-D a temperature limiter that has a direct effect on the average temperature. When this "MAXTEMP" is exceeded, for example because of a defect in the control circuit or unintentional of the "Safe Temp" or set point temperature on the RCT, the ETS-D immediately and permanently turns off the separate circuit of the RCT.

The stirring function then continues to run at the speed that was set before the malfunction.

A 6-pin jack is located on the rear side of the instrument for connecting the ETS-D, the contact thermometer or the contact plug. The electronics of the instruments returns a test current that must flow via connector pins 3 and 5 for the heating plate to heat up.

Safety contact thermometers

acc. to DIN 12 878 class 2 or acc. Gerstel are connected with a three wire cable, the test current flows through the contact thermometer.

Safety function:

If the test current is interrupted because of e.g. breakage of contact thermometer or falling out of the cable plug, the heating cuts off.

The required plug allocation is indicated on a reference plate above the diode bushing.

Contact thermometer without safety circuit

acc. to DIN 12 878 class 0. The instrument only heats if the test current circuit is closed by an electrical connection of the plug pins 3 and 5.

2-wire connecting cables:

Connect plug pins 3 and 5 of the instrument plug.

3-wire connecting cables:

Here the test current circuit can also be produced in the terminal head of the contact thermometer (connect plug pins 2 and 3).

A 3-wire cable with the required bridge is available (accessories).

Settings

For the detailed instructions for settings and limit values, please refer to the operating instructions for the instrument you are connecting.

The desired average temperature can be adjusted on the ETS-D or contact thermometer. In addition, a "MAXTEMP" can be set for the ETS-D, in other words, a maximum average temperature can be set for malfunctions in combination with the RCT. The required surface temperature of the heating plate can be selected with the "Temp" dial.

Adjusting the "Temp" dial to the maximum adjustable temperature will result in the fastest possible heating time, but the average temperature may fluctuate to values above the set-point temperature on the contact thermometer, for example. By adjusting the "Temp" dial to approximately twice the set-point value (thus with a set-point or 60 °C the Temp dial would be set to 120 °C), you will reach a good compromise between a fast heating time and overshooting the set point.

If you adjust the Temp dial to exactly the set-point temperature, the medium will not reach the set-point temperature, since some loss of the heat will always occur between the heating plate and the medium.

The maximum heating plate temperature can be adjusted will the "Safe Temp" screw.

Setting the temperature control mode

When using an external PT 1000 temperature sensor, the user can choose between two types of control:

PI mode

Good control results, minimized overshooting, slow rise in temperature

2P-mode (two-point controller)

Maximum heating rate, increased overshooting

Factory setting: PI mode

Changing the temperature control mode

1. Set target temperature to 2 °C
2. Switch off device
3. Hold down temp knob
4. Switch on device

This activates or deactivates the two-point controller (2P) for the external PT 1000 temperature sensor (2P appears on the display).

When switching on the device, 2P is also displayed next to the operating mode A/B/D when the two-point controller is activated. When the heating function is active in 2P mode, (with external PT 1000 temperature sensor) the actual temperature flashes - that notifies the user that the process temperature has been greatly overshoot!

Maintenance

The device is maintenance-free.

Cleaning



For cleaning disconnect the main plug.

Only use cleansing agents which have been recommended by **IKA®**.
Use to remove:

Dyes isopropyl alcohol
Construction materials isopropyl alcohol/water containing surfactant

Cosmetics isopropyl alcohol/water containing surfactant
Foodstuffs water containing surfactant
Fuels water containing surfactant

- Do not allow moisture to get into the appliance when cleaning.
- Wear protective gloves when cleaning the devices.
- Please consult with **IKA®** before using any cleaning or decontamination methods, other than those recommended here.

Ordering spare parts

When ordering spare parts, please give:

- Machine type
- Manufacturing number, see type plate
- 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 "**Decontamination Clearance 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.

Accessories

- Stirring bars: ø 6 mm, length up to 15 mm
 ø 7 mm, length up to 60 mm
 ø 10 mm, length up to 80 mm
- RS 1 Set of magnetic stirring bars
- RSE Stirring bar remover
- H 15 Bath attachment • H 28 Bath attachment
- H 29 Oil bath attachment • H 30 Oil bath attachment
- H 16 V Support rod • H 16.3 Extension
- H 38 Holding rod • H 44 Cross sleeve
- ETS-D5 Contact thermometer
- ETS-D6 Contact thermometer

Error codes

Any malfunctions during operation will be identified by an error message on the display (E and F).
Proceed as follows in such cases:

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

Error code	Cause	Effect	Solution
E3	Temperature inside device too high	Heating off	- Switch off device and allow to cool down
E4	Motor blockage	Heating off Motor off	- Switch off device <i>- Warning! Only to be carried out by authorized service personnel: Carry out an internal test on the device to check the plug-in connector for the motor</i>
E5	No temperature increase in sensor at continuous temperature difference	Heating off	- Place the sensor in the medium - Reduce the volume of the media - Use a carrier fluid with better heat conductivity properties - Replace the glass vessel with a metal pot - Increase the "Time-out" period
E6	Break in safety circuit	Heating off	- Plug in contact plug (L) - Plug in PT 1000 contact thermometer / temperature sensor - Replace faulty connecting cable, plug, or contact thermometer
E24	Surface temperature (temperature of control sensor): of the base plate is higher than the set safe temperature limit	Heating off	- Switch off device until the surface temperature of the base plate is lower than the selected safe temperature limit - Set a higher safe temperature limit
E44	Surface temperature (temperature of safety sensor): of the base plate is higher than the set safe temperature limit	Heating off	- Switch off device until the surface temperature of the base plate is lower than the selected safe temperature limit - Set a higher safe temperature limit
E25	Heating and switching element monitoring	Heating off	- Switch off device - Set the safe temperature limit > 55 °C see also "Functional check of inactivating the safety circuit" <i>- Warning! Only to be carried out by authorized service personnel; Carry out an internal test on the device to check the plug-in connector for the heating element</i>
E26	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 authorized service personnel: Carry out an internal test on the device to check the plug-in connector for the temperature sensor</i>
E46	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 authorized 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:

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

Technical Data

Device		
Operating voltage range	Vac	220 – 230 ± 10%
	Vac	115 ± 10%
	Vac	100 ± 10%
Nominal voltage	Vac	230/ 50 Hz
	Vac	115/ 60 Hz
	Vac	100/ 60 Hz
Frequency	Hz	50/ 60
Power consumption (+10%) max. at 230 Vac	W	650
115 Vac		610
100 Vac		610
Display		digital
Permissible duration of operation	%	100
Permissible ambient temperature	°C	+5 to +40
Permissible relative humidity	%	80
Protection type acc. DIN EN 60529		IP 42
Protection class		I
Overvoltage category		II
Contamination level		2
Fuse		F1/F2 T6,3A/250V (at nominal voltage 230 V) T10A/250V (at nominal voltage 115 V and 100 V)
Operation at a terrestrial altitude	m	max. 2000
Dimensions (B x T x H)	mm	165 x 275 x 85
Wight	kg	2,5
Motor		
Speed range	rpm	50 – 1500
Power consumption	W	16
Setting resolution	rpm	10
Speed variation (no load, nominal voltage, at 1500 rpm, ambient temperature 25 °C)	%	±2
Stirred quantity max. (H ₂ O)	ltr	20

Base plate		
Dimensions	mm	Ø135
Material		Al-alloy
Heating		
Heating power (-5%/+10%) at nominal voltage	W	600
Adjustment and display resolution	K	1
Surface temperature	°C	Ambient temperature - 310
Temperature sensor PT 1000 variation DIN EN 60751 Kl. A	K	$\leq \pm (0,15 + 0,002 \times T)$
Temperature variation max. at 100 °C	K	$\pm 1,5$
Heating plate control hysteresis, no container, center of heating plate at 100 °C	K	± 5
Control hysteresis with temperature sensor PT 1000*	K	± 1
with ETS-D5*	°C	$\pm 0,5$
with ETS-D6*	°C	$\pm 0,2$
Adjustable safety circuit		
Safety temperature limit (adjustable)	°C	50 – 360 (± 10)

* The control accuracy values given were determined using the following set-up: 500 ml water in 600 ml glass beaker, magnetic stirring bar 40, 600 rpm, 50 °C
Subject to technical changes!

Warranty

Please contact Asynt with any issues encountered with your apparatus. Warranty period is 24 months, return to supplier basis, and does not cover worn out parts, nor faults resulting from improper use, insufficient care or maintenance not carried out in accordance with the instructions within this manual.