# IKA

designed for scientists

# KS 4000 i control
# KS 4000 ic control


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EN 61010-1, EN 61010-2-051, EN 61326-1, EN 60529 und EN ISO 12100.

Eine Kopie der vollständigen EU-Konformitätserklärung kann bei sales@ika.com angefordert werden.

## EU Declaration of conformity EN

We declare under our sole responsibility that this product corresponds to the directives 2014/35/EU, 2006/42/EC, 2014/30/EU and 2011/65/EU and conforms with the standards or normative documents: EN 61010-1, EN 61010-2-051, EN 61326-1, EN 60529 and EN ISO 12100.

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## 欧盟标准(EU)符合性声明 ZH

我们声明本产品符合2014/35/EU, 2006/42/EC, 2014/30/EU和2011/65/EU相关规定并符合下列标准和规范: EN 61010-1, EN 61010-2-051, EN 61326-1, EN 60529 和EN ISO 12100。

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## Gewährleistung DE

Entsprechend den **IKA**-Verkaufs- und Lieferbedingungen beträgt die Gewährleistungszeit 24 Monate. Im Gewährleistungsfall wenden Sie sich bitte an Ihren Fachhändler, oder senden Sie das Gerät unter Beifügung der Lieferrechnung und Nennung der Reklamationsgründe direkt an unser Werk. Frachtkosten gehen zu Ihren Lasten.
Die Gewährleistung erstreckt sich nicht auf Verschleißteile und gilt nicht für Fehler, die auf unsachgemäße Handhabung und unzureichende Pflege und Wartung, entgegen den Anweisungen in dieser Betriebsanleitung, zurückzuführen sind.

## Warranty EN

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.

## Garantie FR

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.

## 保修 ZH

根据IKA公司保修规定本机保修两年；保修期内如果有任何问题请联络您的供货商，您也可以将仪器附发票和故障说明直接发至我们公司，运费由贵方承担。
保修不包括零件的自然磨损，也不适用于由于过失、不当操作或者未按使用说明书使用和维护引起的损坏。

Source language: German

EN

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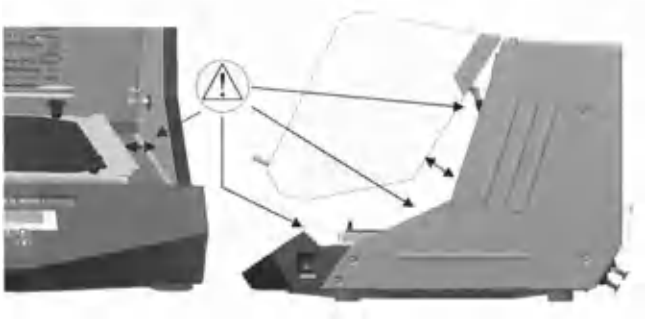
## Safety instructions

- **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.

The media used in the appliance may result in danger specific to the media and the process. This applies, for example, to shaking cultures with living cells and to aggressive or flammable media. Particulars as small estimated endangerments can become, if they arise with one another in combination, a larger endangerment. This manual cannot describe the dangers and resulting safety measures in more detail.

- This appliance should only be operated by suitably trained personnel familiar with the appliance and authorized to work in this area.
- The machine may only be opened by trained specialists - even during repairs. The machine is to be unplugged from the mains before opening. Live parts inside the machine may still be live for some time after unplugging from the mains.
- **NOTE !** Covering or parts that are capable of being removed from the unit without accessory equipment have to be reattached to the unit for safe operation in order to prevent, for example, the ingress of fluids, foreign matter, etc.
- Wear your personal protective equipment in accordance with the hazard category of the medium to be processed. There is a risk of:
  - splashing liquids
  - projectile parts
  - body parts, hair, clothing and jewellery getting caught.
- Follow the safety instructions, guidelines, occupational health and safety and accident prevention regulations.
- Beware of the high dead weight of the appliance when transporting. Ensure that your fingers do not get crushed when setting down the appliance.
- Always install the appliance on a flat, stable non-slip base.
- Pay attention to the vessels on the shaking table when setting the shaking rate. This will prevent any of the medium to be shaken from spurting out of the sample vessels.

- Ensure that parts of the body, hair or items of clothing cannot be trapped by the motion parts.
- Never touch moving parts.
  **Caution! The shaker still runs after the cover has been opened. Wait for it to stop running.**
  *(Risk of being crushed, shocked or cut, see figure illustrating danger points).*



- Should vessels break during operation or the media be spilt, interrupt the shaking process immediately, remove any vessel residue and clean the appliance.

**Danger of being burnt!** Exercise caution when touching housing components and attachments. They may become hot. Watch for residual heat after appliance has been switched off.

- Pay attention to the risk of:
  - flammable materials
  - glass breakage
  - flammable media with low boiling temperatures
  - level of medium which is too high
  - biological and microbiological materials.

- All accessories and vessels in place for the shaking process must be firmly secured.
- Shaking vessels which are not properly secured could get damaged or be projected out, thus causing injury. It is essential to regularly check that the vessels to be shaken and the attachments are firmly secured, especially before using the appliance again.
- If you notice that the device is not running smoothly, the speed must always be reduced until no more uneveness occurs in the operation.
- Because of improper loading and the position of the center of gravity, dynamic forces may arise during the agitation process that cause the shaker to move about on the table. For restrictions of load capacity and material weight during high shaking frequencies, please see the description in the "Attachments" section.
- Additional hazards to the user may occur if inflammable materials are used during the shaking operation.
- Furthermore, the shaking unit may only be used to stir those materials or material mixtures that the user knows will not react dangerously to the extra energy produced by the stirring. This also applies to extra energy by means of solar radiation during the shaking procedure.
- The shaker may not been used in explosive atmospheres, for mixing dangerous substances or under water.
- When using an external temperature sensor, it must always be in the medium. Immerse the external temperature sensor at least 20mm into the medium.
- 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.
- Caution! Never process and heat up any media that has a flash point higher than the adjusted safe temperature limit that has been set.
  The safe temperature limit must always be set to at least 25 °C lower than the fire point of the media used.
- When servicing, the wiring selected by IKA must be set up again!
- Avoid allowing objects to push or strike the agitation table.
- Keep a minimum distance of 100 mm from the appliance on all sides.

## 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.

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.

## Unpacking

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

**Contents of package:**

**KS 4000 i control:**
- Shaking device
- Mains cable
- Operating instructions
- 4 clamping screws short
- 2 clamping screws long
- Temperature sensor PT 1000.60

**KS 4000 ic control:**
- Shaking device
- Mains cable
- Operating instructions
- 4 clamping screws short
- 2 clamping screws long
- Temperature sensor PT 1000.60
- 2 hose connecting pieces
- unlocking handle

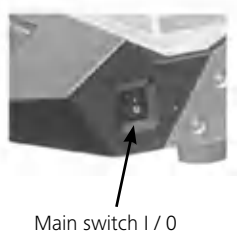
## Commissioning

Make sure before start-up of the equipment that the drain hose leads into a drain! Check whether the voltage specified on the type plate matches the mains voltage available. The power socket used must be earthed (protective earth conductor contact).
If these conditions are met, the device is ready to operate after plugging in the mains plug. If these procedures are not followed, safe operation cannot be guaranteed and/or the equipment may be damaged.

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

## Switching on

The appliance is switched on using the switch on the side of the appliance. Once it has been switched on, all of the LEDs light up briefly during the self test.




① 8888 888 888
Display fields

② A 888 888 888 01
Operating mode — Software Version

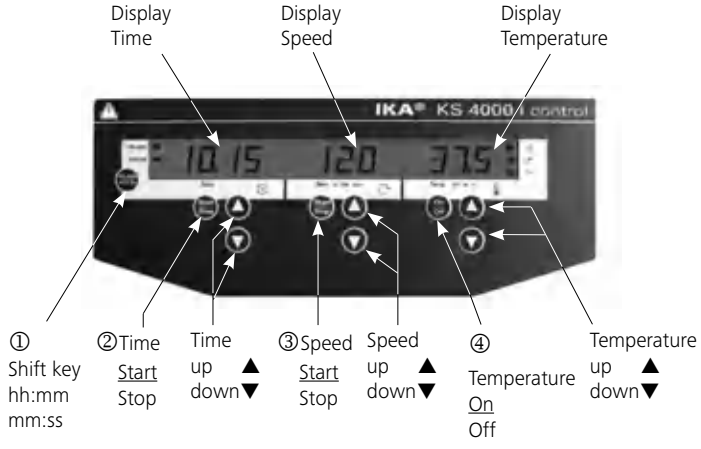
③ SAFE 275 555
Safety limit values | max. adjustable speed | max. adjustable temperature

Note the load guideline values for the attachments prior to switching appliance on (see "Attachments").

## Setting the safety limit values

If the Time Start/Stop key ② is held down while "SAFE" is displayed, the safety limit values can be changed using the respective up/down keys.

## Operator panel and display




Tapping the Start/Stop keys or On/Off key starts the particular functions.
The desired default values can be changed using the ▲ or ▼ keys. Use the shift key ① to switch from hour/minute mode to minute/second mode.
If the elapsed time exceeds the value of 100 hours, the display switches from hour/minute mode 99:59

to hour mode h 100

Only whole hours are displayed in hour mode.
The following sections contain detailed information about the individual functions.

## Function Shaking

Press the ③ key to start or stop the shake function. The speed can be adjusted during operation. The displayed value flashes until the pre-set speed has been reached.

When the shaking function is started using button ③ , the timer automatically starts measuring the time until the next switch-off.

**Note:** The shaking function can only be started when the cover is closed. When the cover is opened, the shaker automatically switches off the shaking and heating functions.

## Timer

The desired shaking duration is set on the operator panel of the timer using the Time up/down keys. The shift key can be used to switch from hour mode to minute mode.
The Time Start/Stop key activates the timer and shaking functions. When the time is up, the shaking function stops and an acoustic signal is given off. If the cover is opened before the time is up, the timer goes to "pause" and the display flashes. If the cover remains open for more than 15 minutes, the timer switches off and an error code appears on the display. The shaker no longer starts when the cover is closed.
If the timer is not activated, the Time display automatically shows the operating time following the start of the shaking function.

## Function Heating

Once the appliance starts, the display indicates the actual value for the set temperature.

Press the ④ key to start or stop the heating function. The temperature is entered using the Temp up/down keys. In operation, the temperature is displayed in 0.1 °C steps.
The target value appears approx. every 5 seconds and remains on the display for 2 seconds.

Note:
The heating function can only be started when the cover is closed. When the cover is opened, the shaker automatically switches off the shaking and heating functions.

## Operating modes

You can choose between operating modes A, b and C

| | |
|---|---|
| A | Appliance does not start up again following power outage<br>Safety limit value for speed and temperature adjustable. |
| b | Appliance starts up again following power outage<br>Safety limit value for speed and temperature adjustable. |
| C | Appliance starts up again following power outage<br>Safety limit values cannot be changed. |

## Setting the operating mode

Switch on appliance and simultaneously hold down the Time Start/Stop key ② and the shift key ① .
The display indicates either A b or C depending on the operating mode set (factory default setting A).
Switching the appliance off and on switches to the next operating mode .

Following the selection of the operating mode, the corresponding letter appears on the display for 5 seconds, the appliance is ready for operation.

## External temperature sensor

If external temperature sensor PT1000.60 is connected to the internal slide-on receptacle, the temperature can be measured at any place in the medium.

(Connector for PT1000.60)

The temperature control of the heating works automatically with this display or measuring value. This is indicated by the lighting up of the LED next to the temperature sensor symbol.


Locate the external temperature sensor and the connecting cable so that the shaking motion is unimpeded and no vessels are damaged or tipped over.

## Calibration - temperature

The appliance is calibrated at the factory.
This function allows the temperature to be calibrated to a desired value.
This may be necessary, for example, if special sample containers, their arrangement or external influences (e.g. sunshine) cause the measuring value for the temperature to be incorrect.

**Calibration without inserted sensor:**

- Fill Erlenmeyer flask (250ml) with water to the 100ml mark
- Place the Erlenmeyer flask in the centre
- Immerse the sensor of the external measuring device in the water
- Set the target temperature
- Close the cover and start the Temp function
- Wait until the temperature in the incubation cover has stabilised.
- While holding down the shift key ①, briefly press the Temp On/Off key ④, the CAL display appears; keep holding down the shift key ①.
- Set the temperature value read off the external measuring device using the Temp up ▲ down ▼ keys
- Calibration is complete when you release the shift key.

**Calibration with inserted sensor:**

Calibration with inserted sensor takes place in the same way as described above.

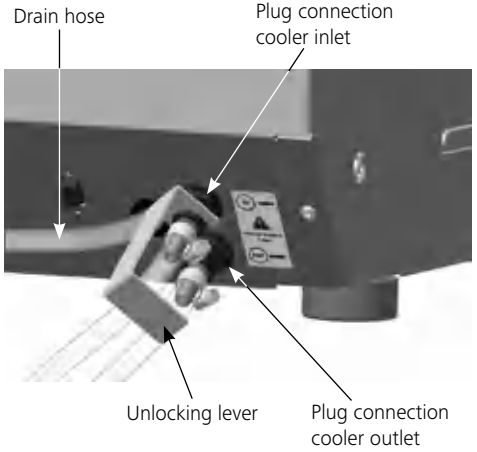
## Reset

To restore the factory settings, hold down the Mot ▲ key and the Temp ▼ key and press the main switch I/O.

Factory setting: Operating mode A
Upper speed limit 500 rpm
Safety temperature limit 90 °C
Temperature calibration.

## Appliance variant KS 4000 ic control

There is a cooler built into this appliance variant.
By using an external cooling unit, the working temperature can be lowered in relation to the room temperature (depending on the supply temperature).
The cooler is connected to an external cooling unit (e.g. IKA KV 600) via the plug connection at the back of the appliance. The inlet and outlet connections are labelled accordingly at the back of the appliance. To connect the cooling pipes there are two hose connection pieces included. They can be connected to a hose with a 10mm interior diameter. The connectors are unlocked by coaxially positioning the unlocking lever and pressing slightly in the direction of the arrow. By positioning and light pressure in the direction of the plug, the connectors are locked/connected to the inlet/outlet plug connections on the housing.



Water is the only coolant that may be used (with antifreeze, e.g. ethylene glycol).
Permissible cooling agents - inlet temperature >3°C.
Observe the maximum permissible pressure of 1 bar! As a safeguard, we recommend using a pressure limiter (e.g. IKA C25). This is not necessary when using an IKA KV600.

Accumulated condensate is drained out of the cooler through the drain hose.

## Attachments

The following attachments are offered as accessories:

**AS 4000.1** universal attachment

**AS 4000.2** bracket attachment

**AS 4000.3** bowl attachment

The attachments are affixed to the shaking table using the four clamping screws provided.

Load (standard values)

| Load / kg | 6 | 12 | 15 | 20 |
|---|---|---|---|---|
| Max. speed / rpm | 500 | 400 | 300 | 120 |

**Assembly information for AS 4000.1**

## Error codes

An error is indicated by an acoustic signal and an error code is displayed.

E.g.: 


Note:
During continuous operation, the load may slip, for example, resulting in the appliance becoming excessively unbalanced. To prevent this, there is a motion sensor built in which reduces the speed gradually once a critical limit has been reached.
When faults are not specified in the table, you switched the appliance off and again on. If faults cannot be eliminated directly, you must perform a RESET (see "Reset")! If the faults still cannot be eliminated, the appliance must be inspected by a technical service.

| Error code | Description | Cause | Effect | Solution |
|---|---|---|---|---|
| Er 3 | Temperature inside unit too high | • Permitted ambient temperature has been exceeded<br>• Ventilation slots or fan housing blocked | Heating off | • Switch off the unit. Allow it to cool down and then switch on again.<br>• Clean ventilation slots or fan housing<br>• Observe maximum permissible ambient temperature |
| Er 4 | Differanceberween setpoint and actual speeds is too large | • Motor blocked or overloaded | Heating off | • Reduce the torque load (load)<br>• Reduce the setpoint speed |
| Er 8 | The calibration value of the temperature sensor is outside the limit value | • Fault in calibration procedure<br>• Value was incorrectly stored to memory<br>• EPROM switching error | Heating off | • Repeat the calibration procedure |
| Er 14 | External temperature sensor, short-circuit | • Short-circuit at temperature sensor plug<br>• Short-circuit in connecting cable or on temperature sensor | Heating off | • Check the plug<br>• Substitude the temperature sensor |
| Er 16 | External temperature sensor has exceeded the SAFE Temp | • SAFE Temp is set at a temperature lower than the actual temperature on the external temperature sensor | Heating off | • Allow the unit to cool<br>• Set the SAFE Temp at a higher temperature |
| Er 17 | Temperature sensor - Incubation - room has exceeded the SAFE Temp | • SAFE Temp is set at a temperature lower than the actual temperature on the external temperature sensor | Heating off | • Allow the unit to cool<br>• Set the SAFE Temp at a higher temperature |
| Er 26 | Difference between the internal control and safety temperature sensors too large | • Ventilation slots in incubation room blocked<br>• Radial-flow fan does not rotaded<br>• Fault in the control or safety temperature sensors | Heating off | • Switch off the unit. Allow it to cool down and then switch on again.<br>• Check fan or ventilation slots and clean if necessary |
| Er 60 | Power outage | • Power outage during operation | Interruption of heating or shaking function | • Delete the display by pressing the shift key |

| Error code | Description | Cause | Effect | Solution |
|---|---|---|---|---|
| PC 1 | In remote operation (PC) with watchdog function 1 enabled: No communication between PC and unit | • PC does not send data during the watchdog time<br>• The connection/cable to the PC is broken | Heating off<br>Motor off | • Switch off the unit. Allow it to cool down and then switch on again.<br>• Clean ventilation slots or fan housing<br>• Observe maximum permissible ambient temperature |
| PC 2 | In remote operation (PC) with watchdog function 2 enabled: No communication between PC and unit | • PC does not send data during the watchdog time<br>• The connection/cable to the PC is broken | The setpoint temperature is set to the WD safety temperature<br>The setpoint speed is set to the WD safety speed | • Change the watchdog time<br>• Send data from the PC within the watchdog time<br>• Check the connector cable and plug |

## Interface and outputs

**Configuration**

The unit can be controlled from an external PC (using the dedicated software labworldsoft) via the RS 232 C serial interface fitted to the unit.

**To increase safety when controlling the shaking unit from a PC, enable the watchdog function for monitoring the continuous serial data flow (see section watchdog function)**

- The functions of the inteface lines between laboratory instrument and automation system are selected from the specfied signals of the EIA-standard RS 232 C, corresponding with DIN 66020 Part 1. The allotment of the bushing can be taken from illustration.
- For the electrical properties of the interface lines and for the allotment of the signal status, standard RS 232 C, corresponding with DIN 66259 Part 1 applies (see capture PC 2.1 cable).
- Transmission method: Asynchronous signal transmission in start-stop-operation
- Mode of transmission: Fully Duplex
- Character format: Character imaging acc. to data format DIN 66022 for start-stop-operation. 1 start bit; 7 character bits; 1 parity bit [(straight (even)]; 1 stop bit.
- Transmission speed: 9600 bit/s
- Access method: Data communication from shaker to computer is only possible on demand of the computer

**Instruction syntax**

Here applies the following:

- The instructions are generally sent from the processor (master) to the laboratory instrument (slave).
- The laboratory instrument exclusively sends on demand of the processor. Even error codes cannot be spontaneously communicated from the laboratory instrument to the processor (automatic system)
- Instructions and parameters as well as subsequent parameters are separated by at least **one** blank.

(Code: hex 0x20)

- Each individual instruction including parameters and data as well as each reply are terminated with CR LF (Code: hex 0x0D and 0x0A) and have a maximum lenght of 80 characters.
- The decimal separator in a floating point number is the point. (Code: hex 0x2E)

The above statements largely correspond with the recommendations of the NAMUR-Assocation (NAMUR-recommendations for the design of electric plug connections for the analog and digital signal transmission to labortory - MSR individual units. Rev. 1.1).

**Overview of the NAMUR-instructions**

Abbreviations:

X,y = numbering parameter (integer number)
m = variable value, integer
n = value of variable, floating point number
X = 1 Pt1000 medium temperature (external temperaturesensor)
X = 2 temperature (incubations room)
X = 3 safety temperature
X = 4 speed
X = 6 safety speed
X = 50 Pt1000.60 medium temperature sensor offset in K (-5.0 <= n <=+5.0)
X = 52 incubations room temperature sensor offset in K (-5.0 <= n <=+5.0)

| NAMUR instuctions | Function |
|---|---|
| IN_NAME | Input description name |
| IN_PV_X X=1;2;3;4; | Reading the real value |
| IN_SOFTWARE | Input software ID number date, version |
| IN_SP_X X=1;2;3;4;6;12; 42;50;52;53; | Reading the set rated value |
| IN_TYPE | Input laboratory unit ID |

| NAMUR instuctions | Function |
|---|---|
| OUT_NAME name | Output description name. (Max. 10 characters, default: KS4000 ic) |
| OUT_SP_12@n | Setting the WD safety temperature with the echo of the set value |
| OUT_SP_42@n | Setting the WD safety speed with the echo of the set value |
| OUT_SP_X n X=1;2;4;50;52 | Setting the rated value to n |
| OUT_WD1@m | Watchdog mode 1: When a WD1 event occurs, the heating and shaking functions are shutdown and message PC 1 is displayed. Set the watchdog time to m (20...1500) seconds, with echo of the watchdog time. This instruction starts the watchdog function and must be sent within the set watchdog time. |
| OUT_WD2@m | Watchdog mode 2: When a WD2 event occurs, the speed setpoint will be set to the WD safety setpoint speed and the temperature setpoint will be set to the WD safety setpoint temperature. The PC 2 warning is displayed. The WD2 event can be reset with OUT_WD2@0- resetting also blocks the watchdog function. Set the watchdog time to m (20...1500) secondes, with echo of the watchdog time. This command starts the watchdog function and must be sent within the set watchdog time. |
| RESET | Switching off the instrument function |

| NAMUR instuctions | Function |
|---|---|
| START_X<br>X=1;2;4 | Starting the instrument's (remote) function<br>*(Display additionally: PC)* |
| STATUS | Display of status<br>1S: mode of operation A<br>2S: mode of operation B<br>3S: mode of operation C<br>S0: manual opration without fault<br>S1: Automatic operation Start (without fault)<br>S2: Automatic operation Start (without fault)<br><0: error code: (-1)<br>-1: error 1<br>- ... (see table)<br>-31: error 31<br>-83: wrong parity<br>-84: unknown instruction<br>-85:wrong instruction sequence<br>-86: invalid rated value<br>-87: not sufficient storage space |
| STOP_X<br>X=1;2;4 | Switching off the instrument - (remote) function. Variables set with OUT_SP_X are maintained. Contains the instruction RMP_STOP.<br>*(Display additionally: PC)* |

**"Watchdog" function, monitoring the serial data flow**

The following applies to situations where the watchdog function is enabled (see Namur instructions). If no new transmissions of these commands from the PC take place within the preset watchdog time, the heating and shaking functions will be shutdown according to the watchdog mode selected or will be controlled using the preset setpoints. An operating system crash, a PC power failure or a fault in the connecting cable to the instrument can cause an interruption in data transmission.

**"Watchdog"– Mode 1**

If an interruption in data transmission occurs which is longer than the preset watchdog time, the heating and shaking functions will be shutdown and the error message PC 1 will be displayed.

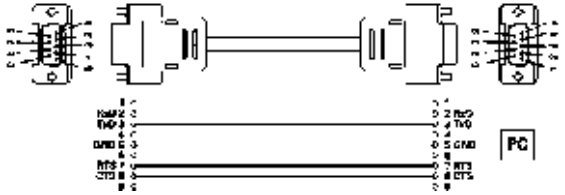
**"Watchdog"– Mode 2**

If an interruption in data transmission occurs which is longer than the preset watchdog time, the speed setpoint value will be set to the WD safety speed setpoint and the temperature setpoint will be set to the WD safety temperature setpoint. The PC 2 warning message will be displayed.

**Connections between shaking instrument and external devices**

**PC 1.1 Cable**

Cable PC 1.1 for connection to the 9-pin socket on the computer.




## Maintenance and cleaning

The shaker KS 4000 i control and KS 4000 ic control is maintenace-free. It is subject only to the natural wear and tear of components and their statistical failure rate.

Examine in regular intervals the functionality and the correct attachment of the two gas-filled supports!

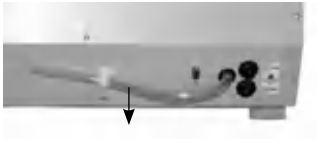
**When ordering spare parts, please give the manufacturing number shown on the type plate, the machine type and the name of the spare part.**

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

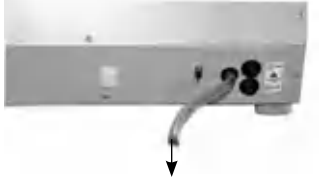
Use only cleansing agents which have been approved by IKA to clean IKA devices: water containing tenside / isopropyl alcohol.

- Wear the proper protective gloves during cleaning of the devices.
- Electrical devices may not be placed in the cleansing agent for the purpose of cleaning.
- Before using another than the recommended method for cleaning or decontamination, the user must ascertain with the manufacturer that this method does not destroy the instrument.

**Collecting tray with drain hose (for picture see below)**
*(applies to KS4000 i control and KS4000 ic control)*
In the event of glass breakage, leaking liquid is collected by the collecting tray below the shaking table and guided to the drain hose via a drain at the rear.



1. Remove drain hose from bracket



2. Place drain hose in laboratory drain

Cleaning of the collecting tray:
- four countersunk head screw at the top side of the shaking table loosen
- shaking table upward remove.

Cleaning the Plexiglas cover:
- Do not dry wipe.
- Do not use abrasive materials.

Clean dusty surfaces with warm water, detergent and a soft cloth.

For disinfecting, only use products prescribed by the manufacturer specially for use on Plexiglas.

**Note:** Isopropanol (2-propanol) can be used for cleaning or disinfection (bacteria and viruses).

## Accessories

| | |
|---|---|
| **AS 4000.1** | Universal attachment |
| **AS 4000.2** | Holding bracket attachment |
| **AS 4000.3** | Dish attachment |
| **PC 1.1** | Adapter |

See more accessories on **www.ika.com**.

## Technical data

| | | |
|---|---|---|
| Design voltage | **VAC** | 230±10% |
| or | **VAC** | 115±10% |
| Design frequency | **Hz** | 50/60 |
| Heating power | **W** | 1000 |
| Input power | **W** | 1120 |
| Speed range | **rpm** | 10 ... 500 |
| Heating temperature range | **°C** | RT +5 .... 80 |
| Temperature constancy (200ml water at set point T=37°C, RT 25°C) | **K** | 0.1 |
| Temperature sensor PT1000.60 - variation DIN EN 60751 Kl.A | **K** | ≤±(0,15 + 0,002 x ITI) |
| Permitted duration of operation | **%** | 100 |
| Permitted ambient temperature | **°C** | +15 ... +32 |
| Permitted relative humidity | **%** | 80 |
| Protection class acc. DIN EN 60529 | | IP 30 |
| Protection class | | I |
| Overvoltage category | | II |
| Contamination level | | 2 |
| Operation at a terrestrial altitude | **m** | max. 2000 above sea level |
| Drive | | Speed control asynchronous motor |
| Protection at overload | | Temperature sensor in motorwinding |
| Radius orit | **mm** | 20 |
| Shaking motion | | orbital |
| Max. load | **kg** | 20 |
| Dimensions (W x H x D) | **mm** | 580 x 520 x 750 |
| Weight (i control) | **kg** | 50 |
| Weight (ic control) | **kg** | 55 |
| Speed setting | | Button on front side |
| Dissolution of adjusting | **rpm** | 1 |
| Speed display | | LED - Display |
| Max. speed deviation from idle | **rpm** | ±5 |
| Temperature setting | | Button on front side |
| Dissolution of adjusting | **K** | 0.1 |
| Temperature display | | LED - Display |
| Time setting | | Button on front side |
| Time display | | LED - Display 1 ... 999 hh:min/min:sec |
| Interface | | RS 232 C |

**KS 4000 ic control**

| | | |
|---|---|---|
| Temperature range (inlet T>3°C) | **°C** | 12 ... 80 |

**Note**: Complies to EN 61000-3-11 subject to conditional connection: Zmax = 0.462 Ω. If necessary, consult your electricity supplier.

Subject to technical changes!

# IKA

designed for scientists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