

IKA

designed for scientists

KS 130 control
KS 130 control NOL



KS 260 control
KS 260 control NOL
HS 260 control
HS 260 control NOL



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EU-KONFORMITÄTSERLÄRUNG

DE

Wir erklären in alleiniger Verantwortung, dass dieses Produkt den Bestimmungen der Richtlinien 2014/35/EU, 2006/42/EG, 2014/30/EU und 2011/65/EU entspricht und mit den folgenden Normen und normativen Dokumenten übereinstimmt: EN 61010-1, EN 61010-2-051, EN 61326-1, EN 60529, und EN ISO 12100.

Eine Kopie der vollständigen EU-Konformitätserklärung kann angefordert werden.

EU DECLARATION OF CONFORMITY

EN

We declare under our sole responsibility that this product corresponds to the regulations 2014/35/EU, 2006/42/EG, 2014/30/EU and 2011/65/EU and conforms with the standards or other normative documents: EN 61010-1, 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.

DÉCLARATION UE DE CONFORMITÉ

FR

Nous déclarons sous notre seule responsabilité que le présent produit est conforme aux prescriptions des directives 2014/35/UE, 2006/42/CE, 2014/30/UE et 2011/65/UE ainsi qu'aux normes et documents normatifs suivants: EN 61010-1, 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.

欧盟(EU)标准符合性声明

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。

完整版本欧盟(EU)标准符合性声明可通过索取。

GEWÄHRLEISTUNG

Entsprechend den IKA-Verkaufs- und Lieferbedingungen beträgt die Gewährleistungszeit 24 Monate. Im Gewährleistungsfall wenden Sie sich bitte an Ihren Fachhändler. Sie können aber auch das Gerät unter Befügung der Lieferrechnung und Nennung der Reklamationsgründe direkt an unser Werk senden. 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

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

Selon les conditions de vente et de livraison d'IKA, la garantie s'étend sur une période de 24 mois. En cas de demande de garantie, s'adresser au distributeur. Il est également possible d'expédier l'appareil accompagné de la facture et de la raison de la réclamation directement à notre usine. Les frais de port sont à la charge du client.

La garantie ne recouvre pas les pièces d'usure et ne s'applique pas les défauts résultant d'une manipulation non conforme, d'un entretien et d'une maintenance insuffisants ou du non-respect des instructions du présent mode d'emploi.

保修

根据IKA公司规定本机保修24个月。保修期内若有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送至我们公司，运费由贵方承担。

保修不包括零件的自然磨损，也不适用于过失、不当操作或者未按操作说明书使用和维护引起的损坏。

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Safety instructions

In order to be able to use the device properly and safely, every user must first read the operating instructions and observe the safety instructions contained therein. Take care of these operating instructions and keep them in a place where they can be accessed by everyone.

Only staff who have been trained accordingly, know the device and are authorised to carry out work in this field should use this device. The device may only be opened by trained specialists - even during repairs. The device is to be unplugged from the mains before opening. Live parts inside the device may still be live for some time after unplugging from the mains.



NOTE! Covering or parts that are capable of being removed from the device without accessory equipment have to be reattached to the device for safe operation in order to prevent, for example, the ingress of fluids, foreign matter, etc..

When working with the shaking device, the user must select and wear his personal protective equipment according to the mixing hazard category. Defective or inadequate protective equipment can expose the user to the risk of spurting liquids, projectile parts or being pulled in at the shaking table or support. Never touch moving parts (risk of crushing, impact and cutting, see fig. 1: Danger zones).

Ensure that parts of the body, hair or items of clothing cannot be trapped by the motion parts.

Please follow the relevant safety instructions and guidelines, and occupational health and safety regulations for use in the laboratory.

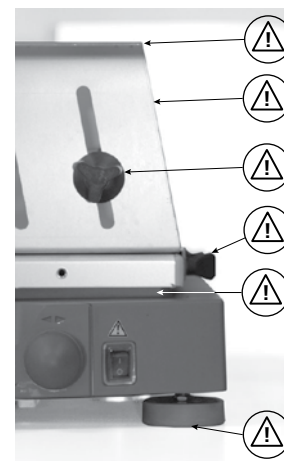


Fig. 1

Beware of the high dead weight of the device when transporting. Ensure that your fingers do not get crushed when setting down the device.

Always install the device 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.

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 device again.

If you notice that the device is not running smoothly, the speed must always be reduced until no more unevenness occurs in the operation.

Because of improper loading and the position of the center of gravity, dynamic forces may arise during the shaking process that cause the shaker to move on the table. For limits on the load or the weight placed on the shaking table at high shaking frequencies, please refer to the diagram in the section "Supported weight (load)".

After an interruption in the power supply during a shaking procedure, the device does not restart by itself in operating mode A (factory setting).

Additional hazards to the user may occur if inflammable materials are used during the shaking operation.

Furthermore, the shaking device may only be used to mix those materials or material mixtures that the user knows will not react dangerously to the extra energy produced by the shaking. This also applies to extra energy by means of solar radiation during the shaking procedure.

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.

Accessories may only be assembled once the plug has been disconnected.

The safety of the user cannot be guaranteed if the device is operated with accessories that are not supplied or recommended by the manufacturer or if the device is operated improperly, contrary to the manufacturer's specifications. The original **IKA** cable layout must be restored following servicing!

Even small undetectable damage may result in serious damage to the motor bearing. Careful handling will guarantee safe work and a long service life of the device. The device can only be disconnected from the power supply by pulling out the power plug or the connector plug.

The socket for the power cord must be easily accessible.

The power switch of the device must be accessed immediately, directly and without risk at any time. If access to the power switch cannot be ensured, an additional emergency stop switch that can be easily accessed must be installed in the work area.

If the device is controlled remotely (e.g. via a PC with *labworldsoft®*), it must be ensured that the device, including attachment and vessels, is in a safe condition for the shaking process and that no other persons are endangered. Pay attention to the marked areas in Figure 1.

Intended use

The **KS 130 control / KS 130 control NOL** and **KS 260 control / KS 260 control NOL**, **HS 260 control / HS 260 control NOL** are suitable for using with various attachments for mixing liquids in bottles, flasks, test tubes and bowls for a maximum supported weight of 2.0 kg and 7.5 kg.

The devices are designed for use in laboratories. The motion of the shaking table or of the containers placed on it is circular or horizontal.

The devices are designed for use in laboratories. The movement of the shaking table or the placed vessels is circular (**KS**) or horizontal back and forth (**HS**).

For proper use, place the device on a stable, even and no-slip surface. Ensure there is sufficient space from the device to other objects and that the device does not move during the shaking process.

Unpacking

Unpacking:

- Unpack the device carefully.
- Any damage should be notified immediately to the shipping agent (post office, railway network or logistics company).

Delivery scope:

The scope of delivery includes: One shaker, 4 clamping screws, one single open-ended spanner, a power cable and an operating instructions.

Useful information

With the purchase of this device, you have acquired a high-quality product. The design of the device and its special shape ensure ease of handling and problem-free work. The materials used and an exact designation of them will significantly facilitate and simplify recycling and reuse of parts.

The speed-controlled external rotor asynchronous motor enables precise speed adjustment in the range from 80 to 800 rpm (**KS 130 control / KS 130 control NOL**) / 10 to 500 rpm (**KS 260 control / KS 260 control NOL**) and 10 to 300 rpm (**KS 260 control / HS 260 control NOL**). The electronic motor control keeps the set speed constant even if the support weight on the table increases. The heat dissipated by the motor can heat up the holding surface for the shaking containers.

The **control** device is equipped with a locking mechanism. This makes it possible to fasten the shaking table in a defined position. For example the device can be integrated into a system or screwed with a table. In addition, the rubber feet must be unscrewed from the base plate so that the exposed threaded hole (M6) can be used to secure the device. Make certain that the maximum depth of 5 mm for inserting the screws is not exceeded.

The **control** device can be delivered with a reverse operating mode (clockwise / counterclockwise motion) for the vibration table on request. However, the reverse operation mode can only be used by means of the serial interface in combination with a PC (for example with Labworldsoft®).

It is easy to exchange the various attachments.

The **control** device and **control NOL** device are equipped with a serial interface that makes it possible to control the device through the PC (for example with Labworldsoft®).

Commissioning

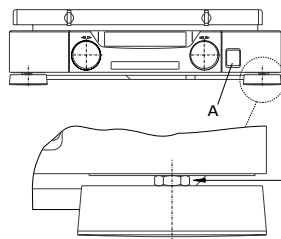
Check whether the voltage specified on the type plate matches the mains voltage available.

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.

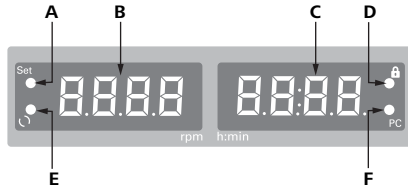
If the mounting surface is not even, you can improve the safety level of the device in reference to how it stands with the adjustable feet.



To do this, turn the appropriate device foot downward with the wrench (included with delivery) until the device is standing securely on the surface.

To prevent the foot of the device from coming loose by itself, hold down the foot with one hand and tighten the opposite hexagonal nut with the other hand until it is finger tight.

Display



A	Set indicator	The LED lights up at the same time as the set value is displayed or setting of the value.
B	Speed display	Display the speed value.
C	Timer display	Display the time value.
D	Locking function status indicator	Indicates that the locking function is active.
E	Shaking function status indicator	Indicates that the shaking function is active.
F	External control indicator	Indicates that the device is controlled externally, via the interface, e.g. by a PC.

Switching on

Switch on the device via the power switch (rocker switch) on the front of it. After switching on, a self-test is carried out, all display elements light up, a short signal sounds and the safety-relevant functions are checked.



Self-test



Device type: e.g. KS 130



Software version: 0.01 Operating mode: A



Speed limit: 230 rpm

Note: In mode A, as long as the LED of the set indicator flashes, the speed limit can be set by turning the left knob. If no changes are made for a period of 3 seconds, the speed limit saved and the LED of the set indicator stops flashing.



Speed limit stored

Then the speed setting (e.g. 130 [rpm]) and the timer setting (e.g. 03:58 [h:min]) appear on the screen.



Set values

The device is ready for operation.

Working with the device

Setting the speed

Switch on the device with the power switch and wait until the device is ready for operation. The set speed (e.g. 130 [rpm]) is displayed on the left, the LED of the set indicator lights up.

The set speed can be changed by turning the left rotary knob. Changing the speed is also possible while the device is shaking.

Setting the timer value

Switch on the device with the power switch and wait until the device is ready for operation. The timer value (e.g. 3:58 [h:min]) is displayed on the right, the LED of the set indicator lights up.

The timer value can be changed by turning the right rotary knob. Changing the timer value is also possible while the device is shaking. Once the timer has started, however, the value can no longer be changed.

Note: The expiration of the timer is indicated by a signal sequence (3 tones in 3 seconds).

Shaking function without timer

If the shaking function is started by pressing the left rotary knob, the left display shows the actual speed and the shaking function indicator LED lights up. The right display shows the time value.

The device regulates the speed to reach the set speed. The display shows the actual speed for 4 seconds and only the shaking function indicator LED lights up. Then, the display shows the set speed, the LED of the set indicator and the LED of shaking function indicator light up. Then the actual speed is displayed again for 4 seconds, etc.

Pressing the left rotary knob again to stop the shaking function. The display shows the set values and the LED of the set indicator lights up.

Shaking function with timer

During the shaking process, the timer function can be switched on by pressing the right rotary knob. From now on, the timer runs.

The shaking process and the timer function can also be started simultaneously by pressing the right rotary knob.

The two LED dots between **h** and **min** flash every second while the timer is running. The shaking process and the timer can be stopped by pressing the right or left rotary knob. It is not possible to stop one of the functions separately.

After the timer has run out and the shaking process has been stopped automatically, or manually by pressing one of the two rotary knobs, the display shows the set values.

Operating modes

The device can be operated in the modes described below:

Operation mode A (factory setting):

After switching on the device with the power switch, the shaking and timer functions are switched off and the stored set value are displayed. The set value can be changed.

After a power failure (equivalent to disconnecting from the power), the device does not restart by itself in mode A. Previously functions must be restarted.

The upper speed limit can only be set or changed in operating mode A.

Operating mode B:

After switching on the device with the power switch, the shaking and timer functions are switched off and the stored set values are displayed. The set values can be changed.

When switching to operating mode B, the setting of the upper speed limit is taken over from operating mode A and cannot be changed.

After a power failure (equivalent to disconnecting from the mains), the device does not restart itself in mode B. Previously functions must be restarted.

Operating mode C:

When switching to operating mode C, the set values for: upper speed limit, target speed and timer are taken over from operating mode B and cannot be changed.



After switching on the device with the power switch or after a power failure (equivalent to disconnecting from the mains), the device starts up again in mode C if the shaking function was activated previously. The stored set values are displayed accordingly.

Switching the operating mode:

The following steps are required to switch the operating modes:

- Turn off the device with the power switch.
- Press and hold both rotary knobs and turn on the device with the power switch. After about 1 second, the rotary knobs can be released.

Note: It is not possible to switch between operating modes **A**, **B** and **C** in random order. The operating mode can be switched by repeating these two steps a.) and b.) according to the following steps.

A - step a.) + b.) => **B** - step a.) + b.) => **C** - step a.) + b.) => **A** - step a.) + b.) =>

Setting the audible signal function

To activate or deactivate the audible signal function, the following steps are necessary:

- Turn off the device with the power switch.
- Press and hold the right knob and turn on the device with the power switch. After approx. 2 seconds, the display shows "**bEEP on**" or "**bEEP off**" (depending on the previous setting) and the rotary knob can be released.
- By pressing the right rotary knob, the signal function can be activated (**bEEP on**) or deactivated (**bEEP off**) as long as the LED of the set indicator flashes. When switching from "**bEEP off**" to "**bEEP on**", a sound signal sounds.



Audible signal function activated



Audible signal function deactivated

Note: If no changes are made in 3 seconds, the setting will be saved and the set indicator LED will stop flashing.



Audible signal function, setting saved

Note: Safety-relevant signal tones, such as error messages or the timer expiration, cannot be switched off.

Setting the lock function

Note: All devices with the abbreviation „NOL“ in the model name (power rating plate) do not have a lock function.

The locking function for the shaking table can be activated or deactivated directly after the setting of the acoustic signal.

The following steps are required to activate or deactivate the locking function:

- Turn off the device with the power switch.
- Press and hold the right rotary knob and switch the device on with the power switch.

After approx. 2 seconds, the display shows **"bEEP on"** or **"bEEP off"** (depending on the previous setting) and the rotary knob can be released.

Confirm the settings or wait until the display **"Lock on"** or **"Lock off"** (depending on the previous setting).

- By pressing the right rotary knob, as long as the LED of the set indicator flashes, the locking function can be activated (**Lock on**) or deactivated (**Lock off**).



Lock function activated



Locking function deactivated

Note: If no changes are made in 3 seconds, the setting is saved and the LED of the set indicator stops flashing.



Locking function, setting saved

After that, the overall operating time (hours) appears on the screen.



Operating hours, for example: 12345 hours

The activated locking function is indicated by the illuminated LED of the status indicator Lock function is displayed.



ATTENTION! After switching on the device with the power switch or after a power failure (equivalent to disconnecting from the power), the device searches for the locking position by a defined movement of the shaking table and fixes it.

Attachments

Attachments recommended by **IKA** must be connected to the shaking table to ensure safe and secure operation. In addition, the usable weight and speed ranges shown in the diagrams (hatched areas) must not be exceeded.

Attachments for KS 130 control:

AS 130.1 Universal attachment

Universal, steplessly adjustable clamping cylinders make it possible to adjust to any container shape.

The universal attachment consists of:

AS 1.30 basic suspension	1x	Dimension (WxHxD) [mm]
AS 1.5 fastening screw	4x	260 x 90 x 235
AS 1.31 clamping cylinder	3x	

ATTENTION! The base suspension of the universal attachment is secured in place by four lateral clamping screws on the agitation table.

AS 130.2 Holding bracket adapter

With additional holding brackets (AS2.1, AS2.2, AS2.3, AS2.4 and AS2.5) the holding bracket adapter is suitable for working with round flasks, measuring flasks and Erlenmeyer flasks.

Recommended / maximum fitting

AS 2.1 Holding bracket	12 / 12	Dimension (WxHxD) [mm]
AS 2.2 Holding bracket	8 / 9	230 x 24 x 235
AS 2.3 Holding bracket	5 / 8	
AS 2.4 Holding bracket	4 / 4	
AS 2.5 Holding bracket	2 / 4	

ATTENTION! The holding bracket adapter is secured in place by four lateral clamping screws on the agitation table.

AS 130.3 Dish attachment

For gentle agitation at low speed, for example for Petri dishes or culture flasks. The dish attachments are equipped with an antislip sheet that prevents the dish from moving around during the agitation process.

Dimension (WxHxD) [mm]
420 x 33 x 270

ATTENTION! The dish attachment is secured in place by four lateral clamping screws on the agitation table.

AS 130.4 Reactant glass adapter

For intensive shaking of tubes, reactant bottles, cuvettes and centrifuge tubes. Clamping range from Ø10mm to Ø16mm for a maximum of 64 tubes.

Dimension (WxHxD) [mm]
228 x 95 x 234

ATTENTION! The reactant glass adapter is secured in place by four lateral clamping screws on the agitation table.

After vessels with a large diameter have been agitated for a long time and the equipment is readjusted for vessels with a smaller diameter, the clamping straps must be bent back carefully to ensure that they clamp securely.

Attachments for KS 260 control / HS 260 control:

AS 260.1 Universal attachment

Universal, steplessly adjustable clamping cylinders make it possible to adjust to any container shape.

The universal attachment consists of:

AS 1.60 basic suspension	1x	Dimension (WxHxD) [mm]
AS 1.5 fastening screw	8x	425 x 135 x 334
AS 1.61 clamping cylinder	4x	

ATTENTION! The base suspension of the universal attachment is secured in place by four lateral clamping screws on the agitation table.

AS 260.2 Holding bracket adapter

With additional holding brackets (AS2.1, AS2.2, AS2.3, AS2.4 and AS2.5) the holding bracket adapter is suitable for working with round flasks, measuring flasks and Erlenmeyer flasks.

Recommended / maximum fitting

AS 2.1	Holding bracket	12 / 12	Dimension (WxHxD) [mm]
AS 2.2	Holding bracket	8 / 9	330 x 24 x 334
AS 2.3	Holding bracket	5 / 8	
AS 2.4	Holding bracket	4 / 4	
AS 2.5	Holding bracket	2 / 4	

ATTENTION! The holding bracket adapter is secured in place by four lateral clamping screws on the agitation table.

AS 260.3 Dish attachment

For gentle shaking at low speed, for example for Petri dishes or culture flasks. The dish attachments is equipped with an anti-slip sheet that prevents the dish from moving around during the agitation process.

Dimension (WxHxD) [mm]
410 x 33 x 370

ATTENTION! The dish attachment is secured in place by four lateral clamping screws on the agitation table.

AS 260.5 Separating funnel attachment

For intensive shaking of separating funnels.

Max. fitting:	Dimension (WxHxD) [mm]
6 x 50 ml Separating funnel	334 x 145 x 425
5 x 100 ml Separating funnel	
3 x 250 ml Separating funnel	
3 x 500 ml Separating funnel	

ATTENTION! The separating funnel attachment is secured in place by four lateral clamping screws on the agitation table.

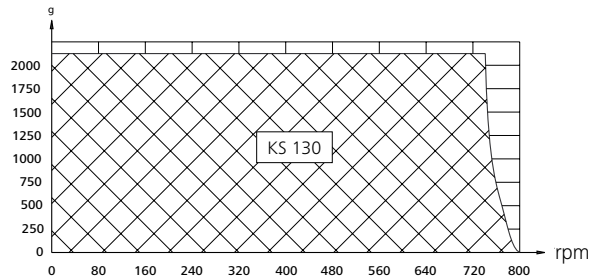
Supported weight (load)

In order to ensure safe and secure operation, the shaker must only be operated within the range of usable weight and speed (see diagram - hatched area). Please make certain that the holding surface on which the shaker is placed is clean and level. Otherwise the working range shown in the diagram (the hatched area) cannot be used.

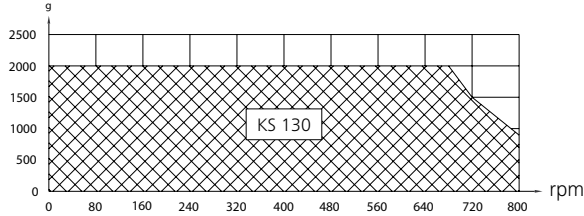
If the shaker is screwed together with an adjacent piece of equipment (i.e. if it is integrated into a system) it should be noted during operation that dynamic forces may arise as a result of unfavorable loading circumstances and the position of the center of gravity. This may cause the adjacent equipment to vibrate or may cause the table to vibrate uncontrollably. If you notice that the device is running unevenly, the speed must in any case be reduced until the running irregularities no longer occur.

Make certain that individual agitation vessels are placed in the middle of the shaking table and multiple shaking vessels are placed evenly on the shaking table, and that all vessels are securely fastened in place.

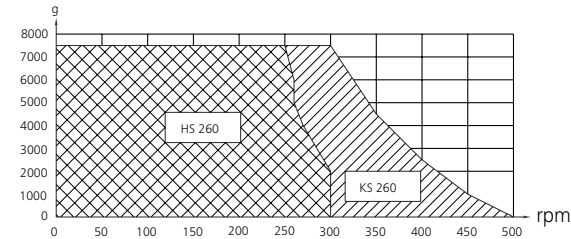
AS 130.1 Universal attachment



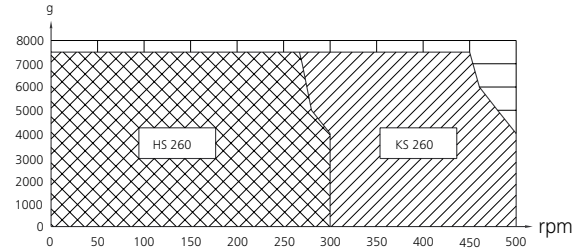
AS 130.4 Reactant glass adapter



AS 260.1 Universal attachment



AS 260.5 Separating funnel attachment



Error codes

If an error code is encountered, an audio warning signal is generated and the error code appears on the display field. First, please try to continue operating by turning the device off and back on again. If it is still not possible to eliminate an error after an extended wait, please contact our service department. If you do so, you should always tell us what error code has been encountered. This simplifies the process of tracking down the error and makes it possible to form a preliminary opinion.

Error code	Error	Cause of the error
Er 2	No communication between PC and control device in remote operation with active watchdog function in Mode 1.	- Interface not connected. - PC is not sending any data within the amount of time set by the watchdog.
Er 3	Internal device temperature is too high.	- Permissible ambient temperature exceeded.
Er 4	Motor locked or over loaded, problem with reading data/signal from light barrier.	- Shaking table is being hindered in its stroke motion - Internal device error
Er 9	Error while reading stored values.	-PCB Logic.
Er 41	Triac defective	-Internal device error.
Er 42	Safety relay defective	-Internal device error.
WD ('Ld)	No communication between PC and control device in remote operation with active watchdog function in Mode 2.	- Interface not connected - PC is not sending any data within the amount of time set by the watchdog.

Interface and outputs

The device is equipped with a 15-pin SUB-D connector on the rear side of the device. The pins are assigned in operation with analog and serial signals.

Analog output

Voltage values for the speed measurement quantify are present on the analog pins.

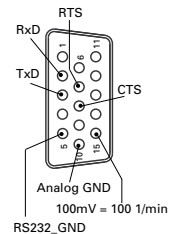
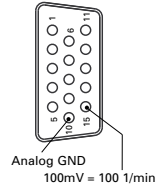
- (10) Analog GND
- (15) Speed measurement value 100mVDC / 100 1/min

RS 232 C serial interface

The serial assignment of the socket can be used to control the device externally by means of a PC and a suitable application program.

Configuration of the serial RS 232 C interface

- The function of the interface line between the laboratory device and the automation system is a selection of the signals specified in EIA Standard RS 232 C, corresponding to DIN 66020 Part 1. For the assignment of the signals, please refer to the illustration.
- Standard RS 232 C applies to the electronic properties of the interfaces and the assignment of signal states in accordance with DIN 66259 Part1.
- Transmission procedure: Asynchronous character transmission in start-stop mode
- Type of transmission: full duplex
- Character format: Character creation according to the data format in DIN 66022 for start-stop mode. 1 start bit; 7 character bits; 1 parity bit (even); 1 stop bit.
- Transmission speed: 9600 baud
- Data flow control: RTS/CTS hardware handshake



- RTS: (Pin 7) LOW (positive tension) / PC may send
- RTS: (Pin 7) HIGH (negative tension) / PC may not send
- CTS: (Pin 8) LOW (positive tension) / PC recipient
- CTS: (PIN 8) HIGH (negative tension) / PC not recipient
- Access method: Data communication from laboratory instrument to processor is only possible on demand of the processor.

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 length 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-Association. (NAMUR-recommendations for the design of electric plug connections for the analog and digital signal transmission to laboratory- MSR individual units. Rev. 1.1)

Overview of the NAMUR-Instructions

Abbreviations:

- X,y = numbering parameter (integer number)
- M = value of variable, integer number
- n = value of variable, floating point number
- X = 4 speed
- X = 6 speed range limit ("safety" speed)

NAMUR Instructions		Function	Display additional
IN_PV_X	X=4	Reading the real-value.	
OUT_SP_X n	X=4	Setting the actual value to n up to a maximum of the set upper speed limit.	
IN_SP_X	X=4; 6	Reading the set rated value.	
START_X	X=4	Starting the instrument's (remote) function	Remote
STOP_X	X=4	Switching off the instrument function. Variables set with OUT_SP_X are maintained. Contains the instruction RMP_STOP	Remote
RESET		Switching off the instrument function	
STATUS		Display of status <0: error code: (-1) -2: Er2 / VWD -3: Er3 -4: Er4 -9: Er9 -41: Er41 -42: Er42 -83: wrong parity -84: unknown instruction -85: wrong instruction sequence -86: invalid rated value -87: not sufficient storage space	
RMP_IN_X	X=4	Reading the real segment number of ramp. With ramp not started: 0	
RMP_IN_X_y	X=4	Reading the accumulated value and the ramp segment duration (hh:mm:ss) of ramp segment y.	
RMP_OUT_X_y n hh:mm:ss	X=4	Setting the accumulated value (n) and the ramp segment duration (hh:mm:ss) for ramp segment y	
RMP_START_X	X=4	Starting the ramp function, beginning with ramp segment No. 1. (Only possible after prior START_X.) After RMP_STOP_X, START_X is not necessary.	

RMP_STOP_X	X=4	Switching off ramp function. Rated value=0 (Ramp is maintained, that means , ramp can be restarted with RMP_START_X.	
RMP_PAUSE_X	X=4	Stopping the ramp function. Freezing of real rated value and real ramp segment time.	
RMP_CONT_X	X=4	Continuation of ramp function (After prior RMP_PAUSE_X).	
RMP_RESET_X	X=4	Switching off ramp functions and deleting of all set ramp segments	
RMP_LOOP_SET_X	X=4	To work off the ramps in one loop	
RMP_LOOP_RESET_X	X=4	Ending of ramp loop	
IN_TYPE		Requiring identification of laboratory instrument	
IN_NAME		Requiring the designation name	
OUT_NAME name		Output of designation name (max. 6 characters, default: IKA_S-)	
OUT_WD1@m		Watchdog mode 1: If the WD1 result occurs, the agitation process is turned off and Er2 is displayed. The watchdog time is set to m (10...1800) sec with echo of the watchdog time. This command starts the watch-dog function and must always be sent within the time set by the watchdog.	
OUT_WD2@m		Watchdog mode 2: If the WD2 result occurs, the target speed is set to the WD target safety speed that has already been set. The warning VWD is displayed. The WD2 result can be reset with OUT_WD2@0. The watchdog time is set to m (10...18000) sec with echo of the watchdog time. This command starts the watchdog function and must always be sent within the time set by the watchdog.	
OUT_SP_42@n		Sets the WD target speed with echo of the value set.	

Communication between laboratory instrument and PC

PC 1.4 Adaptor

This adaptor is required to connect the 15-pin connector to a 9-pin interface.

PC 2.1 Cable

This cable is required to connect the 9-pin connector to a PC (9-pin connector).

PC 1.5 Cable

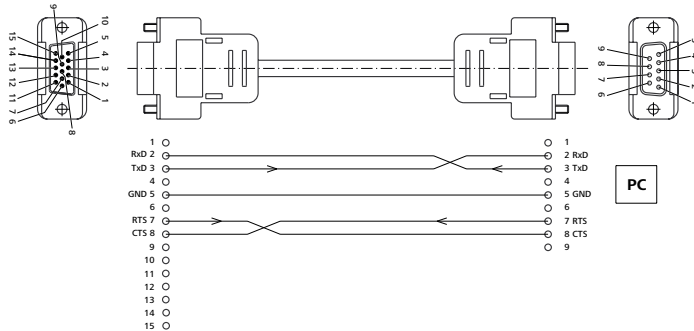
This cable is required to connect the 15-pin connector to a PC (25-pin connector).

PC 2.2 Adaptor

This adaptor is required to connect the 25-pin connector to a PC (9-pin connector).

PC 3.1 Cable

This cable is required to connect the 15-pin connector to a PC (9-pin connector).



Device software update

Keep your device up-to-date with the IKA Firmware update tool.

The firmware update can be done with a computer connected through USB-Interface. For this, you need register on our website MyIKA first.

After registering your device IKA will inform you about available updates for your devices.

Please download the software "FWUToolSetup.zip" from our IKA service website.

Motor protection / safety device

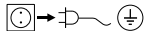
If the motor is locked or if a load is placed on it resulting in a higher temperature than permitted, the device is turned off automatically by the safety circuit. To eliminate the error, the weight of the material must be reduced. Allow the device to cool off. The device must be turned off and back on again.

The motor is turned off immediately in the event of a malfunction by a safety circuit. A malfunction occurs if the safe and secure functionality of the device cannot be guaranteed. A malfunction is displayed by the error message being shown on the display of the speed indicator (see the section "Error Codes").

Maintenance and cleaning

The device 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 main plug!

Use only cleaning agents which have been approved by **IKA** to clean **IKA** devices: water containing surfactant / isopropyl alcohol.

- Wear protective gloves while 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.
- If a different cleaning or decontamination method than the method defined by **IKA** is planned, the user must ascertain with **IKA** that this method does not damage the device.

Spare parts order:

When ordering spare parts, please give:

- machine type
- manufacturing number, see type plate
- item and designation of the spare part
- software version.

Repair:

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

For repair, please request the “**Decontamination Certificate**” form **IKA** or use the download printout of it from **IKA** website.

If you require servicing, return the device in its original packaging. Storage packaging is not sufficient. Please also use suitable transport packaging.

Accessories

KS 130 control

- AS 130.1** Universal attachment
- AS 130.2** Fixing clip attachment
- AS 130.3** Dish attachment
- AS 130.4** Test tube attachment

KS 260 control / HS 260 control

- AS 260.1** Universal attachment
- AS 260.2** Fixing clip attachment
- AS 260.3** Dish attachment
- AS 260.5** Separating funnel attachment

General accessories

- STICKMAX** Adhesive mat
- PC 1.5** Cable
- PC 2.1** Cable
- PC 1.2** Adapter

Technical data

		KS 130 control KS 130 control NOL	KS 260 control KS 260 control NOL	HS 260 control HS 260 control NOL
Design voltage	VAC	230 ± 10 % / 115 ± 10 %		
Frequency	Hz	50 / 60		
Motor rating input	W	45		
Motor rating output	W	10		
Permissible ON time	%	100		
Permissible ambient temperature	°C	+5 ...+ 50		
Permissible relative humidity	%	80		
IP code according to EN 60529		IP 21		
Protection class		I		
Overvoltage category		II		
Contamination level		2		
Operation at a terrestrial altitude	m	Max. 2000 above seal level		
Drive		Speed control asynchronous motor		
Protection at overloaded		Temperature sensor in motor winding		
Fuse in the device plug		2x T1A 250V		
Speed min (adjustable)	rpm	80	10	10
Speed range	rpm	0 ... 800	0 ... 500	10 ... 300
Speed display		LED		
Max. Speed deviation from idea	%	± 1		
Shaking motion		orbital	orbital	reciprocating
Shaking stroke	mm	4	10	20
Max. Load (including attachment)	Kg	2	7.5	7.5
Timer function		yes		
Timer display		LED		
Time setting range		1 ... 5999 min		
Interface		RS 232 C / analog		
Dimensions (W x H x D)	mm	270 x 98 x 316	360 x 98 x 420	360 x 98 x 420
Weight	kg	9.8	8.8	8.8

Subject to technical changes!