

IKA

designed for scientists

MS 3 control



Operating instructions

Source language: German

EN

4

操作说明

ZH

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取扱説明書

JA

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사용 설명서

KO

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Warning symbols

- 

Indicates an (extremely) hazardous situation, which, if not avoided, will result in death, serious injury.
- 

Indicates a potentially hazardous situation, which, if not avoided, can result in death, serious injury.
- 

Indicates a potentially hazardous situation, which, if not avoided, can result in injury.
- 


Indicates practices which, if not avoided, can result in equipment damage.
- 

Indicates crushing risk of fingers/hand.

Safety instructions


For your protection

- **Read the operating instructions in full before starting up and follow the safety instructions.**
- Keep the operating 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.


 **WARNING** **Wear your personal protective equipment in accordance with the hazard category of the medium to be processed. Otherwise there is a risk of:**

- splashing liquids
- projectile parts
- body parts, hair, clothing and jewellery getting caught.

- Keep hand/arm vibration to a minimum (Directive 2002/44/EC) when operated manually:
 - Keep the sample container as vertical as possible.
 - Only exert the minimum pressure necessary for the mixing process.
 - Use attachments for multiple samples when there is a large number of samples.
- 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.

 **CAUTION** **Before starting the device set a low speed. Gradually increase the speed.**

- If the shaking movement of the appliance increases (resonance), reduce the speed or pass through the critical phase as quickly as possible.
- Reduce the speed if
 - the medium splashes out of the vessel because the speed is too high
 - the appliance is not running smoothly
 - the appliance begins to move around because of dynamic forces.

 **CAUTION** **Caution! Risk of crushing when changing attachments.**

- Firmly secure the accessories and vessels in place, otherwise shaking vessels could be damaged or projected out.
- Check the appliance and accessories beforehand for damage each time you use them. Do not use damaged components.
- Position one single shaking vessel in the centre and several shaking vessels so that they are evenly spread out.
- Sharp edged vessels cause wear debris on the attachments.



DANGER

Beware of the risk of

- flammable materials
- glass breakage as a result of mechanical shaking power

- Do not work with biological or microbiological media.
- 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.



DANGER

Do not operate the appliance in explosive atmospheres, with hazardous substances or under water.

- Safe operation is only guaranteed with the accessories described in the "Accessories" chapter.
- Always disconnect the plug before fitting accessories.
- The appliance does not start up again automatically following a cut in the power supply.
- The appliance may heat up when in use.

For protection of the equipment

- The voltage stated on the nameplate must correspond to the mains voltage.
- The device must only be operated with the original plug-in power supply unit.
- Protect the appliance and accessories from bumps and impacts.
- The appliance may only be opened by experts.

Unpack

Unpack

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

Delivey scope

- MS 3 control
- Power supply
- Standard attachment MS 3.1
- Universal attachment MS 3.3
- One-hand insert MS 1.21
- Microtiter attachment MS 3.4
- Test tube insert MS 1.32
- Operating instructions

Correct use

Use

- ▶ For mixing liquids
 - Touch mode for single test tubes
 - Continuous mode for single or several vessels

Range of use





Indoor environments similar to that a laboratory of research, teaching, trade or industry.



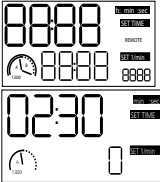




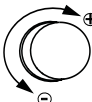
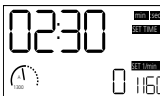
The safety of the user cannot be guaranteed:

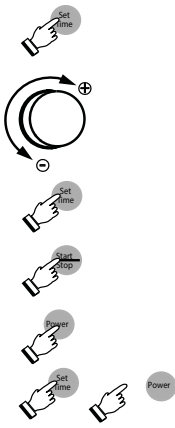
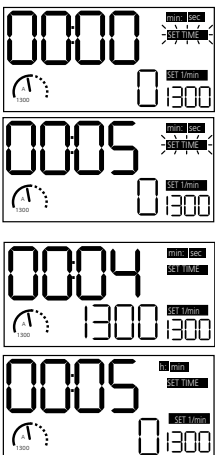
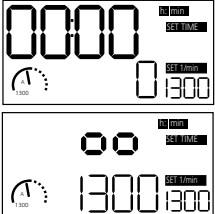
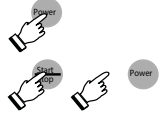

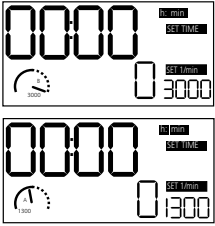
- if the device is operated with accessories that are not supplied or recommended by the manufacturer.
- if the device is operated improperly or contrary to the manufacture's specifications.
- if the device or the printed circuit board are modified by third parties.

Commissioning

Operating modes












	Mode A <i>(with speed limiter)</i>	Mode B <i>(without speed limiter)</i>
Touch mode <i>(with standard attachment MS 3.1)</i>	max. 3000 1/min 	max. 3000 1/min 
	with/without timer	
Continuous mode <i>(with all attachments)</i>	max. 1300 1/min 	max. 3000 1/min 
	with/without timer	

Setting	Action	Display
1 Plugging in the mains plug	 The unit is ready for service when the mains plug has been plugged in	
2 Switching on	 Introductory screen The values which were previously set (speed and timer) are stored. The mode will always be set to A when the device is powered on	
3 Setting the operating modes	Touch mode  Change to continuous mode  Mode A Operating mode "Touch" Speed upto 3000 1/min Mode A Operating mode "Continuous" operation Speed upto 1300 1/min	 
4 Speed adjustment		

5.1	Setting Timer / Change Timer Setting	 <p>Change to mode t/min</p>	<p>Mode Timer in sec</p> <p>Set the desired time</p> <p>Confirm</p> <p>Countdown runs An audible signal will be given three times when the countdown is complete</p> <p>Switch off the device</p> <p>Keep the button "Set Time" pressed and also press the button "Power".</p>	
5.2	Operation without timer setting		<p>Value "Time"=0, no countdown</p> <p>Value "Time"=0, no countdown, Device in operation</p>	
6	Change mode	<p>A → B</p>  <p>B → A</p> 	<p>Switch off the device</p> <p>Switch on: Keep the button "Start/Stop" pressed and also press the button "Power"</p> <p>Mode B Operating modes "Touch" and "Continuous operation" Speed up to 3000 l/min</p> <p>Switch off the device and switch on again, see 1</p>	

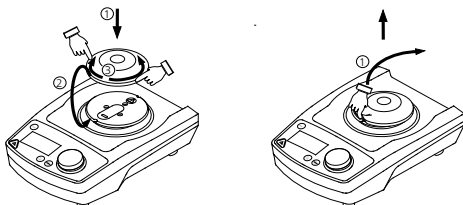
Accessories

Possible uses and permitted speed ranges of attachments:

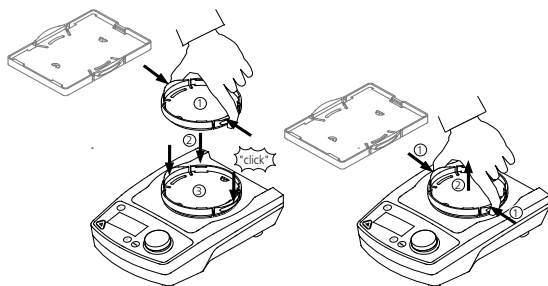
Designation	Description	Ident- Nr.	Touch mode	Continuous mode	Speed range (rpm)	Mode
 MS 3.1 Standard attachment	- For test tubes and small vessels upto \varnothing 50 mm	3426300	x - -	- x x	0/100-3000 0/100-1300 0/100-3000	A and B A B
 MS 3.3 Universal attachment	- For different rubber foam inserts	3426600	-	x	0/100-1300 0/100-3000	A B
 MS 3.4 Microtiter attachment	- For one microtiter plate	3426400	-	x	0/100-1300	A
 MS 3.5 PCR-Plate attachment	- For one 96-well PCR-plate	3428000	-	x	0/100-1300	A
 MS 3.51 PCR-Plate insert	- For inserting into the PCR-Plate attachment	3428700	-	x	0/100-1300	A
 MS 1.21 One-hand insert	- For inserting into the universal attachment	L001540	-	x	0/100-1300 0/100-3000	A B
 MS 1.30 Test tube insert	- For inserting into the universal attachment - For 24 tubes \varnothing 6 mm	25005776	-	x	0/100-1300	A
 MS 1.31 Test tube insert	- For inserting into the universal attachment - For 14 test tubes \varnothing 10 mm	L001840	-	x	0/100-1300	A
 MS 1.32 Test tube insert	- For inserting into the universal attachment - For 6 test tubes \varnothing 12 mm	L001850	-	x	0/100-1300	A
 MS 1.33 Test tube insert	- For inserting into the universal attachment - For 4 test tubes \varnothing 16 mm	L001860	-	x	0/100-1300	A
 MS 1.34 Test tube insert	- For inserting into the universal attachment - You can make holes as you like	L001830	-	x	0/100-1300	A

Changing attachments

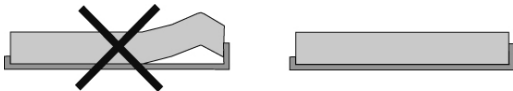
MS 3.1



MS 3.3
MS 3.4



Using inserts



Other accessories

- PC 1.2
- PC 2.1
- labworldsoft®, from version 5.0 on
- Adapter
- Analog cable
- Software

Interface and output

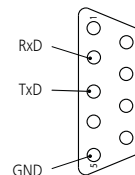
The device is equipped with a 9-pin SUB-D connector on the rear side of the device.

Serial interface RS 232 C

The serial assignment of the socket can be used to control the device externally by means of a PC and a suitable application program, e.g. labworldsoft®, from Version 5.0 on.

Configuration of the serial interface RS 232 C

- 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 Part 1.
- 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 stopbit.
- Transmission speed: 9600 Bit/s
- Data flow control: no



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 desing of electric plug connections for the analog and digital signaltransmission 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

NAMUR instruction		FUNCTION	Display additional
IN_PV_X	X=4	Reading the real-value	
OUT_SP_Xn	X=4	Setting the actual value to n up to a maximum of the set upper speed limit	
IN_SP_X	X=4	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.	Remote
RESET	X=4	Switching off the instrument function	
STATUS		Display of status 1*: Mode A 2*: Mode B *0: manual operation without fault *1: automatic operation Start (without fault) *2: automatic operation Stop (without fault) <0: error code: (-1) -3: Er3 -83: wrong parity -84: unknown instruction -85: wrong instruction sequence -86: invalid rated value -87: not sufficient storage space	

Communication laboratory device - PC

The communication of the laboratory device and the PC requires the following adapter and cables, available by IKA.

PC 2.1 Cable

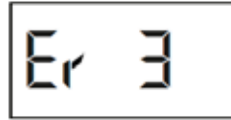
This cable is required to connect the 9-pin connector to a PC.

PC 1.2 Adapter

This adaptor is required to connect the 9-pin connector to an 8-way serial interface (25-pin plug).

Error code

Any malfunctions during operation will be identified by an error message on the display.



Proceed as follows in such cases:

- Disconnect power supply
- Carry out corrective measures
- Restart devicen

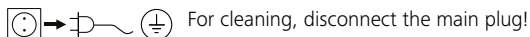
Error code	Cause	Effect	Correction
Er 3	- The movement of the agitation label is obstructed - Internal fault	Motor blockage	Switch off the device

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.

Maintenance

The appliance is maintenance-free.



Use only cleaning agents which have been approved by IKA to clean the devices: water (containing surfactant) and 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, see spare parts diagram and spare parts list, see www.ika.com.

Repair


Please only send devices in for repair that have been cleaned and are free of materials which might present health hazards.

For this, use the “**certificate of compliance**” form which you can obtain from **IKA** or can download a version for printing from the **IKA** website at www.ika.com.

If your appliance requires repair, return it in its original packaging. Storage packaging is not sufficient when sending the device - also use appropriate transport packaging.

Technical data

Power supply

Input	V	100 ... 240
	A	0.8
	Hz	50/60
Output	Vdc	24
	W	24 (Limited power source)
Protection class		2 (double insulated) 

Shaker

Operating voltage	Vdc	24
	mA	800
Power consumption, normal operation	W	20
Power consumption, standby operation	W	2
Motor-output power	W	8
Drive		EC - motor
Speed range	rpm	0/100 ... 3000 adjustable in tens steps rotating knob in front of the device
Speed adjustment		digital
Speed display		digital
Agitation stroke	mm	4.5
Shaking motion		horizontal, circular
Perm duration of operation	%	100
Timer mode seconds		1 sec ... 59 min 59 sec
mode minutes		1 min ... 59 h 59 min
Timer display		digital
Perm ambient temperature	°C	+5 ... +40
Perm. relative humidity	%	80
Protection type acc. to DIN EN 60529		IP 21
Contamination level		2
Overvoltage category		II
Operation at a terrestrial altitude	m	max. 2000
Interface		RS 232