IKA

designed for scientists

Oven 125 control - dry
Oven 125 control - dry glass

Device setup

Oven 125 control - dry / Oven 125 control - dry glass
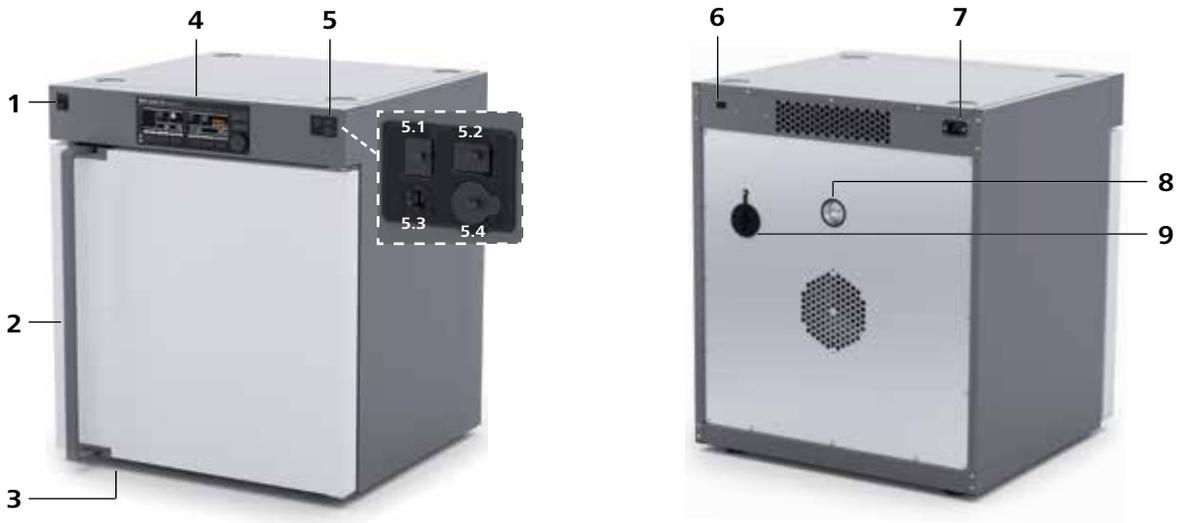
Fig. 1

Pos.	Designation
1	Mains switch
2	Door handle
3	Device foot
4	Operator Panel and display
5	5.1 USB interface
	5.2 USB interface - Data Storage
	5.3 Safety temperature limiter
	5.4 Interface for external temperature sensor
6	Interface RS 232
7	Mains socket
8	Venting flap
9	Cable feed-through (external temperature sensor)
10	Oven light
11	Fan
12	Rack slide-in supports
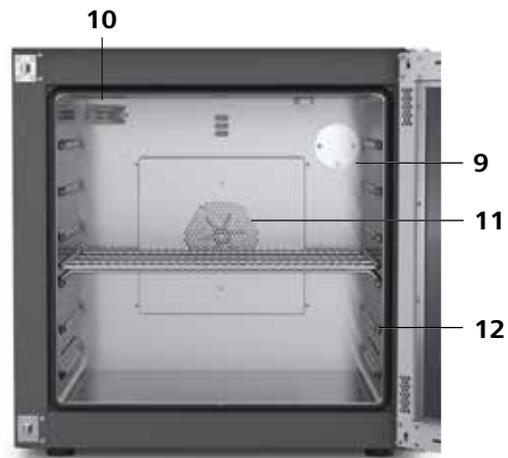
Dangerous spots

Oven 125 control - dry / Oven 125 control - dry glass
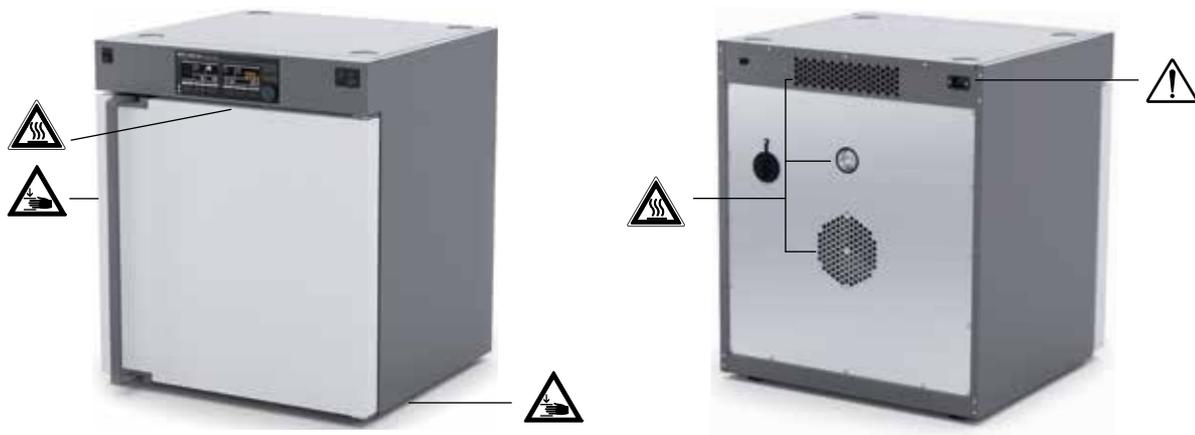
Fig. 2

Contents

EU Declaration of conformity

We declare under our sole responsibility that this product corresponds to the directives 2006/42/EG, 2014/35/EU, 2014/30/EU and 2011/65/EU and conforms with the following standards or normative documents: EN 61010-1, EN 61010-2-010, EN 61326-1, EN 60529, EN ISO 12100 and DIN 12880.

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

Explanation of warning symbols

⚠ **DANGER**	Indicates an (extremely) hazardous situation, which, if not avoided, will result in death or serious injury.
⚠ **WARNING**	Indicates a hazardous situation, which, if not avoided, can result in death or serious injury.
⚠ **CAUTION**	Indicates a potentially hazardous situation, which, if not avoided, can result in injury.
⚠ **NOTICE**	Indicates practices which, if not avoided, can result in equipment damage.
⚠ **CAUTION**	Indicates a hazardous situation that result from a hot surface!
⚠ **CAUTION**	Indicates crushing risk to fingers/hands.

Safety instructions

General information:

- **Read the operating instructions completely 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 device.
- Follow the safety instructions, guidelines, occupational health and safety and accident prevention regulations.

Transport and installation:

| ⚠ **CAUTION** | **Ensure that your fingers do not get crushed when setting down the device.** |

- Beware of the high dead weight of the device when transporting.

- Insufficient ventilation may result in the formation of explosive mixtures. Only use the device in well ventilated areas.
- Disconnect the mains plug before cleaning, maintenance and transportation of the unit

Device setup:

| ⚠ **DANGER** | **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 bodily injury and property damage, observe the relevant safety and accident prevention measures when processing hazardous materials. |

| ⚠ **WARNING** | **Please pay attention to the dangerous spots of the device in Fig. 2.** |

| ⚠ **CAUTION** | **Media may only be processed or heated with this device in safe operation without monitoring if their flash point lies above the set safety temperature limit. The set safety temperature limit must be at least 25°C below the flash point of the medium in use. (EN 61010-2-01)** |

| ⚠ **CAUTION** | **There is a crushing risk when opening or closing the door. Keep your hands away from squeezing edges.** |

- Set up the device in a spacious area on an even, stable, clean, non-slip, dry and fireproof surface.

- Secure the device with the anti-tilt device to ensure stability while loading and unloading shelves and during operation. Ensure the anti-tilt bracket is properly fixed, in particular when the device is stacked.

- The feet of the equipment must be clean and undamaged.

Work with the device:

⚠ **WARNING**

Do not start up the device if:
- it is damaged
- cable is damaged.

The device must have cooled down before loading/unloading.

Do not move any loaded racks.

Heavy loads can lead to tilting of the device. Observe loading recommendations for the shelves.

Never use the device for:
- heating food
- drying living beings
- heating room

⚠ **WARNING**

The safety temperature limit must be set in such a way that the maximum permitted temperature is not exceeded. Check the safety temperature limit regularly.

⚠ **CAUTION**

The area around the air outlet nozzle can get very hot at high operating temperatures.

Power supply/Switching off the device:

- The voltage stated on the type plate must correspond to the mains voltage.
- The device can only be disconnected by pulling out the mains plug.
- Socket must be earthed.
- The device will automatically restart in mode B and C following any interruption to the power supply.

- Protect the power cable against kinks.
- Check power cables at regular intervals for possible material fatigue.
- Power cable should not come into contact with hot parts.

Heating:

⚠ **CAUTION**

When high operating temperatures are used, the device may get very hot, particularly at the openings at the back.

Risk of burns caused by vapour or hot surfaces. Pay attention to the residual heat after switching off.

Accessories:

⚠ **NOTICE**

Use the locking brake when using the roller frame or roller stand.

- Safe operation is only guaranteed with the accessories described in the "Accessories" section

- Only use **IKA** approved accessories!
- Use only original **IKA** spare parts!
- Check the device and accessories for damage before each use. Do not use damaged components.
- Protect the device and accessories from blows and impacts.

Maintenance:

- The device must only be opened by trained specialists, even during repair. The device must be unplugged from the power supply before opening. Live parts inside the device may still be live for some time after unplugging from the power supply.

Disposal instructions:

- End users are obliged by law to return all used disposable and rechargeable batteries. Throwing them into the household waste is prohibited! Disposable/rechargeable batteries containing harmful substances are marked with this symbol to indicate that they must not be disposed of as household waste.

- The device, accessories and packaging must be disposed of in accordance with local and national regulations.

Intended use

Use:
The **Oven 125 control - dry / Oven 125 control - dry glass** is a drying oven for a wide range of heating, drying and heating applications.

The device must only be used for heating up non-explosive substances and objects. Do not process substances or objects that might cause explosive vapour.

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

Your safety cannot be guaranteed:
- If the device is operated with accessories that are not supplied or recommended by **IKA**.
- If the device is operated improperly or in contravention of the **IKA** specifications.
- If the device or the printed circuit board are modified by third parties.

Useful information

General

Door open detection

⚠ **CAUTION** | **Hot air may stream out when the door is opened. The inner chamber may also stay at high temperatures for some time.**

⚠ **NOTICE** | **The heating function may be in operation even if the door is open.**

When the door is open the icon ⎕ will be displayed. The chamber light will be switched on and fan will be switched off.

Graph
The scaling of the temperature axis (Y-axis) is automatically determined, depending on the target temperature and the actual internal and external temperature.
The time axis (X-axis) is permanently scaled to 30 minutes.

Data management
Data logging function is automatically active when USB storage device is plugged in and tempering function is active.
The sampling time is fixed at 10 seconds. The data will be saved in a read only CSV file (.csv) name "IKAyymmddhhmm" on the USB storage device, where "yymmddhhmm" is the date and time of the heating function is turned on.
Example: "IKA1812312359.csv", data log on 2018 December 31 at 11:59pm. The data that are being logged will be in sequence as follows.
1. Date (YY/MM/DD)
2. Time (HH:MM:SS)
3. Limit Temperature (°C / °F)
4. Set Temperature (°C / °F)
5. Control Temperature (Reference sensor)
6. Internal Actual Temperature (°C / °F)
7. External Actual Temperature (°C / °F)
8. Fan Speed (%)
9. Flap Opening (%)

Calibration and adjustment

This menu shows how offset values can be entered after the respective temperatures are approached and cross-checked with an external measuring device (calibrated).

Individual load and ambient conditions might influence the temperature behaviour of the chamber. This influence can be neutralised by using the 3-point calibration and offset function. This function allows the temperature to be calibrated and adjusted at three different temperature values.

Use a calibrated reference measuring device in case of adjustment. The operation can be done at a single, or up to three temperature levels:

Set 1: Temperature calibration and adjustment at low temperature value.

Set 2: Temperature calibration and adjustment at medium temperature value.

Set 3: Temperature calibration and adjustment at high temperature value.
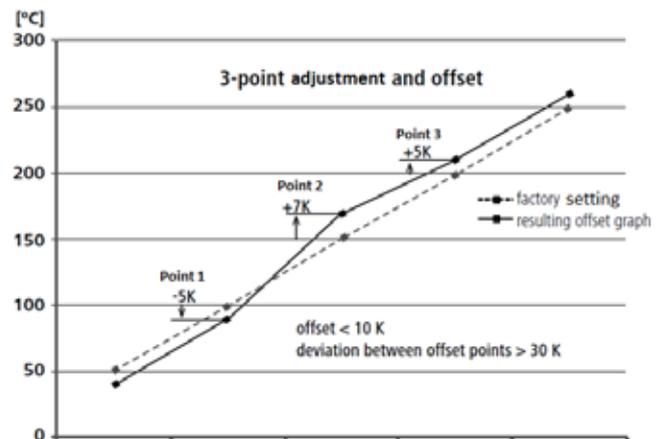
Temperature monitoring

The temperature monitoring function is a constantly active function whenever the heating operation of the device is turned "ON". The main purpose of this function is to notify the user in the case of abnormal temperature behaviour such as overshoot and undershoot. The hysteresis level is adjustable from 1.0 K to 50.0 K and the factory default value would be 10.0 K. Furthermore, there will be an additional option to turn "OFF" the heating operation when temperature is behaving abnormally.

Case 1: Temperature overshoot
When the temperature overshoots the stable set temperature and exceeds the predefined hysteresis limit, the ⚠ icon will be shown on the main screen of the device.
If the user has selected the option to turn "OFF" heating operation, heating operation will be automatically turned "OFF" when the temperature exceeds the predefined hysteresis limit or else heating operation will continue.

Case 2: Temperature undershoot
When the temperature falls below from stable set temperature and passes the predefined hysteresis limit, the ⚠ icon will be shown on the main screen of the device.
If the user has selected the option to turn "OFF" heating operation, heating operation will be automatically turned "OFF" when the temperature falls below the predefined hysteresis limit or else heating operation will continue.

Case 3: Temperature exceeds hysteresis limit and recovers
If the user did not select the option to turn "OFF" heating operation, whenever the temperature overshoots or undershoots the stable set temperature and passes the predefined hysteresis limit, the ⚠ icon will be shown on the main screen of the device.
When the temperature recovers to the stable set temperature, the ⚠ icon will still remain on the main screen of the device until the user stops the heating operation or changes the set temperature.

Case 4: Door Open during heating operation "ON"
Whenever door open is detected while entire heating operation is turned "ON", the temperature monitor function will be automatically suspended.
The temperature monitoring function will automatically resume when the temperature has reached the set temperature and is stable.

The symbol ⚠ disappears when the tempering process is stopped or when the set temperature is changed during the tempering process. Generally the graph below explains the temperature monitoring function in 4 cases.
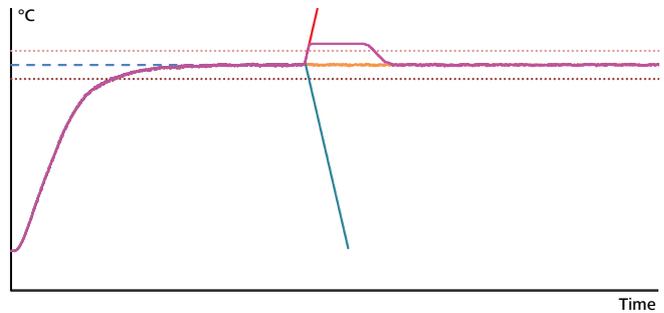
- - - Set Temperature
.... +Hysteresis
.... -Hysteresis
——— Normal Temperature Behaviour
——— Case 1: Temperature Overshoot
——— Case 2: Temperature Undershoot
——— Case 3: Temperature Exceed Hysteresis Limit and Recover
— · —Case 4: Door Open

Transportation and storage

⚠ NOTICE

The device should only be transported by qualified persons with suitable handling equipment, such as a pallet truck and forklift!

The device must be protected against mechanical impact, vibrations, dust deposits and corrosive ambient air during transportation and storage. It is also important to ensure that the relative humidity does not exceed 80 %.
The device must be completely emptied before transportation and storage.

The device can be transported:

- with a pallet truck.
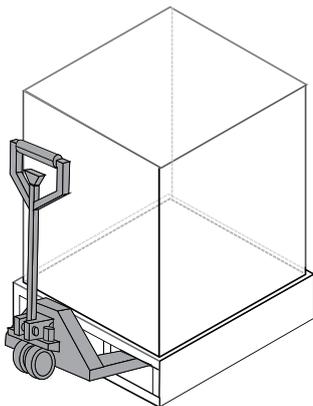
- by hand / unaided (4 persons).
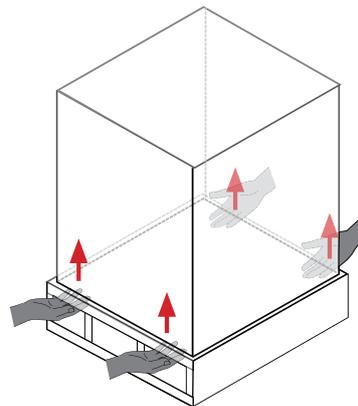
Unpacking

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

Scope of delivery
- **Oven 125 control - dry** or **Oven 125 control - dry glass**
- 2 shelves
- Screwdriver (for safety temperature limiter)
- Tilt protection
- Power cable set

- USB cable
- User guide
- Calibrating certification
- Warranty card

Installation

⚠ NOTICE	**Transport and assembly is the same for the drying oven with glass door!**

Moving the device

⚠ NOTICE	**When transporting the device do not use the door handle. This may damage the device.**

The device can be moved:
- with optional accessory (roller stand).
- on a pallet (transport straps).
- by hand (4 persons at least).
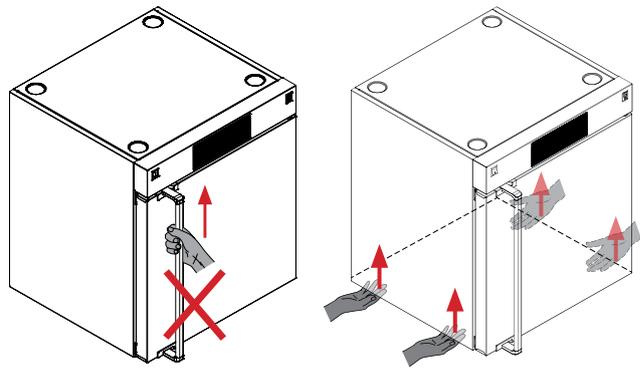
Setting up

⚠ WARNING	**Fixing against the wall is compulsory!**

- Place the device on and even, clean, dry and fireproof surface in well-ventilated environment.

- Keep sufficient distance from radiators and other heat sources.
- Keep at least 150 mm between walls and the device.

Fixing the device to the wall

⚠ NOTICE	**The screws used for fixing are selected according to the wall conditions and they are not included.**

As indicated in the following figures, you should attach the device to a wall with the tilt protectors included with the device.
Fasten the tilt protectors to the rear side of the device.
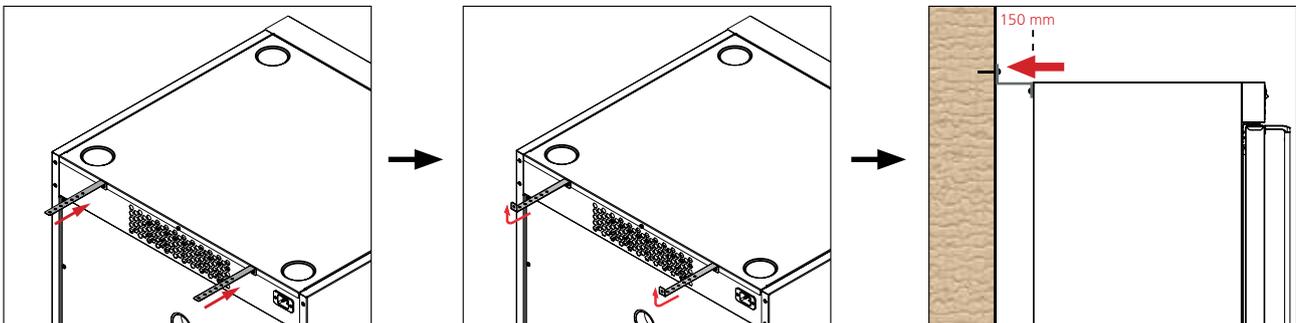
Inserting the shelves
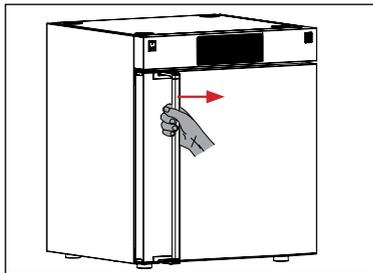
- Open the door.   - Insert the shelves.   - Load shelves evenly.
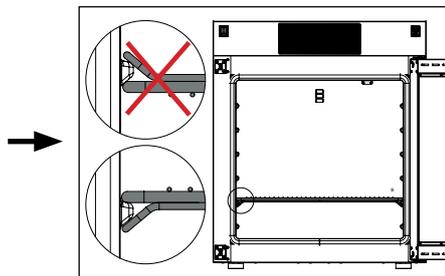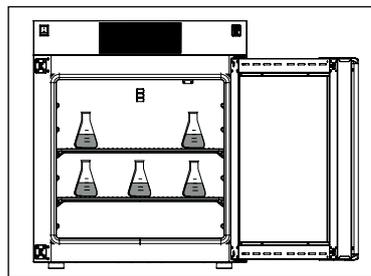
Note: Keep distance between samples and hot inner surface. Temperature of the inner wall may be much higher than set temperature!

Stacking the device

| ⚠ **CAUTION** | **Never stack more than two devices.** **When stacking the device, four persons are required to lift it.** | ⚠ **NOTICE** | **In order to keep enough space, please use stacking adapter recommend by IKA.** |

< 150 mm

Stacking adapter

> 150 mm
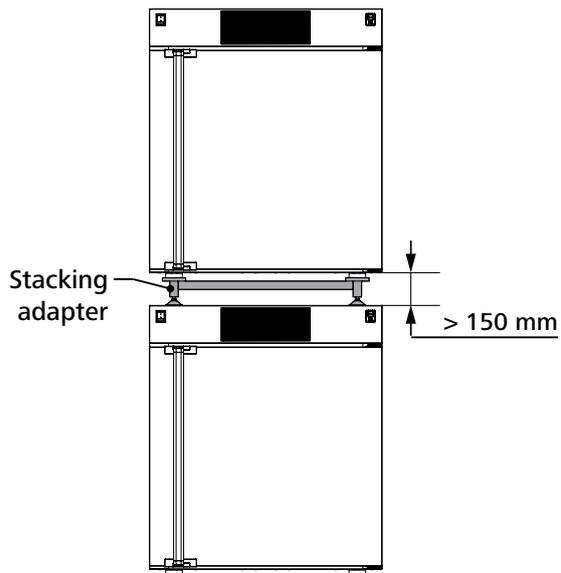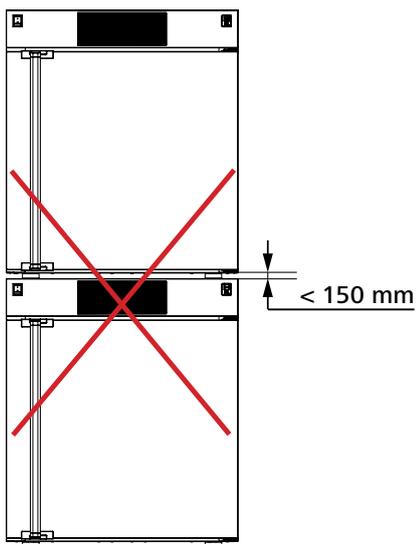
Changing the door opening direction

⚠ **WARNING**	**When changing the door opening direction, two persons are required due to the heavy weight of the door (about 15 kg).**

❶ Open the door.
❷ Hold the door and loosen the hinge pin with a suitable tool.
❸ Remove the door carefully.
❹ Alternate the position of the keepers and hinges with a 4 mm hexagonal wrench.
❺ Reverse and assemble the door. Make sure that the pin is in the correct position while assembling the door.
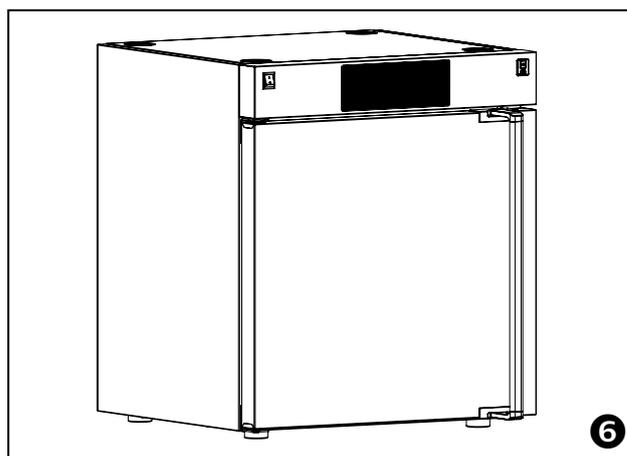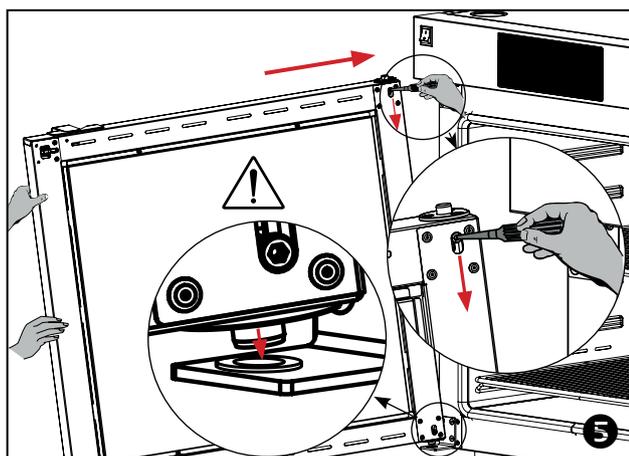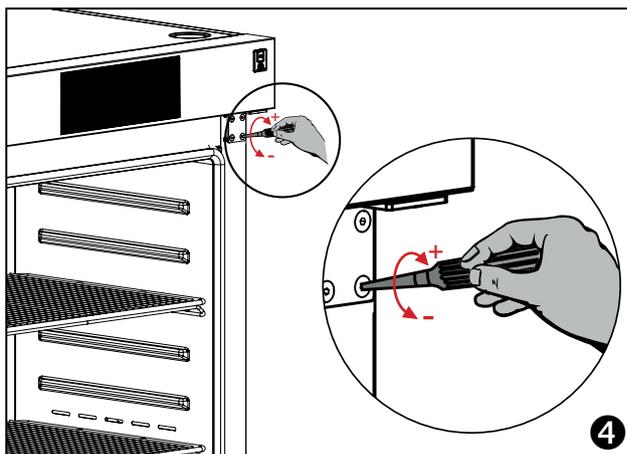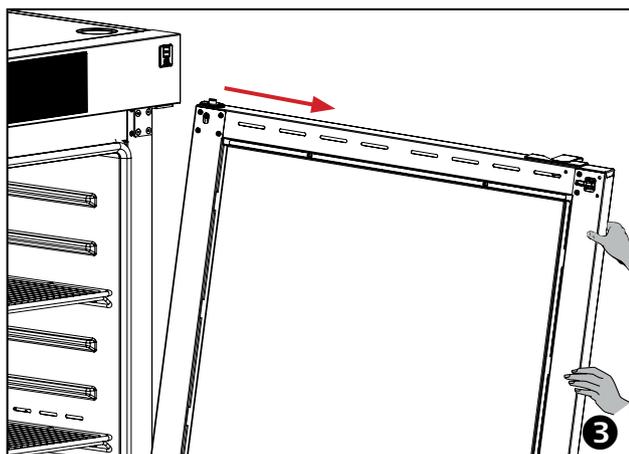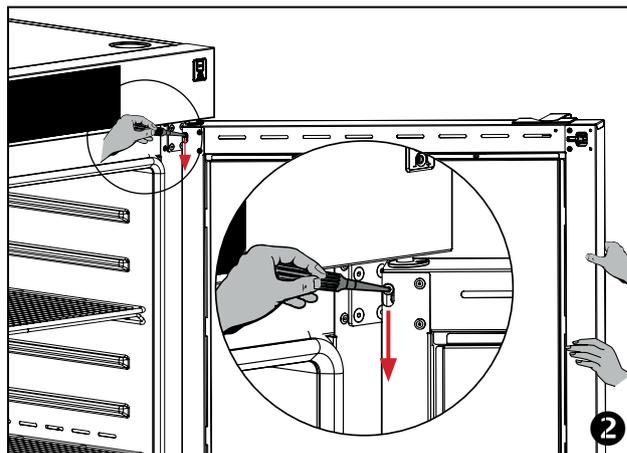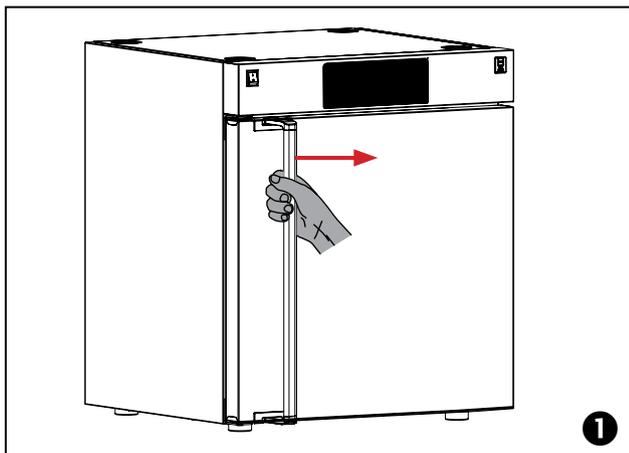
Operator panel and display

Operator panel
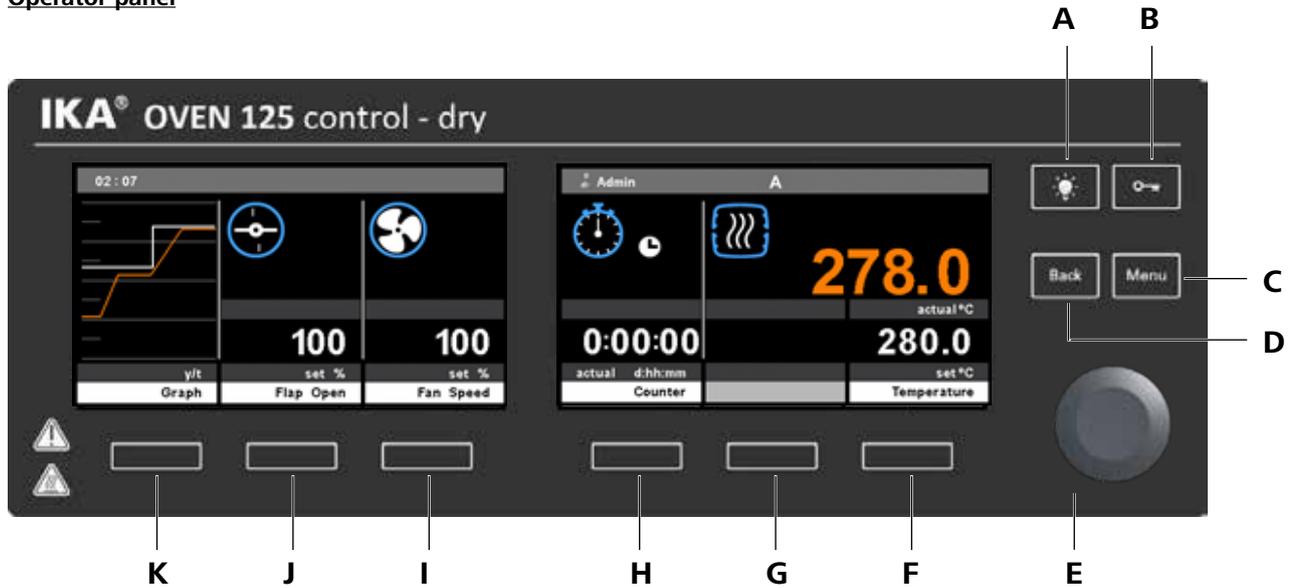
Pos.	Designation	Function
A	**Light button:**	Switch light on/off
B	**Lock key:**	Lock/unlock keys.
C	**"Menu" button:**	Open/close main menu
D	**"Back" button:**	Back to previous menu item
E	**Rotary/push knob:**	Navigate, select and change menu inputs, start/stop
F	**Temperature selection button:**	Temperature input, screen quick access
G	**Selection button:**	No function
H	**Timer/counter selection button:**	Edit menu for timer/counter functions
I	**Fan speed selection button:**	Edit menu for the fan speed functions
J	**Flap Open selection button:**	Edit menu for ventilation flaps - open
K	**Graph selection button:**	Graph function display

Symbols at working screen

Symbol	Description
🔑	Key lock is activated
🖴	USB storage medium is connected
⟲	USB cable is connected
💡	Light is switched on
A B C	Operating mode is activated
Admin	Active profile
PC	Device is controlled by a PC
🚪	Oven door is open
⟋	External temperature sensor connected
♨	Heating function
♨	Temperature control function activated (animated)
♨	Device heating (animated)

Symbol	Description
⏱	Counter switched off
⏱	Counter switched on (animated)
⏱	Timer switched off
⏱	Timer switched on (animated)
⏰	"Counter/Timer" display time-regulated
🌡	"Counter/Timer" display temperature
🌀	Fan switched off
🌀	Fan switched on (animated)
⊙	Ventilation flap opening or closing (animated)
⚠	Symbol for temperature monitoring
✔	Input value confirmation

Setting the safety temperature limit

The maximum temperature that can be reached in the oven is limited by an adjustable safety temperature limiter. Once this limit has been attained, the device switches off the heating.

Adjust the temperature limit (increase the value by turning clockwise / decrease the value by turning anticlockwise) using the screwdriver supplied with the device.

The set safety temperature is displayed in the operating field (F).

Temperature limit

Factory setting: approximate max. value
Adjustment range: see "Technical data".

⚠ WARNING	**The safe temperature limit must always be set to at least 25 °C lower than the flash point of the media used.**
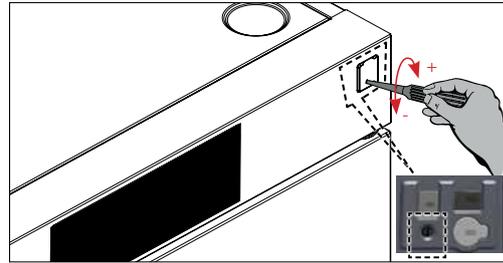
Commissioning

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

The power socket used must be earthed.

If the above conditions are met, the device is ready for operation after plugging in the mains plug. If these conditions are not met, safe operation is not guaranteed and the device could be damaged. Observe the ambient conditions (temperature, humidity, etc.) listed under "Technical data".

Switch on

After switching on (Fig. 1, 1) the start screen displays the firmware version and device type, device designation.

Firmware Update Tool

At the left of the start screen, the information start screen for the Firmware Update Tool appears. You can use the tool to update the software of your IKA device to the latest version. Firmware updates contain new functions or optimisations of previous functions. You can download the Firmware Update Tool at *www.ika.de/fut.*

Working screen

After displaying the start screen and the firmware update information, the working screen appears. The device is ready for operation.

Pos. Description

a   Time
b   Ventilation flap opening
c   Fan target speed
d   Counter/Timer display
e   Temperature target value
f   Actual oven temperature
g   Actual temperature of inserted external temperature sensor
h   Timer target value
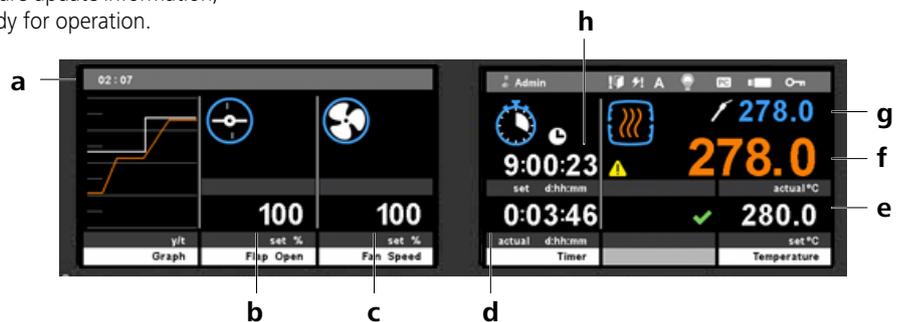
Menu settings

Menu structure

Temperature
- Control mode
  - Accurate PID .... activated
  - Fast PID .... -
  - Int./Probe Temp Control
    - Internal .... activated
    - External .... -
- Temperature Monitoring
  - Hysteresis .... 10.0 K
  - Forced Heating OFF .... -
- Calibration
  - Internal
    - Temperature 1 .... 60.0°C
    - Temperature 2 .... 160.0°C
    - Temperature 3 .... 300.0°C
    - Delta temperature 1 .... 0.0 K
    - Delta temperature 2 .... 0.0 K
    - Delta temperature 3 .... 0.0 K
  - External
    - Temperature 1 .... 60.0°C
    - Temperature 2 .... 160.0°C
    - Temperature 3 .... 300.0°C
    - Delta temperature 1 .... 0.0 K
    - Delta temperature 2 .... 0.0 K
    - Delta temperature 3 .... 0.0 K
- Set value notification .... activated

Timer
- Counter .... activated
- Timer
  - Days .... -
  - Hours .... -
  - Minutes .... -
- Control
  - Time .... activated
  - Temperature .... -

Mode
- A .... activated
- B .... -
- C .... -

Program
- Program 1-5
  - Start
    - Loop count
      - Immediately .... -
      - Delayed .... -
    - Endless loop
      - Immediately .... -
      - Delayed .... -
  - Edit
    - Program segments 1-5
      - Edit
        - Segment number .... -
        - Control Mode
          - Time .... -
          - ± x.x K .... -
          - Ramp .... -
        - Time hh:mm .... -
        - Fan Speed .... -
        - Flap % .... -
      - Insert .... -
      - Delete .... -
      - Save .... -

Profile
- Admin and User 1-4
  - Load .... Admin
  - Edit
    - Password 000
    - Access
      - Settings .... -
      - Program .... -
      - Data Manager .... -
  - Delete .... -
  - Rename .... -

Data Manager — Memory Info .... -

Settings
- Language
  - English .... activated
  - German .... -
  - ... . -
- Units
  - Temperature
    - °C .... activated
    - °F .... -
- Date and Time
  - Edit
    - Date
      - Day .... -
      - Month .... -
      - Year .... -
    - Time
      - Hour .... -
      - Minute .... -
      - Second .... -
- Sound
  - ON .... activated
- Factory settings
  - Settings .... -
  - Program .... -
  - Calibration
    - Internal .... -
    - External .... -
  - Profiles .... -
  - All .... -
- Communication — Device name .... -
- Information
  - Temperature .... -
  - Software .... -

Navigation in the menu
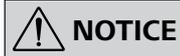
When the temperature control is active, the menu is locked, while all the selection buttons on the main screen are active.

- Press the "Menu" key (C).
- Select the menu by turning the rotary/push knob (E) clockwise or anticlockwise to select the desired menu or sub-menu, which can then be selected by pressing the rotary/push knob (E).

- Push or turn the rotary/push knob (E) again to select the desired menu option and edit the values or settings, or activate/deactivate a function.
- Turn the rotary/push knob (E) on "OK" or press the "Back" key (D) to end the procedure and return to previous menu or working screen.

Menu details

🌡️ Temperature

Control mode
The option of changing between two PID modes.

Accurate PID
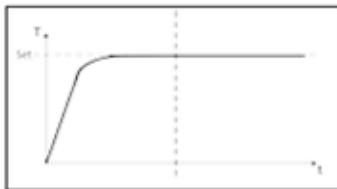
For use with temperature-sensitive materials that must be handled with care.

Advantages:
- Precise temperature control
- Minimum deviation above/below the target temperature

Disadvantage:
- Longer heating up time

Fast PID
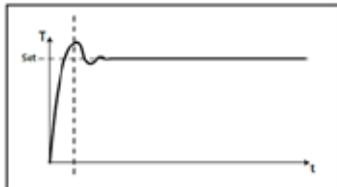
For use when a fast heating up time is needed and there should then be precise temperature control.

Advantage:
- Short heating up time

Disadvantage:
- There will be a certain level of deviation above and below the target temperature.

Internal / Probe Temp control
The temperature is regulated according to the internal/external temperature sensor.

Temperature Monitoring
You can monitor the temperature behaviour. If the temperature behaviour exceeds the defined hysteresis value, the ⚠️ symbol appears at the actual temperature.

Hysteresis
This enables the temperature control function of the device to switch off when the actual temperature exceeds the specified hysteresis value. It also defines the permitted tolerance of temperature variation.

Calibration
This makes it possible to adapt the temperature display, to get more precise temperature regulation.

- *Internal temperature sensor / external temperature sensor:* The external/internal temperature sensor is adapted here using the 3-point calibration.

Set value notification
Gives a notification when the actual temperature is in the range of ± 1.0 K of the target temperature and the ✅ symbol is shown next to the target temperature.

⏱️ Timer

Counter (service hour counter)
The counter function counts as soon as the heating function is active. The maximum value is 99:23:59 (Days: Hours: Minutes).

Timer (adjustable operating duration)
The timer function starts as soon as the temperature control function is active. The remaining time is shown on the display. When the specified time has elapsed the heating function is switched off. The maximum value is 99:23:59 (Days: Hours: Minutes).

Control
Counter and timer setting options:

- *Time*: The counter and timer are controlled depending on the time. The counter and timer start running immediately, whether the target temperature has been reached or not.
- *Temperature*: The counter and timer work according to temperature. They only start running when the target temperature has been reached.

Operating mode

Mode A: After power on/power failure no automatic restart of functions.

Mode B: After power on/power failure automatic restart of functions, depending on previous settings.

Mode C: Set values (set in mode A or B) cannot be changed. After power on/power failure automatic restart of functions, depending on previous settings.

Programs

Under programs, 5 user-defined temperature-time profiles can be created. A program can consist of up to 5 segments. Once a program has been selected, the following options are available:

Start
Starts the program when loop mode is requested.

- *Infinite loop:* Upon completion of the last segment, the program continues with the first segment until the user ends the program by stopping a device function.
- *Loop Count:* Indicates the total number of loop cycles until program end.

  Under program mode, two menu options can be selected:

  Immediately: Program will start immediately.

  Delayed: Program will start when scheduled date and time is reached.

  Delayed start option requires user to enter scheduled date and time settings.

  After the scheduled date and time is reached, the program will activate.

  Before reaching the scheduled time, the user cannot access any feature of the device. Cancel the delayed program start option by pressing "Cancel" button.

⚠ **NOTICE** | **At the end of the program all device functions are switched off.**

Edit
The program parameters are edited/changed in a matrix of lines (segments) and columns (functions):
- *"Seg. No." column* (Segment Number)
- *"Set Temp." column* (specifies the desired target temperature)
- *"Control Mode" column*
  The temperature-time profiles can be created using 3 different methods. Choose the method you want by turning then confirming (pressing) the rotary/push knob (E).
  1. *Time-controlled (Time)*
     In "Control Mode Time" the target values and settings of the segment are valid for the duration indicated in the column "Time hh:mm". The end of the segment is reached when the time specified in the column "Time hh:mm" has elapsed – regardless of whether the target temperature specified in the column "Temp" has been reached or not.

  2. *Hysteresis-controlled (± x.x K)*
     a) Value in the column "Time hh:mm" =0
        The segment is ended when the target temperature specified in the "Temp" column is reached within the control hysteresis (tolerance) specified in the column "Control Mode (± x.x K)".
     b) Value in the column "Time hh:mm" <>0
        As a). Also, the target temperature that has been reached is maintained for the time specified in the column "Time hh:mm".

⚠ **NOTICE** | **After the temperature method is selected, the control hysteresis can be controlled (± x.x K) by turning and pressing the rotary/push knob(E) once again.**

  3. *Gradient-controlled (Ramp)*
     This enables even heating up with a defined gradient. The segment is closed after the target temperature has been reached.
     The gradient in K/min comes from the quotient of the temperature difference and the time "Time hh:mm" specified in the current segment.
     The temperature difference is calculated from the target value temperatures of the current and preceding segment.

⚠ **NOTICE** | **The ramp function can only be selected from the 2nd segment.**

- *"Time hh:mm" column* (see "Control Mode")
- *"Fan Speed" column* (Fan speed in % for this segment)
- *"Flap %" column* (position of the ventilation flap for this segment)

Delete
Deletes the selection highlighted in blue (segment or program).

Insert
Inserts a new program segment after the selected segment.

Rename
Allows you to rename the program.

Save
Saves the changes.

 Profiles

The admin (standard profile) has access to all the settings. You can create four additional profiles.

Load
Activates the selected profile.

Edit
Password:
Protects the configured profiles with a 3-character password.

Rename
Renames the profile.

Access
Allows a profile access to the settings listed below.
• Settings
• Program
• Data Manager

Delete
Deletes the profile highlighted in yellow (selected).

 Data Manager

Memory Info
User information on the memory that is available.

 Settings

Languages
The "Languages" option allows the user to select the desired language.

Units
Here you can specify the measuring units for the temperature values in °C or °F.

Data and time
In this menu, you can set the the date and time.

Sound
The "Sound" option allows the user to activate/deactivate the keypress sound and to set the volume.

Factory settings
The user can reset the device to the factory settings here.
The following parameters can be selected by the user for the reset.

Settings
• Programs
• Settings
• Profiles
• All

Communication
Device name:
This menu option can be used to edit the device name.

Information
Temperature:
It gives the user an overview of the device temperature parameters.
Software:
Displays the device software version used.

Operation

Temperature

Temperature control

⚠ **NOTICE** **The temperature calibration and comparison for the external sensor is not possible if the sensor is plugged in.**

The temperature can be changed during operation and when on standby. The temperature regulation mode can be changed in the settings.
On the working screen:
1. Press the Temperature selection button (F).
2. Press and turn the rotary/push knob (E) to set the temperature. (Increase by turning clockwise, reduce by turning anti-clockwise)
3. Press the rotary/push knob (E). The value is saved as a measurement.
4. Press the back button (D) --> working screen.
5. The heating function is started automatically by pressing the rotary/push knob (E) on the working screen. The animated symbol appears on the display.

Control Mode
• Accurate PID: Slow heating up time without exceeding the temperature
• Fast PID: Fast heating up time, exceeding the temperature minimally

Counter and Timer:

Timer

On the working screen:
1. Press the Timer/Counter selection button (H).
2. Press the button (H) again and select the Timer option by rotating the rotary/push knob (E). Confirm your selection with button (E).
3. Press and turn the rotary/push knob (E) to set the time. (Increase by turning clockwise, reduce by turning anticlockwise.)
4. Press the rotary/push knob (E). The value is saved.
5. Press the menu button (C) --> working screen
6. The counter/timer function is started automatically by pressing the rotary/push knob (E) on the working screen. The animated symbol appears on the display.

Control
Choose whether the timer should be started immediately or after the target temperature has been reached.

Mode
Select the time function timer or counter.

Fan speed:

The fan speed can be changed during operation and when on standby.
On the working screen:
1. Press the fan speed selection button (I).
2. Press the selection button under the fan speed.
3. Turn the rotary/push knob (E) to set the speed in 10% steps: 0% (stopped), 100% (full speed).
4. Press the rotary/push knob (E). The new value is saved.
5. Press the back button (D) --> working screen.
6. The set fan speed value is started automatically by pressing the rotary/push knob (E) on the working screen. The animated symbol appears on the display.
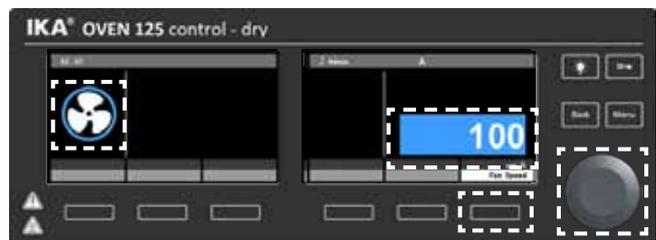
Ventilation flap:

The ventilation flap can be changed during operation and when on standby.
On the working screen:
1. Press the ventilation flap open selection button (J).
2. Press the selection button under the ventilation flap value.
3. Turn the rotary/push knob (E) to set the position of the flap. The ventilation flap can be set in 10% steps: 0% (closed) - 100% (open). The symbol shows the current position.
4. Press the rotary/push knob (E). The new value is saved.
5. Press the back button (D) --> working screen.
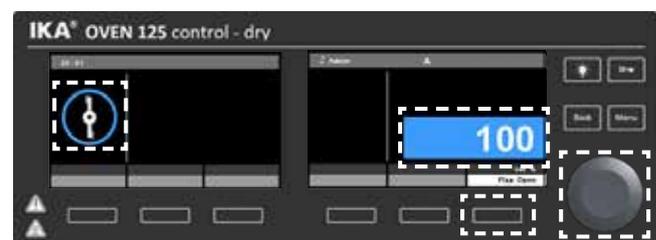
Graph:

On the working screen:
1. Press the graph selection button (K). The graph shows the current measurements during operation.
2. Press the graph selection button (K) again. --> working screen.

Light:

Activate / Deactivate the light

• Press and hold the light button (A). The symbol 🔆 appears on the display. This function can always be activated.

Note: The light is automatically activated if the door is opened and automatically deactivated if the door is closed.

Lock key:

• Press the Lock key (B) for 2 seconds to lock/unlock. All keys and the rotary/push knob (E) are locked. The symbol 🔒 appears on the display.
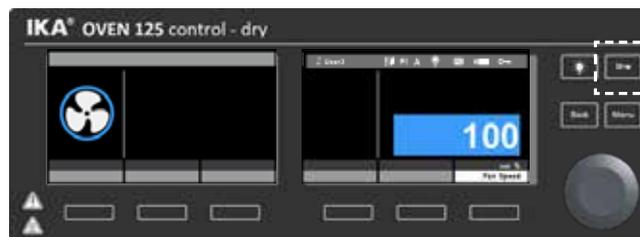
Interface and output

The device can be connected to a PC and operated with the laboratory software labworld*soft*® through USB or RS 232 interface. The device software can also be updated with a PC via the RS 232 or USB port.

Note: Please observe the system requirements as well as the operating instructions and help section of the software.

RS 232 interface communication PC
Configuration:
• The functions of the interface connections between the stirrer machine and the automation system are chosen from the signals specified in EIA standard RS 232 in accordance with DIN 66 020 Part 1.
• For the electrical characteristics of the interface and the allocation of signal status, standard RS 232 applies in accordance with DIN 66 259 Part.
• Transmission procedure: asynchronous character transmission in start-stop mode.
• Type of transmission: full duplex.
• Character format: character representation in accordance with data format in DIN 66 022 for start-stop mode. 1 start bit; 7 character bits; 1 parity bit (even); 1 stop bit.
• Transmission speed: 9600 bit/s.
• Data flow control: none
• Access procedure: data transfer from the stirrer machine to the computer takes place only at the computer's request.

USB interface:
The Universal Serial Bus (USB) is a serial bus for connecting the device to the PC. Equipped with USB devices can be connected to a PC during operation (hot plugging).
Connected devices and their properties are automatically recognized.

USB device drivers:
First, download the latest driver for **IKA** devices with USB interface from: *http://www.ika.com/ika/lws/download/usb-driver.zip.*
Install the driver by running the setup file. Then connect the **IKA** device to the PC using the USB data cable.
The data communication is via a virtual COM port.

Note: the USB driver is uncessary for Windows 10 system. Don't install it for Windows 10 system!

Data management:
Data logging function is automatically active when USB storage device is plugged in and tempering function is active.
The sampling time is fixed at 10 seconds. The data will be saved in a read only CSV file (.csv) name "IKAyymmddhhmm" on the USB storage device, where "yymmddhhmm" is the date and time of the heating function is turned on.
Example: "IKA1812312359.csv", data log on 2018 December 31 at 11:59pm. The data that are being logged will be in sequence as follows.
1. Date (YY/MM/DD)
2. Time (HH:MM:SS)
3. Limit Temperature (°C / °F)
4. Set Temperature (°C / °F)
5. Control Temperature (Reference sensor)
6. Internal Actual Temperature (°C / °F)
7. External Actual Temperature (°C / °F)
8. Fan Speed (%)
9. Flap Opening (%)

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 **www.ika.com**.

Command syntax and format:

The following applies to the command set:

- Commands are generally sent from the computer (master) to the device (slave).
- The device sends only at the computer's request. Even fault indications cannot be sent spontaneously from the device to the computer (automation system).
- Commands are transmitted in capital letters.
- Commands and parameters including successive parameters are separated by at least one space (code: hex 0x20).
- Each individual command (incl. parameters and data) and each response are terminated with blank CR LF (Code: hex 0x0d hex 0x0A) and have a maximum length of 80 characters.
- The decimal separator in a number is a dot (code: hex 0x2E).

The above details correspond as far as possible to the recommendations of the NAMUR working party (NAMUR recommendations for the design of electrical plug connections for analogue and digital signal transmission on individual items of laboratory control equipment, rev. 1.1).

The NAMUR commands and the additional specific **IKA** commands serve only as low level commands for communication between the device and the PC.

With a suitable terminal or communications programme these commands can be transmitted directly to the device. The **IKA** software package, Labworld*soft*®, provides a convenient tool for controlling the device and collecting data under MS Windows, and includes graphical entry features, for motor speed ramps for example.

Commands	Function
IN_PV_2	Read the internal actual temperature
IN_PV_1	Read the external actual temperature
IN_SP_2	Read the internal setting temperature
IN_SP_1	Read the external target temperature
IN_SP_3	Read the safety setting temperature
IN_SP_4	Read the fan speed value
IN_SP_40	Read the flap open value
OUT_SP_2 X	Set the internal setting temperature, X = 0 to 300 in steps of 0.1 °C
OUT_SP_12@n	Setting WD2 safety limit temperature with set value echo
OUT_SP_4 X	Fan target value, X = 0 to 100 in steps of 10 %
OUT_SP_40 X	Flap target value, X = 0 to 100 in steps of 10 %
OUT_WD1@m	Watchdog mode 1: if event WD1 should occur, the heating functions are switched off and WD1 is displayed. Set watchdog time to m (20 - 1,500) seconds, with watchdog time echo. This command launches the watchdog function and must be transmitted within the set watchdog time.
OUT_WD2@m	Watchdog mode 2: if event WD2 should occur, the temperature target value is changed to the WD safety temperature limit value. The warning WD2 is displayed. The WD2 event can be reset with OUT_WD2@0 - this also stops the watchdog function. Set watchdog time to m (20 - 1,500) seconds, with watchdog time echo. This command launches the watchdog function and must be transmitted within the set watchdog time.
START_2	Start the heating function
STOP_2	Stop the heating function
RESET	Switches off the device function

Note: When the USB cable is disconnected while the device is running, the device stays in PC mode. To reset to function without PC, switch the device off and on again.

"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 function will be shut down 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 device 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 function will be shut down 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 temperature setpoint will be set to the WD safety temperature setpoint. The PC 2 warning message will be displayed.

Connections between device and external devices:
USB 2.0 cable A - B:
This cable is required to connect USB interface to a PC.

USB B

USB A
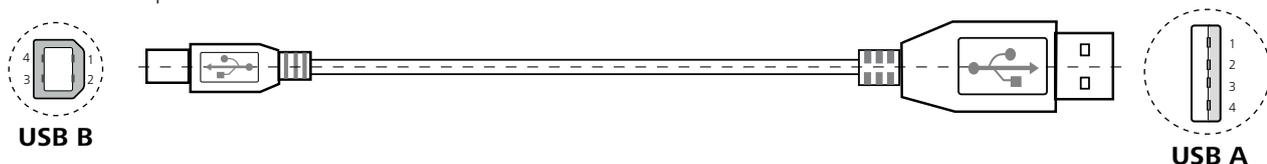
Maintenance and cleaning

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 mains plug!

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

- For materials which are not listed, please request information from **IKA** application support.
- Wear protective gloves while cleaning the device.
- 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, you must ascertain from **IKA** that this method does not damage the device.

Spare parts order:
When ordering spare parts, please specify:
- Machine type.
- Serial number, see type plate.
- Item and designation of the spare part, see **www.ika.com**, spare parts diagram and list.

Repair:
Please send the 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" from **IKA**, or download a printout of it from the **IKA** website **www.ika.com**.
If you require servicing, return the device in its original packaging. Storage packaging is not sufficient. Please also use suitable transport packaging.

Accessories

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

Warranty

In accordance with **IKA** warranty conditions, the warranty period is 24 months. For claims under the warranty please contact your local dealer. You may also send the machine directly 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.

Error codes

Note: The warning message has to be acknowledged by pressing the "OK" button.

Warning	Cause	Effect	Solution
USB file login failed	a) USB storage device is not in FAT format b) Insufficient memory capacity	File login failed	a) Format the USB storage device in FAT format b) Ensure that enough memory capacity is available.
WD2	No connection between the PC and the device for a specified period	Target temperature changes to the safety temperature limit set in WD2	Check cable between PC and device.

Any malfunctions during operation will be identified by an error message on the display.
Proceed as follows in such cases:
- Switch off device using the main switch at front of the device.
- Carry out corrective measures.
- Restart device.

Error code	Cause	Effect	Solution
Internal sensor error	Internal temperature sensor defective/missing	Heating off	Contact the **IKA** Service Department.
External sensor error	a) External temperature sensor defective/missing b) External temperature sensor is not plugged in correctly	Heating off	Plug in the external temperature sensor correctly. Contact the **IKA** Service Department.
Temperature in the device too high (PCB power)	a) Ambient temperature (PCB) too high b) PCB malfunction	Heating off	Turn off the device and let it cool down.
Temperature limit exceeded	The set temperature exceeds the safety temperature	Heating off	Contact the **IKA** Service Department.
Heating Er 1	a) Heating damaged b) PCB malfunction	Heating off	Contact the **IKA** Service Department.
Heating Er 2	a) Heating damaged b) PCB malfunction	Heating off	Contact the **IKA** Service Department.
Safety relay damaged	PCB malfunction	Heating off	Contact the **IKA** Service Department.
Safety temperature limiter	Safety temperature limiter damaged	Heating off	Contact the **IKA** Service Department.
Temperature switch open	a) The temperature exceeds the safety temperature B) Temperature switch damaged	Heating off	Contact the **IKA** Service Department.
No external sensor	External sensor is not inserted	Heating off	Switch off device and plug in the external temperature sensor.

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

Working temperature ❶	**°C**	Room temperature +5 ... 300
Safety circuit adjustable	**°C**	50 ... 320
Adjustment and display resolution	**K**	0.1
Temperature stability (at 150 °C)	**K**	± 0.5
Temperature homogeneity (at 150 °C)	**K**	± 2.5
Temperature display		yes
Timer		yes
Timer display		LCD
Time adjustment range		1 minute ... 99 days : 23 hours : 59 minutes
Number of racks		Max. 6
Max. load per rack	**kg**	30
Inner chamber working range (WxDxH)	**mm**	550 x 525 x 450
Total volume of the inner chamber	**l**	125
Dimensions (W x H x D)	**mm**	700 x 825 x 650
Weight (**Oven 125 control- dry**)	**kg**	82 (**Oven 125 control - dry** + 2 racks)
Weight (**Oven 125 control- dry glass**)	**kg**	89 (**Oven 125 control - dry glass** + 2 racks)
Permitted ambient temperature range	**°C**	+5 ... +40
Permissible relative humidity	**%**	80
Protection class according to DIN EN 60529		IP 20
Safety class		I
Overvoltage category		II
Pollution degree		2
RS 232 interface		yes
USB interface		yes
Oven lamp	**W**	25 (230 VAC) 25 (120 VAC)
Heating fan	**W**	50 (230 VAC) 43 (115VAC)
Circulation fan	**W**	32 (230 VAC) 35 (115 VAC)
Operating voltage range	**VAC**	230 ± 10 % 115 ± 10 % 100 ± 10 %
Frequency	**Hz**	50/60
Max. power input	**W**	2507 (230 VAC) 1603 (115 VAC) 1253 (100 VAC)
Heating power	**W**	2400 (230 VAC) 1500 (115 VAC) 1150 (100 VAC)
Power input standby	**W**	2
Operation at a terrestrial altitude	**m**	max. 2000

❶ 115 V / 100 V glass door version up to 250 °C (300 °C upon request).

Note: Complies with EN61000-3-11 and is subject to special connection conditions: Zmax = 0.362 Ω. If necessary clarify with your electricity provider.

Subject to technical changes!

IKA

designed for scientists

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