IKA

designed for scientists

ETS-D7

ENGLISH

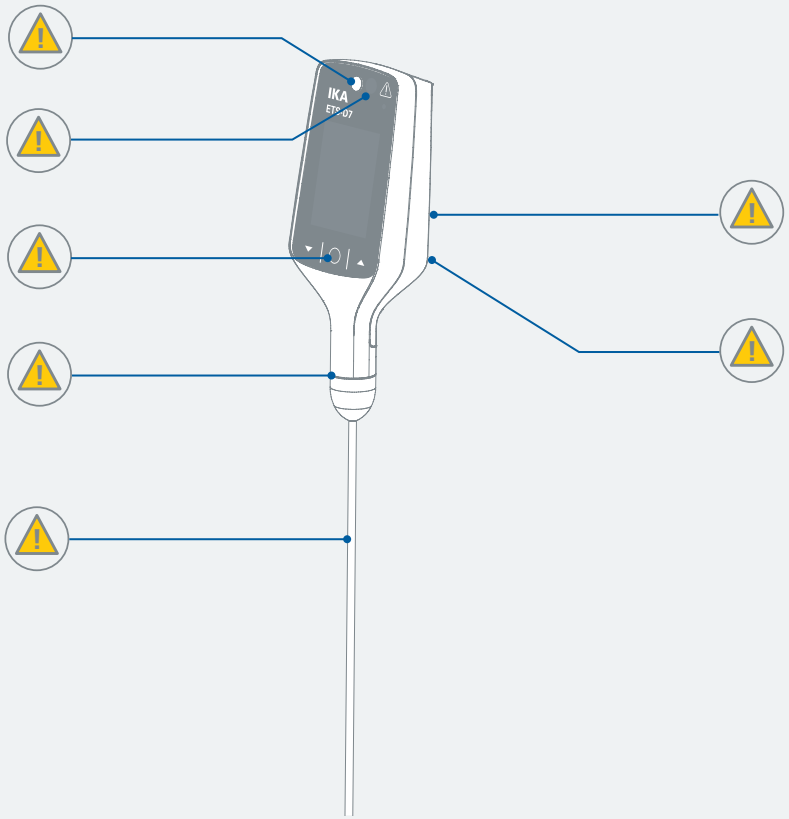


Fig. 1

Source language: German

EU Declaration of conformity

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

Wireless module:
Directive: 2014/53/EU
Standards: EN 60950-1, EN 300328, EN 301489-1, EN 301489-17

A copy of the complete Declaration of Conformity or further declarations of conformity can be requested at **sales@ika.com**.

Note for USA (FCC)

This equipment complies with Part 15 of the FCC rules. Any changes or modifications not expressly approved by the Manufacturer could void the user's authority to operate the equipment. This device complies with Part 15 of the FCC rules subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) This device must accept all interference received, including interference that may cause undesired operation.

NOTE:
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules.
These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.
This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Note for Canada (IC)

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:
(1) This device may not cause interference
(2) This device must accept any interference, including interference that may cause undesired operation of the device.
This device complies with Health Canada's Safety Code 6 / IC RSS-210. The installer of this device should ensure that RF radiation is not emitted in excess of the Health Canada's requirement.

Explication of warning symbols

/// Warning symbols

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

Warning! Indicates a hazardous situation, which, if not avoided, can result in death, 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.

Danger! Indicates the exposure to a hot surface.

/// General Symbols

A— Position number
Indicates device components relevant to actions.

Correct / result
Indicates the correct execution or the result of an action step.

Wrong
Indicates the incorrect execution of an action step.

Note
Indicates steps of actions that require particular attention.

Beep
Indicates action steps, for which beep sounds are to be heard.

Safety instructions

/// General information

› **Read the operating instructions in its entirety before using the device and follow the safety instructions. If this accessory is used with another device, observe also its operating instructions.**
› Keep the operating instructions in a place where it 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.
› The device must only be used in a technically perfect condition.

Notice!
› Pay attention to the marked sites in **Fig. 1**.

/// Device design

Notice!
› The tip of the temperature sensor must be immersed at least 20 mm deep into the medium.
› The stainless steel temperature sensor must not be used with aggressive media such as acids, caustic solutions or distilled water, due to the risk of corrosion. The H 66 glass sensor should be used in such cases.
› Only use glass encapsulated temperature sensors for electrolysis procedures.
› Always use the extension cable H 70 when the media being processed produces vapour. This ensures that the control unit does not come into contact with the vapour.

/// Working with the device

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 body injury and property damage, observe the relevant safety and accident prevention measures when processing hazardous materials.

Danger!
› Exercise caution when touching the temperature sensor!
› The temperature sensor can reach dangerous temperatures. Pay attention to the residual heat on the temperature sensor after removing from the media.

Warning!
› 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.
› Beware of hazards due to:
- flammable materials,
- combustible media with a low boiling temperature.
› Process pathogenic materials only in closed vessels under a suitable fume hood.
› The safety temperature must be set in accordance with EN 61010-2-010 Chapter "Requirements for devices containing or using flammable liquids".
- The surface temperature of the flammable medium that is exposed to air may not exceed its flash point.
  A danger usually arises if a medium is heated in open vessels.
- The surface temperature of the heating device may not exceed the value of (***t*** - 25) °C (= set value of the safety circuit) on the surface of the flammable medium and in contact with air, whereby ***t*** is the fire point of the liquid.
  A danger usually arises if a medium is heated in glass vessels (glass breakage).

If a setting made by the user (medium temperature or safety temperature) could bring a flammable medium into a state in which the conditions mentioned above could be exceeded, additional measures must be introduced that will protect the user from this danger.

Caution!
› Wear your personal protective equipment in accordance with the hazard category of the media to be processed. There may be a risk from:
- splashing and evaporation of liquids,
- ejection of parts,
- release of toxic or combustible gases.

› Do not touch the temperature sensor while measurements are being taken. This will prevent incorrect results.

/// Accessories

› Protect the device and accessories from bumps and impacts.
› Check the device and accessories for damage before each use. Do not use damaged components.
› Safe operation is guaranteed only with the use of original IKA accessories.

/// Power supply / Switching off the device

› The voltage stated on the type plate must correspond to the power voltage.
› Do not remove the device battery.
› Before transporting the device, switch it off completely using the "Turn off" menu setting.

/// Maintenance

› The device must only be opened by trained specialists, even during repair.

/// Disposal instructions

› The device, accessories and packaging must be disposed of in accordance with local and national regulations.
› Do not throw used battery into your household waste. Dispose of them properly in accordance with statutory regulations.
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 may not be disposed of as household waste.

Intended use

/// Use

› The ETS-D7 device can be used to measure temperature or pH value. To do this, a wireless or USB cable connection to a compatible end device must be established.
› The built-in battery provides up to 50 hours of operation (display 100% on) or 100 hours (display off).

/// Area of use

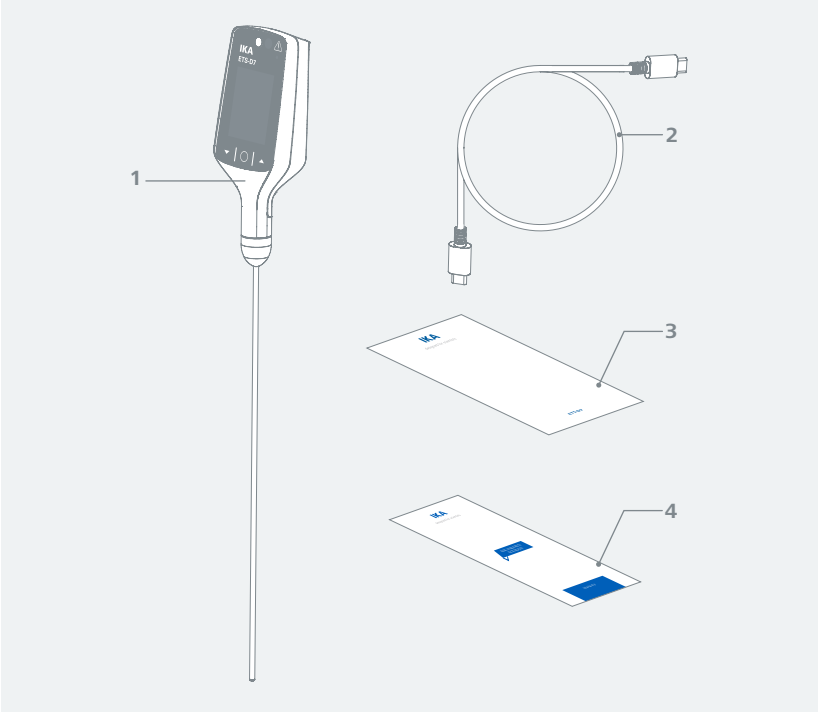
› Indoor environments similar to that a laboratory of research, teaching, trade or industry area.
› The safety of the user cannot be guaranteed:
- if the device is operated with accessories that are not supplied or recommended by the manufacturer,
- if the device is operated improperly or contrary to the manufacture's specifications,
- if the device or the printed circuit board are modified by third parties.

Unpacking

/// Unpacking

› Unpack the device carefully. Any damage should immediately be reported to the carrier (mail, rail or freight forwarding company).

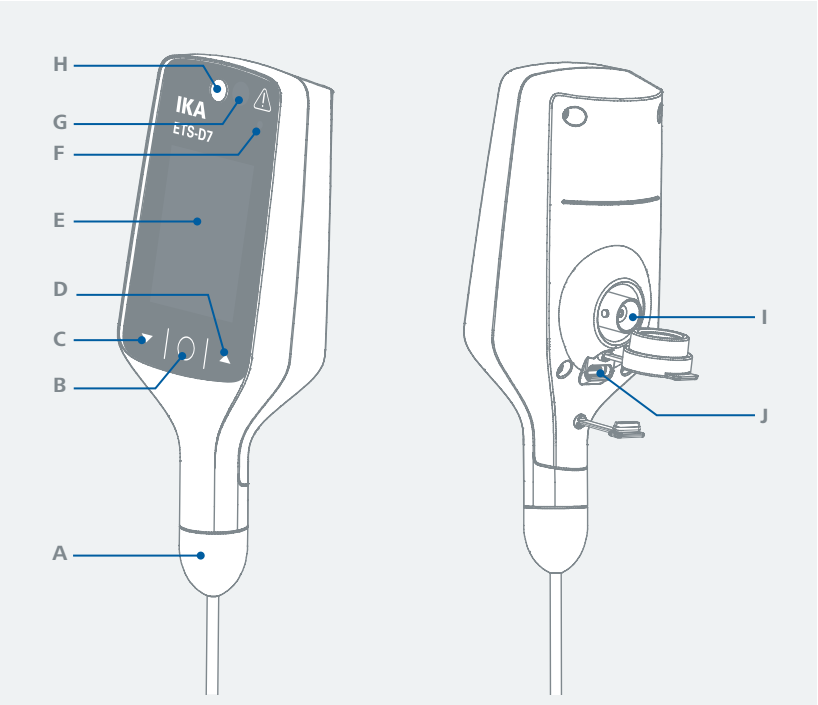
/// Scope of delivery



1	ETS-D7
2	USB-C to USB-C cable
3	User guide
4	Warranty card

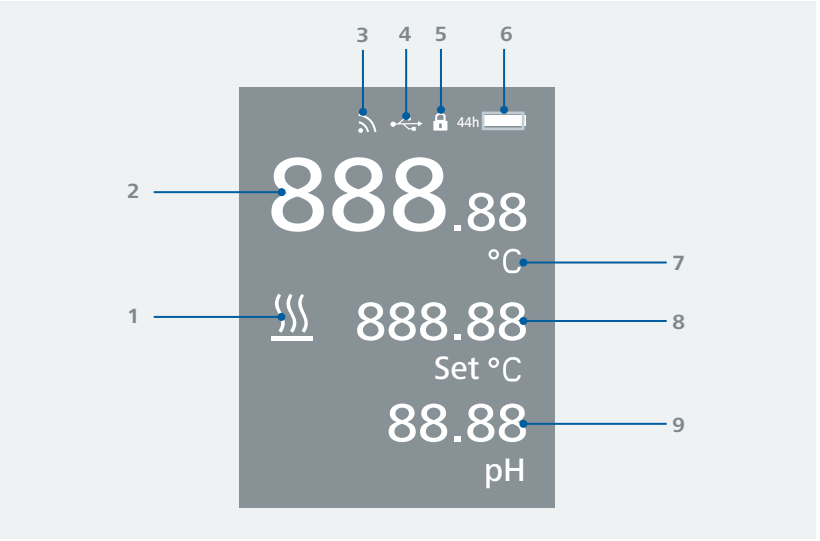
Operator panel and display

/// Operator panel



A	Replaceable temperature sensor H 62.51	F	Status LED
B	Menu button	G	Brightness sensor
C	Button “Down“	H	Infrared sensor
D	Button “Up“	I	BNC port (pH)
E	Display	J	USB-C port

/// Display

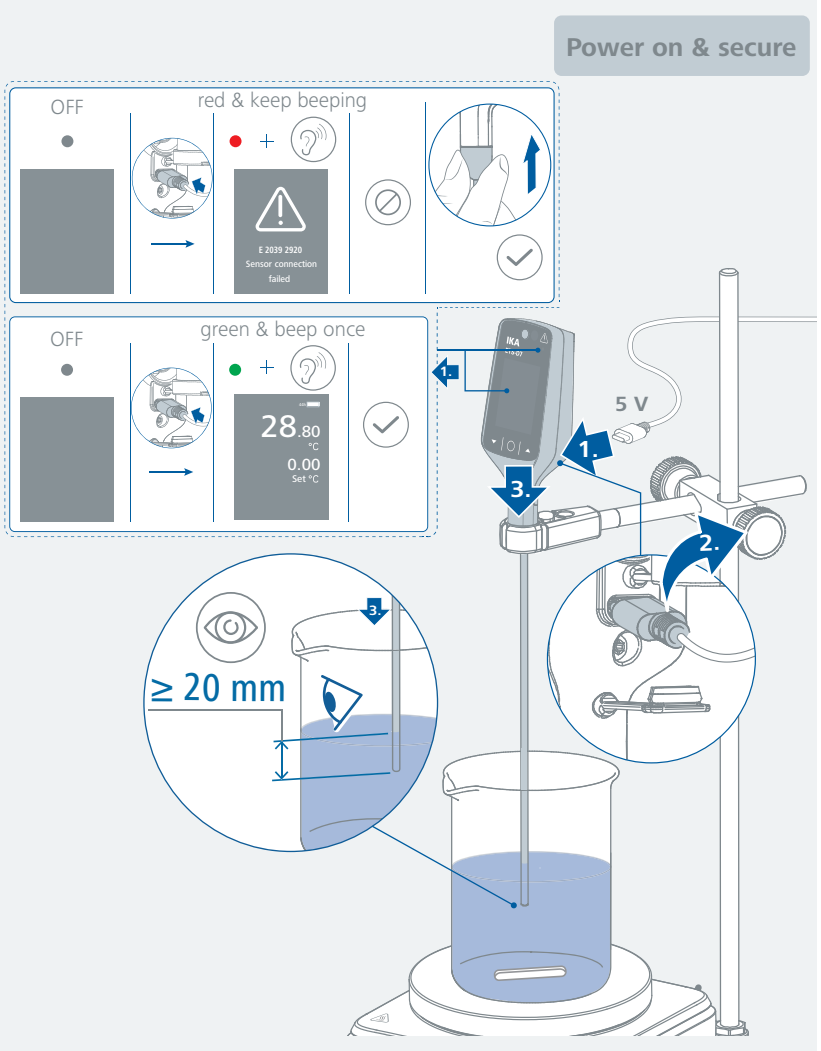


1	Heating function activated	6	Battery charge level
2	Actual temperature value	7	Temperature unit
3	Wireless connection	8	Set temperature value
4	USB cable connected	9	pH value
5	All buttons locked		

Installation

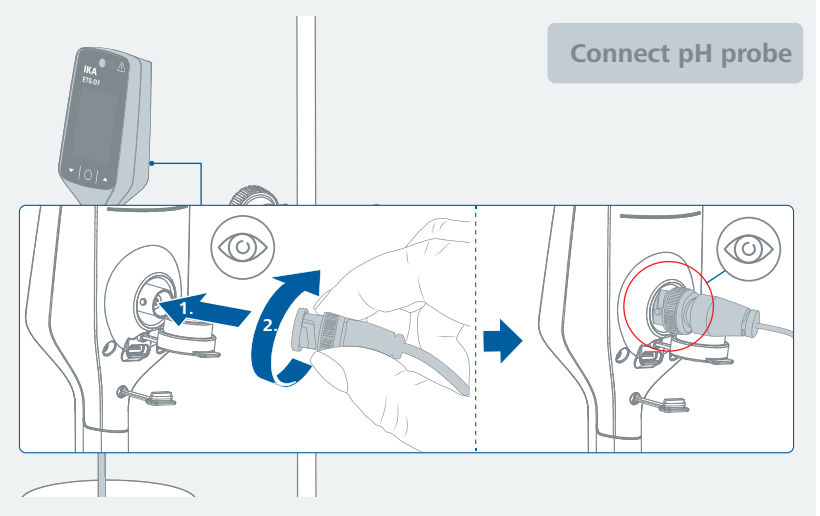
/// Power on and secure

› The device must be charged before it is used for the first time. To do this, connect the device to a computer or a suitable power supply (5 V) via the USB-C port. During charging, the status LED blinks green and the display is on. Once charging is complete, the USB-C cable can be disconnected from the device.
Note: If the connection between the temperature sensor and the device is faulty, an error message will appear on the device display, the status LED will light up red continuously, and an acoustic signal will be heard. You can stop the acoustic signal by pressing the menu button.
› Securely attach the device to a stand (e.g., using the H 38 holding rod). Ensure that the temperature sensor is immersed at least 20 mm deep into the medium.



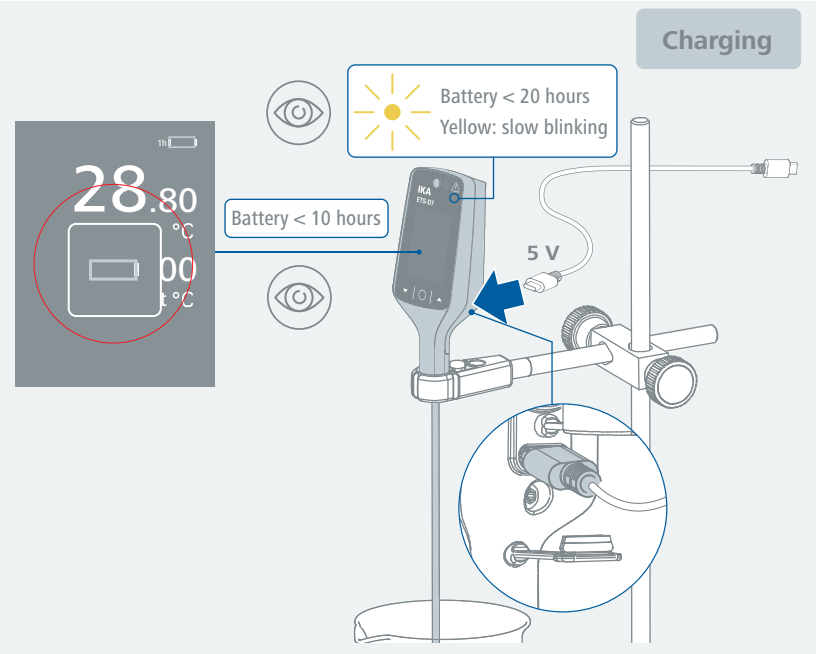
/// Connecting the pH probe

› Connect the BNC-connector of the pH-probe to the BNC socket on the rear of the device and lock in place using the bayonet fitting.



/// Charging

› The status LED will blink yellow slowly when the battery working time is below 20 hours.
› The battery warning icon will appear when the battery working time is below 10 hours.



Operation

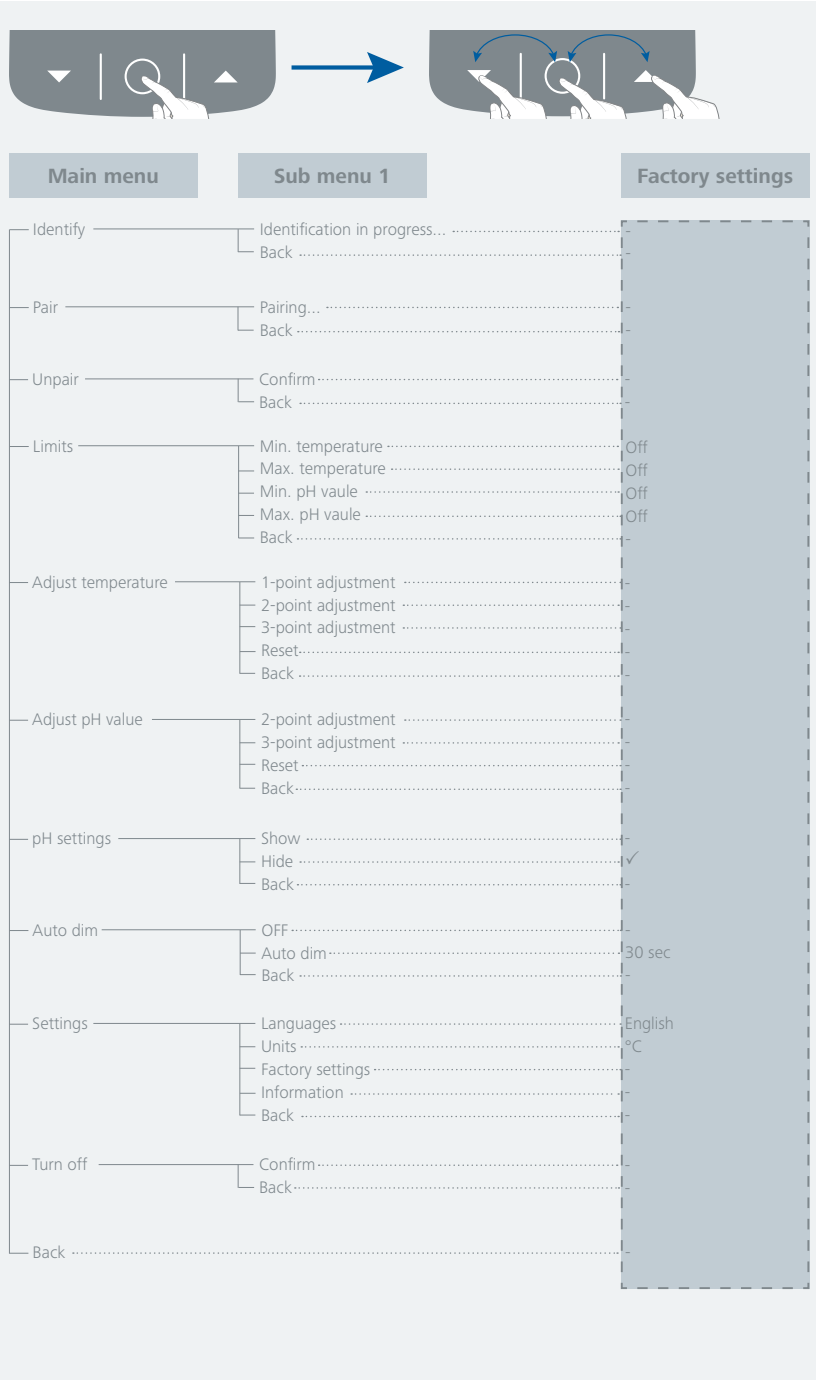
/// Menu navigation

Menu button
› Press one second to access the menu and confirm the menu settings.
› Press and hold for three seconds to lock or unlock the device.
› Press and hold for three seconds to return to the main screen if you are already in a sub-menu.

Button “Up / down“
› Press briefly to set the temperature / pH values or to switch menu options.

Button “Up“
› Press and hold for three seconds to freeze or release the displayed values.
Note: This is only available when the device is used as a standalone measuring device.

/// Menu structure



Identify:

Identification in progress...
In this menu option, a wirelessly connected device can be identified.
This menu option is only visible if there is an active wireless connection.

Pair:

Paring…
In this menu option, a wireless connection can be established.
This menu option is only visible if there is no active wireless connection.
Press the menu button to start the connection process. The status LED blinks blue slowly during the search process (30 seconds) and lights up blue continuously when pairing is successful. The screen will return to last sub menu when the paring process is finished.
- Pairing successful !
- Pairing failed !

Note:
The device can be operated at a distance of up to 15 meters from the end device using the WPAN connection.

Unpair:

Confirm
In this menu option, an existing wireless connection can be disconnected.
This menu option is only visible if there is an active wireless connection.
Press the menu button to confirm, the connection will be disconnected and the status LED colour will change from blue to green. The screen will return to main menu when the unparing process is finished.
- Unpaired !

Limits:

In this menu option, various setpoint values can be limited.
This menu item is only visible when there is no active wireless connection.
Note:
› If the value is set to "Off", the function is disabled.
› When the actual temperature value is outside the set limit value, the status LED will flash yellow and an acoustic signal will be heard.

Min. temperature: Off / -20 °C … 400 °C, 1 °C / step
Max. temperature: Off / -20 °C … 400 °C, 1 °C / step
Min. pH value: Off / 0.00 … 14.00, 0.10 / step
Max. pH value: Off / 0.00 … 14.00, 0.10 / step

Adjust temperature:

To reduce temperature deviations due to tolerances, the user can adjust the temperature sensor together with the device. A calibrated temperature reference meter is required.
The device is pre-calibrated before shipping. Sensor tolerances in accordance with DIN IEC 751 Class A are not taken into account.
The complete measurement chain can be calibrated in order to eliminate the effects of the contact resistance at the plug connector and the sensor tolerances (inclusive of temperature drift).
The calibration process is started using the "Adjust temperature" menu:
1-point adjustment: -20 …400 °C, 0.1 °C / step
2-point adjustment: -20 …400 °C, 0.1 °C / step
3-point adjustment: -20 …400 °C, 0.1 °C / step
The following items are required:
- An additional temperature measuring device with an accuracy of ±0.05 °C
- Max. three stable, constant temperature sources (media at different, controlled temperatures)

The steps are as follows:
› Immerse both temperature sensors in the medium. Wait until the display on the temperature measurement device has stabilised.
› Enter the measured temperature on the device (ETS-D7) using the up and down buttons.
› Confirm the value entered using the menu button.

Reset
This menu option restores the adjusted temperature parameters to the factory settings.

Adjust pH value:

The pH sensor must be calibrated before being used to attempt a pH measurement.
The calibration is used to adjust the pH sensor and the device so that they work together correctly. As part of the process, the neutral and pH gradient are specified for the measurement chain.
The pH calibration should be carried out using pH 7, pH 4 and pH 9 buffer solutions in accordance with DIN 19266.
The temperature sensor must be connected during pH calibration.

2-point adjustment: 0.00 …14.00, 0.01 / step (factory setting: pH 7.00 / pH 4.00)
3-point adjustment: 0.00 …14.00, 0.01 / step (factory setting: pH 7.00 / pH 4.00 / pH 9.00)

The steps are as follows:
› Immerse the pH probe and temperature sensor in the required buffer solution.
› Once the value is stable, confirm it by pressing the menu button.
› Rinse both probes thoroughly with distilled water and dry them with a soft, lint-free paper towel. Do not rub!
› Follow the instructions on the display, then immerse the pH probe and temperature sensor in the next buffer solution.
› Once the value is stable, confirm it by pressing the menu button.
› In the case of the 3-point adjustment, a third buffer solution must be used.
› pH measurements can be carried out once the calibration has been completed successfully.

Note:
The use of the temperature sensor is limited by the maximum permissible temperature.
Ensure that the temperature of the medium does not exceed the maximum permissible temperature.

Reset
This menu option restores the adjusted pH parameters to the factory settings.

pH settings:

This menu option allows the screen to show or hide the pH value.

Factory setting: Hide

Show: Show pH value on main screen
Hide: Hide pH value on main screen

Auto dim:

This menu option allows the user to select various settings for the display, which will affect the battery working hours.

Factory setting: 30 sec

OFF: "Auto dim" off
Auto dim: 30 sec / 1 min ... 15 min, 1 min / step
Confirm the value using the menu button. After confirmation, the screen will return to the previous main menu.

Settings:

Languages
The "Languages" option allows the user to select the desired language.
A check mark indicates the language selected for the system.

Units
The "Units" option allows the user to select the unit of measurement for the temperature value displayed on the screen in "°C" or "°F."
A check mark indicates the unit of measurement selected for the system.
Factory setting: °C

Factory settings
In the "Factory settings" menu option, all changed menu settings can be reset to the factory settings.

Information
This menu option displays the most important device settings, such as the software version.

Turn off:

Confirm
This menu option allows the user to turn off the device.

Back:

This menu option allows the screen to return to main screen.

Interfaces and outputs

The device software can be updated with a PC via the USB port.

Notice!
Please comply with the system requirements together with the operating instructions and help section included with the software.

/// 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

Connect the IKA device through the USB data cable to the PC. The data communication is via a virtual COM port.
From Windows 10 and onwards the standard Windows USB driver is automatically loaded and a COM port number is assigned (find details in Windows Device Manager: "USB Serial Port (COMxx)"). If you have problems with USB communication, first ask your IT system administrator whether access to the USB interface is restricted for data security reasons.

/// Command syntax and format

The following applies to the command set:
- Commands are generally sent from the computer (Leader) to the device (Follower).
- 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 0x20 hex 0x0d hex 0x20 hex 0x0A) and have a maximum length of 80 characters.
- The decimal separator in a number is a dot (Code: hex 0x2E).

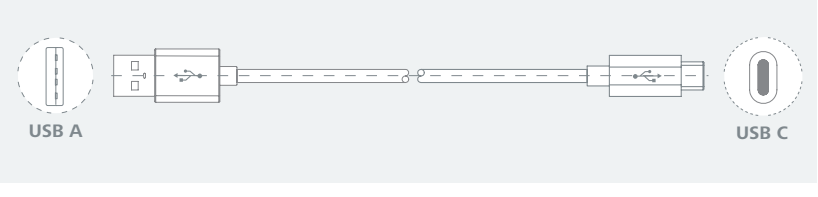
The above details correspond as far as possible to the recommendations of the NAMUR working party (NAMUR recommendations for the design of electrical plug connections for analogue and digital signal transmission on individual items of laboratory control equipment, rev. 1.1).

The NAMUR commands and the additional specific IKA commands commissioning serve only as low level commands for communication between the device and the PC. With a suitable terminal or communications program these commands can be transmitted directly to the device. The IKA software package, labworld*soft*®, provides a convenient tool for controlling device and collecting data under MS Windows, and includes graphical entry features.

NAMUR Commands	Function
IN_NAME	Read the device name
IN_PV_1	Read medium actual temperature
IN_PV_80	Read pH value

/// Connections between device and external devices

USB-A to USB-C cable:
This cable is required to connect the USB port to a PC or terminal device.



USB-C to USB-C cable:
This cable is required to connect the USB port to a PC or terminal device.

Maintenance and cleaning

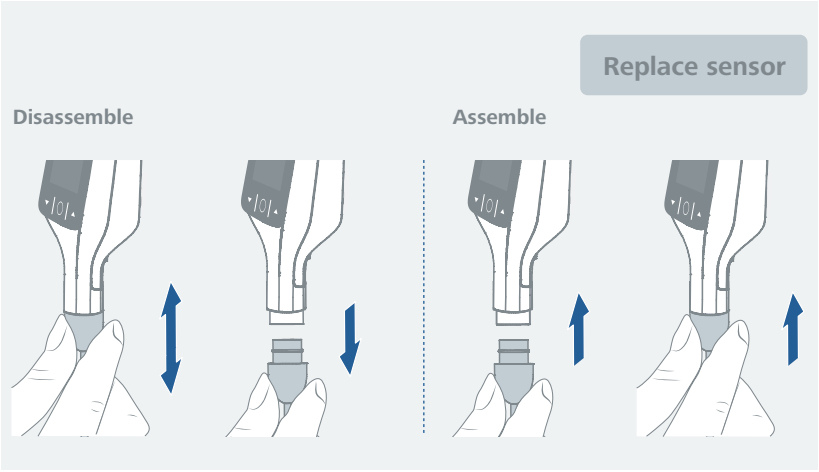
› The device is maintenance-free. It is only subject to the natural wear and tear of components and their statistical failure rate.

/// Cleaning

› For cleaning disconnect the the device from the power supply.
› Use only cleaning agents which have been approved by IKA to clean the devices: Water containing surfactant / isopropyl alcohol.
› Wear protective gloves during 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.
› Before using another than the recommended method for cleaning or decontamination, the user must ascertain with IKA that this method does not destroy the device.

/// Replacing extension cable / sensor

› Pull the temperature sensor downwards with the cover cap until the plastic snap connection has been released.
› Slide the temperature sensor or extension cable back over the attachment on the device with the cover cap. Ensure that the new accessory is correctly installed and connected.



/// Ordering spare parts

› When ordering spare parts, please give:
- device type.
- serial number, see type plate.
- position number and description of spare part, see **www.ika.com**.
- software version.

/// Repairs

› Please only send in devices for repair that have been cleaned and are free of materials which might present health hazards.
› For repair, please request the "**Safety Declaration (Decontamination Certificate)**" from IKA or use the downloaded printout of it from 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.

Accessories

› For accessories see **www.ika.com**.

Error codes

› The fault is shown by an error code on the display as following if the error occurs.
Proceed as follows in such cases:
- Turn off the device.
- Carry out corrective measures.
- Restart the device.

Error code | Causes | Effect | Solutions

E39: Temperature

20392920 - Temperature sensor fault

Causes	› sensor not connected or defective
Effect	› device stops working
Solutions	› assemble or connect temperature sensor correctly › replace temperature sensor

20390023 - Temperature out of range

Causes	› medium temperature is higher than the maximum set temperature
Effect	› device stops working
Solutions	› switch off the device and allow the medium to cool down

› If the actions described fails to resolve the fault or another error code is displayed:
- contact the service department.
- send the device for repair, including a short description of the fault.

Technical data

General data	
DC Voltage	5 V
Replaceable temperature sensor	H 62.51
Brightness detection	yes
Infrared detection	yes
Display	TFT
Capacitive touch button	yes
Acoustic warning	yes
Status LED	yes
Permissible ambient temperature	+5 ... +40 °C
Permissible relative humidity	80 %
Protection class according to DIN EN 60529	IP 54
Dimensions (W x D x H)	52 x 385 x 40 mm
Weight	125 g
Operation at a terrestrial altitude	max. 2000 m
Battery	
Rechargeable battery	yes
Battery type	Lithium-ion RCR123A 16340
Baterry voltage	3.7 V
Battery capacity	700 mAh
Permissible duration of operation (battery)	50 hours (display 100% on) 100 hours (display off)
Battery charging time	50% at 60 minutes 75% at 90 minutes
Battery charging current max.	500 mA
Interface	
USB-C	yes
pH connection (BNC)	yes
WPAN (Wireless Personal Area Network)	yes
Max. communication distance (depends on the building)	15 m
Temperature measurement	
Temperature measuring range (with H 62 sensor)	-20 ... 400 °C
Temperature sensor type	PT 1000 DIN IEC 751 Class A
Temperature measurement resolution (with H 62 sensor)	0.01 K
Temperature sensor measuring accuracy	±0.1 K + Tolerance PT 1000
Immersion depth min.	20 mm

pH measurement	
pH measurement range	0 ... 14
pH measurement accuracy	± 0.1
pH measurement resolution	± 0.01

Subject to technical changes!

Warranty

› In accordance with IKA Terms and Conditions of Sale, the warranty period is 24 months. For claims under the warranty please contact your local dealer. You may also send the device 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 instructions.

IKA

designed for scientists

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