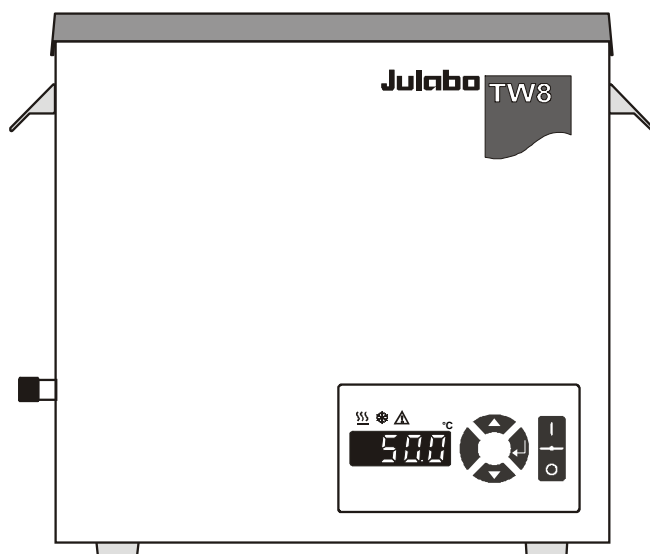


English

Operating manual

Water Baths

TW2
TW8
TW12
TW20



1.951.6062BE3 04/08

Julabo
Innovative Temperature Technology

JULABO Labortechnik GmbH

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Operating manual

Pages 2 to 10

Operating instructions

Pages 12 to 21

Congratulations!

You have made an excellent choice.

JULABO thanks you for the trust you have placed in us.

This operating manual has been designed to help you gain an understanding of the principles of operating and possibilities of our water baths. For optimum utilization of all functions, we recommend that you thoroughly study this manual prior to beginning operation.

Quality Management System



The JULABO Quality Management System:

Development, production and distribution of temperature application instruments for research and industries conform to the requirements according to DIN EN ISO 9001:2000.
Certificate Registration No. 01 100044846

Unpacking and checking

Unpack the water baths and accessories and check for damages incurred during transit. These should be reported to the responsible carrier, railway, or postal authority, and a request for a damage report should be made. These instructions must be followed fully for us to guarantee our full support of your claim for protecting against loss from concealed damage. The form required for filing such a claim will be provided by the carrier.

Printed in Germany

Changes without prior notification reserved

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Operating manual

Description

JULABO water baths have been designed for temperature application to specific fluids in a bath tank.



- ☑ The water baths are operated via the splash-proof keypad. The implemented microprocessor technology allows to set and to store the setpoint that can be indicated on the LED temperature display.



- ☑ The PID temperature control adapts the heat supplied to the thermal requirements of the bath.



- ☑ The water baths conforms to the relevant requirements specified by European guidelines.



- ☑ The models TW8, TW12, TW20 provide a drain screw and handles for easy relocation.



JULABO water baths are not conceived for direct temperature application to food and luxury articles or pharmaceutical and medico-technical products. Direct temperature application means: Unprotected contact of the object with the bath medium (bath fluid).

Operator responsibility – Safety recommendations

The products of JULABO Labortechnik GmbH warrant a safe operation if installation, operation and maintenance is carried out according to common safety regulations. This section informs you about potential dangers that may arise from operating the circulator and also mentions the most important safety precautions

Persons:

The operator is responsible for the qualification of the personnel operating the units. The operator should be constantly informed about the dangers involved with their job

activities as well as preventive actions.

Make sure all persons expected to carry out operation, installation and maintenance of the unit read and understand the safety information and operating instructions.

When using hazardous materials, the circulator may only be operated by persons that are absolutely familiar with these materials and the circulator. These persons must be fully aware of possible risks.


If you have any questions concerning the operation of your unit or the information in this manual, please contact us!


Contact

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 info@julabo.de

 www.julabo.de

Handling:

You received a product conceived for industrial use. Nevertheless, avoid strikes to the housing, vibrations, damages to the keypad foil (keys, display) or contamination.

Make sure the product is regularly checked for proper condition. Regularly check (at least every 2 years) the proper condition of the mandatory, warning, prohibition and safety labels.

Take care that the mains supply features a low impedance to avoid any negative affects on the instrument being operated in the same mains.

This unit is designed for operation in a controlled electromagnetic environment. This means that transmitting devices (e.g. cellular phones) should not be used in the immediate vicinity.

Magnetic radiation may influence other units with components susceptible to magnetic fields

(e.g. a monitor). We recommend to keep a minimum distance of 1 m.

Permissible ambient temperature: max. 40 °C, min. 5 °C.

Permissible relative air humidity: 50 % (40 °C).

Do not store in an aggressive atmosphere. Protect from contaminations. Do not expose to sunlight.

Operation:




Only qualified personnel is authorized to perform configuration, installation, maintenance and repairs of the circulator.

Routine operation can also be carried out by untrained personnel who should however be instructed by trained personnel. The summarized user guidance (short manual) and the specification table with information on individual parameters are sufficient for this.


Use:

The bath may **not** be filled with flammable materials. Fire hazard!
Only use recommended materials (bath fluids). Only use non-acid and non corroding bath fluids.

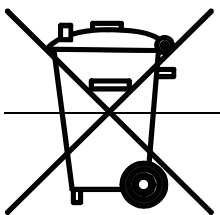
When using hazardous materials, **the user must** attach the enclosed safety labels to the front of the unit so they are well visible:

Warning label W00: Colours: yellow, black		Danger area. Attention! Observe instructions. (operating manual, safety data sheet)
Mandatory label M018 Colours: blue, white		Carefully read the user information prior to beginning operation Scope: EU
Semi S1-0701 Table A1-2 #9		Carefully read the user information prior to beginning operation Scope: NAFTA

Particular care and attention is necessary because of the wide operating range. There are thermal dangers: Burn, scald, hot steam, hot parts and surfaces that can be touched.

Warning label W26: Colours: yellow, black		Hot surface warning. (The label is put on by JULABO)
--	---	---

Disposal:



Valid in EU countries

Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE).

This directive requires electrical and electronic equipment marked with a crossed-out trash can to be disposed of separately in an environmentally friendly manner.

Contact an authorized waste management company in your country. Disposal with household waste (unsorted waste) or similar collections of municipal waste is not permitted!

EC Conformity



The products described in the operating instructions conform to the requirements of the following European guidelines:

Low voltage regulations with respect to legal harmonization of the member countries concerning electric devices for use within certain voltage limits.

EMC guideline with respect to legal harmonization of the member countries concerning electromagnetic compatibility.

Julabo

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Eisenbahnstr. 45
77960 Seelbach / Germany

Warranty conditions

JULABO Labortechnik GmbH warrants its products against defects in material or in workmanship, when used under appropriate conditions and in accordance with appropriate operating instructions

for a period of ONE YEAR.

Extension of the warranty period – free of charge



With the '1PLUS warranty' the user receives a free of charge extension to the warranty of up to 24 months, limited to a maximum of 10 000 working hours.

To apply for this extended warranty the user must register the unit on the JULABO web site www.julabo.de, indicating the serial no. The extended warranty will apply from the date of JULABO Labortechnik GmbH's original invoice.

JULABO Labortechnik GmbH reserves the right to decide the validity of any warranty claim. In case of faults arising either due to faulty materials or workmanship, parts will be repaired or replaced free of charge, or a new replacement unit will be supplied.

Any other compensation claims are excluded from this guarantee.

Technical specifications

Water Bath		TW2	TW8
Working temperature range	°C	20 ... 99,9*	20 ... 99,9*
Temperature stability		±0,2	±0,2
Temperature selection		digital	digital
Temperature indication		LED	LED
Resolution	°C	0.1	0.1
Temperature control		PID1	PID1
Heater wattage (at 230 V)	kW	1,0	2,0
Heater wattage (at 115 V)	kW	1,0	1,0
Bath opening (WxL)	cm	15x13	23x27
Bath depth	cm	11	14
Filling volume	liters	1 ... 2	3 ... 8
Overall dimensions (WxDxH) with Makrolon [®] -cover	cm	17x16x26 17x16x37	29x32x28 29x32x44
Weight	kg	3,5	8,5
Ambient temperature	°C	5 ... 40	5 ... 40
Mains power connection 230 V/50-60 Hz	V/ Hz	190-253 / 50-60	190-253 / 50-60
Current input (at 230 V)	A	4	8
Mains power connection 115 V/60 Hz	V/ Hz	103-127 / 50-60	103-127 / 50-60
Current input (at 115 V)	A	9	9

All measurements have been carried out at: rated voltage and frequency
operating temperature: 70 °C ambient temperature: 20 °C bath fluid: water

Technical changes without prior notification reserved.

Water Bath		TW12	TW20
Working temperature range	°C	20 ... 99,9*	20 ... 99,9*
Temperature stability		±0,2	±0,2
Temperature selection		digital	digital
Temperature indication		LED	LED
Resolution	°C	0.1	0.1
Temperature control		PID1	PID1
Heater wattage (at 230 V)	kW	2,0	2,0
Heater wattage (at 115 V)	kW	1,0	1,0
Bath opening (WxL)	cm	35x27	50x30
Bath depth	cm	14	18
Filling volume	liters	5 ... 14	8 ... 26
Overall dimensions (WxDxH) with Makrolon [®] -cover	cm	40x32x28 40x32x44	50x35x32 50x35x49
Weight	kg	8,9	14,2
Ambient temperature	°C	5 ... 40	5 ... 40
Mains power connection 230 V/50-60 Hz	V/ Hz	190-253 / 50-60	190-253 / 50-60
Current input (at 230 V)	A	8	8
Mains power connection 115 V/60 Hz	V/ Hz	103-127 / 50-60	103-127 / 50-60
Current input (at 115 V)	A	9	9

All measurements have been carried out at: rated voltage and frequency
operating temperature: 70 °C ambient temperature: 20 °C bath fluid: water

Technical changes without prior notification reserved.



*)

Important notice:

When the working temperature is higher than 90 °C, it might happen that due to strong production of steam there is considerable dripping on the inside of the lift-up Makrolon[®] cover. Some drops may fall directly into the material to be tempered.

Safety installations according to IEC 61010-2-010:

Excess temperature protection	130 °C - fixed value
Classification according to DIN 12876-1	class I
Alarm message	optical + audible (permanent)

Environmental conditions according to IEC 61 010-1:

Use only indoor.

Altitude up to 2000 m - normal zero.

Ambient temperature: +5 ... +40 °C (for storage and transportation)

Air humidity:

Max. rel. humidity 80 % for temperatures up to +31 °C,

linear decrease down to 50 % relative humidity at a temperature of +40 °C

Protection class according to IEC 60 529 IP43

Power supply: corresponds to Class I; according to VDE 0106 T1

not for use in explosive atmosphere

Max. mains fluctuations of ± 10 % are permissible.

Overvoltage category II

Pollution degree 2

Standards for interference resistance EN 61326

Emitted interferences

The unit adheres to the threshold values for emitted interferences according to table 3.

Interference resistance

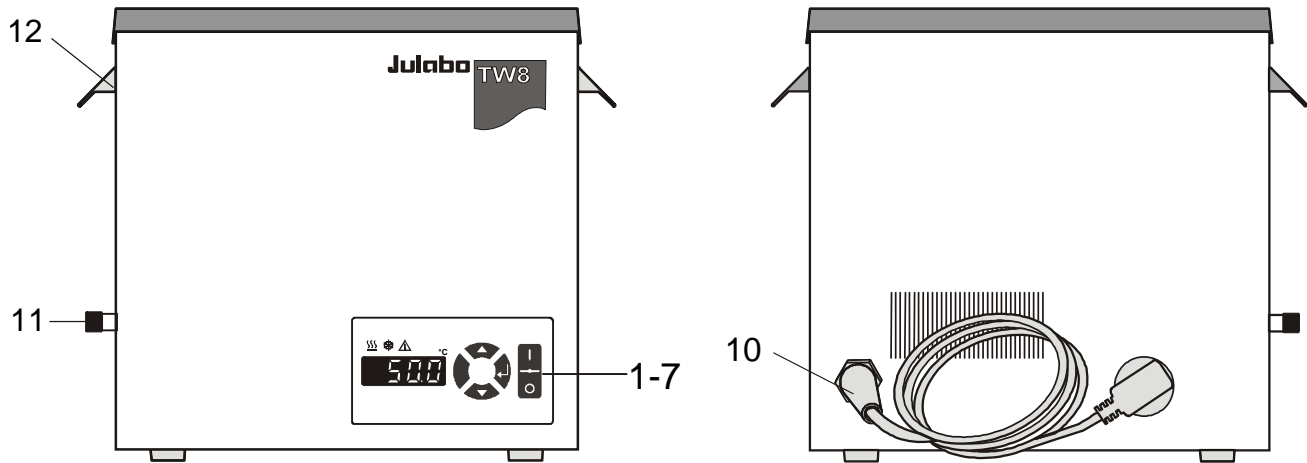
The unit conforms to the requirements according to table B.1.

Operating instructions









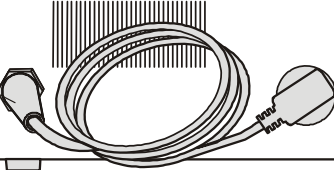



1. Operating controls and functional elements

Front view

Rear view



Example: TW8

- | | | | | | | |
|----|--|--|----|---|-----|--|
| |  | Mains power switch, illuminated | | | | |
| | <table border="0"> <tr> <td>█</td> <td>on</td> </tr> <tr> <td>○</td> <td>off</td> </tr> </table> | █ | on | ○ | off | |
| █ | on | | | | | |
| ○ | off | | | | | |
| 1 |  | | | | | |
| 2 |  | Edit keys (increase/decrease setting) | | | | |
| 3 |  | Enter key (store) | | | | |
| 4 |  | LED temperature display, menu indication | | | | |
| 5 |  | Control indicator – Heating | | | | |
| 6 |  | Control indicator – Cooling (without function) | | | | |
| 7 |  | Control indicator – Alarm | | | | |
| 10 |  | Mains power cable with plug | | | | |
| 11 |  | Drainage screw | | | | |
| |  | Connector for liquid level/cooling set (accessory) | | | | |
| 12 |  | Handle | | | | |

2. Safety notes for the user



In addition to the safety warnings listed above, warnings are posted throughout the manual. These warnings are designated by an exclamation mark inside an equilateral triangle. „Warning of a dangerous situation (Attention ! Please follow the documentation).“
The danger is described according to an alarm keyword.
Read and follow these important instructions.

**Warning:**

Describes a possibly highly dangerous situation. If this is not avoided, serious injury and danger to life could result.

**Caution:**

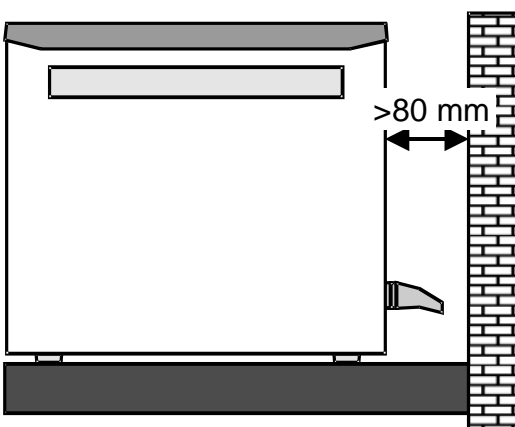
Describes a possibly dangerous situation. If this is not avoided, slight or minor injuries could result.
A warning of possible damage can also be contained in the text.

**Notice:**

Describes a possibly harmful situation. If this is not avoided, the product or anything in its surroundings can be damaged.

3. Preparations

3.1. Installation



Place the waterbath in an upright position.

Keep a wall distance of minimum 80 mm.

3.2. Bath fluids



Caution:

No liability for use of other bath fluids!

Do not use flammable bath fluids!

Water:

The quality of water depends on local conditions.

Ferrous water can cause corrosion - even on stainless steel.

Chloric water can cause pitting corrosion.

Recommended bath fluids: water



Notice:

Please contact JULABO before using other than recommended bath fluids.

JULABO takes no responsibility for damages caused by the selection of an unsuitable bath fluid.

Unsuitable bath fluids are liquids which e.g.

- have corrosive characteristics or
- tend to cracking.



Caution:

The temperature controlling i.e. of fluids in a reactor constitutes normal circulator practice.

We do not know which substances are contained within these vessels. Many substances are:

- inflammable, easily ignited or explosive
- hazardous to health
- environmentally unsafe

i.e.: **dangerous**

The user alone is responsible for the handling of these substances!



Accessory:

We recommend the use of the "Aqua-Stabil" protective media to eliminate the formation of algae, bacteria, and other micro-organisms.

Order No.	Description
8 940 006	6 bottles ea 100 cc
8 940 012	12 bottles ea 100 cc

3.3. Filling / Draining

Filling

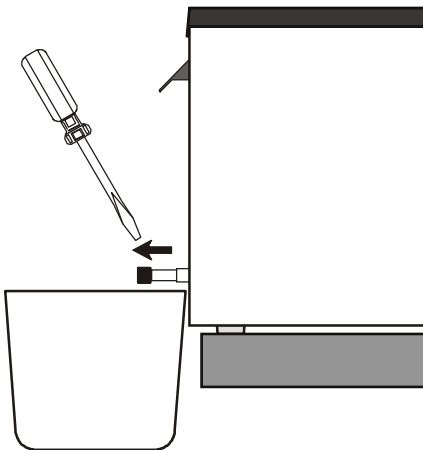
- Recommended maximum filling level is 25 mm below the tank rim
- Minimum filling level: approx. 1 cm above the perforated stainless steel base plate.

Note:

The working filling level depends on size and number of the items (fixtures) to be placed inside.

The recommended procedure is to fill the water bath only partially, place the items (fixtures) inside and then correct the filling level (adding or removing liquid) as required.

Draining



- Press the mains switch to turn the waterbath off
- TW2
Take the water bath in both hands and pour out the bath liquid into a suitable vessel.
- TW8, TW12, TW20
Place a suitable collecting bucket or tub underneath the unit for draining the used bath liquid.
- To drain the liquid open the drainage screw (11) on the side of the water bath.
- After the liquid has been fully drained, securely tighten the drainage screw (11) again.



Warning:

Do not drain the bath fluid while it is hot!

There are thermal dangers when opening the bath cover:

Burn, scald, hot steam, hot parts and surfaces that can be touched.

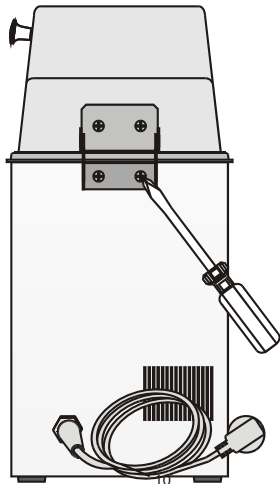
Check the temperature of the bath fluid prior to draining

(by switching the unit on for a short moment, for example).

Recommendation:

Use the water bath cover to keep temperature losses to a minimum. This is especially important for working temperatures above 60 °C.

Accessories



Lift-up Makrolon® covers

Order numbers:

TW2	TW8	TW12	TW20
8 970 289	8 970 286	8 970 287	8 970 288

The lift-up Makrolon® covers are supplied with pre-assembled hinges. Screw the hinges with the included screws to the rearside of the bath by means of a screwdriver.

TW2 Insert capacity for test tube racks to 100 °C, stainless steel

TW2	1
-----	---

Order No.	Test tube rack	
8 970 330	for 24 test tubes	16/17 mm dia.

TW8 TW12 TW20 Insert capacity for test tube racks to 100 °C, stainless steel

TW8	TW12	TW20
2	3	4

Order No.	Test tube racks	
8 970 344	for 50 test tubes	16/17 mm dia.
8 970 345	for 90 test tubes	12/13 mm dia.
8 970 346	for 90 microliter tubes	16/17 mm dia.
8 970 347	for 21 test tubes	30 mm dia.

TW8 TW12 TW20 Insert capacity for test tube racks to 80 °C, Polypropylene

TW8	TW12	TW20
2	3	4

Order No.	Test tube racks	
8 970 380	for 60 test tubes	16/17 mm dia.
8 970 381	for 90 test tubes	12/13 mm dia.
8 970 382	for 90 microliter tubes	16/17 mm dia.
8 970 383	for 21 test tubes	30 mm dia.

3.4. Maintaining a constant water level / Countercooling

For cooling tasks near the ambient air temperature the liquid level/cooling set can be used for countercooling.

By special pipe routing, cool faucet water is continuously supplied to the water bath, while at the same time, the heated water is drained via the overflow connection of the Level/Cooling set.

① A specific water flow rate of 100 ml/minute is sufficient to compensate for the characteristic temperature.



Caution:

Securely attach all tubing to prevent slipping.

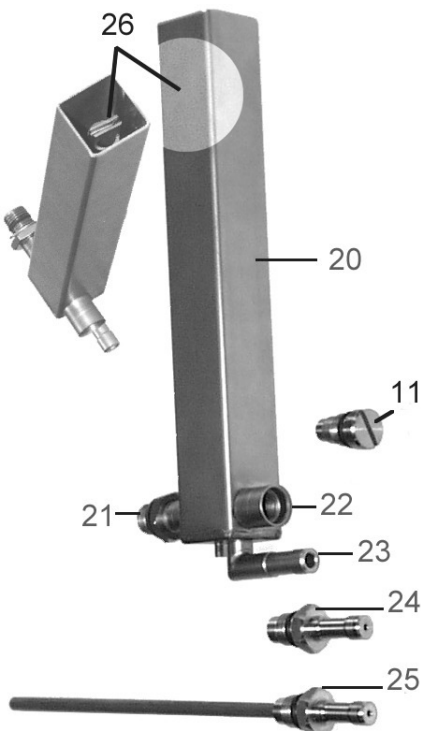
Observe the laws and regulations of the water distribution company valid in the location where the unit is operated.

Use of the liquid level/cooling set for a continuous supply of faucet water:

1. to keep the water level constant, especially for applications up to the boiling point (supply of faucet water only in the amount of evaporation losses).
2. for countercooling of cooling tasks near the ambient surrounding temperature (cool faucet water is continuously supplied to the water bath, while at the same time, the heated water is drained via the overflow connection of the liquid level/cooling set).

Liquid level/cooling set

Order number: 8 970 415



11 drainage screw on water bath

20 compensation reservoir

21 connecting sleeve

22 supply/drainage sleeve

23 overflow sleeve

24 adaptor screw for constant liquid level function

25 adaptor screw assy. for countercooling function and simultaneous constant liquid level control

26 adjuster screw for filling level adjustment



4. Operating procedures

4.1. Power connection



Caution:

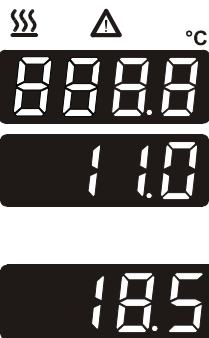
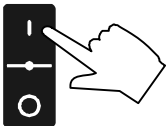
ConnOnly connect the unit to a power socket with earthing contact (PE – protective earth)!

We disclaim all liability for damage caused by incorrect line voltages!

Check to make sure that the line voltage matches the supply voltage specified on the identification plate.

Deviations of $\pm 10\%$ are permissible.

4.2. Switching on / Start - Stop




- **Switching on:**

Turn on the mains power switch (1).

- ① The unit performs a self-test. All segments of the 4-digit LED temperature DISPLAY and all indicator lights will illuminate. Then the software version (example: n 11.0) appears.

Together with the display of the water bath temperature the operating state is also displayed. (Example: 18.5 °C)

The heat-up phase is indicated by the yellow heating control light  which will blink in regular intervals when the selected temperature has been attained.

- **Switching off:**

Turn the unit off with the mains power switch.

4.3. Setting the temperatures

① Setting can be carried out in the start/stop condition.

1. Press one of the keys ▼ ▲ for a short moment. The setpoint value instead of the actual value is indicated on the display for about 8 seconds. The value can now be changed.
2. Change value:
Press ▲ to set a higher value.
Press ▼ to set a lower value.
Keep the keys depressed for the value to change fast.
3. Press enter ↵ to store the value.

5. Troubleshooting guide / Error messages



Whenever the microprocessor electronics registers a failure, a complete shutdown of the heater and circulating pump is performed. The alarm light "⚠" illuminates and a continuous signal tone sounds.

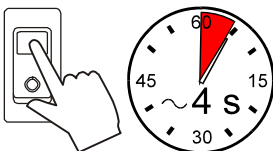
The LED temperature display indicates the cause for the alarm in form of a code.



- Safety sensor or working temperature sensor.
- The water bath is operated without bath fluid, or the liquid level is insufficient.
Replenish the bath tank with the bath fluid.



- Cable of the working temperature sensor interrupted or short-circuited.



After eliminating the malfunction, press the mains power switch off and on again to cancel the alarm state.

If the unit cannot be returned to operation, contact an authorized JULABO service station.

6. Safety recommendations

Follow the safety recommendations to prevent damage to persons or property. Further, the valid safety instructions for working places must be followed.



- Only connect the unit to a power socket with earthing contact (PE – protective earth)!
- Operation is permitted with **non-flammable** liquids only.
- Place the instrument on an even surface on a pad made of **non-inflammable** material.
- Do not stay in the area below the unit.
- Make sure you read and understand all instructions and safety precautions listed in this manual before installing or operating your unit.
- Never operate the unit without bath fluid in the bath.
- Prevent water from penetrating into the hot bath oil.
- Do not drain the bath fluid while it is hot!
Check the temperature of the bath fluid prior to draining (by switching the unit on for a short moment for example).
- Never operate damaged or leaking equipment.
- Always turn off the unit and disconnect the mains cable from the power source before performing any service or maintenance procedures, or before moving the unit.
- Always empty the bath before moving the unit.
- Never operate equipment with damaged mains power cables.
- Condensation that could appear in and on other units near the water bath may result in reduced operating safety. Be careful when setting up and operating the water bath!



- Some parts of the bath cover may become extremely warm during continuous operation.
When lifting the bath cover, pay attention to hot steam!
Be careful when touching these parts!

7. Cleaning / repairing the unit

**Caution:**

Always turn off the unit and disconnect the mains cable from the power source before cleaning the unit..

Prevent humidity from entering into the water bath.

Repairs are to be carried out only by qualified service personnel authorized by JULABO.

Cleaning:

For cleaning the bath tank and the immersed parts of the water bath, use low surface tension water (e.g., soap suds).

Clean the outside of the unit using a wet cloth and low surface tension water.

The water bath is designed for continuous operation under normal conditions. Periodic maintenance is not required.

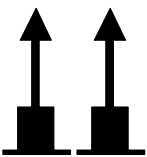
The tank should be filled only with a bath fluid recommended by JULABO. To avoid contamination, it is essential to change the bath fluid from time to time.

Repairs

Before asking for a service technician or returning a JULABO instrument for repair, please contact an authorized JULABO service station.

When returning the unit:

- Clean the unit in order to avoid any harm to the service personnel.
- Attach a short fault description.
- During transport the unit has to stand upright. Mark the packing correspondingly.
- When returning a unit, take care of careful and adequate packing.
- JULABO is not responsible for damages that might occur from insufficient packing.



JULABO reserves the right to carry out technical modifications with repairs for providing improved performance of a unit.