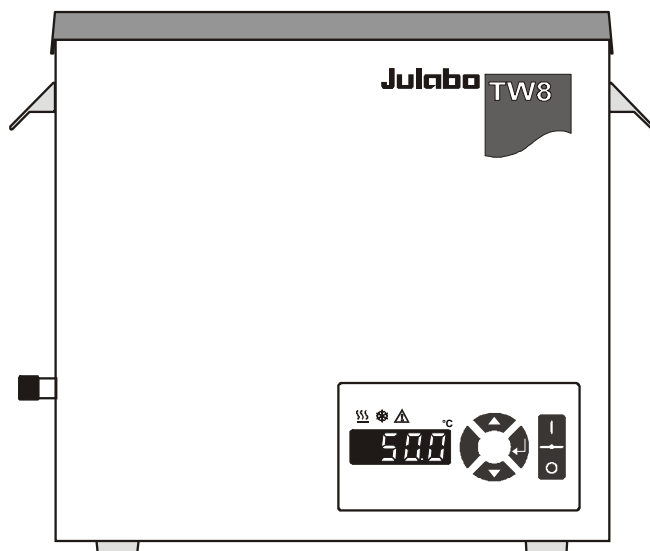


**English**

# OPERATING MANUAL

## Water Baths

TW2  
TW8  
TW12  
TW20



**Julabo**  
THE TEMPERATURE CONTROL COMPANY

JULABO Labortechnik GmbH  
77960 Seelbach / Germany

☎ +49 (0) 7823 / 51-0

📄 +49 (0) 7823 / 24 91

✉ [info@julabo.de](mailto:info@julabo.de)

🌐 [www.julabo.de](http://www.julabo.de)

---

## **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.

### **The JULABO Quality Management System**



Temperature control devices for research and industry are developed, produced, and distributed according to the requirements of ISO 9001:2008. 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

## 1. Intended use

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



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).

### 1.1. Description



- ☑ 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.

## 2. 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





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 unit. 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** JULABO Labortechnik GmbH  
Eisenbahnstraße 45  
77960 Seelbach / Germany

 +49 (0) 7823 / 51-0  
 +49 (0) 7823 / 24 91  
 info@julabo.de  
 www.julabo.de

### Safety recommendations for the operator

- 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.

### Appropriate Operation

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

Routine operation can also be carried out by untrained personnel who should however be instructed by trained personnel.

### Use:

Insufficient ventilation may result in the formation of explosive mixtures. Only use the unit in well ventilated areas. The unit is not for use in explosive atmosphere.




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

The bath may **not** be filled with flammable materials. Fire hazard!


Only use non-acid and non corroding bath fluids.

## Operator responsibility – Safety recommendations

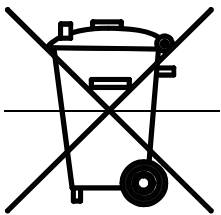
When using hazardous materials or materials that could become hazardous, **the operator must** affix the enclosed safety labels **(1 + 2)** to the front of the unit so they are highly visible:

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

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)
--	--

### 2.1. 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!

## 2.2. 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**

JULABO Labortechnik GmbH  
Eisenbahnstr. 45  
77960 Seelbach / Germany

## 2.3. 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**

**2 Years Warranty**

**1Plus Warranty**

**Registration free of charge on [www.julabo.de](http://www.julabo.de)**

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](http://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.

## 2.4. 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 <sup>®</sup> -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 draw (at 230 V)	A		4	8
Mains power connection 115 V/60 Hz	V/ Hz		103-127 / 50-60	103-127 / 50-60
Current draw (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 <sup>®</sup> -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 draw (at 230 V)	A		8	8
Mains power connection 115 V/60 Hz	V/ Hz		103-127 / 50-60	103-127 / 50-60
Current draw (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.

Safety installations according to IEC 61010-2-010:

Excess temperature protection	105 °C - fixed value
Classification according to DIN 12876-1	class I
Alarm message	optical + audible (permanent)

Environmental conditions according to EN 61 010, part 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

Max. mains fluctuation of  $\pm 10$  % are permissible.

Protection class according to EN 60 529      IP43

The unit corresponds to Class I

Overvoltage category II

Pollution degree 2



**Caution:**

The unit is not for use in explosive environment

Standards for interference resistance according to EN 61326-1

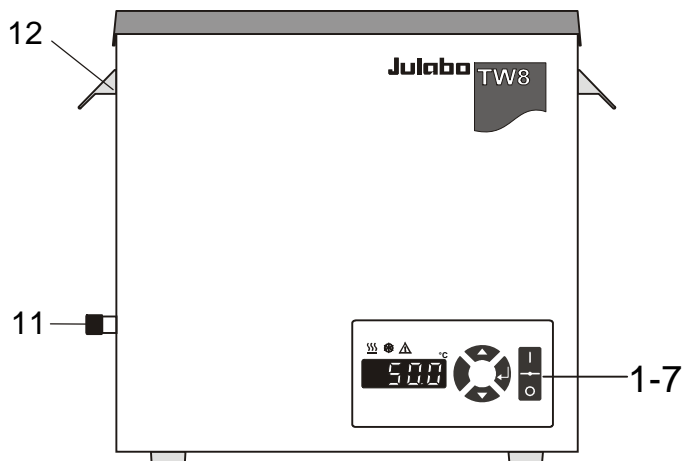
This unit is an ISM device classified in Group 1 (using high frequency for internal purposes)

Class A (industrial and commercial range).

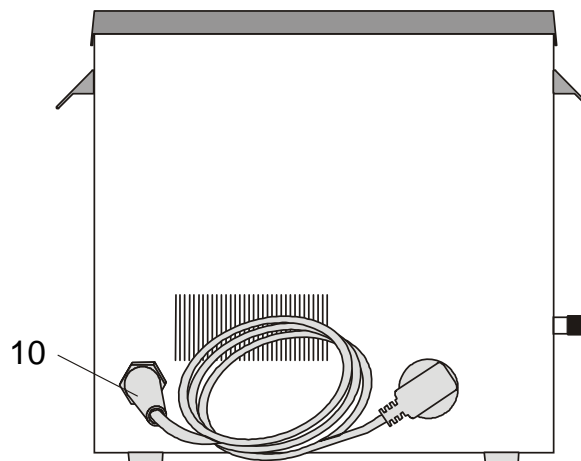
## Operating instructions

### 3. Operating controls and functional elements








Front view



Rear view



Example: TW8

- |    |   |  |
|----|---|--|
| 1  |   | Mains power switch, illuminated<br>I on<br>O off                     |
| 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<br>Connector for liquid level/cooling set (accessory) |
| 12 |   | Handle   |

## 4. Safety notes for the user

### 4.1. Explanation of safety notes



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.

### 4.2. Explanation of other notes



**Note!**

Wants to draw your attention to something particular.



**Important!**

Describes useful information for the operation and the user.

## 5. 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!
- Use safety glasses!

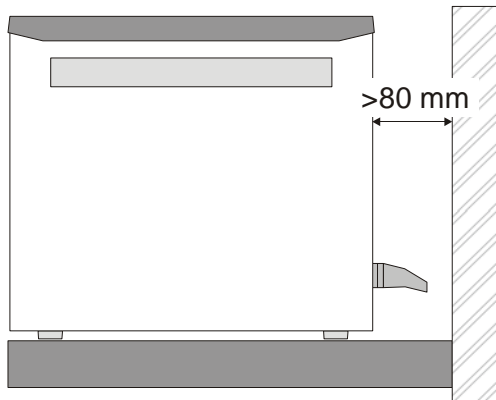
## 6. Preparations

### 6.1. Installation



**Caution:**

The unit is not for use in explosive environment.



Place the waterbath in an upright position.

Keep a wall distance of minimum 80 mm.



**Caution:**

**Potential hazards from the samples**

Proper use of shaking water baths includes immersion of samples contained in test tubes, Erlenmeyer flasks, or other containers for the purpose of controlling their temperature.

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

Many substances are:

- **flammable, easily ignited or explosive**
- **hazardous to health**
- **environmentally unsafe**

i.e.: **dangerous**

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

- Always properly seal all sample containers.



**Notice:**

**There is a danger of electrochemical oxidation or corrosion when using test-tube racks or samples made of non-ferrous metal.**

- Avoid using these types of racks or samples.
- Use only original JULABO test-tube racks.

## 6.2. Bath fluids

**Recommended bath fluids:** soft/decalcified water.



**Caution:**

**Poor water quality may result in corrosion in the bath.**

The quality of water (tap water) depends on local conditions.

- Due to the high concentration of lime, hard water is not suitable for temperature control because it leads to calcification in the bath.
- Ferrous water can cause corrosion - even on stainless steel.
- Chloric water can cause pitting corrosion.
- Distilled and deionized water is unsuitable. Their special properties cause corrosion in the bath, even in stainless steel.

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

Please contact JULABO before using other than recommended bath fluids.

**Do not use flammable bath fluids!**

### 6.3. 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.

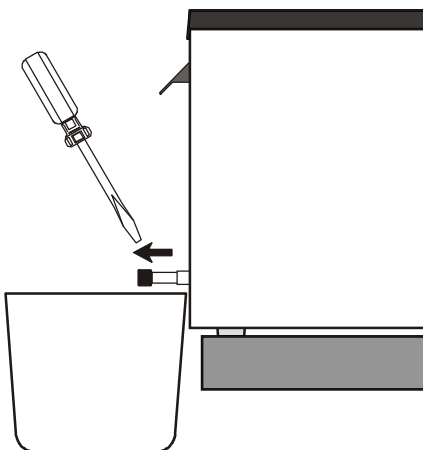


#### Note:

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 water bath 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:

There are thermal dangers when opening the bath cover:  
Burn, scald, hot steam, hot parts and surfaces that can be touched.

- 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).

#### Recommendation:

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

#### 6.4. Maintaining a constant water level / Counter cooling

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

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:

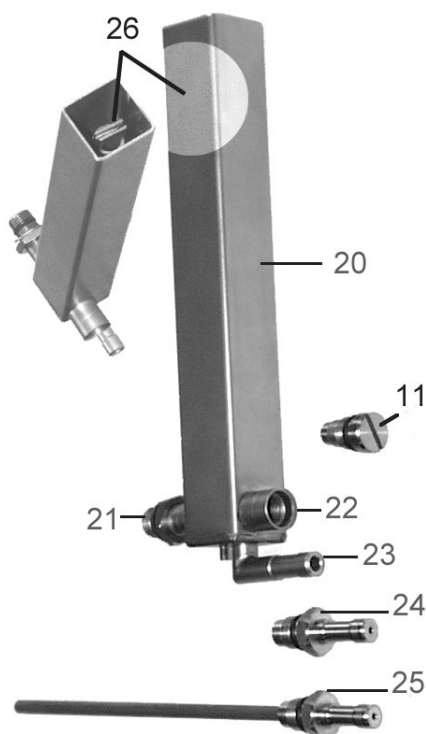
Securely attach all tubing to prevent slipping.  
Observe the laws and regulations of the water distribution company valid in the location where the unit is operated.

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 counter cooling 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

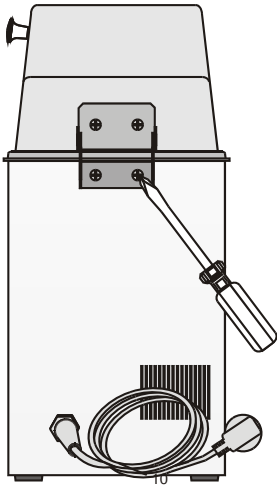
Order number: 8 970 415



- 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 counter cooling function and simultaneous constant liquid level control
- 26 adjuster screw for filling level adjustment



**6.5. Accessoires**



**Lift-up Makrolon® covers**

**Order numbers:**

<b>TW2</b>	<b>TW8</b>	<b>TW12</b>	<b>TW20</b>
<b>8 970 289</b>	<b>8 970 286</b>	<b>8 970 287</b>	<b>8 970 288</b>

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

**TW2**

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

TW2 1

<u>Order No.</u>	<u>Test tube rack</u>	
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

<u>Order No.</u>	<u>Test tube racks</u>	
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

<u>Order No.</u>	<u>Test tube racks</u>	
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.

## Cooling installation / continuo water supply

**Recommendation:** for model TW8, TW12, TW20  
For continuous water supply and counter-cooling

Order No.	Description
8 970 415	Liquid level/cooling set
8 970 416	Cooling coil

## Water bath protective media

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 100 ml each
8 940 012	12 bottles 100 ml each

## 7. Operating procedures

### 7.1. Power connection

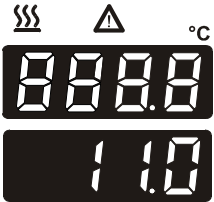


#### **Caution:**

- ConnOnly connect the unit to a power socket with earthing contact (PE – protective earth)!
- The power supply plug serves as safe disconnecting device from the line and must be always easily accessible.
- Never operate equipment with damaged mains power cables.
- Regularly check the mains power cable for material defects.
- 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.

## 7.2. 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.

## 7.3. 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.

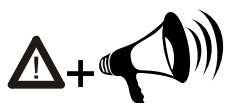


**Notice:**

When the working temperature is higher than 50 °C, it might happen that due to strong production of steam there is considerable dripping on the inside of the lift-up Makrolon<sup>®</sup> cover. Some drops may fall directly into the material to be tempered.

- Always properly seal all sample containers.

## 8. Troubleshooting guide / Error messages



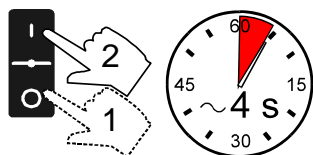
Whenever the microprocessor electronics registers a failure, a complete shutdown of the heater and circulating pump is performed. The alarm light "⚠" illuminates and a continuous signal tone sounds. The LED temperature display indicates the cause for the alarm in form of a code.



- 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.

## 9. Cleaning / repairing the unit



### Caution:

Improper maintenance or repair can result in electric shock or damage to the unit.

- Repairs and any other work are to be carried out only by qualified service personnel authorized by JULABO LABORTECHNIK GmbH.
- 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.
- Prevent humidity from entering into the water bath.
- Do not use alcohol-based or solvent-based cleaning agents. These cleaning agents will result in damage and cracks in the Makrolon® cover.

**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 JULABO Water Baths are 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.

**Returning a unit:** When returning the unit:

- Clean the unit and, if necessary, decontaminate the unit in order to avoid endangering service personnel.
- Attach a short fault description.  
If you intend to return your JULABO unit to us, you will find a Service Return Form on our website [www.julabo.de](http://www.julabo.de). Please use this as a delivery note and include it to the unit or send it in advance either by Fax or E-Mail.
- 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.