

English

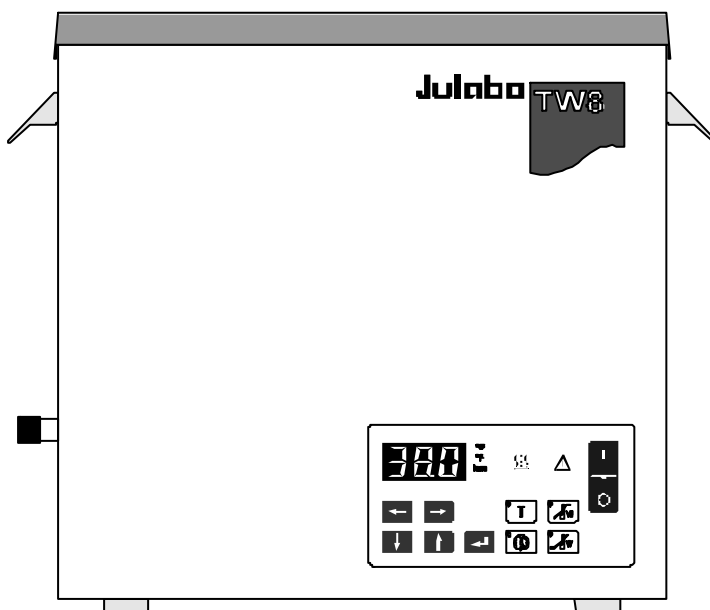
Operating manual

Water Baths

TW8

TW12

TW20



Software Version

TW8/1 n2.0

TW12/1 n2.2

TW20/1 n2.4

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1.951.6061BE4 07/04

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 circulators. For optimum utilization of all functions, we recommend that you thoroughly study this manual prior to beginning operation.

Safety Warnings

Take care your unit is operated only by qualified persons.

Make sure you read and understand all instructions and safety precautions listed in this manual before installing or operating your unit. If you have any questions concerning the operation of your unit or the information in this manual, contact JULABO.

Performance of installation, operation, or maintenance procedures other than those described in this manual may result in a hazardous situation and may void the manufacturer's warranty.

Transport the unit with care. Sudden jolts or drops may cause damages in the interior of the unit.

Observe all warning labels. Never remove warning labels.

Never operate damaged or leaking equipment.

Never operate the unit without bath fluid in the bath.

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.

Refer service and repairs to a qualified technician.

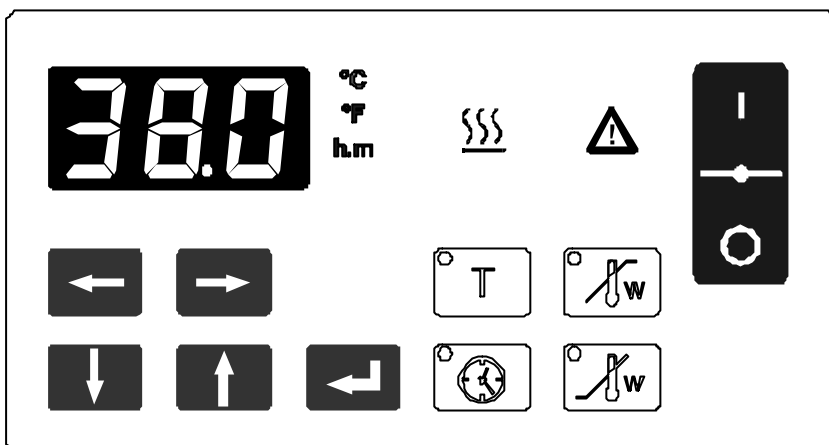


















In addition to the safety warnings listed above, warnings are posted throughout the manual. These warnings are designated by an exclamation mark inside an equilateral triangle. Read and follow these important instructions. Failure to observe these instructions can result in permanent damage to the unit, significant property damage, personal injury or death.

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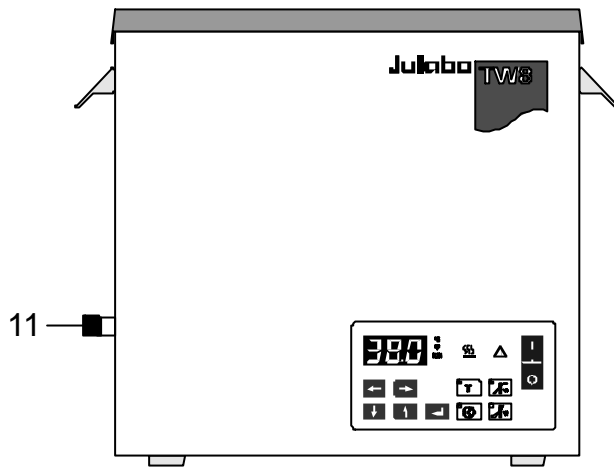
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1. OPERATING CONTROLS AND FUNCTIONAL ELEMENTS

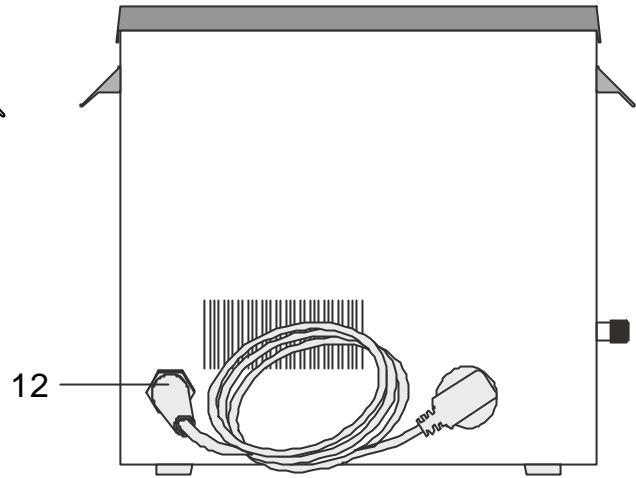


- 1  Mains power switch, illuminated
 -  on
 -  off
- 2  Working temperature
- 3  High temperature warning limit
- 4  Low temperature warning limit
- 5  Operating hours indicator key
- 6 Indication:
 -  
 - MULTI-DISPLAY (LED)
Temperature display optionally in °C or °F; time display in h:m. The corresponding symbol will illuminate on selection.
 - 
 - Indicator light - Alarm red illuminated
 - 
 - Indicator light - Heating yellow illuminated
- 7   Cursors left/right
- 8   Edit keys (increase/decrease setting)
- 9  Enter key (store/quitting the audible signal)

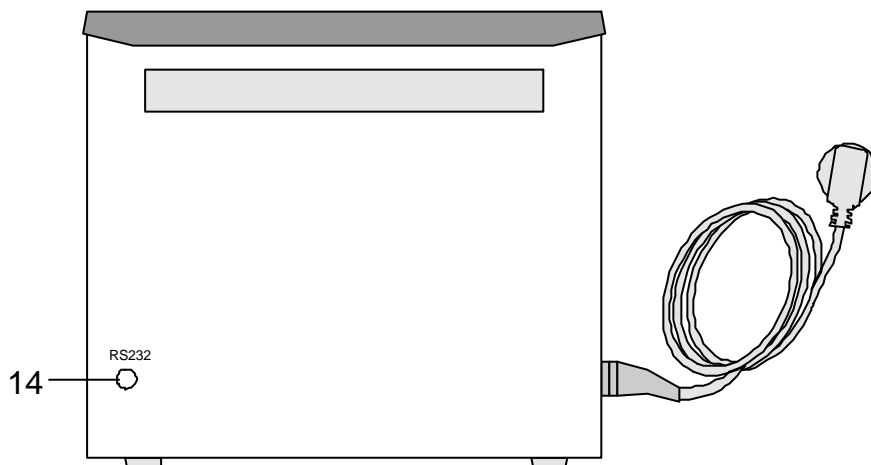
Front view



Rear view



Side view



- 11 Drainage screw
Connector for liquid level/cooling set (accessory)
- 12 Mains power cable with plug
- 14 RS232C interface

2. 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 9001:1994-08.

Certificate Registration No. QA 051004008.

3. DESCRIPTION

JULABO water baths serve to ensure a constant water temperature within the defined working range, and may be used up to the boiling point of the media in use, preferably with water.

JULABO water baths of the series EcoTemp TW8, TW12, TW20 consist of a stainless steel inside lining, containing heater, temperature sensor and the overtemperature protection safety element.

The units are operated via a water protected foil keypad with integrated mains switch. Microprocessor technology enables selection and storage of different temperature values and operating times, and display of them in the LED-MULTI-DISPLAY. The self-optimizing electronic PID-control circuit automatically adjusts the heat supply to the value required by the bath.

The RS232C port permits modern process engineering without additional interface, directly on-line, from the waterbath to your application equipment. The overtemperature protection to DIN 12876-1: 2000 is a safety feature with a fixed safety value of 130 °C. It functions independent of the regulator circuit.

The waterbaths conform to the safety requirements specified by DIN 12876-1: 2000 (class I), as well as DIN 12876-2: 1999/12, the guideline for first voltage range EN 61010.



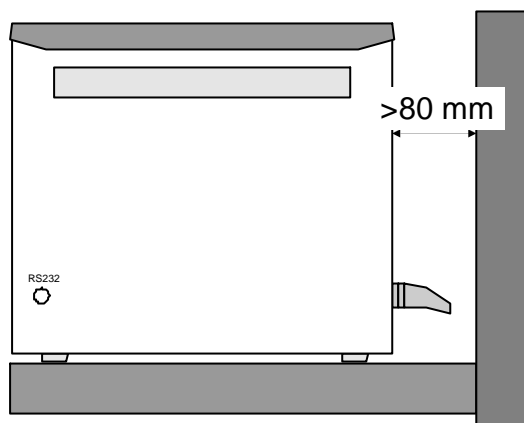
The safety classification 1 permits unattended operation with non-flammable bath liquids!

4. UNPACKING AND CHECKING

Unpack the waterbath 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.

5. PREPARATIONS

5.1. Installation



Place the waterbath in an upright position.

Keep a wall distance of minimum 80 mm.

5.2. Bath liquid

- **Recommended bath liquid:** Water



Do not use flammable bath liquids!
No liability for use of other bath liquids!



The temperature controlling i.e. immersing of test tubes, Erlenmeyer flasks or similar objects directly within the circulator constitutes normal circulator practise.

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

You alone are responsible for the handling of these substances!



Note:

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

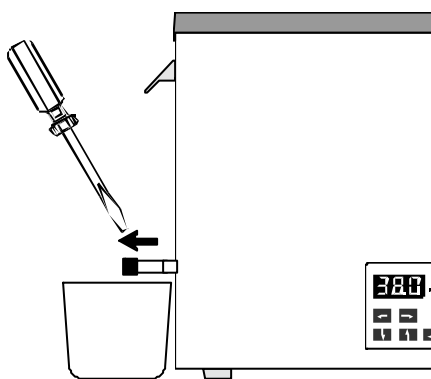
5.3. Filling / Draining

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
- 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.



Exercise CAUTION when emptying hot bath liquids!

Recommendation:

Use the water bath cover to keep temperature losses to a minimum. This is especially important for working temperatures above 70 °C.

Lift-up Makrolon[®] covers

Order numbers:

TW8

TW12

TW20

8 970 286

8 970 287

8 970 288

Flat bath covers

Flat water bath covers of stainless steel with round opening and ring-type inserts are alternatively available (accessory components).

5.4. Maintaining a constant water level / Countercooling

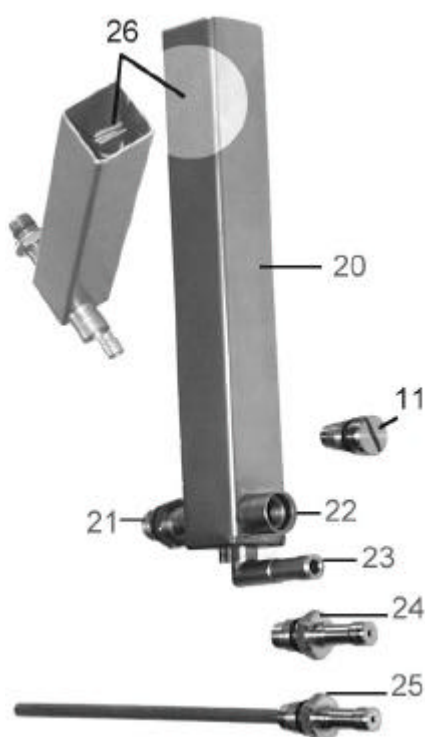
For cooling tasks near the ambient air temperature the liquid level/cooling set can be used for countercooling.

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.

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

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 |

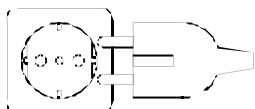


6. OPERATING PROCEDURES

6.1. Power connection

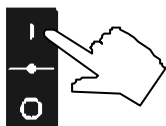


**Connect the unit only to a grounded mains power socket!
We disclaim all liability for damage caused by incorrect line voltages!**



Check to make sure that the line voltage matches the supply voltage specified on the identification plate. Deviations of $\pm 10\%$ are permissible.

7. SWITCHING ON



Switching on:

Turn on the mains power switch.

The unit performs a self-test. All segments of the 4-digit MULTI-DISPLAY (LED) and all indicator lights will illuminate.



Then the software version (example: n 0.0) appears.



Together with the display of the water bath temperature the operating state is also displayed.

(Example: 18.6 °C)

The monitor lamp  illuminates when the heater is in operation (on).



Notes:

- Adjustable parameters and temperature values are retained and the electronic timer is reset to zero when the equipment is switched off.

When the water bath is operating under remote control at the time of switchoff (connected to PC via RS-232 interface connection), the MULTI-DISPLAY (LED) will display the message „OFF“.

(see chapter 8.3. Setup for remote control)

7.1. Setting the temperature







Display and adjustment of the working temperature:


- ① Press the setpoint key .

The indicator light **blinks** and the value previously set appears on the MULTI-DISPLAY (LED).
(example: 25.0 °C).

If no further key is pressed the display will return to show the actual bath temperature after approx. 8 seconds.

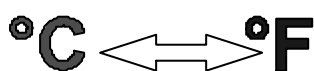
- ② Use the cursor keys   to move left or right on the display until the numeral you wish to change is blinking.

- ③ Use the increase/decrease arrows   to change the selected numeral (0, 1, 2, 3, ... 9).

- ④ Press enter  to store the selected value
(example: 38.0 °C).

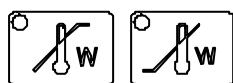


The working temperature is maintained constant after a short heat-up time (e. g. 38.0 °C).



If temperature display in °F is desired, switch to the menu level and select the option „temperature display“ (see page 14).

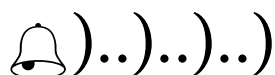
7.2. Warning functions or temperature limit



More protection for your samples in the bath!

As soon as the actual temperature leaves one of the pre-adjusted limits, this status is evaluated.

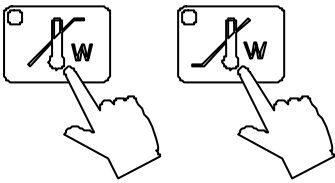
The high- and low-temperature limit can be evaluated in two ways (see page 18).





1. As pure warning function with an acoustic signal in regular intervals. (Signal - Pause)
(DBGM: G94 10 134.5)



2. As temperature limit by switching-off the heating and alarm.








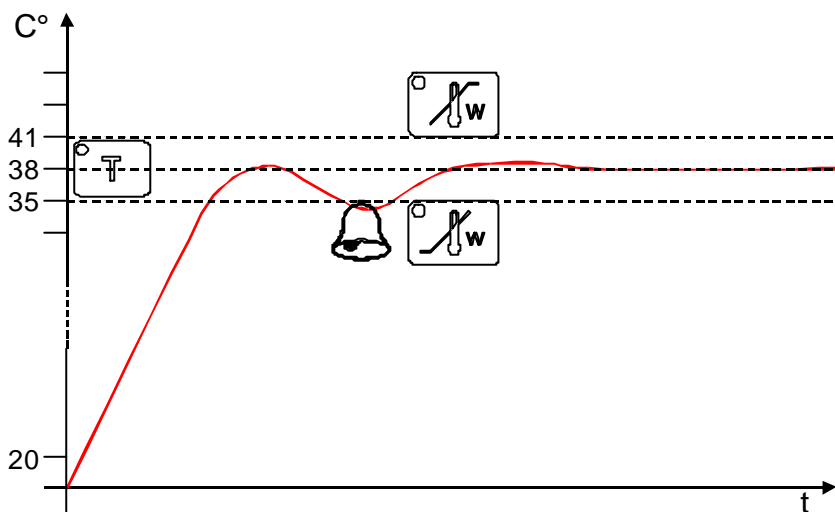
Display and adjustment of over-/undertemperature:

- ① Press the key  (example: 41 °C)
or
 (example: 35 °C).

The indicator light **blinks** and the value previously set appears on the MULTI-DISPLAY (LED).

If no further key is pressed the display will return to show the actual bath temperature after approx. 8 seconds.

- ② Use the cursor keys   to move left or right on the display until the numeral you wish to change is blinking.
- ③ Use the increase/decrease arrows   to change the selected numeral (0, 1, 2, 3, ... 9).
- ④ Press enter  to store the selected value



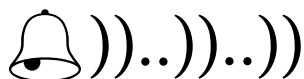
Note:

The warning functions will be activated only after the bath temperature has remained for at least 3 seconds within the adjusted threshold values after the equipment is switched on.

7.3. Electronic timer

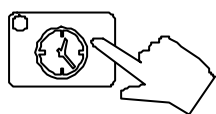
The electronic timer enables adjustment of the operating time up to a maximum of 9 hours and 59 minutes.

Countdown then commences to zero, at which time an acoustical time signal will be issued in intervals (double signal - pause).



- the equipment will not be switched off -



Display and adjustment of the operating time:





- ① Press the key .


The indicator light **blinks** and the MULTI-DISPLAY (LED) will display the remaining operating time (example: 4.28 h:m).

If no further key is pressed the display will return to show the actual bath temperature after approx. 8 seconds.

- ② Use the cursor keys   to move left or right on the MULTI-DISPLAY (LED) until the numeral you wish to change is blinking.

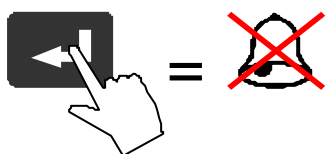
- ③ Use the edit keys   to increase or decrease the numeral value (0, 1, 2, 3, ... 9).



- ④ Press enter  to store the value when the countdown will commence. During that time the monitor lamp (control lamp) will remain permanently illuminated.

When the operating time is expired an acoustical time signal is issued in intervals.

Cancellation of the time signal:



Press enter  to silence the time signal.



Notes:

- Following switch-on of the equipment and after a power failure, the timer will show 0:00 h:m.
- When the equipment is operating remotely controlled the timer is rendered inoperative.

8. MENU FUNCTIONS

Adjustment of parameters which, in most instances, need only be adjusted once, are performed on the water bath at menu level.

1. MULTI-DISPLAY temperature display in °C or °F
2. ATC (absolute temperature calibration)
3. Switchover to remote controlled operation
4. Adjustment of interface parameters
5. Adjustment of the high and low temperature limit. Choice between pure warning function or a temperature limit by switching off the heating.










Selecting/exiting the menu level.

- Simultaneously
press the cursor key  and enter .

8.1. Temperature indication in °C or °F

The working temperature can be displayed in the MULTI-DISPLAY (LED) in °C or °F as desired.



- ❶ Press  and  **at the same time.**
- ❷ Use the cursor keys   to select the menu option „temperature display“
(example: „t C“ = temperature display in °C).
- ❸ Select the alternative state with the edit keys  
and confirm the selection with the ENTER key .
The display now shows „t F“ = temperature display in °F.
- ❹ Press  and  **at the same time.**

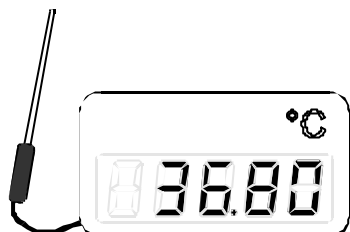
Switchover to the selected display mode takes place automatically upon leaving the menu level.

8.2. ATC - Absolute Temperature Calibration

37.0 °C

Internal sensor (T_F)

ATC serves to compensate a temperature difference that might occur between circulator and a defined measuring point in the bath tank because of physical properties.



The difference temperature is determined ($\Delta T = T_M - T_T$) and stored as correcting factor (example $\Delta T = -0.2$ °C).

Measuring point (T_M)

At0

At1

- ① Press the cursor key and enter **at the same time.**
- ② Use the cursor keys to select the menu option „At0“.
- ③ With the edit keys select "At1" and then press enter .

Enter the corrective value.

-0.2 °C

- ④ Using the cursor keys and the edit keys set the correcting factor (example -0.20 °C) and then press enter .

37.0 °C

Measuring point

- ⑤ Press and **at the same time.**

The temperature on the measuring point rises to a temperature of 37.0 °C and is indicated on the MULTI-DISPLAY (LED)..



The ATC function stays activated until resetting to 00.0 °C.



Recommendation:








Use a calibrated temperature measuring instrument.

8.3. Setup for remote control

If the water bath is to be remotely controlled or monitored, the parameter of the menu option REMOTE must be changed and set from **0** to **1**.

REMOTE 0 = Keypad control
1 = Remote control via RS232 interface












- ❶ Press  and  **at the same time.**
- ❷ Use the cursor keys   to select the menu option REMOTE (display „r 0“).
- ❸ Select the alternative state with the edit keys   and confirm the selection with the ENTER key  (display „r 1“).

The water bath will switch to the REMOTE „STOP“ condition and the MULTI-DISPLAY will show the message „OFF“.

- ❹ Press  and  **at the same time.**

8.4. Adjusting interface parameters

Correct data transmission takes place only when the interface parameters of PC and water bath are identical.

- ❶ Press  and  at the same time.
- ❷ Use the cursor keys   to select the desired menu option (BAUDRATE, PARITY, HANDSHAKE).
- ❸ Select the alternative state with the edit keys   and confirm the selection with the ENTER key .
- ❹ Press  and  at the same time.

Adjustable interface parameters



BAUDRATE 48 = 4800 bauds *
 96 = 9600 bauds



PARITY 0 = no parity
 1 = odd parity
 2 = even parity *



HANDSHAKE
 0 = Protocol Xon/Xoff (software handshake)
 1 = without handshake *
 Data bits = 7; Stop bit = 1 *

(*Factory setting)



Like all parameters which can be entered through the keypad, interface parameters are stored in memory even after the circulator is turned off.

8.5. Evaluation of the temperature limits

The high- and low-temperature limit can be adjusted in two ways (see page 11)



1. As pure warning function with an acoustic warning signal in regular intervals.
Adjustment „Li 0“ – factory adjustment



2. As temperature limit by switching-off the heating.
Adjustment „Li 1“
The alarm is indicated by optical and audible signals (continuous tone) and on the MULTI-DISPLAY (LED) appears the error message "Error 01".

- 1 Press and at the same time.
- 2 Use the cursor keys to select the menu option Limit. (example: „Li 0“).
- 3 Select the alternative state with the edit keys and confirm the selection with the ENTER key (display „Li 1“).
- 4 Press and at the same time.

9. SAFETY INSTALLATION (WITH SHUTDOWN FUNCTION)

(excess temperature protection)



These safety installations is independent of the control circuit. When the temperature of the bath liquid has reached the safety temperature, a complete shutdown of the heater is effected.

The alarm is indicated by optical and audible signals (continuous tone) and on the MULTI-DISPLAY (LED) appears the error message "Error **01**".

10. TROUBLESHOOTING GUIDE / ERROR MESSAGES



Whenever the microprocessor electronics registers a failure, a complete shutdown of the heater is performed.

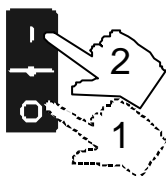
The alarm light "⚠" illuminates and a continuous signal tone sounds.



- Cause:
The waterbath is operated without bath liquid, or the liquid level is insufficient
or
The adjusted temperature limit was exceeded or the temperature fell below the limit..
- Remedy: Replenish the bath tank with the bath liquid. Control the adjustment of the temperature limit. Get to safety the samples.



}
}
} other errors
}



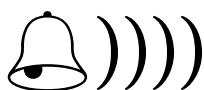
After eliminating the malfunction, press the mains power switch off and on again to cancel the alarm state.
If the unit cannot be returned to operation, contact an authorized JULABO service station.

10.1. Acoustical signals and their differentiation

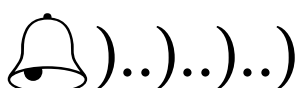
Three different signals are generated by the sound generator as follows:

- an alarm signal
- a warning signal
- a time signal

The signals can easily be recognized and differentiated, even from a good distance. Required actions can be initiated immediately.



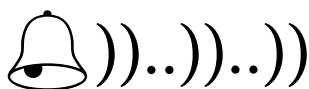
- The Alarm signal is a continuous sound signal.
The heater is completely and permanently switched off.
(see page 19)



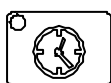
- The warning signal is issued at regular intervals (signal - pause - signal - pause).



The actual bath temperature is higher than the set overtemperature value or lower than the set undertemperature value.
(see page 11)



- The time signal is issued in the intervals (double signal - pause - double signal - pause).

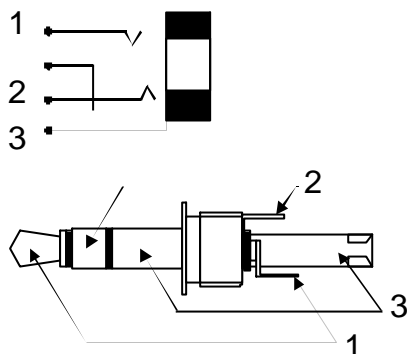


Countdown of the adjusted operating time commences to zero, after which a time signal is issued at intervals
(see page 13)

11. ELECTRICAL CONNECTION

RS232C serial interface

This port can be used to connect a computer with an RS232C cable for remote control of the waterbath.

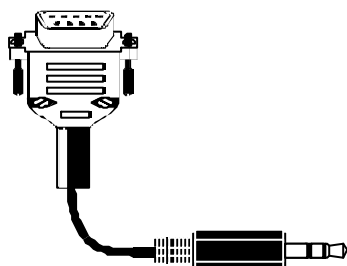


Pin assignment:

Pin 1	RxD	Receive Data
Pin 2	TxD	Transmit Data
Pin 3	0 VD	Signal GND



Use shielded cables only.



Accessories:

RS-232 interface connecting cable, terminated with 3-pin Cinch plug and 9 hole subD socket. Length: 3.0 m.

Order No. 8 980 075

12. REMOTE CONTROL

12.1. Communication with a PC or a superordinated data system

Suitable terminal programs for communicating with a PC are:

MS-Windows	- Terminal.EXE (included with MS-Windows).
MS-DOS	- Procomm Plus, Datastrom Technologies.
MS-DOS	- Norton Utilities.

If the waterbath is put into remote control mode via the menu level, the display will read "OFF" = REMOTE STOP. (see page 16).

The waterbath is now operated via the computer.

In general, the computer (master) sends commands to the waterbath(slave). The waterbath sends data (including error messages) only when the computer asks for it.

A transfer sequence consists of:

- command
 - space (\Leftrightarrow ; Hex: 20)
 - parameter (the character separating decimals in a group is the period)
- end of file (\Leftarrow ; Hex: 0D)

The commands are divided into **in** or **out** commands.

in commands: asking for parameters to be displayed

out commands: setting parameters







The **out** commands are valid only in remote control mode.

Examples:

- Command to set the working temperature T to 55.5 °C:
out_sp_00 \Leftrightarrow **55.5** ζ
- Command to ask for the working temperature T:
in_sp_00 ζ
- Response from the waterbath:
55.5 ζ



12.2. List of commands

Command	Parameter	Response of the waterbath
version	none	Number of software version(V X.xx)
status	none	Status message, error message (see below)
out_mode_05	0	STOP - returns the water bath to the „OFF“ state
out_mode_05	1	START - water bath is switched to the operating state
out_sp_00	xxx.x	Set working temperature „T“
out_sp_02	xxx.x	Set high temperature warning limit  w
out_sp_03	xxx.x	Set low temperature warning limit  w
in_sp_00	none	Ask for working temperature „T“
in_sp_02	none	Ask for high temperature warning limit  w
in_sp_03	none	Ask for low temperature warning limit  w
in_pv_00	none	Ask for actual bath temperature
in_pv_01	none	Ask for the heater wattage being used

12.3. Status messages

Message	Description
01 MANUAL START	Waterbath in keypad control mode.
02 REMOTE STOP	Waterbath in „OFF“ state
03 REMOTE START	Waterbath in remote control mode

12.4. Error messages

Message	Description
-01 TEMP / LEVEL ALARM	Safety temperature or low liquid level alarm
-03 EXCESS TEMPERATURE WARNING	High temperature warning „  „
-04 LOW TEMPERATURE WARNING	Low temperature warning „  „
-05 TEMPERATURE MEASUREMENT ALARM	Error in measuring system
-07 I ² C-BUS WRITE ERROR -07 I ² C-BUS READ ERROR -07 I ² C-BUS READ/WRITE ERROR	Internal error
-08 INVALID COMMAND	Invalid command
-10 VALUE TOO SMALL	Entered value too small
-11 VALUE TOO LARGE	Entered value too large
-12 WARNING : VALUE EXCEEDS TEMPERATURE LIMITS	Value lies outside the adjusted range for the high and low temperature warning limits. But value is stored.
-13 COMMAND NOT ALLOWED IN CURRENT OPERATING MODE	Invalid command in current operating mode

13. OPERATING SAFETY / MAINTENANCE

JULABO Water Baths are designed for continuous operation under normal conditions. Periodic maintenance of the units is not required.

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

Repairs

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

When returning a unit, take care of careful and adequate packing. JULABO is not responsible for damages that might occur from insufficient packing.



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!

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!

13.1. Cleaning the unit



Before cleaning the unit, disconnect the power plug from the mains socket!

Use water (with a low surface tension, e.g., soap) for cleaning the bath.

Clean the unit housing with a moist cloth.

14. TECHNICAL DATA

EcoTemp Series		TW8	TW12	TW20
Working temperature range	°C	25 ... 99.9	25 ... 99.9	25 ... 99.9
with water cooling	°C	20 ... 99.9	20 ... 99.9	20 ... 99.9
MULTI-DISPLAY (LED)				
Resolution	°C	0.1	0.1	0.1
Temperature stability	°C	±0.2	±0.2	±0.2
Computer interface		RS232	RS232	RS232
Electronic timer	h:min	0:01 ... 9:59	0:01 ... 9:59	0:01 ... 9:59
Heater wattage (230 V / 115 V)	W	2000/1000	2000/1000	2000/1000
Bath opening(B x L)	cm	23 x 27	35 x 27	50 x 30
Bath depth	cm	14	14	18
Filling volume	liters	3 ... 8	5 ... 12	8 ... 22
Overall dimensions (B x T x H)	cm	29 x 32 x 28	40 x 32 x 28	56 x 35 x 32
with Makrolon [®] cover	cm	29 x 32 x 45	40 x 32 x 45	56 x 35 x 49
Weight	kg	10	11	20
Mains power connection ±10 %	V/Hz		230/50 or 115/60	
Total power consumption	W		2010 or 1010	

Safety installations according to IEC 61010-2-010:

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

High temperature warning function	optical + audible (in intervals)
Low temperature warning function	optical + audible (in intervals)
Timer	audible (in intervals)
Protection class	IP43 acc. to IEC 529

Standards:

EMC regulations	EN 61326
Guideline for first voltage range	EN 61010-1, EN 61010-2-010

All measurements have been carried out at: (DIN 12876-2: 1999/12)

rated voltage and frequency
 ambient temperature: 20°C;
 operating temperature: 70°C;
 bath liquid: water

15. EC DECLARATION OF CONFORMITY



The following unit complies with the essential safety requirements outlined by the EC Directives concerning the guidelines for electromagnetic compatibility (89/336/EEC) and for the low voltage regulations (73/23/EEC).

Water baths: TW8, TW12, TW20

This unit is manufactured in compliance with the following guidelines

electrical equipment for control technology and laboratory application –
EMC requirements outlined by

EN 61326

safety regulation for electrical devices for measuring, control and
laboratory application specified by

EN 61010

Julabo
Julabo Labortechnik GmbH
Eisenbahnstr. 45
D-77960 Seelbach / Germany

A handwritten signature in black ink, appearing to read 'G. Juchheim', written in a cursive style.

G. Juchheim, Managing Director

16. 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.