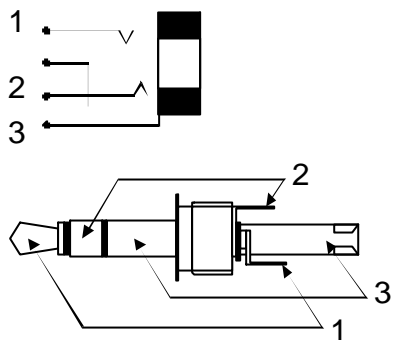


11. ELECTRICAL CONNECTION

RS232C serial interface

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

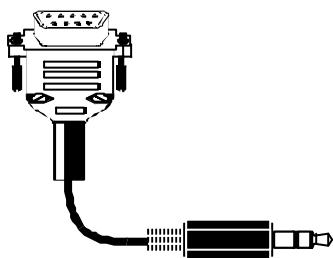


Pin assignment:

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: 2.5 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 (↔; Hex: 20)
- parameter (the character separating decimals in a group is the period)

end of file (↵; 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 Ū 55.5;
- Command to ask for the working temperature T:
in_sp_00;
- Response from the waterbath:
55.5;



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 T_w
out_sp_03	xxx.x	Set low temperature warning limit T_w
in_sp_00	none	Ask for working temperature „T“
in_sp_02	none	Ask for high temperature warning limit T_w
in_sp_03	none	Ask for low temperature warning limit T_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 ...100	25 ...100	25 ...100
with water cooling	°C	20 ...100	20 ...100	20 ...100
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	18
Mains power connection ±10 %V/Hz		230/50 or 115/60		
Total power consumption	W	2010 or 1010		

Safety installations DIN 12876-1: 2000

Excess temperature protection	130 °C - fixed value
Alarm indication	optical + audible (continuous tone)
Safety 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 50081-2 / EN 50082-2
Guideline for first voltage range	EN 61010

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. WARRANTY CONDITIONS

JULABO USA, Inc. 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 no less than

ONE YEAR

from the date of delivery of the products. To avoid forfeiture of the warranty and to allow JULABO to be of continuing service to the scientific community, the record of purchase is required to be returned to JULABO or one of its authorized representatives within 30 days of receipt of equipment.

JULABO's sole obligation shall be to repair or to replace at JULABO's option, F.O.B. its plant or locally, without charge, any part(s) that prove defective within the warranty period, providing the customer notifies JULABO promptly and in writing of any such defect. Compensation for labor by other than JULABO's employees will not be JULABO's obligation. Part(s) replacement does not constitute an extension of the original warranty period.

JULABO will not assume responsibility for unauthorized product modifications, or for repairs, replacements, or modifications negligently or otherwise improperly made or performed by persons other than JULABO employees or authorized representatives.

JULABO MAKES NO WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, AS TO THE DESIGN, SALE, INSTALLATION, OR USE OF ITS PRODUCTS, AND SHALL NOT BE LIABLE FOR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF ITS PRODUCTS.

While JULABO's personnel or that of its authorized representatives are available to advise customers concerning general applications of all manufactured products, oral representations are not warranties with respect to particular applications, and should not be relied upon if inconsistent with product specifications or the terms stated herein.

All glassware, such as reference thermometers, etc, are expressly excluded from this warranty declaration.

In any event, the terms and conditions contained in JULABO's formal sales contracts shall be controlling and any change must be in writing and signed by an authorized executive of JULABO USA, Inc.