



# TE400 Peltier Chiller

## Operating Manual

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## 1 Introduction

### **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 operation and possible applications of our circulators. For optimal utilization of all functions, we recommend that you thoroughly study this manual prior to beginning operation.

The TE 400 is a new generation recirculating chiller designed for precise temperature control of analytical instrumentation, industrial lasers and imaging. The TE 400 is a thermoelectricbased recirculating chiller with few moving parts offering solid-state construction and high reliability. It is also environmentally friendly as no hazardous refrigerants are used. Innovating heat dissipation technologies in conjunction with optimized thermoelectric cooler modules have been incorporated into the design to offer a compact solution with high cooling capacity. The pump offers sufficient flow with low pulsation for low pressure drop applications and uses ceramic bearings to assure long life operation.

This chiller offers an LCD touchscreen display for easy user interface to set temperature, alarm features and monitor coolant supply temperature. The programmable alarm offers freeze protection and can alert users when fluid level falls below normal operating conditions. If a critical component fails, such as the fan or pump, the unit will operate in a safe mode. This TE 400 uses a semi-closed system with a large reservoir tank to reduce the coolant maintenance and comes with quick disconnect liquid connections to simplify hood up to supply line.

This user manual provides necessary information to the customer for proper installation, operation, communication, and maintenance of the chiller.

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## 2 About this manual

This manual is intended for the equipment specified on the cover page.



### NOTE

#### **Observe the safety instructions!**

Read the Safety section of this manual before using the equipment for the first time.

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### 2.1 Original JULABO spare parts

Hassle-free continuous operation and safety also depend on the quality of the spare parts used.

Only original JULABO spare parts guarantee the highest possible quality and safety. Original JULABO spare parts are available directly from JULABO or your specialist dealer.

Please note that JULABO cannot provide a warranty service if non-original JULABO spare parts are used.

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### 2.2 Accessories

JULABO offers a wide range of accessories for the devices. Accessories are not described in this manual.


The complete range of accessories for the devices described in this manual can be found on our website **[www.julabo.us](http://www.julabo.us)**. Use the Search function on the website.


## 2.3 Warnings


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The manual contains warnings to increase safety when using the device. Warnings must always be observed.

A warning sign displayed in signal color precedes the signal word. The signal word, highlighted in color, specifies the severity of the hazard.

	<b><i>DANGER</i></b>
	This signal word designates a danger with a high level of risk which, if it not prevented, will result in death or serious injuries.

	<b><i>WARNING</i></b>
	This signal word designates a danger with a medium level of risk which, if it not prevented, may result in death or serious injuries.

	<b><i>CAUTION</i></b>
	This signal word designates a danger with a low level of risk which, if it not prevented, may result in minor to moderate injuries.

	<b><i>NOTE</i></b>
	This signal word designates a possibly harmful situation. If it is not avoided, the system or objects in its vicinity may be damaged.

## 2.4 Symbols used

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Various symbols are used throughout this manual to aid reading comprehension. This list describes the symbols used.

- ✂ Tools needed for the following approach
- ▶ Prerequisite to be met for the following procedure
- 1. Numbered action steps
- ↪ Interim result for individual action steps
- Ⓢ Additional note for individual action steps
- ✓ Final result of a procedure
- <> Terms in angle brackets denote control menu
- [] Terms in square brackets denote keys, softkeys and buttons



## **3 Safety Precautions**

This section provides an overview of all the important safety aspects for optimal protection of personnel as well as safe and trouble-free operation of the equipment.

The operating manual and warning instructions specified herein should be reviewed completely by all personnel prior to operating the unit. Disregarding instructions within this manual may result in considerable danger.

### **3.1 Guidelines for Safe Operation**

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#### **3.1.1 Prevent Hazards**

Hazards can be prevented by safety-conscious and anticipatory behavior of staff. Individuals working with the unit should keep the following in mind:

- Always keep a complete and legible copy of this operating manual (or the location at which it can be found) available at the installation site of the unit.
- Use personal protection equipment.
- Unit personnel must be familiar with all operating elements of the unit before starting work on the unit.
- Only use the unit for its intended purpose.
- Conduct inspections on a regular basis and ensure the unit is operational and free of damage.
- All unit warning and information signs must be kept in legible condition. If a warning or information sign is lost or illegible, it must be replaced.
- Unit repairs may be carried out by qualified personnel only.
- Any disruption or recognizable change concerning the unit should be reported to the responsible person.
- Adhere to the accident prevention regulations as well as any regional regulations.

### 3.1.2 Personal Protective Gear

To minimize health hazards, wearing personal protective gear is required when handling the unit. The following personal protective gear must always be worn when handling the unit:



#### Protective footwear

For protection from falling parts and to prevent slipping.

When cleaning or performing maintenance or repair work on the unit, the following specific personal protective gear is required:



#### Protective gloves



To protect the hands from rubbing, abrasions, cuts, or more serious injuries. To prevent burns when touching hot coolant.



#### Protective eyewear

To protect the eyes against flying parts or splashing coolant.

### 3.1.3 Guidelines Regarding Electrical Equipment

 	<b><i>DANGER</i></b>
	<p><b>Electrical danger!</b></p> <p>Work on electrical installations must be carried out only by trained and authorized electricians.</p> <ul style="list-style-type: none"><li>• Observe all regional regulations when connecting electrical equipment to mains. Be aware of the connection diagram information.</li><li>• Electrical shock hazards exist if the electrical installations are defective or the insulation fails during operation.</li><li>• Switch off and disconnect the unit from the electrical mains and follow Lockout-Tagout procedures whenever conducting service work.</li><li>• Ensure continuity to ground and isolation from power lines.</li><li>• Any changes regarding the operation of the unit can have an influence on safe operation. All intended changes should be authorized by the manufacturer prior to implementation.</li><li>• Keep unauthorized persons away from the working area.</li></ul>

### 3.1.4 Inadmissible Operating Conditions

Operating the unit under improper conditions is not permitted as the operator's safety cannot be guaranteed. Some operating conditions not permitted are the following:

- Using the unit for a purpose other than its intended use
- Using of the unit when any part of it is damaged, not working properly, the electrical installation is not correct, or the electrical insulation is damaged
- Protective or safety equipment is non-functional, defective, improperly installed, or missing
- The unit or operating parameters were modified without consulting the manufacturer
- Operation in areas exposed to explosion hazards
- Operation without a cooling media not recommended by the manufacturer
- Any equipment connected to RS232 must be certified to IEC 61010-1/ IEC 60950-1/ IEC 623681 should be connected to the DB-9 port.
- Only JULABO approved cable must be used to connect Flow meter to the unit. Refer to [Spare Parts](#) to order this cable.
- High Temperature Limit on Coolant Return - The maximum allowable coolant return (inlet) is 50°C. It is the responsibility of the customer to ensure that this limit is not exceeded. JULABO recommends a thermal shutoff be used in conjunction with the equipment being connected to the Recirculating Chiller. Methods include:
  - A method to turn off the heat load from injecting additional heat into the coolant. This will allow the Recirculating Chiller to reduce the temperature of the coolant further until stable.
  - A method that stops or restricts the coolant flow into the Recirculating Chiller. This will result in a Coolant High Pressure alarm, which will shut down the system for safety.
  - A method that interrupts the power to the Recirculating Chiller.


If any of these methods are activated, please reference the [Alarms](#) section.



#### NOTE

The manufacturer is not liable for damage occurring when using the unit in a way it was not intended. This also voids JULABO' warranty.

### 3.1.5 Specialized Knowledge

	<b>NOTE</b>
	<p><b>Authorized persons!</b>                  Servicing the unit is limited to individuals with adequate knowledge and training pertaining to the required area of service. In some circumstances licensed professionals are required to perform the required service work.</p>

The activities listed *Table 1* in may only be performed by personnel with specialized knowledge.

Activities	Qualifications
Working on mechanical and / or hydraulic installations	Industrial technician or sufficiently instructed personnel who can work on the unit under the guidance of the manufacturer’s technical support or installation instructions
Working on electrical installations and equipment	Skilled and licensed electrician
Working on refrigeration components and systems	Skilled and licensed refrigeration technician

Table 4 Activities and specialized knowledge

## 3.2 Safety and Signaling Equipment Included in the Unit

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The unit is equipped with the following safety equipment:

- The minimum coolant level in the system is detected by a 'low fluid level' alarm condition triggered by an optical level switch. When the coolant level drops below the LOW" level marking on the front of the chassis, the controller shuts off the entire unit.
- Controller has a freeze protection incorporated into the LCD. The default temperature selection that can be made is only 10C to 40C, when the coolant selected by the customer is water (default). Depending on the other coolant options selected the setpoint temperature can be selected to below 10C value. More details are given under Choosing the Coolant
- The coolant supply temperature is monitored by the controller. There are two temperature delta alarms monitoring this. The low temperature delta alarm alerts the customer if the coolant supply temperature is not within certain pre-specified temperature delta below the temperature set point in a specified amount of time, after starting the unit or changing the set point. Similarly, the high temperature delta alarm alerts the customer if the coolant supply temperature is not within certain pre-specified temperature delta above the temperature set point in a specified amount of time after starting the unit or changing the set point.

## 3.3 In Case of Accidents

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Should you or another person be injured when working with the unit, do the following:

- Stay calm
- Perform first aid
- Always call the company's first aid personnel
- If necessary, call the applicable emergency number

## 3.4 Environmental Issues

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Environmentally conscious and anticipatory behavior of staff helps avoid environmentally hazardous events. The following apply for environmentally conscious behavior:

- Environmentally hazardous substances must be stored in appropriate containers to avoid releasing them into the soil or drainage systems.
- Environmentally hazardous substances must be used or disposed of according to regional regulations.
- When dealing with working fluids, always be aware of the safety data sheet of the corresponding manufacturer.

## 4 Specifications

<b>TECHNICAL SPECIFICATIONS</b>	
<b>Model</b>	<b>TE 400</b>
<b>Performance</b>	
Cooling Capacity	400 Watts (Boost Mode)
Setpoint Range	-5°C to 40°C
Temperature Stability	±0.05°C
Maximum forward pressure	1.2 bar
Maximum Flow rate	7 lpm
<b>Storage</b>	
Temperature, w/o coolant	0°C to 50°C
Humidity	5% to 95%, non-condensing
<b>Operation</b>	
Coolant	Water or Water/Glycol
Temperature <sup>2</sup>	10°C to 40°C
Relative Humidity	35% to 85%
Altitude	2,000 meters
Location	Indoor use
<b>Input</b>	
Voltage <sup>1</sup>	115 – 230 VAC
Current	2.17-4.35 A
Frequency	50/60 Hz

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<b>Physical</b>	
Dimensions, W x D x H	413 X 274 x 400 mm
Weight (w/o coolant)	21 kg
Coolant Capacity	1 L
Pump connection	M16x1 Male thread
<b>Compliance</b>	UL Mark for Laboratory Equipment (ANSI / UL / CSA / IEC EN 61010-1 Edition 3)

<sup>1</sup> Nominal capacity rating is given at a 20°C (68°F) setpoint, 20°C (68°F) ambient temperature, sea level, and 60Hz operation.

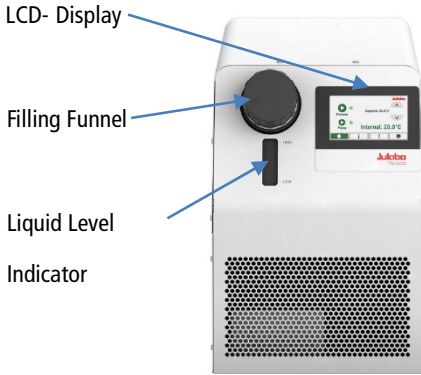
<sup>2</sup> For ambient conditions outside this range, please contact JULABO.



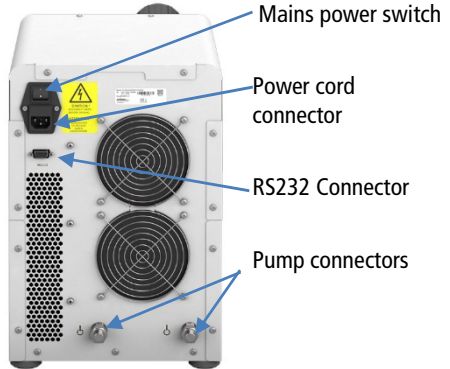
## 5 Component Locations



Isometric View



Front View



Rear View

## 6 Transport, Packaging and Storage

### 6.1 Safety



#### **WARNING**

##### **Damage due to improper transportation**

Injuries to persons and significant damage to property can occur in the case of improper transportation.

- When unloading the packed unit on delivery, including in-house transport, proceed very carefully and obey the symbols and instructions on the packaging.
- Do not remove the packaging until immediately before installing the unit.



#### **NOTE**

##### **Risk of damage through improper transportation**

The mounting suspensions of different components inside the unit are not secured with transportation locks. In the case of improper transportation, these can be damaged and would need to be replaced.

- Transport the unit upright.
- Unit is not to be subjected to mechanical impact.

### 6.2 Checking the Delivery Condition

If any transport damage is noticed, do the following:

- Refuse the delivery or accept it with reservation.
- Note extent of damage on the transport documents or on the delivery note.
- Inform the manufacturer immediately of any damage incurred during transport

### 6.3 Symbols on the Packaging

The symbols listed in *Table 2* attached to the packaging:

Symbol	Meaning
	<p><b>Top</b></p> <p>The arrows mark the top of the package.</p> <p>The package must be stored and transported in such a way that the arrows always point upwards.</p>
	<p><b>Fragile, Handle with Care</b></p> <p>This symbol indicates fragile, easily breakable goods.</p> <p>Goods marked with this symbol must be handled carefully and should never be rolled or tied tightly.</p>
	<p><b>Keep dry</b></p> <p>This symbol indicates goods which are sensitive to moisture/humidity.</p> <p>Goods marked with this symbol must be protected from overly high air humidity levels.</p>
 <p>DO NOT STACK ON TOP SIDE</p>	<p><b>Do not stack</b></p> <p>This symbol indicates that goods are sensitive to stacking</p>
 <p>HANDEL WITH CARE</p>	<p><b>Handle with care</b></p> <p>This symbol indicates that package must be handled with care</p>




Symbol	Meaning
	<p><b>Team lift</b></p> <p>This symbol indicates that two or more persons must be used for lifting as the package is heavy</p>
	<p><b>Keep Upright</b></p> <p>This symbol indicates the goods are sensitive to tilt. Goods marked with this symbol must not be tilted. If the symbol turns red, that means goods were tilted beyond 80° angle</p>

Table 5 Packaging symbols

## 6.4 Packaging

	<p><b>NOTE</b></p> <p><b>Hazard for environment due to improper disposal</b></p> <p>Packaging materials are valuable raw materials which can be reused in many cases or reconditioned and recycled.</p> <ul style="list-style-type: none"> <li>• Dispose of packaging materials in an environmentally friendly way.</li> <li>• Follow the locally valid waste disposal regulations. If necessary, employ a special waste disposal company to dispose of packaging materials.</li> </ul>
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The unit is packed according to the anticipated transportation conditions (such as packed in sealed plastic or cardboard box on a transport pallet). The packaging function is to protect the unit against damage and corrosion until installation. The packaging material should remain on the unit until just prior to installation. Packaging includes integrated ramp.


## 6.5 Unpacking


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Before unpacking the unit, use appropriate safety measures to make sure no person is injured in this process. Unit may be heavy.

## 6.6 Handling the Unit While in the Packaging

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	<b>WARNING</b>
	<p><b>Danger due to lifting and carrying heavy loads</b></p> <p>Manual handling of the loads (lifting, pushing, and carrying) must be avoided.</p> <ul style="list-style-type: none"><li>• Unit weight – Refer to <a href="#">Specifications</a>.</li><li>• Use only suitable means of transport (such as industrial truck or lift truck).</li></ul>

	<b>WARNING</b>
	<p><b>Danger of injury due to tipping or falling loads. Bruises. Bone fracture.</b></p> <p>When handling with industrial truck, observe the following basic rules:</p> <ul style="list-style-type: none"><li>• Wear personal protective gear (such as protective footwear and protective gloves).</li><li>• Do not walk or stand under a suspended load.</li><li>• Use only suitable means of transport (such as an industrial or lift truck).</li><li>• Use only industrial trucks with appropriate capacity for loading. Unit weight – Refer to <a href="#">Specifications</a>.</li><li>• Secure the unit so that it cannot tip or fall.</li></ul>

## 6.7 Storing the Unit

These storage conditions apply to the following:

- New units
- Units that were already in operation but will be temporarily out of operation. Refer to [Temporary Placing Out of Operation](#).

Store the units as follows:

- Completely drained of coolant to prevent possible damage due to freezing.
- Dry, dust-free environment, protected against direct sunlight
- According to required storage temperature and relative humidity. Refer to [Specifications](#).
- For storage that exceeds three months, it is recommended that the unit is placed inside its original packaging.

## 6.8 Preparing the Unit for Further Transport

For detailed information and specific instructions on how to prepare the unit, refer to [Safety Precautions](#).



### NOTE

#### **Risk of damage due to improper transportation**

A coolant that has not been drained or packaging with inappropriate dimensions may cause damage during transport.

- Drain the coolant before transporting the unit. Refer to [Draining Procedure](#).
- Use proper packaging.

### 6.8.1 Transporting the Unit (after use)

#### **Requirements**

- ▶ Unit is switched off and disconnected from the electrical power source
- ▶ Unit and coolant cooled to the ambient temperature
- ▶ Coolant is drained. Refer to [Draining Procedure](#).
- ▶ Coolant hoses disconnected from the unit. Refer to [Disconnect Hoses](#).

**Procedure**

1. Pack the unit according to the transport conditions that can be expected.
    - ↳ JULABO advises to use original packaging, if available, or an equivalent packaging..
  2. Mark the packaging with the appropriate symbols. Refer to [Symbols on the Packaging](#).
- ✓ The unit can now be transported.

## 7 Installation Requirements

Minimum Clearance from obstructions is required to ensure that air intake and air discharge is not blocked as this could affect cooling capacity:

- Front side: 40 cm
- Left side : 25 cm
- Right side: 25 cm
- Rear side: 40 cm

The location must be level.

When choosing the installation location, the following must be kept in mind:

- The flow of the cooling air must not be restricted.
- Coolant inlet and coolant outlet connections must be easily accessible.
- Power Cord must be easily accessible.
- All hoses must be installed without sharp bends

## 8 Installation Procedure

### 8.1 Connect Hoses



#### NOTE

##### **Risk of damage by using improper or faulty coolant hoses**

This may lead to damage to persons, damage to property, or corrosion damage.

- When choosing coolant hoses pay attention to burst pressure and compatibility with coolant.
- Only use coolant hoses without any signs of damage.
- If water is being used as coolant, ensure that non-transparent hoses are used to prevent algae growth in the water. Otherwise, appropriate additives must be used



#### NOTE

When connecting the coolant hoses pay attention to flow direction. Follow the documentation released by the manufacturer of the unit to be cooled.

Transparent coolant hoses increase algae growth and biofouling of the components in the unit, and this reduces the performance of the unit. Thus, only use non-transparent coolant hoses.

The coolant hoses are connected to the unit by M16x1 connections. Coolant inlet and coolant outlet are labeled with respective symbols.





Outlet

Inlet

Connecting Hoses

### Requirements

- ▶ Unit prepared for maintenance. Refer to Preparing the Unit for Maintenance
- ▶ Hoses

### Procedure

1. Remove the protection caps from the coolant inlet and coolant outlet connections of the unit.
  2. Connect an appropriate coolant hose to the coolant inlet and coolant outlet respectively.
  3. Connect the coolant hoses to the corresponding connections of the unit to be cooled.
- ✓ The coolant hoses are now connected to the unit.

## 8.2 Disconnect Hoses

---

The coolant hoses are connected to the unit at the coolant inlet and coolant outlet connections, labeled with respective symbols.

### Requirements

- ▶ Unit prepared for maintenance. Refer to [Preparing the Unit for Maintenance](#).
- ▶ Coolant cooled to the ambient temperature.

### Required Tools and Materials

- ✂ Absorbent cloth
- ✂ Bonding agent
- ✂ Protection caps

### Procedure

1. The coolant inlet and outlet fittings have M16x1 connections installed.  
Disconnect the hoses from coolant inlet and outlet fittings on the back of the unit.
- ✓ The coolant hoses are now disconnected from the unit.

## 8.3 Connecting Power

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### Requirements

- ▶ The unit construction provides protection against the risk of electrical shock by grounding appropriate metal parts. The protection will not function unless the power cord is connected to a properly grounded outlet. It is the user's responsibility to assure a proper ground connection is provided.
- ▶ Power Cord with C13 connector
- ▶ Use cable rated for 10A 250V with IEC320-C13 receptacle. The customer side of the cable must follow required standard for the country of installation

### Procedure

1. Cable with a 'C13' Connector should be connected to the IEC power connection on unit as shown below.
2. Turn the Power Switch ON.
3. When the Power Switch is ON, the Power Switch should light up as well as the LCD Panel.



C13 Connector

Connecting Power

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## 8.4 Adding Coolant and Priming Unit

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The unit is not intended for use with corrosive fluids. Automotive Antifreeze should never be used as a freezing point depression or corrosion protection fluid. Automotive antifreeze contains additives that can damage system components and will void the warranty.

Approved fluids and their normal operating temperature ranges are:

- Filtered/Single Distilled water, +10°C to +40°C
- Up to 30% Inhibited Ethylene Glycol (EG) /Water, -10°C to +40°C
- Up to 30% Inhibited Propylene Glycol (PG) /Water, -10°C to +40°C

see [www.julabo.us](http://www.julabo.us)

It is important to maintain the proper mixture of EG or PG and water over time. Instruments are available on the market for measure glycol content and should be used periodically and when refilling the system to check the coolant mixture ratio.

Inhibited EG or PG should be used when the coolant is being exposed to aluminum components in order to prevent galvanic corrosion.

## Suggested Contaminant Limits:

	<b>PPM</b>
<b>Organics</b>	
Algae, Bacteria, etc.	0
<b>Inorganic Chemicals</b>	
Calcium	<10
Chloride	<25
Copper	<1.0
Iron	<0.2
Lead	0
Magnesium	<5
Manganese	<0.05
Nitrates \ Nitrites	<10
Potassium	<2
Silicate	<5
Sodium	<4
Sulfate	<25
Hardness	<1
Total Dissolved Solids	<25
<b>Other Parameters</b>	
pH	6.8. 7.5
Resistivity	<0,1 MΩ-cm

### Requirements

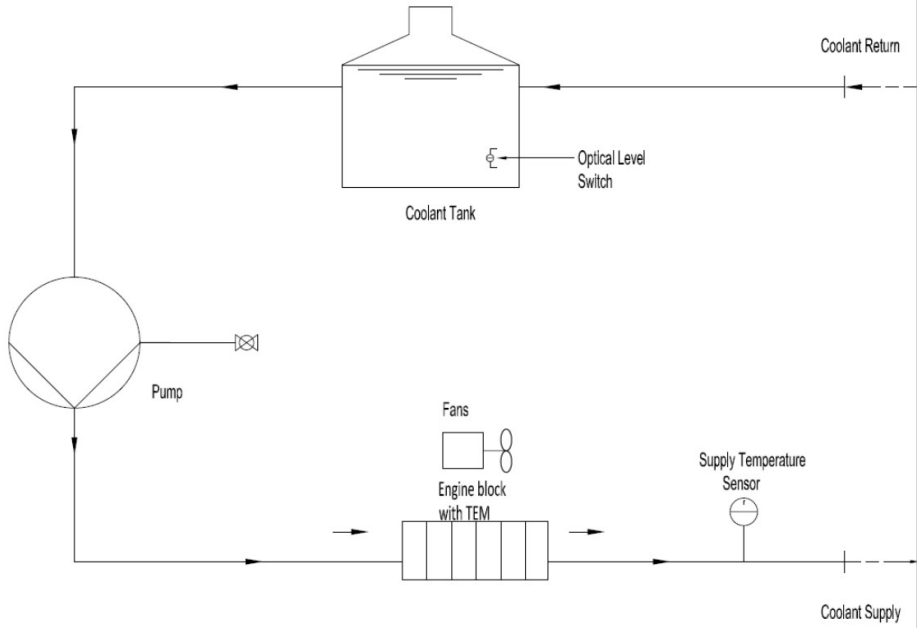
- ▶ Unit prepared for maintenance. Refer to [Preparing the Unit for Maintenance](#).
- ▶ Power connected to unit.
- ▶ Coolant hoses connected to the unit (Make sure the hoses are corrected to the correct ports).

### Required Tools and Materials

- ✂ Filling funnel
- ✂ Measuring cup
- ✂ Absorbent cloth

### Procedure

1. Remove the Fill Cap.
  2. For information regarding coolant to be used and quantity, refer to [Specifications](#). Use a filling funnel to avoid moistening any current-carrying components with coolant. Note: If refilling coolant, go to last step.
  3. Add coolant up to required level. Ideal coolant level is just below the 'HIGH' marking on the front view port of the tank.
  4. Press the 'PUMP' button on the LCD panel to fill the coolant lines to the application.
  5. When the tank level starts reducing, continue adding coolant through the fill port, until the ideal coolant level is reached with the pump continuously running.
  6. Note: Do not let the pump run dry as it can be damaged.
  7. Mount the coolant cap again.
- ✓ The coolant is now added.

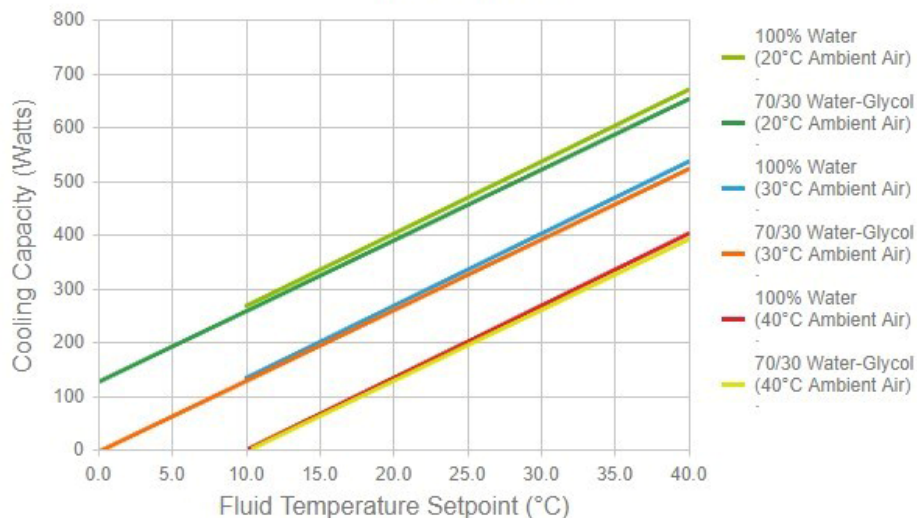


Plumbing and Refrigeration Diagram

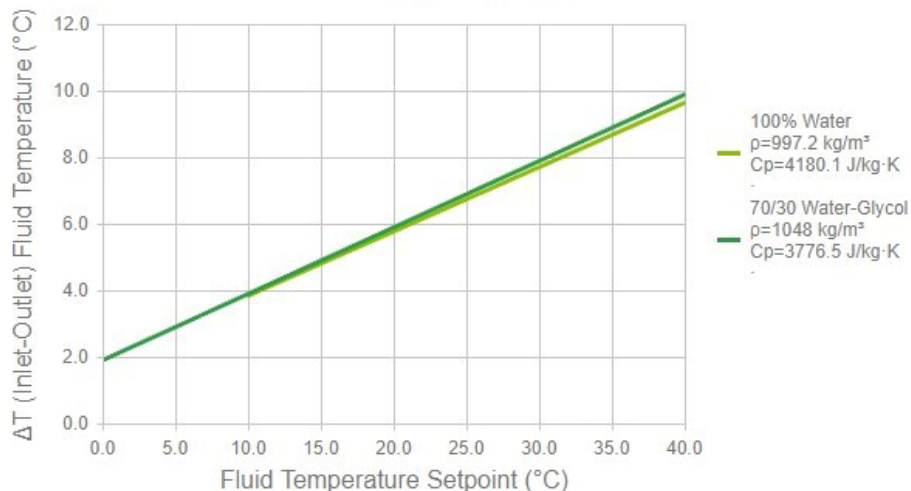
## 9 Performance Graphs

### 9.1 Thermal Performance

TE400-T0-00-PC1 Cooling Capacity  
1 L/min Fluid Flow

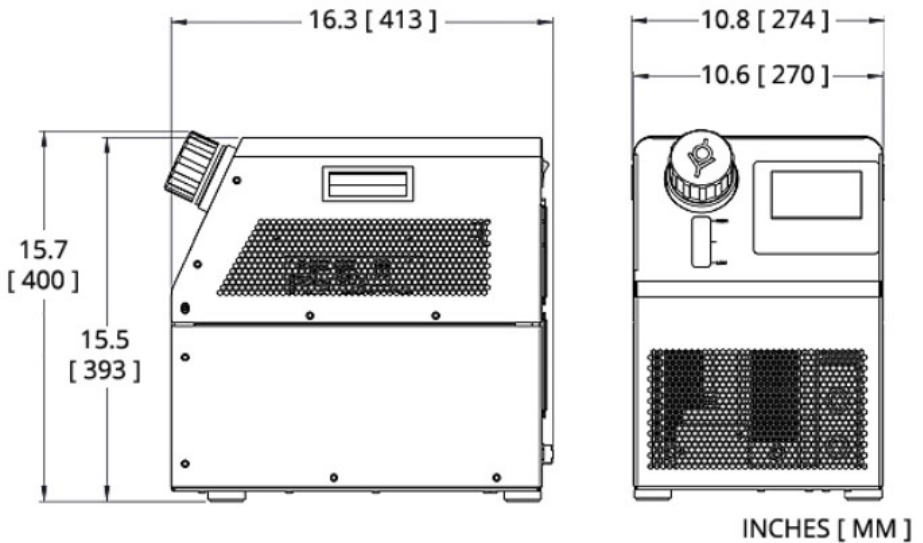


TE400-T0-00-PC1  $\Delta T$  (Inlet-Outlet) Fluid Temperature  
Max System Cooling at 20°C Ambient Air  
1 L/min Fluid Flow



Thermal Performance of TE 400 with Cooling Fluids: Water & 30% EG/W

## 10 Chiller Dimensions



TE 400 Chiller Overall Dimensions

## 11 Controller Display Panel Functions

### 11.1 Startup Screen







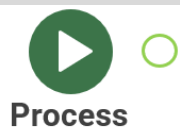
When the unit is first powered on, the touch panel shows this screen for 10 seconds.











## 11.2 Main Screen



Buttons	Description
	Main Menu is selected
	Information Menu is selected
	Alarm menu is selected
	Settings menu is selected
	Pump is OFF
	Pump is ON
	Chiller is OFF

Buttons	Description
 Process	Chiller is running
	Setpoint increments/decrements in 1.0
	Setpoint increments/decrements in 0.1
	Increase setpoint by selected increment level
	Decrease setpoint by selected decrement level
	Stores set point in flash memory

### 11.2.1 Running the Pump

The pump can be switched on by pressing the PUMP button on screen. The box will turn from grey to green which indicates that the pump is on. By clicking the PUMP button again, the pump will switch off turning the box back to grey.

### 11.2.2 Choosing the Coolant Setpoint

The Coolant setpoint can be set by choosing values using the arrows and changing the increments accordingly. By clicking on the increments, the increment can be changed from 0.1 to 1.0 and vice versa.

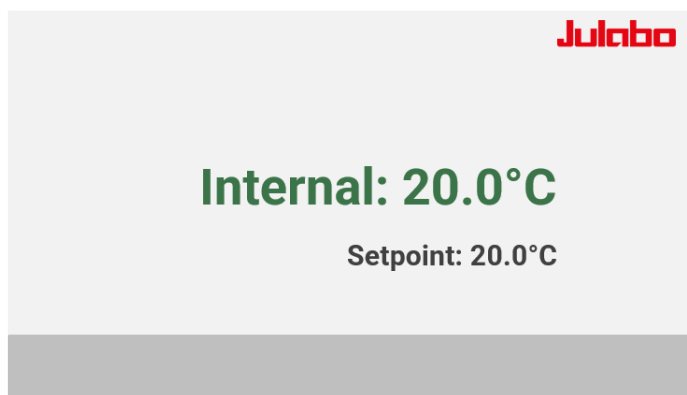
### 11.2.3 Running the system

The system can be run by pressing the RUN button on screen. The box will turn from grey to green which indicates that the machine is running. To switch OFF the machine, click the button again.

## 11.3 Sleep Screen

---

Touch panel goes to sleep when the screen has been inactive for 3 minutes and shows coolant supply temperature. The system does not go to sleep screen when the information screen is being displayed or when the unit is not running.



## 11.4 Information Screen



To see information related to Coolant Supply, click on the Information Menu. The following information is displayed:

	Information	Description
Coolant Supply	Temperature	This is the Supply Temperature from the chiller to the application
	Temperature setpoint	This is the Temperature Setpoint set by User in the Main Menu
	Offset	This is the Setpoint Offset set by the User in the Settings Menu

## 11.5 Alarms Display Screen

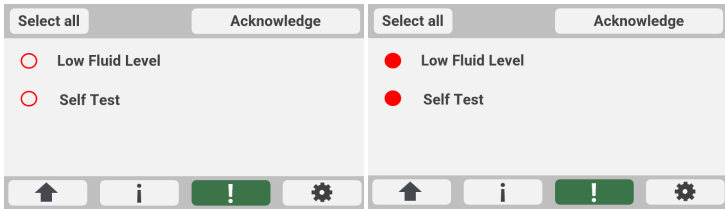
If the system is not in an alarm condition, then the alarms tab doesn't show any alarm.



If the system experiences an alarm condition, the alarm button changes on the home screen to indicate this.

### 11.5.1 Acknowledging Alarms

Alarms can be acknowledged individually by selecting them and then pressing the ACKNOWLEDGE button. When there are multiple alarms, they can be acknowledged together by pressing the SELECT ALL button and then the ACKNOWLEDGE button.

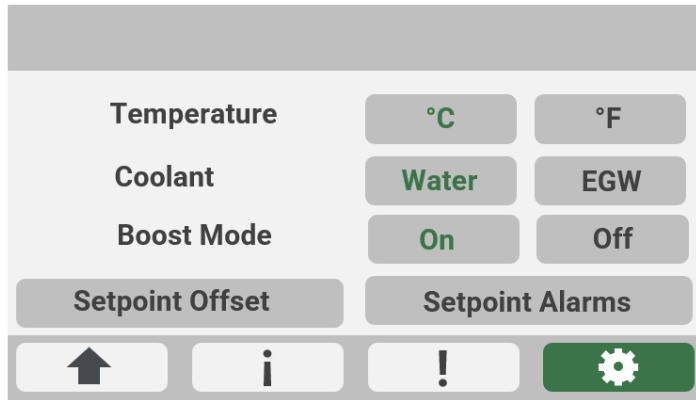


Red alarms are used to indicate an abnormal system condition and is usually associated with the shutdown of a component or the whole system. There is an audible alarm for this condition and requires an action from the customer for the system to restart.

Amber alarms are warnings to indicate an abnormal system condition, but the system or components are not shut down. There is no audible alarm for this condition.

For specific alarm conditions and troubleshooting information, refer to section Alarms

## 11.6 Settings Screen



### 11.6.1 Setting Units

The unit of measure for temperature can be selected in the Settings Menu. The options available for temperature are °C/°F.

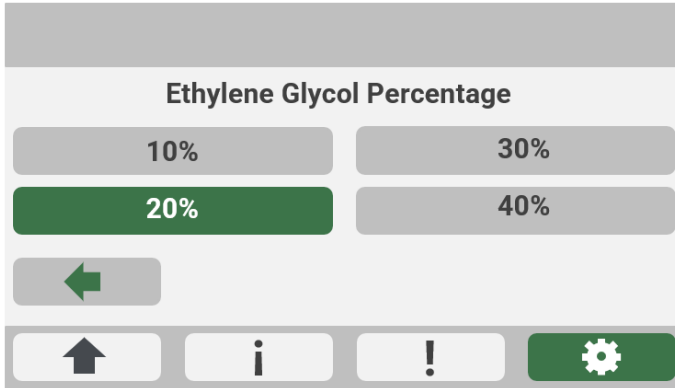
### 11.6.2 Choosing the Coolant

The coolant (Water/ Ethylene Glycol) can be chosen on the Settings Menu. The Ethylene Glycol Percentage can be chosen once the EGW button is pressed. This selection limits the temperature set point value that the customer can select. Below are the temperature range for different glycol percentages. Note that selecting the correct coolant is the responsibility of the customer and should match what is filled in the system by the customer. Selecting the wrong coolant may cause damage to the equipment.

Water: 10°C to 40°C

10% Ethylene Glycol: 5°C to 40°C

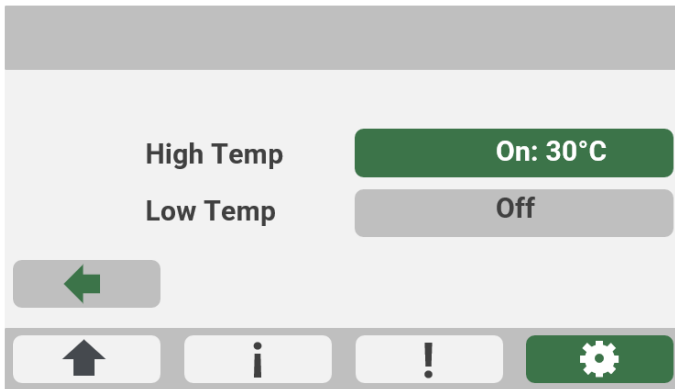
20% Ethylene Glycol: 0°C to 40°C



### 11.6.3 Boost-Mode

Boost Mode can be activated by selecting Boost Mode on/off. If Boost Mode is off, the maximum fan speed will be limited to 65% which reduces the maximum cooling capacity to 325 Watt

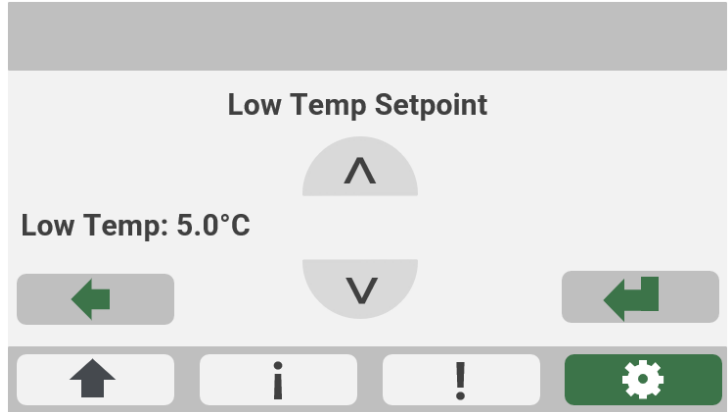
### 11.6.4 Customer Configurable Alarms



Alarms such as Low Temperature  $\Delta$  and High Temperature  $\Delta$  can be set in the Setting Menu. Each Alarm can be turned ON or OFF as required and the value can be changed by clicking on the number.

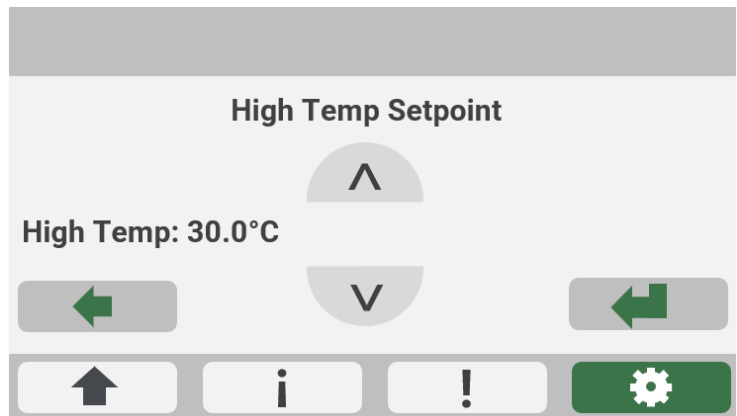
### Low temp delta

This alarm is to alert the customer if the coolant supply temperature doesn't come within this specified deltaT from below the set point in a set amount of time. This alarm is disabled by default. If the customer enables this alarm, then the default value of delta T is 1 and default time is 30 minutes.



### High temp delta

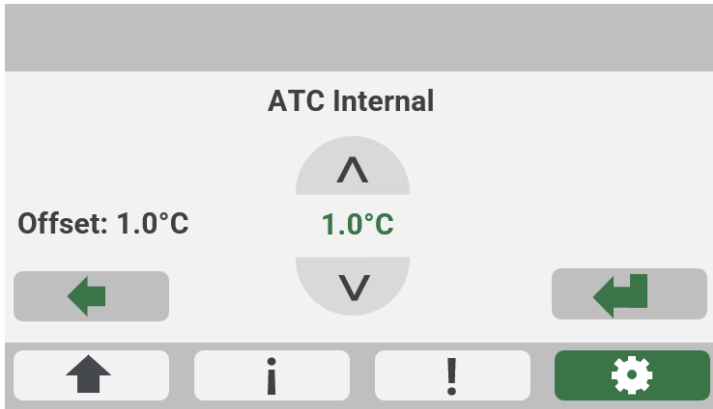
This alarm is to alert the customer if the coolant supply temperature doesn't come within this specified deltaT from above the set point in a set amount of time. This alarm is disabled by default. If the customer enables this alarm, then the default value of delta T is 1 and default time is 30 minutes.





## 11.7 ATC: Setting a Temperature Offset

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This setting allows you to offset the displayed temperature from the measured temperature.

## 12 Troubleshooting

For troubleshooting, use the following:

- Alarm status screen
- Wiring diagram
- Plumbing Diagram
- Troubleshooting table (below)

Issue	Possible Cause	Corrective Measures	Clearance By
Unit does not start	Power not applied. Electrical connection not correct or no mains connection	Check power supply and ensure proper voltage in the line. Check connection, insert mains plug	Operator
	Coolant level too low. Alarm for low coolant will be active	Check coolant level and top off, if necessary. Refer to <a href="#">Adding Coolant</a>	Operator
	Main switch not turned on	Turn main switch on	Operator
Unit running but cooling capacity is too low	Buckled or pinched lines	Install the hoses with a larger radius to hoses avoid sharp bends.	Operator
	Improperly placed unit	Required clearance with the wall of the unit. Refer to <a href="#">Installation Requirements</a>	Operator
	Blocked Heat sink	Clean Heat sink. Refer to <a href="#">Cleaning the Heat sink</a>	Operator
	Coolant level too low	Check coolant level and top up, if necessary. Refer to <a href="#">Adding Coolant</a>	Operator
	Disconnected coolant hoses	Connect the coolant hoses. Refer to <a href="#">Connecting the Coolant Hoses</a>	Operator
	Dirty coolant filter	Clean or replace filter. Refer to <a href="#">Replace filter</a>	Operator
	No flow in cooling circuit	Check system for blockage or lack of fluid	Operator

	Fan does not rotate	Check to determine if the fan is rotating	Operator
	Ambient air temperature too high	Operate unit within allowable ambient temperature range	Operator
	Pump mode turned on, but cooling mode turned off	Ensure cooling mode turned on. Refer to <a href="#">Controller Display Panel Functions</a>	Operator
	Incorrect coolant mixture	Make sure mixture is within guidelines. Refer to <a href="#">Adding Coolant and Priming Unit</a>	Operator
	TE engine	Confirm that all alarm conditions are cleared	Operator
Noise	Blocked cooling circuit	Ensure that cooling circuit is not blocked	Operator

## 13 Alarms

\* - Red: Critical with Stop, Amber: Notify, Green: Status

	Alarm	Criticality	Alarm Description	Cause	Effect	Action Required/ Troubleshooting
	Low fluid level	Red	Coolant fluid level is low.	Possible leak in the coolant line	Entire system stops running	Check to see if the coolant level is at the recommended level on the front fill port. Add coolant if necessary and acknowledge the alarm on the LCD screen. This will clear the alarm. Now run the unit. If the problem persists, contact JULABO customer service.
	Coolant supply temperature sensor failure	Red	Coolant supply temperature sensor is not working properly	Coolant supply temperature sensor is not working properly	If this happens during system	
	Coolant supply high temp $\Delta$	Red	Alerts the customer if the coolant supply temperature is not within certain prespecified temperature delta above the temperature set point, within a specified amount of time after starting the unit or changing the set point	High load on the system than the specified capacity or ambient temperature is too high	Unit alarms to indicate customer the condition. Unit continues running.	<p>Check if the ambient temperature is too high or above operating limits.</p> <p>If possible, check if the load on the system is beyond the specified capacity for specific operating temperatures.</p> <p>After fixing above issue, acknowledge the alarm on the LCD screen. This will clear alarm.</p> <p>If the problem persists, contact JULABO customer service.</p>

	Coolant supply low temp $\Delta$	Red	Alerts the customer if the coolant supply temperature is not within certain prespecified temperature delta below the temperature set point, within a specified amount of time, after starting the unit or changing the set point	Hot gas bypass heating loop is not functioning properly, or ambient temperature is too low	Unit alarms to indicate customer the condition. Unit continues running.	<p>Check if the unit has been sitting in ambient temperature below the specified operating temperature. If</p> <p>so, move the system to recommended operating ambient temperature and wait for few minutes for the system refrigerant to warm up.</p> <p>After fixing above issue, acknowledge the alarm on the LCD screen. This will clear alarm. If the problem persists, contact JULABO customer service.</p>
Self-Test	Self-Test	Red	Controller checks whether all the sensors are functioning properly after the power switch is turned on	Sensors not connected properly or component failure	System wouldn't Run if self-test fails	<p>Check if there are any other alarms listed in the alarms page of the LCD screen along with this alarm. Check if those issues can be resolved using the guidelines above. After fixing the issue, acknowledge the alarm on the LCD screen. This will clear the alarm. Now Run the unit. If the problem persists, contact JULABO customer service.</p>

Coolant Temperature	Coolant temperature alarm (customer )	Red	Customer method to detect high temperature	Coolant return (inlet) temperature is higher than 50°C	Depends on the method customer implements	<p>Verify the heat load has not exceeded the rating of the recirculating chiller.</p> <p>If the unit is still powered, check the alarm screen to find the referenced alarm in this table.</p> <p>After fixing the issue, acknowledge the alarm on the LCD screen. This will clear the alarm. Now run the unit. If the problem persists, contact JULABO customer service.</p> <p>If the unit was shut down, repower, and run the unit. If the problem persists, contact JULABO customer service.</p>
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## 14 Communications Interface

### 14.1 Instructions for Setup

RS232 serial communications are available. They are accessible via the DB-9 connectors on the rear of the chiller. Refer Inadmissible Operating Conditions to avoid any safety hazards.

A Terminal Emulator or other comparable device will need to be connected to the DB-9 to allow command to be entered.

Terminal Settings:

Baud Rate 115200, Data – 8-bit, Parity – none, Stop – 1 bit, Flow Control - none

### 14.2 Commands and responses

Command	Description	General Response
OUT_MODE_05 1	Start tempering	none
OUT_MODE_05 0	Stop tempering	none
IN_MODE_05	Read whether tempering is active or not	0: tempering stopped 1: tempering started
OUT_SP_00 _XXX, XX	Change the target temperature to XXX.XX	none
IN_SP_00	Read the target temperature	XXX.XX
IN_PV_00	Read the current temperature	XXX.XX
IN_PV_01	Read the current heating/cooling power	-100 (100% cooling) ... +100 (100% heating)
STATUS	Read the current status	See table below
VERSION	Read the unit name and firmware version	JULABO TE400 VERSION 1.01

**Responses for „STATUS“-command:**

02 REMOTE STOP	Tempering stopped
03 REMOTE START	Tempering started
-08 INVALID COMMAND	The last command received by the chiller was unknown
-10 VALUE TOO SMALL	The parameter of the last command was out of range. Example:
-11 VALUE TOO LARGE	If the chillers setpoint range is -5...40°C and "OUT_SP_00 -10.00" is received (-10 VALUE TOO SMALL) or "OUT_SP_00 50.00" is received (-11 VALUE TOO LARGE).

**Responses for „STATUS“-command in case of alarm**

<b>Error cause</b>	<b>Response</b>
Low fluid level	-01 ALARM: 1700001
Coolant supply temperature sensor failure	-05 ALARM: 1700005 -201 ALARM:1700030
Coolant temperature out of range, above setpoint	-14 ALARM: 1700003
Coolant temperature out of range, below setpoint	-144 ALARM: 1700044
Any other alarms	-999 ALARM: 1700099

**Command entry format**

All commands need to be transferred in ASCII-Code and to be terminated with Carriage Return (HEX: 0x0D) and linefeed (HEX:0x0A).



## 15 System Maintenance and Service


Diligent maintenance is the prime factor for assuring an error-free and efficient operation of the unit. All the maintenance tasks contained in this chapter must be performed according to the maintenance intervals.

### 15.1 Safety


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All safety and warning instructions must be reviewed completely by all personnel prior to maintenance work of the unit. Refer to Safety Precautions.

#### Improper Maintenance


	<b>WARNING</b>
	<p><b>Danger of injury due to improperly performed maintenance</b></p> <p>Improper maintenance can lead to personal injury or material damage.</p> <ul style="list-style-type: none"><li>• Disconnect the unit from all sources of power during maintenance work.</li><li>• Ensure that there is enough working area at the beginning of the maintenance work.</li><li>• Provide all components and tools required for maintenance work.</li><li>• Keep the working area clean and tidy. Loose components and tools, which are lying on each other or lying around, are sources of accidents.</li><li>• Check all components for soiling and damage. Do not use damaged or incorrect components.</li><li>• Handle the components with care, to avoid damage.</li><li>• Assemble components properly. Comply with specified screw tightening torques.</li><li>• Secure components, to prevent them from falling or tipping over.</li><li>• Only perform maintenance work using conventional tools. Improper or damaged tools can result in personal injury.</li></ul>

## Handling Coolant

	<b>CAUTION</b>
	<p><b>Danger of slipping or endangering the environment due to spilled coolant</b></p> <p>Spilled coolant can cause slipping and endanger those working in the environment.</p> <ul style="list-style-type: none"> <li>• Do not spill coolant.</li> <li>• Immediately remove the spilled coolant with an appropriate bonding agent.</li> <li>• Dispose the bonding agent and coolant mixture in accordance with regional regulations.</li> </ul>

	<b>NOTE</b>
	<p><b>Testing and replacing external coolant hoses</b></p> <p>Coolant hoses can become brittle through age and must be checked at regular intervals.</p> <ul style="list-style-type: none"> <li>• Observe the specifications of the coolant hoses manufacturer</li> </ul>

## Environmental Issues

	<b>NOTE</b>
	<p><b>Danger to the environment due to improper handling</b></p> <p>Environmentally conscious and anticipatory behavior of staff avoids environmentally hazardous impacts.</p> <p>The following principles apply for environmentally conscious behavior:</p> <ul style="list-style-type: none"> <li>• Environmentally hazardous substances must not get into the soil or into the drains. They should be kept in appropriate containers.</li> <li>• Environmentally hazardous substances must be used and disposed according to regional regulations.</li> <li>• When dealing with working fluids, remain aware of the safety data sheet of the corresponding manufacturer.</li> </ul>

**Personnel**

Unless otherwise noted, all maintenance tasks described in this chapter can be performed by the operator of the unit.

Other maintenance tasks must be performed by specially trained qualified personnel. This is specially noted in the description of the single maintenance task.

**Personal Protective Gear**

The following personal protective gear for all maintenance work must be worn:

- Protective footwear
- Protective gloves
- Protective eyewear

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**15.2 Maintenance Schedule**

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Follow maintenance task described in table 3 to ensure proper operation of the unit.

The interval between maintenance are only recommendations and may vary depending on use of the unit and operating environment.

<b>Interval</b>	<b>Required Activities</b>	<b>Criteria</b>	<b>Personnel</b>
Regularly	Clean heat exchanger. Refer to Cleaning the Heat Exchanger.	Plate fins and ventilation grids polluted	Skilled employee
	Check the coolant level and replenish it, if necessary. Refer to Adding Coolant and Priming Unit.	Coolant level at or below "Low" level	Operating personnel
	Inspect coolant hoses, connections and pipes for cracks and for leaks (visual inspection)	Coolant hoses, pipes and connections are leaking	Operating personnel
	Inspect the coolant quality (visual inspection)	Turbidity, airborne particles	Operating personnel

Table 6 Maintenance

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### 15.3 Preparing the Unit for Maintenance

All necessary safety measures must be taken to prevent accidents when carrying out the maintenance. The following preparations must be made:

- Terminate the cooling operation.
- Let the unit and its coolant cool down to the ambient temperature.
- Switch off the unit.
- Disconnect the unit from mains by pulling the mains plug.
- Secure the unit against being switched on again.
- Verify that the unit is de-energized.
- Keep unauthorized persons away from the working area.
- Place the unit on a level surface

### 15.4 Verification of Safe State after Maintenance

- Ensure that all screws are securely fastened
- Make sure that there are no loose electrical connections.
- Ensure that the controller completes the diagnostic.

### 15.5 Draining Procedure



#### NOTE

#### **Risk of Damage to the pump**

When the coolant level in the coolant tank is too low and if it runs the pump dry, the pump can be damaged or destroyed.

- Avoid running the pump dry to prevent damage

#### **Requirements**

- ▶ Unit prepared for maintenance. Refer to Preparing the Unit for Maintenance..
- ▶ Coolant hoses disconnected from the unit. Refer to [Disconnect Hoses](#).
- ▶ Coolant cooled down to the ambient temperature.

### Required Tools and Materials

✂ Collection container/Hose – Note, unit holds approximately 1-2 liters of fluid.

### Procedure

1. First you may tip it over and drain the reservoir. If you can't do that then, first, connect a fitting to the inlet and allow the reservoir to drain. Next, connect a fitting to the outlet. It might be best to have some hose on this one to allow gravity to help drain the engine. A lite burst of air 5-10 PSI into the reservoir could help to push the liquid from the engine.  
✓ The coolant is now drained.

## 15.6 Coolant Maintenance

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Periodically inspect the coolant for contamination. Replace if the coolant becomes dirty/contaminated.

## 15.7 Cleaning the Heat Exchanger

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Cooling capacity is heavily reduced if the heat exchanger is contaminated. The heat exchanger must be checked for contamination (particulates) regularly and be cleaned, if required.

The cleaning of the heat exchanger must be performed in accordance with the maintenance intervals.



### **DANGER**

#### **The use of water/chemicals for cleaning the heat exchanger can cause short circuit and damage the fan**

The use of water/chemicals for cleaning the heat exchanger can damage the fan and result in a short circuit. In this case persons are in danger to get an electric shock.

- Do not clean the heat exchanger with water/chemicals.

**NOTE****Damage to the fins of the heat exchanger due to improper handling of the unit**

Damaged fins of the heat exchanger lead to a reduced cooling capacity.

- Take care not to damage the fins of the heat exchanger when cleaning the heat exchanger.
- Air pressure used to clean the fins must be controlled to prevent damage to the fins.
- If the fins of the heat exchanger are not in a suitable condition, the unit must only be used again once the damage has been rectified.

**Requirements**

- ▶ Unit prepared for maintenance. Refer to [Preparing the Unit for Maintenance](#).

**Required Tools and Materials**



- ✂ Vacuum cleaner
- ✂ Compressed air pistol/pressurized air spray
- ✂ Hand brush
- ✂ Brush

**Procedure**

1. Clean the heat exchanger and grill with a vacuum cleaner, or compressed air.
2. Care must be taken not to damage the fins.

## 16 Decommissioning and Disposal

### 16.1 Temporarily Placing Out of Operation

 	<p><b><i>DANGER</i></b></p> <p><b>Electrical danger!</b></p> <p>Work on electrical installations may be carried out by trained and authorized electricians only.</p> <ul style="list-style-type: none"><li>• Switch off the unit before starting your work.</li><li>• Disconnect the unit from mains by pulling the mains plug.</li><li>• Secure the unit against being switched on again.</li><li>• Verify that the unit is disconnected.</li><li>• Carry out necessary earthing connections.</li><li>• Keep unauthorized persons away from the working area.</li></ul>
--	--

The decommissioned unit must be stored in a dry and dust-free room.  
For recommended storage conditions, refer to Storing the Unit

#### **Prior to Decommissioning**

##### **Procedure**

1. Finish the cooling operation.
  2. Disconnect the unit from mains.
  3. Let the unit and the coolant cool down.
  4. Disconnect coolant hoses from the unit. Refer to Disconnect Hoses.
  5. Drain the coolant. Refer to Draining Procedure
  6. Clean the unit. Refer to System Maintenance and Service.
  7. Secure the coolant inlet and coolant outlet connections with protection caps against soiling.
- ✓ The unit has now been decommissioned.

## 16.2 Returning the Unit to Service After Decommissioning

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### **Procedure**

1. Thoroughly clean the unit. Refer to System Maintenance and Service.
2. Check that the unit is in operating condition.
3. Install the unit and put it into operation. Refer to Installation Procedure.

## 16.3 Final Decommissioning or Disposal

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Final decommissioning or disposal of the unit must be performed in accordance with the regulations of the country of use.

Contact JULABO to return end-of-life units through the official website at <https://www.julabo.us> or contact a company specializing in the disposal and recycling of equipment.

## 16.4 Disposal of Operating Materials

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The operating materials of the unit can be hazardous to the environment and to health.

- Make sure the operating materials are disposed of or recycled according to local regulations.
- Also, the safety specifications of the coolant manufacturer must be obeyed.

## 16.5 Return of the Unit to JULABO

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### **Declaration of decontamination**

Before re-shipment of the unit a declaration of decontamination must be sent to JULABO.



## 17 EC Declaration of Conformity

### EG-Konformitätserklärung nach EG Maschinenrichtlinie 2006/42/EG, Anhang II A EC-Declaration of Conformity to EC Machinery Directive 2006/42/EC, Annex II A

Hersteller / Manufacturer:

JULABO GmbH  
Gerhard-Juchheim-Strasse 1  
77960 Seelbach / Germany  
Tel: +49 7823 51-0



Hiermit erklären wir, dass das nachfolgend bezeichnete Produkt  
We hereby declare, that the following product

Produkt / Product: Peltier Umlaufkühler / Peltier Recirculating Cooler

Typ / Type: TE400

Serien-Nr. / Serial-No.: siehe Typenschild / see type label

aufgrund seiner Konzipierung und Bauart in der von uns in Verkehr gebrachten Ausführung den grundlegenden Sicherheits- und Gesundheitsanforderungen der nachfolgend aufgeführten EG-Richtlinien entspricht.  
due to the design and construction, as assembled and marketed by our Company – complies with fundamental safety and health requirements according to the following EC-Directives.

**Maschinenrichtlinie 2006/42/EG; Machinery Directive 2006/42/EC**  
**EMV-Richtlinie 2014/30/EU; EMC-Directive 2014/30/EU**  
**RoHS-Richtlinie 2011/65/EU; RoHS-Directive 2011/65/EU**

**Angewandte harmonisierte Normen und techn. Spezifikationen:**  
Applied following harmonized standards and technical specifications:

EN IEC 63000:2018

Technische Dokumentation zur Beurteilung von Elektro- und Elektronikgeräten hinsichtlich der Beschränkung gefährlicher Stoffe  
Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

EN ISO 12100 : 2010

Sicherheit von Maschinen - Allgemeine Gestaltungsleitsätze - Risikoanalyse und Risikominderung (ISO 12100:2010)  
Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)

EN 61010-1 : 2010 / A1 : 2019 / AC : 2019-04, EN 61010-1 : 2010 / A1:2019

Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte, Teil 1: Allgemeine Anforderungen  
Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1: General requirements

EN IEC 61010-2-010:2020

Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte Teil 2-010: Besondere Anforderungen an Laborgeräte für das Erhitzen von Stoffen  
Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 2-010: Particular requirements for laboratory equipment for the heating of materials

EN 61326-1:2013

Elektrische Mess-, Steuer-, Regel- und Laborgeräte-EMV-Anforderungen- Teil 1: Allgemeine Anforderungen  
Electrical equipment for measurement, control, and laboratory use - EMC requirements - Part 1: General requirements

EN IEC 61326-1:2021

Elektrische Mess-, Steuer-, Regel- und Laborgeräte-EMV-Anforderungen- Teil 1: Allgemeine Anforderungen  
Electrical equipment for measurement, control, and laboratory use - EMC requirements - Part 1: General requirements

**Bevollmächtigter für die Zusammenstellung der technischen Unterlagen:**

Authorized representative in charge of administering technical documentation:  
Hr. Torsten Kauschke, im Haus / on the manufacturer's premises as defined above

**Die Konformitätserklärung wurde ausgestellt**  
The declaration of conformity was issued and valid of

Seelbach, 12.05.2023

i.V. Bernd Rother, Senior Expert Products & Innovation

## 18 UK Declaration of Conformity

**UK Office:** JULABO UK Ltd., Unit 7, Casterton Road Business Park,  
Old Great North Road, Little Casterton, Stamford, PE9 4EJ, United Kingdom,  
Tel.: +44 1733 265892

### UKCA-Declaration of Conformity

**Manufacturer:** JULABO GmbH  
Gerhard-Juchheim-Strasse 1  
77960 Seelbach / Germany  
Tel: +49 7823 51-0



This declaration is issued under the sole responsibility of the product manufacturer

**Product:** Peltier Recirculating Cooler  
**Type:** TE400 **Serial-No.:** see type label

The object of the declaration described above is in conformity with the relevant UK Statutory Instruments and their amendments:

**Supply of Machinery (Safety) Regulations 2008**  
**Electromagnetic Compatibility Regulations 2016**  
**The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012**

### Applied following harmonized standards and technical specifications:

EN IEC 63000:2018  
*Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances*

EN ISO 12100 : 2010  
*Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)*

EN 61010-1 : 2010 / A1 : 2019 / AC : 2019-04, EN 61010-1 : 2010 / A1:2019  
*Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1: General requirements*

EN IEC 61010-2-010:2020  
*Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 2-010: Particular requirements for laboratory equipment for the heating of materials*

EN 61326-1 : 2013  
*Electrical equipment for measurement, control, and laboratory use - EMC requirements - Part 1: General requirements*

EN IEC 61326-1:2021  
*Electrical equipment for measurement, control, and laboratory use - EMC requirements - Part 1: General requirements*

### Authorized representative in charge of administering technical documentation:

JULABO UK Ltd., Mr. Gary Etherington, Unit 7, Casterton Road Business Park, Little Casterton, Stamford PE9 4EJ  
United Kingdom, Telephone: +44 1733 265892

The declaration of conformity was issued and valid of

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## 19 UL Certificate of Compliance

### CERTIFICATE OF COMPLIANCE

**Certificate Number** E230198  
**Report Reference** E230198-20230621  
**Issue Date** 2023-JUNE-21

**Issued to:** JULABO GMBH  
Gerhard-Juchheim-Strasse 1  
Seelbach, Baden-Wurttemberg, 77960  
DE

**This certificate confirms that representative samples of** LABORATORY-USE ELECTRICAL EQUIPMENT  
Model – TE400

Have been evaluated by UL in accordance with the Standard(s) indicated on this Certificate.

**Standard(s) for Safety:** UL 61010-1 - Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements  
CSA C22.2 No. 61010-2-010 - Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use

**Additional Information:** See UL Product iQ® at <https://iq.ulprospector.com> for additional information.

This Certificate of Compliance indicates that representative samples of the product described in the certification report have met the requirements for UL certification. It does not provide authorization to apply the UL Mark. Only the Authorization Page that references the Follow-Up Services Procedure for ongoing surveillance provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.

  
Deborah Jennings-Comer, VP Regulatory Services  
UL LLC

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please contact UL Customer Service at <http://ul.com/about/ulcertification>



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## 20 Warranty Conditions

### Initial Warranty

Upon Seller's receipt of payment in full for the products and subject to Buyer's compliance with the terms of sale and any other agreement with Seller relating to the products, Seller warrants to the Buyer that the products manufactured by the Seller are free from defects in material and workmanship for a period not to exceed two (2) years of operation from the date the product is shipped by Seller to Buyer (the "Initial Warranty").

EXCLUSION OF ALL OTHER EXPRESS WARRANTIES; EXCLUSION OF ALL IMPLIED WARRANTIES

OTHER THAN THE INITIAL WARRANTY, NO OTHER EXPRESS WARRANTIES ARE MADE. ALL IMPLIED WARRANTIES OF EVERY TYPE AND KIND, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, ARE EXCLUDED IN ALL RESPECTS AND FOR ALL PURPOSES. SELLER DISCLAIMS AND MAKES NO IMPLIED WARRANTIES WHATSOEVER.

### Exclusions

The Initial Warranty does not include damage to the product resulting from accident, misuse, improper installation or operation, unauthorized or improper repair, replacement or alteration (including but not limited to repairs, replacements, or alterations made or performed by persons other than Seller's employees or authorized representatives), failure to provide (or use of improper) maintenance, unreasonable or unintended use or abuse of the product, or failure to follow written installation or operating instructions. Buyer must return the product's record of purchase to the Seller or one of Seller's authorized representatives within thirty (30) days of the date the product is shipped by Seller to Buyer in order to make a claim under the Initial Warranty. Notwithstanding anything contained herein to the contrary, all glassware, including but not limited to reference thermometers, are expressly excluded from the Initial Warranty.

Additional Exclusions: The initial warranty does not include damage resulting from the use of improper or unauthorized cleaning/descaling agents. Seller recommends the use of fusionchef™ by Julabo Descaling Agent (Order # – 9FX1171) in all situations unless otherwise noted by the Seller's employee or Seller's authorized representative. Most other industrial/commercial descaling agents have a pH level that is too low (too acidic) and may cause damage to critical unit components.

### Buyer's sole remedies; Limitations on Seller's Liability

Buyer's sole and exclusive remedy under the Initial Warranty is strictly limited, in Seller's sole discretion, to either: (i) repairing defective parts; or (ii) replacing defective parts. In either case, the warranty period for the product receiving a repaired or replaced part pursuant to the terms of the Initial Warranty shall not be extended. All repairs or replacements performed by Seller pursuant to these Warranty Provisions shall be performed at one of the Seller's facility in Allentown, Pennsylvania, U.S.A. or at the facility of an authorized representative of Seller, which location shall be determined by Seller in its sole discretion; provided, however, that Seller may, in its sole discretion perform such repairs or replacements at Buyer's facility in which case Buyer shall pay Seller's travel, living and related expenses incurred by Seller in performing the repairs or replacements at Buyer's facility. As a condition precedent to Seller's obligation to repair or replace a product part under the Initial Warranty, Buyer shall (i) promptly notify Seller in writing of any such defect; (ii) shall have returned the

product's record of purchase to Seller or to Seller's authorized representatives within thirty (30) days of the date the product is shipped by the seller; and (iii) assist Seller in all respects in its attempts to determine the legitimacy and basis of any claims made by or on behalf of Buyer including but not limited to providing Seller with access to the product to check operating conditions. If Buyer does not provide such written notice to Seller within the Initial Warranty period or fails to return the product's record of purchase as set forth above, Seller shall have no further liability or obligation to Buyer therefor. In no event shall Seller's liability under the Initial Warranty exceed the original purchase price of the product which is the subject of the alleged defect.

THE REMEDIES PROVIDED IN THE INITIAL WARRANTY ARE THE SOLE AND EXCLUSIVE REMEDIES AVAILABLE TO THE BUYER. NOTWITHSTANDING ANYTHING TO THE CONTRARY CONTAINED HEREIN, AND EVEN IF THE SOLE AND EXCLUSIVE REMEDIES FAIL OF THEIR ESSENTIAL PURPOSE FOR ANY REASON WHATSOEVER, IN NO EVENT SHALL SELLER BE LIABLE FOR BUYER'S MANUFACTURING COSTS, LOST PROFITS, GOODWILL, OR ANY OTHER SPECIAL, INDIRECT, PUNITIVE, INCIDENTAL OR CONSEQUENTIAL DAMAGES TO BUYER OR ANY THIRD PARTY AND ALL SUCH DAMAGES ARE HEREBY DISCLAIMED.

### **Assignment**

Buyer shall not assign any of its rights or obligations hereunder without the prior written approval of Seller; provided, however, that if Buyer is a distributor of Seller, the rights and obligations of Buyer under these Warranty Provisions shall inure to the benefit of and be binding upon Buyer's customers who provide the product's proof of purchase to Seller pursuant to the terms set forth herein. Seller may assign any or all of its rights or obligations hereunder without Buyer's prior consent.

### **Governing Law**

The Warranty Provisions and all questions relating to their validity, interpretation, performance, and enforcement shall be construed in accordance with, and shall be governed by, the substantive laws of the Commonwealth of Pennsylvania without regard to its principles of conflicts of law.

### **Waiver**

Any failure of the part of Seller to insist on strict compliance with the Warranty Provisions shall no way constitute a waiver of such right. No claim or rights arising out of a breach of the Warranty Provisions by Buyer may be discharged in whole or in part by a waiver of the claim or right, unless the waiver is in writing signed by an authorized representative of Seller. Seller's waiver or acceptance of any breach by Buyer of any provisions of the Warranty Provisions shall not constitute a waiver of or an excuse for nonperformance as to any other provision of the Warranty Provisions nor as to any prior or subsequent breach of the same provision.

### **Freight**

Seller will arrange and pay for shipping and handling for the return of the unit to the Buyer.

Units purchased from JULABO USA and partners within the United States and Canada: Seller will arrange and pay for shipping and handling charges for the unit to be returned to the Seller. Seller will arrange and pay for shipping and handling for the return of the unit to the Buyer.

Units purchased from other JULABO entities or purchased outside of the United States/Canada borders: Buyer will arrange and pay for shipping and handling charges for the unit to be returned to the Seller. Seller will arrange and pay for shipping and handling for the return of the unit to the Buyer. This is in effect during the 1 or 1 plus factory warranty period.

**Out of Box Failure (OBF)**

An Out of Box Failure (OBF) is defined as a product failure immediately following unpacking and installation of a newly delivered product. JULABO provides a 14-day grace period after the date of shipment, during which time the delivered product must be checked for defect. The same exclusions that apply to the regular warranty also apply to OBF classification. For example, JULABO will not be liable for transport damage, damage inflicted by the customer or any other party, or defects arising from improper installation or usage.