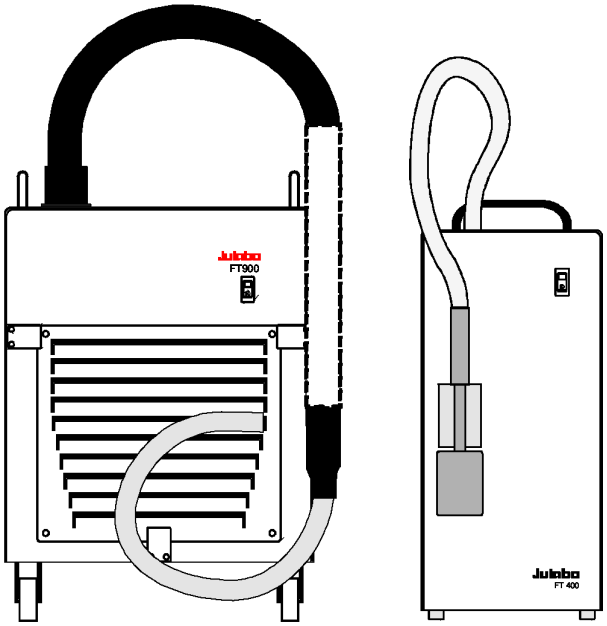
*English*

# Operating manual

## Immersion Coolers
FT200 FT400 FT900

## Flow-Through Cooler
FD200



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Innovative Temperature Technology

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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
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 can damage the refrigeration lines.
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.
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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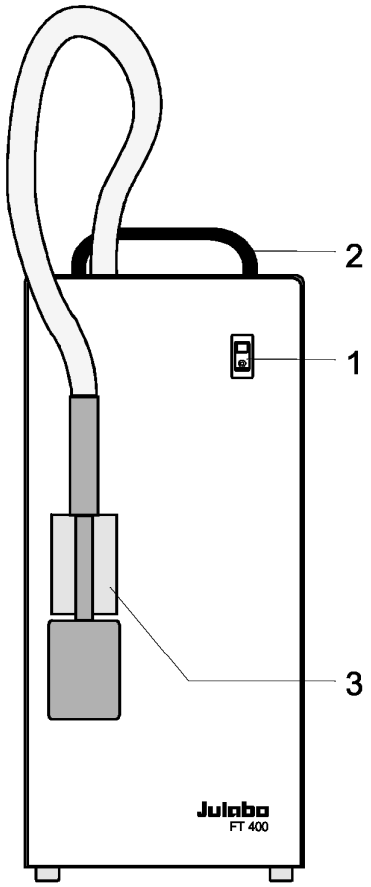
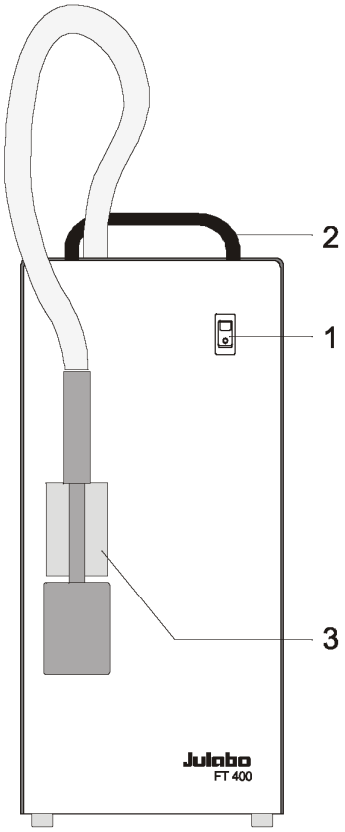
# 1. OPERATING CONTROLS AND FUNCTIONAL ELEMENTS

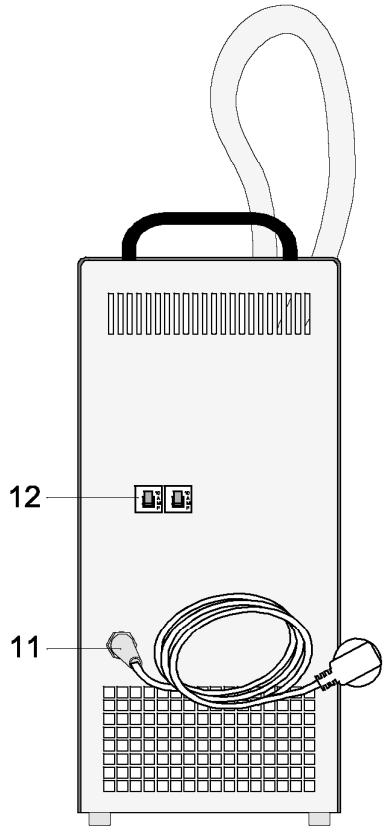
FT400



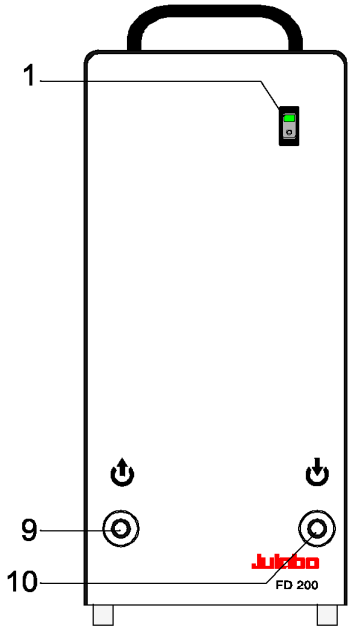

FT200




Rear view

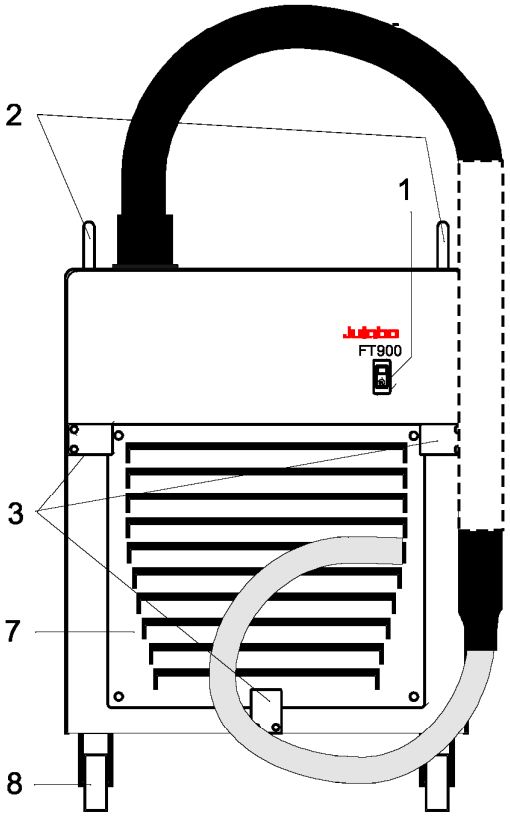



FD200

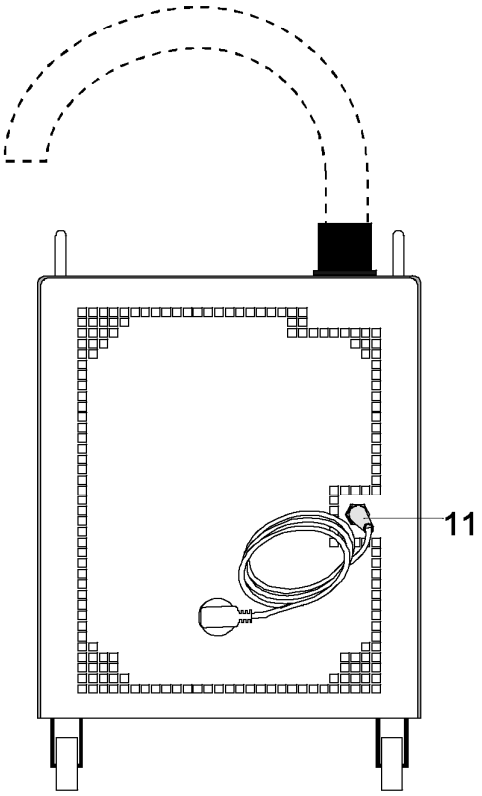



| | | |
|---|---|---|
| 1 | Mains switch, illuminated | |
| 2 | Cooling control light | |
| 3 | Clamp for immersion probe | |
| 7 | Removable ventilation grid | |
| 8 | Castor with locking lever | |
| 9 | Tube connection - discharge | |
| 10 | Tube connection - intake | |
| 11 | Mains power cable with plug | |
| 12 | Safety cutouts: Mains fuses 10 A | |

FT900




Rear view



# 2. DESCRIPTION

The JULABO immersion coolers FT200, FT 400 and FT900 are employed to cool liquids for working temperatures ranging from +50 °C to -90 °C, such as in:

Dewar vessels, beakers, or other containers
in conjunction with heating circulators for continuous countercooling or for dry-ice substitution.

The JULABO FD200 Flow-Through Cooler is employed to cool liquids in closed circuits. This unit is generally installed at the intake of a heating circulator to draw heat away from the circulating bath liquid.
Models FD200, FT200 and FT400 are provided with a handle for portable use. Model FT900 is equipped with four castors. Two of the castors include locking levers that should be pressed down after setting up the unit to prevent it from moving.
The immersion probe is connected to the instrument with a flexible, specially insulated tube. On model FT900 the immersion probe is also flexible and may be adjusted precisely to different positions within the vessel.

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

# 3. Quality Management System

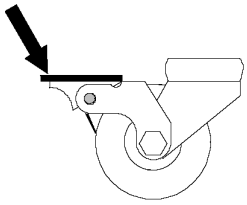

The JULABO **Q**uality **M**anagement **S**ystem:
Development, production and distribution of temperature application instruments for research and industries conform to the requirements according to DIN EN ISO 9001:1994-08.
Certificate Registration No. QA 051004008.

# 4. UNPACKING AND CHECKING

Unpack the unit 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 filling such a claim will be provided by the carrier.

# 5. Preparations

## 5.1. Location

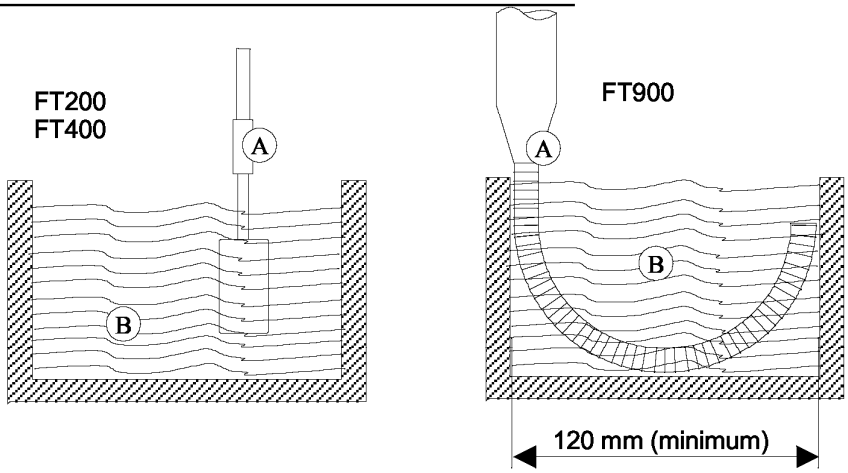


- The instrument should be set up at a frost-proof and dry location.
- The place of installation should be large enough and provide sufficient air ventilation to ensure the room does not warm up excessively because of the heat the instrument radiates to the environment. (Max. permissible ambient temperature: 40 °C). With regard to a disturbance in the cooling loop (leakage), the guideline EN 378 prescribes a certain room space to be available for each kg of refrigerant.
  The necessary amount of refrigerant is specified on the type plate.
  > For 0.25 kg of refrigerant R134a, a room space of 1 $m^3$ is required.
  > For 0.48 kg of refrigerant R404A, a room space of 1 $m^3$ is required.
  > For 0.68 kg of refrigerant R23, a room space of 1 $m^3$ is required.
- The ambient temperature must not exceed 35 °C.
- A distance of at least 20 cm on each side must be maintained for ventilation, allowing internal heat to be conducted away from the unit.
- Press down the castor levers on model FT900
- IMPORTANT:
  Wait <u>at least one hour</u> after setting up a unit before placing it into operation. Mishandling during transport (e.g., laying on side) may have caused oil to enter the evaporator, capillary tube, or injection valve, considerably reducing cooling performance

## 5.2. Immersion Probe

Avoid touching the immersion probe if it is frosted.
DANGER OF INJURY. Use gloves.
Switch the unit on only if the probe is immersed into the bath fluid.

To prevent the immersion probe (A) from icing, it should be completely immersed into the bath liquid (B).




Accessory: Clamp for cooler probe FT200/400 - order no. 8 970 400

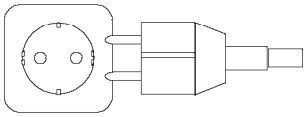
### 5.3. Tube connection FD200

- Connect the tubes and secure with tube clamps.
  discharge (9)
  intake (10)

Recommended flow rate: 2 to 3 l/min

## 6. OPERATING PROCEDURES

### 6.1. Power connection

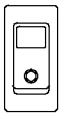


Check to make sure that the line voltage matches the supply voltage specified on the identification plate.

Deviations of ±10 % are permissible.

Only connect the unit to a power socket with earthing contact (PE – protective earth)!
We disclaim all liability for damage caused by incorrect line voltages!

### 6.2. Switching On



- Turn on the mains switch (1) to place the unit into operation.
  The control light in the switch will illuminate.

The immersion probe – as part of the cooling circuit – should not be exposed to bath temperatures above the working temperature of the immersion cooler.
This would cause damage to the compressor.
Do not immerse a frosted immersion probe into hot bath oil.
DANGER OF INJURY!

## 7. SAFETY RECOMMENDATIONS FOR THE USER

- Only connect the unit to a power socket with earthing contact (PE – protective earth)!
- Place the instrument on an even surface .
- Do not touch the immersion probe if it is covered with ice.
- Do not bend the tube connection of the immersion probe
- Keep the air intake and exhaust grids free of obstructions. (Maintain a sufficient distance from all surrounding surfaces!)
- Do not move the unit from the position where it was set up during operation.
- Employ suitable connecting tubing.
- Avoid sharp bends in the tubing, and maintain a sufficient distance from surrounding walls.
- Regularly check the tubing for material defects (e.g. for cracks).
- Never operate damaged or leaking equipment.
- Always turn off the unit and disconnect the mains cable from the power source before performing any service or maintenance procedures, or before moving the unit.
- Never operate equipment with damaged mains power cables.
- Electrical connections and any other work on the cooling system must be performed by qualified personnel only.

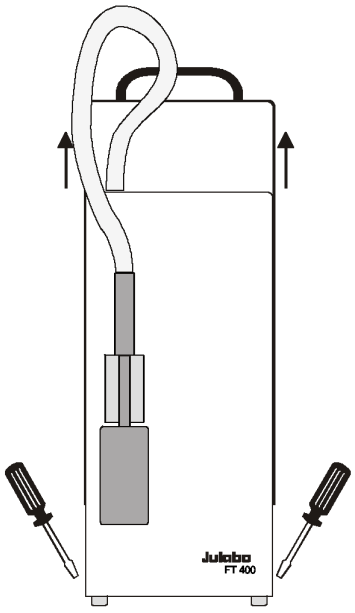
## 8. TROUBLESHOOTING

- Malfunction of compressor:
  The cooling compressor is equipped with an overload protection device that will be triggered by overheating or excessive current consumption. Possible causes include insufficient ventilation or contamination of the condenser.
  After a cool-down phase, the motor is automatically switched on again.

- Interruption of the cooling loop (FD200) by a bended tube.

# 9. OPERATING SAFETY / MAINTENANCE

Before cleaning the unit, disconnect the power plug from the mains socket!
Always turn off the unit and disconnect the mains cable from the power source before performing any service or maintenance procedures.
Electrical connections and any other work on the cooling system must be performed by qualified personnel only.
Prevent humidity from entering into the immersion cooler.

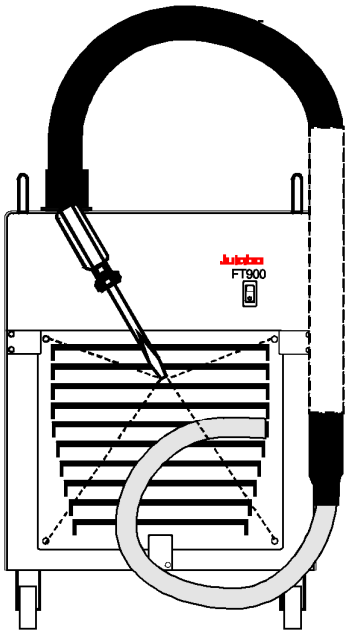



JULABO coolers are designed for continuous operation under normal conditions.
Periodic maintenance is not required.

Regularly check the condensor for dirt contamination. Clean the ribbed condensor, because dust and dirt will reduce cooling performance of the unit.

Cleaning the Cooling Compressor:

- Switch off the unit, disconnect mains power cable.
- Remove the hood (FD200, FT200, FT400).




- The ventilation grid (7) is detached by unscrewing the four mouting screws (FT900).
- Clean the ribbed condensor with a vacuum cleaner.
- Replace the hood or the ventilation grid.
- Switch on the unit.

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

**Repairs**

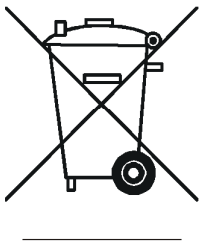
Before asking for a service technician or returning a JULABO instrument for repair, please contact an authorized JULABO service station.

When returning the unit:

- Clean the unit in order to avoid any harm to the service personnel.
- Attach a short fault description.
  If you intend to return your JULABO unit to us, you will find a Service Return Form on our website www.julabo.de (Sales & Service/Technical Support/Service Forms). Please use this as a delivery note and include it to the unit or send it in advance either by Fax or E-Mail.
- During transport the unit has to stand upright. Mark the packing correspondingly.
- When returning a unit, take care of careful and adequate packing.
- JULABO is not responsible for damages that might occur from insufficient packing.

## 9.1. Disposal

This unit contains the refrigerants R134a, R404A and R23– at this time considered not to have any negative effects on the ozone layer. However, during the long operating period of the unit, disposal prescriptions may change. So only qualified personnel should take care of disposal.



Valid in EU countries

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

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

Contact an authorized waste management company in your country.

Disposal with household waste (unsorted waste) or similar collections of municipal waste is not permitted!

# 10. TECHNICAL SPECIFICATIONS

| | | FT200 | FD200 |
|---|---|---|---|
| Temperature range | °C | -20 to +30 | 10 to +30 |
| Cooling capacity | °C | +20 0 -30 | +20 +10 |
| (medium ethanol) | W | 250 150 40 | 220 180 |
| Refrigerant | | R134a | R134a |
| Recommanded flow rate | l/min | -- | 2 - 3 |
| Freezing protection | °C | -- | 10 |
| Immerson probe (Lxdia.) | mm | 90x40 | -- |
| Connection tubing (L) | mm | 1200 | -- |
| Dimensions (WxLxH) | mm | 180x270x390 | 180x270x390 |
| Ambient temperature | °C | 5 ... 35 | 5 ... 35 |
| Power requirement | V/Hz | 230/50 | 230/50 |
| or | V/Hz | 115/60 | 115/60 |
| Weight | kg | 18 | 16 |

| | | FT400 | FT900 |
|---|---|---|---|
| Temperature range | °C | -40 ... +30 | 90 ... +30 |
| Cooling capacity | °C | +20 +10 -40 | +20 +10 -40 -80 |
| (medium ethanol) | W | 450 360 30 | 270 265 200 70 |
| Cooling compressor | | | 2-stufig |
| Refrigerant | | R404A | R404A/R23 |
| Immerson probe (Lxdia.) (flexible) | mm | ----- | 650x15 |
| Immerson probe (Lxdia.) | mm | 120x50 | ------- |
| Connection tubing (L) | mm | 1200 | 1600 |
| Dimensions (WxLxH) housing only | mm | 200x300x430 | 380x550x600 |
| Ambient temperature | °C | 5 ... 35 | 5 ... 35 |
| Power requirement | V/Hz | 230/50 | 230/50 |
| Weight | kg | 24 | 50 |

**Note:**
All measurements have been carried out at:
rated voltage and frequency; ambient temperature 20 °C;

Standards:

| | |
|---|---|
| EMC regulations | EN 61326 |
| Guideline for first voltage range | EN 61010-1, EN 61010-2-010 |
| Pressure equipment directive | EN 378 |

Environment:

Use only indoor.

Altitude up to 2000 m - normal zero.

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

Air humidity acc. DIN EN 61 010, part 1:

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

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

Protection class: IP 21 acc. EN 60 529

Power supply: acc. to class 1, VDE 0106 T1

not for use in explosive atmosphere

Max. mains fluctuation of ±10 % are permissible.

Pollution degree 2

Overvoltage category II

# 11. EC Conformity

CE

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

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

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

Julabo

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## 12. 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.