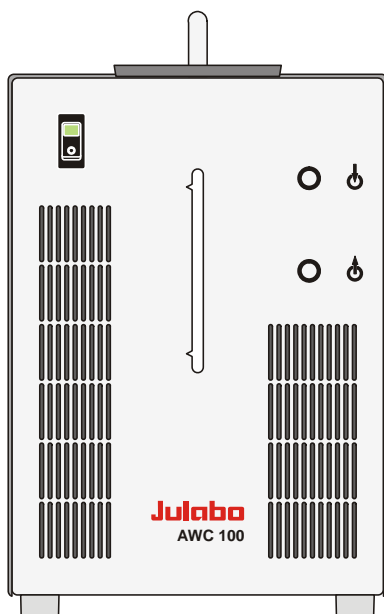


English

OPERATING MANUAL

Compact Recirculating Cooler

AWC100



Julabo
THE TEMPERATURE CONTROL COMPANY

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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 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.

Quality Management System



The JULABO Quality Management System:

Temperature control devices for research and industry are developed, produced, and distributed according to the requirements of DIN EN ISO 9001:2000. Certificate Registration No. 01 100044846

Unpacking and inspecting

Unpack the recirculating cooler and accessories and check for damages incurred during transit. These should be reported to the responsible carrier, railway, or postal authority, and a request for a damage report should be made. These instructions must be followed fully for us to guarantee our full support of your claim for protecting against loss from concealed damage. The form required for filing such a claim will be provided by the carrier.

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1. Intended use

JULABO recirculating coolers have been designed for temperature application to specific fluids. The pump connections can be used for cooling applications in an external circuit at a constant temperature.



JULABO water baths are not suitable for direct temperature control of foods, semi-luxury foods and tobacco, or pharmaceutical and medical products. Direct temperature control means unprotected contact of the object with the bath medium (bath fluid).

1.1. Description

The AWC 100 recirculating cooler is suitable for the cooling of water in loop circuits. A pump supplies the cooling water to the external circuit via the cooling water outlet. The recirculating cooler constantly withdraws heat from the circulating fluid. The water temperature varies with the ambient temperature and may not exceed 40 °C.

2. Operator responsibility – Safety instructions





The products of JULABO ensure safe operation when installed, operated, and maintained according to common safety regulations. This section explains the potential dangers that may arise when operating the circulator and also specifies the most important safety precautions to preclude these dangers as far as possible.

The operator is responsible for the qualification of the personnel operating the units.

- The personnel operating the units should be regularly instructed about the dangers involved with their job activities as well as measures to avert these dangers.
- Make sure all persons tasked with operating, installing, and maintaining the unit have read and understand the safety information and operating instructions.
- When using hazardous materials or materials that could become hazardous, the unit may be operated only by persons who are absolutely familiar with these materials and the unit. These persons must be fully aware of possible risks.

If you have any questions concerning the operation of your unit or the information in this manual, please contact us!

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Safety recommendations for the operator

- You received a product conceived for industrial use. Nevertheless, avoid strikes to the housing, vibrations, damages to the keypad foil (keys, display) or contamination.
- Make sure the product is regularly checked for proper condition. Regularly check (at least every 2 years) the proper condition of the mandatory, warning, prohibition and safety labels.
- Take care that the mains supply features a low impedance to avoid any negative affects on the instrument being operated in the same mains.
- This unit is designed for operation in a controlled electromagnetic environment. This means that transmitting devices (e.g. cellular phones) should not be used in the immediate vicinity. Magnetic radiation may influence other units with components susceptible to magnetic fields (e.g. a monitor). We recommend to keep a minimum distance of 1 m.
- Permissible ambient temperature: max. 40 °C, min. 5 °C.
- Permissible relative air humidity: 50 % (40 °C).
- Do not store in an aggressive atmosphere. Protect from contaminations.
- Do not expose to sunlight.

Appropriate Operation

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

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

Use




For the use according to the intended purpose, special material requirements have to be respected (bath fluids). Only use non-acid and non corroding materials.

Observe all warnings for the used materials (bath fluids) and the respective instructions (safety data sheets).

Only use the unit in well ventilated areas.

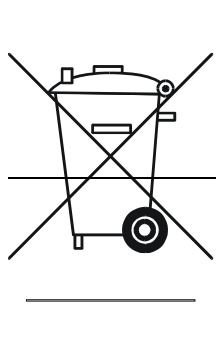
The recirculating coolers are not for use in explosive atmosphere

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

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

Observe the instructions in the manuals for instruments of a different make that you connect to the circulator, particularly the corresponding safety instructions. Also observe the pin assignment of plugs and technical specifications of the products.

2.1. Disposal

	<p><u>Valid in EU countries</u> 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!</p>
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2.2. EC Conformity



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

Directive of the European Parliament and of the Council on the approximation of the laws of the Member States relating to machinery.

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.

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2.3. Warranty conditions

JULABO Labortechnik GmbH warrants its products against defects in material or in workmanship, when used under appropriate conditions and in accordance with appropriate operating instructions

for a period of ONE YEAR.

Extension of the warranty period – free of charge

2 Years Warranty

1Plus Warranty

Registration free of charge on www.julabo.de

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.

2.4. Technical specifications

		AWC100	
Working temperature range	°C	+20 ... +40	
Cooling capacity varying with the temp. Difference between return line temp. and ambient temperature	°C	20	15 10 5
stage 0	W	400	320 220 120
stage 1	W	550	440 300 180
Circulating pump			
flow rate, max.	l/min	2.9	
pressure, max.	bar	0,2	
Noise level, 1 m distance	max	dB(A)	55
Filling volume (internal storage tank)	l	0.85	
Overall dimensions (WxLxH)	cm	20x34x30	
Ambient temperature	°C	5 ... 40	
Weight	kg	11	
Mains power connection	230 V/50-60 Hz	V/Hz	207-253V/50-60
Current draw	(at 230 V)	A	1
Mains power connection	115 V/60 Hz	V/Hz	103-127V/60
Current draw	(at 115 V)	A	1

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

Environmental conditions according to IEC 61 010-1:

Use only indoor.

Altitude up to 2000 m - normal zero.

Ambient temperature: +5 ... +40 °C

Air humidity:

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

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

Max. mains fluctuations of ±10 % are permissible.

The unit corresponds to Class I

Overvoltage category II

Pollution degree 2



Caution:

The unit is not for use in explosive atmosphere

3. Safety notes for the user

3.1. Explanation of safety notes



In addition to the safety warnings listed above, warnings are posted throughout the manual. These warnings are designated by an exclamation mark inside an equilateral triangle. "Warning of a dangerous situation (Attention! Please follow the documentation)."

The danger is classified using a signal word.
Read and follow these important instructions.



Warning:

Describes a possibly highly dangerous situation. If these instructions are not followed, serious injury and danger to life could result.



Caution:

Describes a possibly dangerous situation. If this is not avoided, slight or minor injuries could result. A warning of possible property damage may also be contained in the text.



Notice:

Describes a possibly harmful situation. If this is not avoided, the product or anything in its surroundings can be damaged.

3.2. Explanation of other notes



Note!

Draws attention to something special.



Important!

Indicates usage tips and other useful information.

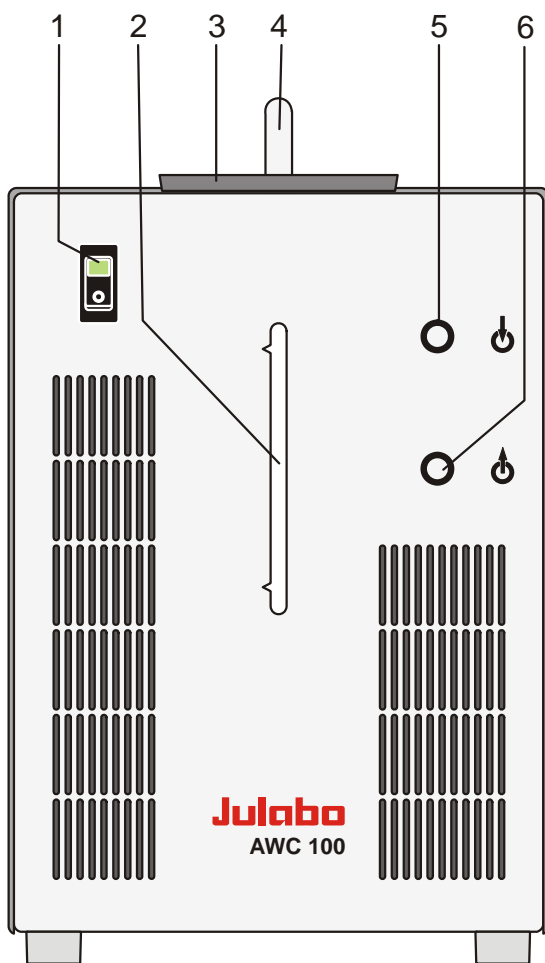
3.3. Safety instructions

Follow the safety recommendations to prevent damage to persons or property. Further, the valid safety instructions for working places must be followed.

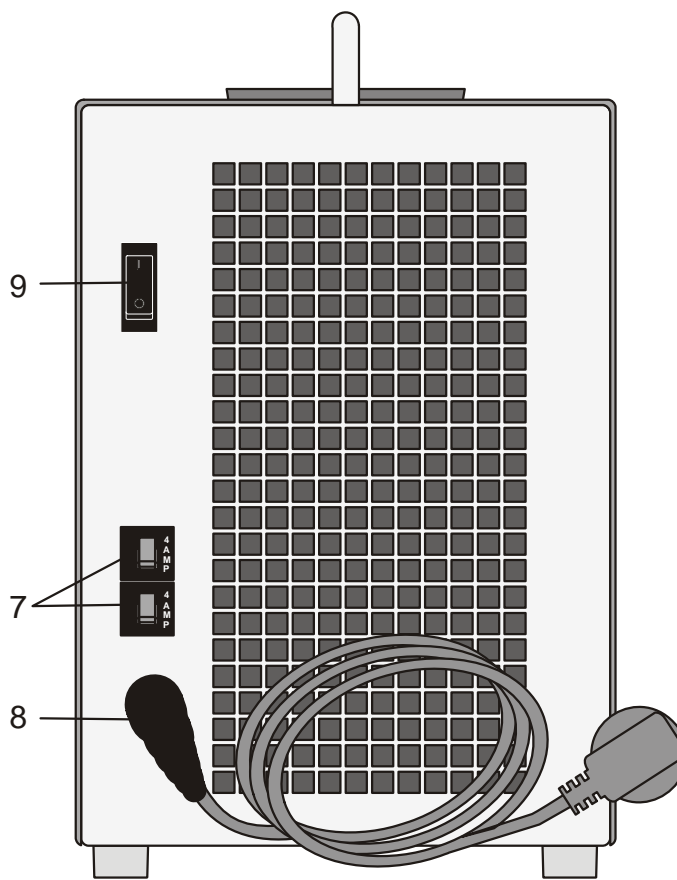


- Only connect the unit to a power socket with earthing contact (PE – protective earth)!
- The power supply plug serves as a safe disconnecting device from the line and must always be easily accessible.
- Place the instrument on an even surface on a pad made of non-inflammable material.
- The instrument is not suited for unsupervised continuous operation.
- Do not stay in the area below the unit.
- Make sure you read and understand all instructions and safety precautions listed in this manual before installing or operating your unit.
- Never operate the unit without bath fluid in the bath.
- Do not drain the bath fluid while it is hot or cold!
- Use suitable connecting tubing.
- Avoid sharp bends in the tubing, and maintain a sufficient distance from surrounding walls.
- Make sure that the tubing is securely attached.
- 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.
- Always turn off the unit and disconnect the mains cable from the power source before cleaning the unit.
- Always empty the bath before moving the unit.
- Transport the unit with care.
- Sudden jolts or drops may cause damage in the interior of the unit.
- Observe all warning labels.
- Never remove warning labels.
- Never operate equipment with damaged mains power cables.
- Repairs are to be carried out only by qualified service personnel.



4. Operating controls and functional elements



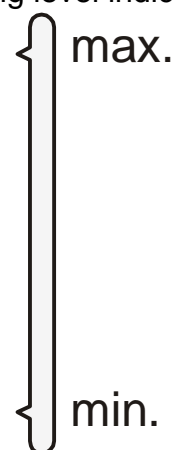
Front



Back

- 1 Mains power switch, illuminated
- 2 Filling level indication
- 3 Lid on cooling water storage tank
- 4 Handle
- 5 Pump connector: Return 
- 6 Pump connector: Feed 
- 7 Safety cutouts: Mains fuses 4 A
- 8 Mains power cable with plug
- 9 Selector switch for cooling capacity

Filling level indication



5. Preparations

5.1. Installation



Caution:

Take care the temperature of cooling water in the loop circuit does never exceed 40 °C.

The cooling capacity varies with the temperature difference between return line and ambient temperature.

See technical specifications page 8

Parts of the unit may be destroyed by high cooling water temperatures. Hot fluid may leak and result in severe skin burns.

- Place the recirculating cooler on an even and solid base.
- The unit should be set up in a frost-proof and dry location.
- Take care the mains switch is easily accessible.
- The ambient temperature must not exceed 40 °C.
Recommendation: approx. 20 °C
- A distance of at least 20 cm on the front and rear venting grids must be maintained for ventilation, allowing internal heat to be conducted away from the unit.

5.2. Bath fluids



Caution:

No liability for use of other bath liquids!

Please contact JULABO before using other than recommended bath fluids. JULABO takes no responsibility for damages caused by the selection of an unsuitable bath fluid

Do not use alcohols.

Water:

The quality of water depends on local conditions.

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

Recommended bath fluids:

Bath fluid	Temperature range
soft/decalcified water	5 °C to 80 °C

5.3. Tubing

Recommended tubing: PVC-tubing; 6 mm ID

- Connect the tubings for cooling the external system to the pump connectors for feed and return (5 and 6) on the front of the recirculating cooler and secure the screw connection firmly.



Caution: Fasten tubing to prevent slipping.
After starting operation, please check all tubing connections in the cooling water circuit for leaks.

5.4. Filling

- Remove the lid (3) and fill in water until the unit is filled to the maximum.
- If the water level sinks below the minimum, take care to fill in more liquid.



Notice: Take care the filling level does not exceed the maximum.
When switching the unit off, take care that water does not flow back to the storage tank. To prevent this use a shut-off valve or a tube clamp for the external circuit.

5.5. Draining



Caution: Switch off the unit and disconnect mains power cable.

- Remove the lid (3).
- Use a suitable vessel.
- Hold the unit on the handle (4) and at the bottom of the front and tilt it to the front.

6. Operating procedures

6.1. Power connection



Caution:

- 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!
- The power supply plug serves as safe disconnecting device from the line and must be always easily accessible.
- Never operate equipment with damaged mains power cables.
- Regularly check the mains power cables for material defects (e.g. for cracks).

Make sure that the line voltage and frequency match the supply voltage specified on the type plate.

Deviations of $\pm 10\%$ are permissible.

6.2. Switching on



- The recirculating cooler is turned on and off with the mains switch. (1). The integrated pilot lamp illuminates.



Caution:

The unit may restart automatically after a power failure.

6.3. Changing cooling capacity



- Use the selector switch (9) on the rear of the unit to change the ventilator rotation speed, i. e. cooling performance. Position „I“ = higher cooling capacity.
- To maintain the full cooling performance, clean the condenser from time to time.

7. Cleaning / repairing the unit



Caution:

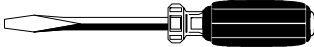
Always turn off the unit and disconnect the mains cable from the power source before cleaning the unit.

Prevent humidity from entering into the circulator.

Service and repair work may be performed only by authorized electricians.

Cleaning:

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

- Switch off the unit, disconnect mains power cable.
- Remove the hood. 
- Clean the ribbed condensor with a vacuum cleaner.
- Replace the hood.
- Connect mains power cable and switch on the unit.

The unit is designed for continuous operation under normal conditions. Periodic maintenance is not required.

Clean the outside of the unit using a wet cloth and low surface tension water (e.g., soap suds).

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.
- When returning a unit, take care of careful and adequate packing.

JULABO is not responsible