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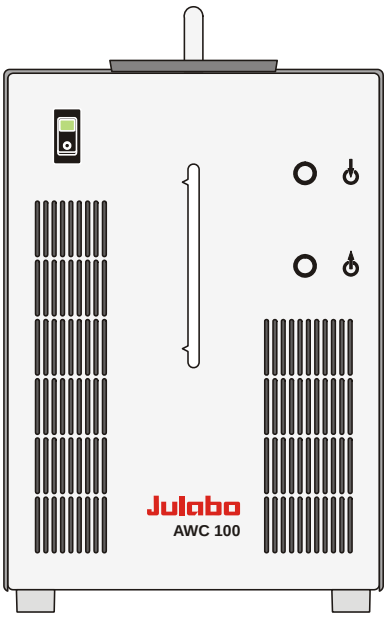
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English

Operating manual

Compact Recirculating Cooler

AWC100



Julabo
THE TEMPERATURE CONTROL COMPANY

JULABO USA, Inc.
884 Marcon Boulevard
Allentown, PA 18109
Phone: +1(610) 231-0250
Fax: +1(610) 231-0260
info @ julabo.com
www.julabo.com

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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.

The JULABO Quality Management System

Temperature control devices for research and industry are developed, produced, and distributed according to the requirements of ISO 9001:2008. 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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Important: keep operating manual for future use

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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.

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

Contact

JULABO USA, Inc.
884 Marcon Boulevard
Allentown, PA 18109

Phone:+1(610) 231-0250
Fax: +1(610) 231-0260
info @ julabo.com
www.julabo.com

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.

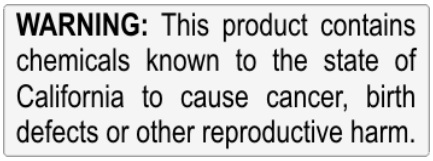
Use

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 environment.

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

If this unit is intended for use within the United States of America, all 3 warning labels **must** be affixed to the housing of the unit prior to use. Directions for the positioning of the individual warning labels are enclosed with the warning labels included in the delivery. Warning labels must be easily visible to users.

1		Warning label W00: Colors: yellow, black Danger area. Attention! Observe instructions. (operating manual, safety data sheet)
2 **or**		Mandatory label M018: Colors: blue, white Carefully read the user information prior to beginning operation. **Scope: EU**
2		Semi S1-0701 Table A1-2 #9 Carefully read the user information prior to beginning operation. **Scope: USA, NAFTA**
3		Warning label Proposition 65

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

However, over the long operating period of the unit, disposal rules may change. Therefore, only qualified personnel should handle the disposal.

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2.2. 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 environment.

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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.

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- 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.

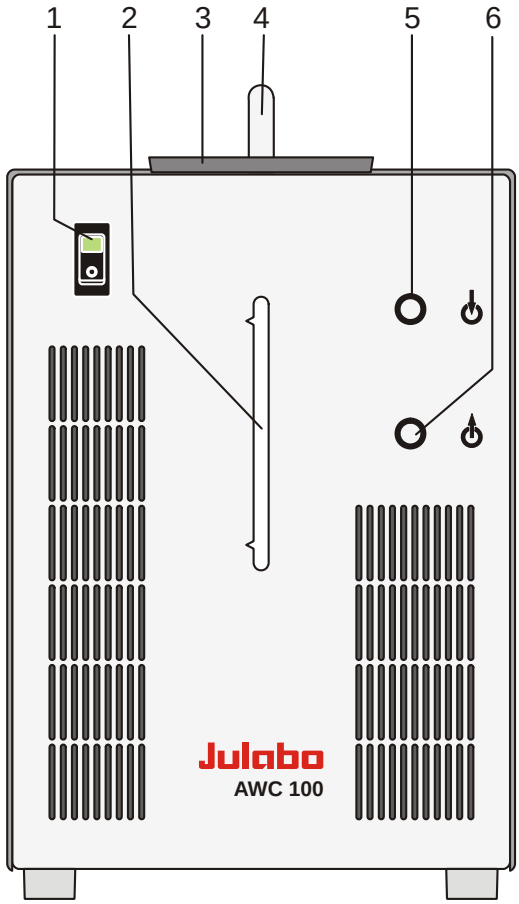


WARNING

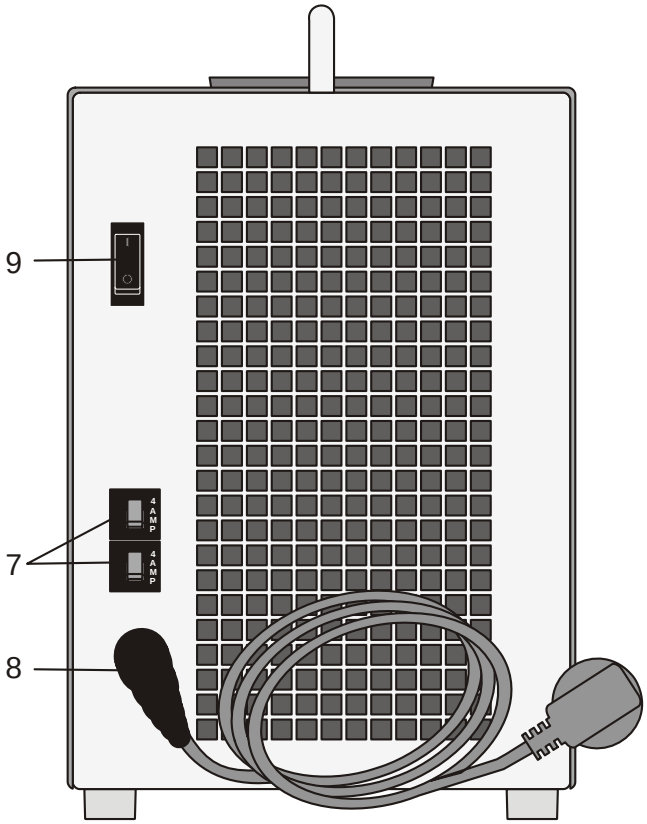
This product contains chemicals known to the state of California to cause cancer, birth defects or other reproductive harm.

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4. Operating controls and functional elements



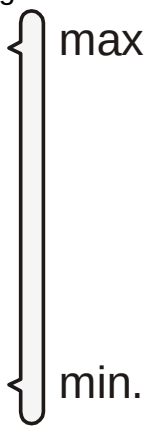
Front



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



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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 7

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

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5.3. Tubing

Recommended tubing:

JULABO Order No.		Suitable for
8930008	1m CR® tubing, 8mm inner dia.	AWC100
8930010	1m CR® tubing, 10 mm inner dia.	AWC100

- 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.

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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 ±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.

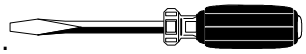
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7. Cleaning / repairing the unit

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

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8. WARRANTY PROVISIONS

The following Warranty Provisions shall apply to products sold in North America by Julabo ("Seller") to the entity shown as buyer ("Buyer") on Seller's invoice.

1. 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 or ten thousand (10,000) hours of operation, whichever comes first, from the date the product is shipped by Seller to Buyer (the "Initial Warranty").

2. 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.

3. 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 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.

4. 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 Seller's facility in Allentown, Pennsylvania, U.S.A. or Vista, California, 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 one of Seller's authorized representatives within thirty (30) days of the date the product is delivered to Buyer; 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 therefore. 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.

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5. 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.

6. 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.

7. 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.

8. 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.

9. Freight. 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.

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