Julabo
THE TEMPERATURE CONTROL COMPANY

200F / 201F / 300F
310F / 449F / 450F
600F / 601F / 800F
1000F / 1001F / 1200F
1800F / 2500F

Refrigerated bath basic units

Original operating manual

30000935.A

01/2024
US

USA Office:

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

Headquarter:

JULABO GmbH
Gerhard-Juchheim-Strasse 1
77960 Seelbach
Germany

Illustrations in this operating manual are for illustrative purposes and are not necessarily displayed to scale.

1 Foreword

Congratulations!

You have made an excellent choice.

JULABO would like to thank you for the trust you have placed in our company and products.

This operating manual will help you become acquainted with the use of our units. Read the operating manual carefully. Keep the operating manual handy at all times.

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.

2.1 Notes on commissioning and operation

The cooling machine is combined with a suitable JULABO circulator to form a refrigerated circulator. Operation is done entirely via the control elements of the connected circulator.

Initial operation as well as the individual operating topics are described in the operating manual of the associated circulator.

Please note that this operating manual, as well as that for the corresponding circulator, supplement one another and must always be read together.

2.2 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.

2.3 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.com**. Use the Search function on the website.

2.4 Warnings

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.

DANGER

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

WARNING

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

CAUTION

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

NOTE

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

2.5 Symbols used

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 Intended use

This section defines the purpose of the unit so that the operator can operate the unit safely and avoid misuse.

This is a laboratory device intended for temperature control applications of liquid media. It can only be operated in conjunction with a JULABO circulator designed for this purpose.

Only use the device if it is in technically perfect condition and only use it in accordance with its intended use. Be aware of safety issues or hazards and comply with the operating manual! In particular, always immediately rectify malfunctions that could impair safety!

The device is not suitable for direct temperature control application of food, other consumables or pharmaceutical or other medical products.

The device is not suitable for use in an explosive environment.

4 Safety

4.1 General Safety Instructions for the operating company

This section outlines the General Safety Instructions that must be observed by the operator to ensure safe operation.

- The operator is responsible for the qualifications of its operating personnel.
- The operator must ensure that the operating personnel has been instructed in use of the device.
- The device operators must receive regular training about the dangers involved in their work and measures to prevent such dangers.
- The operator must ensure that persons entrusted with the operation, installation and maintenance have read and understood the operating manual.
- The device may only be configured, installed, maintained and repaired by trained personnel with appropriate qualifications.
- If hazardous substances or substances that may become hazardous are used, the device may only be used by personnel who are qualified to handle these substances and the device.
- The operator must ensure that the device is checked for safety and functionality at regular and usage-related intervals.
- The safety symbols included with the device must be attached to the device.
- The operator must ensure that the mains supply has a low impedance to prevent influencing other devices powered by the same supply.
- For devices with multiphase permanent connection, a circuit breaker must be included in installation to ensure safe disconnection.

Staff qualifications:

Technical staff is understood to be a person who successfully completed vocational training. They must assess assigned work and be able to independently recognize and avoid possible dangers based on their specialist training and work experience.

4.2 Safety instructions

The unit is built in accordance with state of the art technology and recognized safety regulations. Despite this, its use may pose a risk to life and limb for the user or third parties.

Therefore, always read and observe the following safety instructions before using the product.

Use other than for the intended purpose!

If the device is used for purposes other than those intended by the manufacturer, the protection afforded by the device may be impaired.

Hot surfaces!

The following parts and elements may become hot during operation:

– Bath fluid
– Heating element
– Bath lid
– Bath surface
– Connections for external application

Contact may cause severe burns or scalds to hands and arms, face and limbs.

- Keep sufficient distance from hot surfaces and fluids.
- Wear suitable protective gloves.

Electric shock from electrical system!

Touching damaged live parts can cause severe electric shocks and lead to injury or even death.

- Have damaged insulation and parts of the electrical system immediately repaired by JULABO service technicians or a qualified specialist workshop
- Immediately replace damaged power cords
- When connected with a mains plug, this mains plug must always be readily accessible

Refrigerants are harmful to health!

Refrigerants and their vapors are harmful to health. There is a suffocation risk in enclosed spaces.

- Do not touch or inhale refrigerants.
- Have damage to the refrigerant cycle repaired only by JULABO service technicians or qualified specialists.
- If refrigerant leaks, stop the device immediately and ventilate the room thoroughly.

Natural refrigerants are flammable!

Some products contain flammable refrigerant in a circuit that is sealed for the duration of the respective process. These products can be identified by the  symbol on the type plate. If there is a leak in the refrigerant cycle, a flammable concentration may form in the air and ignite or explode due to potential ignition sources in the vicinity. This can result in serious injury or death.

- Use the required minimum room size for operating the device.
- Do not store any potential sources of ignition near the device.
- Always plug the power cable into the device first and then into the power socket; unplug in reverse order (prevents sparks).
- If refrigerant leaks, stop the device immediately and ventilate the room thoroughly.
- Have damage to the refrigerant cycle repaired only by JULABO service technicians or qualified specialists.
- Have maintenance work performed only by JULABO service technicians or qualified specialists.

Wear personal protective equipment!

Lacking or unsuitable personal protective equipment increases the risk of health damage and injury.

Personal protective equipment includes, for example:

– Work gloves
– Safety shoes
- Protective clothing
– Breathing protection
- Hearing protection
– Face and eye protection

- Specify and provide personal protective equipment for the respective application.
- Use only personal protective equipment that is in good condition and provides effective protection.
- Adapt personal protective equipment to the person, e.g., by size.

Keep safety symbols legible!

Safety symbols on the unit warn of dangers in hazardous areas and are an important part of the unit's safety equipment. Missing safety symbols increase the risk of injury to persons.

- Clean dirty safety symbols.
- Replace damaged and unrecognizable safety symbols immediately.

Maintenance and repair work!

Improper maintenance and repair work jeopardizes operational safety. This can result in serious injury or death.

- Only carry out work described in this operating manual. Switch off the unit and disconnect it from the power supply before carrying out any work.
- All other maintenance and repair work may only be carried out by a JULABO service technician or a qualified specialist workshop.

4.3 Safety symbols

There are safety symbols included with the device, which should be attached to the device before initial operation.

Safety symbols	Description
	Warning of a danger zone. Note operating manual
	Warning about hot surface
	Warning of cold surface
	Warning of a flammable liquid heat transfer medium
	Read operating manual before switching on

4.4 Safety function

Technical safety functions protect the device from damage. The safety functions are not affected by the control circuit. If a safety function trips, all actuators are permanently switched off. The operator is warned by an optical and acoustic alarm on the circulator.

High pressure switch

A pressure switch trips when the condensing pressure reaches a defined value. The device switches off the pump, heater and cooling machine. A continuous signal tone sounds. A warning message appears on the display of the connected circulator. The cause must be determined and rectified.

Intrinsically safe devices do not have a high pressure switch.

5 Product description

5.1 Function description

This section describes the function of the device.

The cooling machine is combined with a circulator to form a refrigerated circulator. The device combination can precisely cool and heat samples over a wide temperature range. The device combination is suitable for external temperature applications. The cooling machine is controlled by the connected circulator.

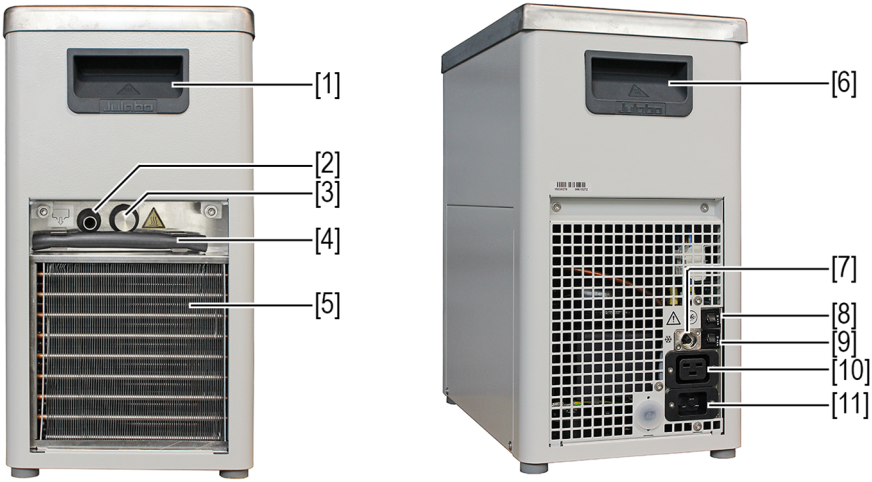
5.2 Possible combinations with circulators

The table lists which cooling machine can be combined with which circulator.

Cooling machine	Circulators				
	CORIO CD	CORIO CP	DYNEO DD	MAGIO MS	MAGIO MX
200F	✓	✓	✓	-	-
201F	✓	✓	✓	-	-
300F	✓	✓	✓	-	-
310F	✓	✓	✓	✓	-
449F	✓	✓	✓	✓	-
450F	✓	✓	✓	✓	-
600F	✓	✓	✓	✓	-
601F	✓	✓	✓	✓	-
800F	✓	✓	✓	✓	-
1000F	✓	✓	✓	✓	-
1001F	✓	✓	✓	-	-
1200F	✓	✓	✓	✓	-
1800F	-	-	-	-	✓
2500F	-	-	-	-	✓

5.3 Operating and functional elements

The following figure shows the operating and functional elements and their position on the unit.

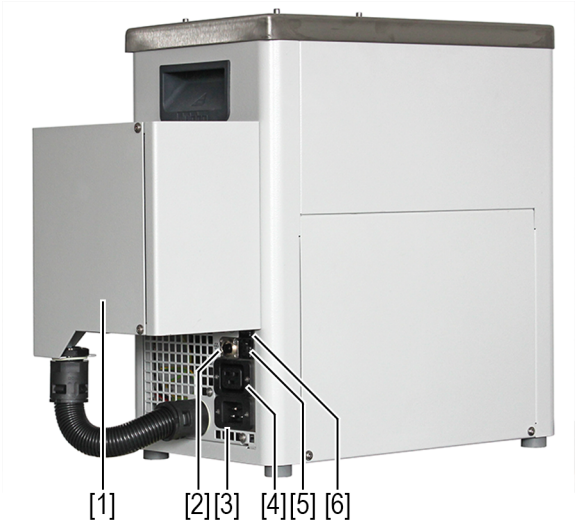


Front (without cover) and rear (e.g. 310F)

1	Recessed grip
2	Bath tank drain opening
3	Drain valve
4	Drain hose (for 310F and 450F)
5	Condenser
6	Recessed grip
7	CAN plug for connection with a circulator
8	Mains fuse, resettable
9	Mains fuse, resettable
10	Circulator mains output socket
11	Mains input socket

5.3.1 External inverter

With the 100 V voltage variant of 310F and 450F, the inverter is mounted on the rear side.



Rear side of 310F/450F (100 V voltage variant)

1	Inverter
2	CAN plug for connection with a circulator
3	Mains input socket
4	Circulator mains output socket
5	Mains fuse
6	Mains fuse

5.4 Operating units with frequency converter

The 449F, 800F, 1200F, 1800F and 2500F units are equipped with frequency converters. In rare cases, operating these units with frequency converters may cause the RCD to trip. This is the case in particular if multiple units with frequency converters are operated on one RCD.

For example, if a three-pole RCD is used, it is advisable to distribute the units across the three phases evenly. Ideally, each unit is protected by its own RCD (RCBO).
To ensure sufficient protection against residual currents, it is also recommended to operate these units on circuits protected by an RCD of type F or higher.

It is currently not possible to use devices with frequency converters on RCDs with a tripping current of 5 mA (so-called GFCIs), which are sometimes used in the USA, since these devices are very sensitive to the high-frequency leakage currents caused by frequency converters.

5.5 Technical data

Performance specifications measured in accordance with DIN12876. Cooling capacities up to 20°C measured with ethanol; over 20°C with thermal oil unless specified otherwise. Performance specifications apply at an ambient temperature of 20°C. Performance values may differ with other bath fluids.

Grouping of the device acc. to CISPR 11:

- The device is an ISM device of group 1, class A, which uses high frequency for internal purposes
- Class A: Use in an industrial electromagnetic environment

In accordance with IEC 61010-1, the device is designed for safe operation under the following ambient conditions:

- Indoor use
- Altitude up to 2000 m above sea level
- Ambient temperature +5 ... 40 °C (unless otherwise specified in the technical data)
- Maximum relative humidity 80 % for temperatures up to 31 °C, decreasing linearly down to 50 % relative humidity at 40 °C
- Mains voltage fluctuations up to ±10 % of the nominal voltage permissible if not otherwise specified
- Contamination level 2
- Overvoltage category II

The technical data for the respective device combination can be found in the operating manual of the associated circulator.

Technical data		**200F**		
Performance values				
Lowest temperature	°C	-20		
Refrigerants		R134a/R290		
Dimensions				
Dimensions (W x D x H)	cm	23 x 39 x 44		
Usable bath opening (W x D)	cm	13 x 15		
Bath depth	cm	15		
Volumes min. … max.	l	3.0 … 4.0		
Weight	kg	23		
Mains connection				
		100 V 50/60 Hz	115 V 60 Hz	230 V 50/60 Hz
Nominal current consumption	A	4	4	2
Total current consumption	A	15	12	16
Switzerland	A			10
Great Britain	A			13
Mains fuse, resettable	A	10	10	10

Technical data		**201F**
Performance values		
Lowest temperature	°C	-20
Refrigerants		R134a
Dimensions		
Dimensions (W x D x H)	cm	44 x 41 x 22
Usable bath opening (W x D)	cm	13 x 15
Bath depth	cm	15
Volumes min. … max.	l	3.0 … 4.0

Weight	kg	23.6		
Mains connection				
		100 V 50/60 Hz	115 V 60 Hz	230 V 50/60 Hz
Nominal current consumption	A	4	3	2
Total current consumption	A	15	12	16
Switzerland	A			10
Great Britain	A			13
Mains fuse, resettable	A	10	10	10

Technical data		**300F**			
Performance values					
Lowest temperature	°C	-25			
Refrigerants		R134a			
Dimensions					
Dimensions (W x D x H)	cm	24 x 43 x 66			
Usable bath opening (W x D)	cm	13 x 15			
Bath depth	cm	15			
Volumes min. … max.	l	3.0 … 4.0			
Weight	kg	28.0			
Mains connection					
		100 V 50/60 Hz	115 V 60 Hz	230 V 50/60 Hz	208-230 V 60 Hz
Nominal current consumption	A	5	4	2	2 (208 V) 2 (230 V)
Total current consumption	A	15	12	16	16
Switzerland	A			10	
Great Britain	A			13	
Mains fuse, resettable	A	10	10	10	10

Technical data		310F		
Performance values				
Lowest temperature	°C	-30		
Refrigerants		R449A/R290		
Dimensions				
Dimensions (W x D x H)	cm	23 x 40 x 43		
Usable bath opening (W x D)	cm	13 x 15		
Bath depth	cm	15		
Volumes min. … max.	l	3.0 … 4.0		
Weight	kg	23		
Mains connection				
		100 V 50/60 Hz	115 V 60 Hz	200-230 V 50/60 Hz
Nominal current consumption	A	4	4	2 (200 V) 3 (230 V)
Total current consumption	A	15	12	16
Switzerland	A			10
Great Britain	A			13
Mains fuse, resettable	A	10	10	10

Technical data		449F
Performance values		
Lowest temperature	°C	-32
Refrigerants		R290
Dimensions		
Dimensions (W x D x H)	cm	37 x 59 x 47
Usable bath opening (W x D)	cm	28 x 35
Bath depth	cm	20
Volumes min. … max.	l	18.0 … 26.0 / 20.0 … 26.0
Weight	kg	36.7

Mains connection				
		100-230 V 50/60 Hz		
Nominal current consumption	A A	5 (100 V) 3 (230 V)		
Total current consumption	A	Max. 16		
Switzerland	A	10		
Great Britain	A	13		
Mains fuse, resettable	A	10		

Technical data		**450F**		
Performance values				
Lowest temperature	°C	-30		
Refrigerants		R449A/R290		
Ambient temperature	°C	+5 ... +35		
Dimensions				
Dimensions (W x D x H)	cm	23 x 40 x 43		
Usable bath opening (W x D)	cm	13 x 15		
Bath depth	cm	15		
Volumes min. … max.	l	3.0 … 4.0		
Weight	kg	23		
Mains connection				
		100 V 50/60 Hz	115 V 60 Hz	200-230 V 50/60 Hz
Nominal current consumption	A	4	5	3 (200 V) 3 (230 V)
Total current consumption	A	15	12	16
Switzerland	A			10
Great Britain	A			13
Mains fuse, resettable	A	10	10	10

Technical data		600F		
Performance values				
Lowest temperature	°C	-35		
Refrigerants		R449A, R452A*		
Dimensions				
Dimensions (W x D x H)	cm	33 x 47 x 47		
Usable bath opening (W x D)	cm	22 x 15		
Bath depth	cm	15		
Volumes min. … max.	l	5.0 … 7.5		
Weight	kg	32.4		
Mains connection				
		100 V 50/60 Hz	115 V 60 Hz	200-230 V 50/60 Hz
Nominal current consumption	A	11	7	3 (200 V) 4 (230 V)
Total current consumption	A	15	12	16
Switzerland	A			10
Great Britain	A			13
Mains fuse, resettable	A	12	12	10

** at 100 V, 50/60 Hz*

Technical data		601F
Performance values		
Lowest temperature	°C	-35/-40*
Refrigerants		R449A, R452A**
Dimensions		
Dimensions (W x D x H)	cm	33 x 46 x 52
Usable bath opening (W x D)	cm	22 x 15
Bath depth	cm	20
Volumes min. … max.	l	8.0 … 10.0
Weight	kg	36.0

Mains connection				
		100 V 50/60 Hz	115 V 60 Hz	200-230 V 50/60 Hz
Nominal current consumption	A	11	7	3 (200 V) 4 (230 V)
Total current consumption	A	15	12	16
Switzerland	A			10
Great Britain	A			13
Mains fuse, resettable	A	12	12	10

** depending on the circulator used*

*** 100 V, 50/60 Hz*

Technical data		**800F**		
Performance values				
Lowest temperature	°C	-40		
Refrigerants		R1270		
Dimensions				
Dimensions (W x D x H)	cm	33 x 48 x 70		
Usable bath opening (W x D)	cm	18 x 13		
Bath depth	cm	15		
Volumes min. … max.	l	5.0 … 7.5		
Weight	kg	38		
Mains connection				
		100 V 50/60 Hz	115 V 60 Hz	200–230V 50/60 Hz
Nominal current consumption	A	6	5	4 (200V) 3 (230 V)
Total current consumption	A	15	12	Max. 16
Switzerland	A			10
Great Britain	A			13
Mains fuse, resettable	A	10	10	10

Technical data		1000F		
Performance values				
Lowest temperature	°C	-40/-50*		
Refrigerants		R449A		
Dimensions				
Dimensions (W x D x H)	cm	42 x 49 x 51		
Usable bath opening (W x D)	cm	18 x 13		
Bath depth	cm	15		
Volumes min. … max.	l	5.0 … 7.5		
Weight	kg	50		
Mains connection				
		115 V 60 Hz	200-230 V 50/60 Hz	
Nominal current consumption	A	9	6 (200 V) 6 (230 V)	
Total current consumption	A	16	16	
Switzerland	A		10	
Great Britain	A		13	
Mains fuse, resettable	A	14	10	

** depending on the circulator used*

Technical data		1001F
Performance values		
Lowest temperature	°C	-38
Refrigerants		R449A
Dimensions		
Dimensions (W x D x H)	cm	45 x 64 x 74
Usable bath opening (W x D)	cm	35 x 41
Bath depth	cm	30
Volumes min. … max.	l	42.0 … 56.0
Weight	kg	70.7

Mains connection				
		200-230 V 50/60 Hz		
Nominal current consumption	A	5 (200 V) 5 (230 V)		
Total current consumption	A	16		
Switzerland	A	10		
Great Britain	A	13		
Mains fuse, resettable	A	10		

Technical data		**1200F**		
Performance values				
Lowest temperature	°C	-40/-50*		
Refrigerants		R1270		
Dimensions				
Dimensions (W x D x H)	cm	33 x 48 x 70		
Usable bath opening (W x D)	cm	18 x 13		
Bath depth	cm	15		
Volumes min. … max.	l	5.0 … 7.5		
Weight	kg	38		
Mains connection				
		100 V 50/60 Hz	115 V 50/60 Hz	200–230V 50/60 Hz
Nominal current consumption	A	9	4	4
Total current consumption	A	15	12	Max. 16
Switzerland	A			10
Great Britain	A			13
Mains fuse, resettable	A	10	10	10

** depending on the circulator used*

Technical data		1800F		
Performance values				
Lowest temperature	°C	-50		
Refrigerants		R1270		
Dimensions				
Dimensions (W x D x H)	cm	40 x 50 x 67		
Usable bath opening (W x D)	cm	18 x 13		
Bath depth	cm	20		
Volumes min. … max.	l	6.5 … 11.0		
Weight	kg	55		
Mains connection				
		200-230 V 50/60 Hz		
Nominal current consumption	A			
Total current consumption	A	16		
Switzerland	A			
Great Britain	A			
Mains fuse, resettable	A	10		

Technical data		2500F
Performance values		
Lowest temperature	°C	-50
Refrigerants		R1270
Dimensions		
Dimensions (W x D x H)	cm	40 x 50 x 67
Usable bath opening (W x D)	cm	18 x 13
Bath depth	cm	20
Volumes min. … max.	l	6.5 … 11.0
Weight	kg	55

Mains connection				
		200-230 V 50/60 Hz		
Nominal current consumption	A			
Total current consumption	A	16		
Switzerland	A			
Great Britain	A			
Mains fuse, resettable	A	10		

5.5.1 Material of parts that come into contact with the medium

The table lists parts that could come into contact with the bath fluid as well as the material that the parts are made of. This data can be used to check the compatibility of the parts with the bath fluid used.

Parts that come into contact with the medium	Material
Bath tank	1.4301/304H
Bath tank drain opening	1.4301/304H
Bath tank/bath cover gasket	FKM Viton
O-ring drain valve	FKM Viton

5.5.2 Refrigerant

For safety reasons and in case of leakage in the refrigerant cycle, there is a specified room volume per kg of refrigerant permitted at the installation site so that no flammable refrigerant/air mixture can form. The amount of refrigerant is indicated on the nameplate.

1 m^3 of space is required for 0,008 kg of R290 refrigerant.

1 m^3 of space is required for 0.357 kg of R449A refrigerant.

1 m^3 of space is required for 0.423 kg of R452A refrigerant.

1 m^3 of space is required for 0,008 kg of R1270 refrigerant.

Regardless of whether there is **one or more** refrigeration systems per room, the calculation/evaluation is **always the same** because it can be assumed that multiple leaks are not causally related or that a failure will occur as a consequence.

6 Transport and installation

This section describes how to transport the unit safely.

CAUTION

Risk of crushing by falling device!
A device that is not secured appropriately can fall down during improper transport and cause crushing injuries.

- Secure the device against tipping and falling during transport
- Secure loose parts against falling during transport
- Transport the device upright and with a suitable means of transport
- Wear personal protective equipment

► The device is switched off and emptied.
► A suitable transport trolley is available.
1. Unplug the power plug from the device.
2. Use the recessed grip to lift the device onto the center of the transport trolley, if necessary in a pair.

☝ See the technical data for weight information.

3. Use straps to secure the device against tipping in the center of the transport trolley.
4. Place loose parts for the device, such as cables, on the transport trolley.

✓ The device is then ready for transport and can be safely transported to its installation location.

6.1 Install the device at the operating location

This section describes how the device is set up at the installation location.

► The unit has been transported to the operation location.
► The size and infrastructure of the operation location are suitable for device operation.
1. If possible, position the device under an extraction system.

☝ Depending on the bath fluid, gases may be created at high temperatures.
☝ Recommended minimum distance of 1 m to other devices, to prevent electromagnetic interference.

2. Place the device on a level, smooth, non-flammable surface.
3. Make sure that the device is in a stable position.
4. For refrigerated circulators: Ensure an open space of at least 20 cm in front of and behind the device.

☝ All ventilation openings in the enclosure must remain uncovered.
☝ The refrigerant cycle must not be damaged.

✓ The unit is set up at the operation location.

7 Maintenance

7.1 Replace detachable power cord

The device is equipped with a detachable power cord.

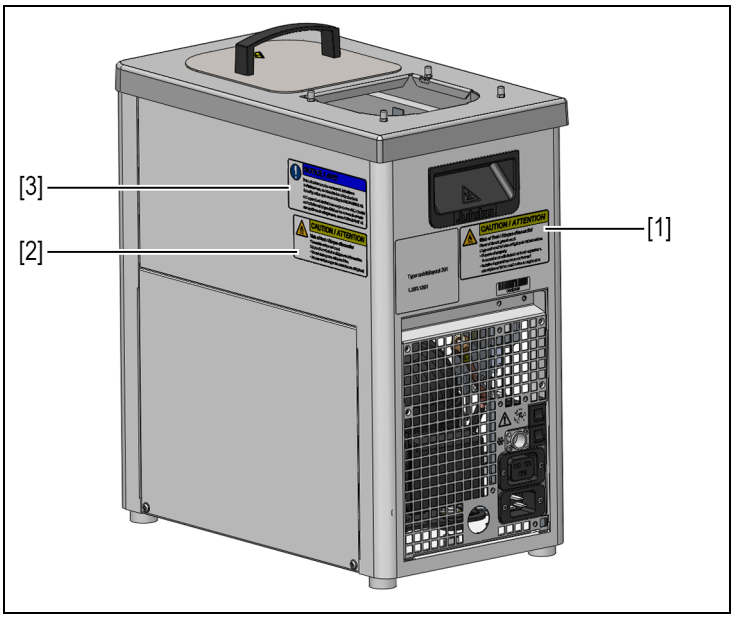
The unit may only be operated with the included power cable. If the power cable needs to be replaced due to a defect, it can be reordered.

Order number	Description
7.901.2655	Power cable EU, 200-230 V
7.901.2694	Power cable US, 200-230 V
7.901.2656	Power cable US, 100-115 V

7.2 Check safety symbols

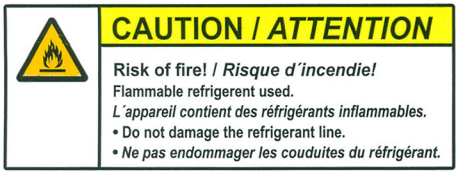
The following section applies only to equipment working with natural refrigerants and operated in the US or Canada.

The safety signs affixed to the device must be clearly legible at all times. Their condition must be checked every two years.



[1] Safety signs (order no.: 3.383.2600):

[2] Safety signs (order no.: 3.383.2630):



[3] Note (order no.: 3.383.2640):

1. Check the safety symbols on the unit for legibility and completeness.
2. Replace defective or missing safety symbols.

☝ Safety symbols can be reordered from JULABO.

✓ The safety symbols on the unit have been checked.

7.3 Emptying

The device must be completely drained if it is to be sent in for technical service or is to be properly disposed of.

In general, the device should be completely emptied before longer shutdowns or when there is a change to the external application.

CAUTION

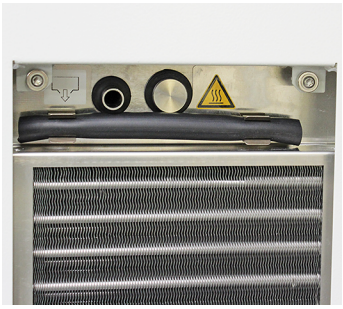
Risk of burns from hot bath fluid!

Bath fluid can become very hot during a temperature control process.
Contact with hot bath fluid can cause scalding.

- Before draining the device, let it cool to room temperature
- Avoid direct contact with hot bath fluid
- Wear protective gloves

► The device is tempered to room temperature and switched off.

1. Place a suitably large collection vessel under the drainage valve.
2. Remove the bath lid.



3. 310F and 450F: Remove the hose and place it on the drain valve [figures].
4. Open the drain valve.

➥ The bath fluid flows into the collecting vessel provided.

5. Close the drain valve when the bath tank is completely empty.
6. Close the bath lid.

✓ The device is emptied. If an external system is connected, it can now be disconnected from the device and also drained.

7.4 Clean device

The outside of the device should be periodically cleaned.

In addition to this, the device must be appropriately decontaminated if hazardous substances have been spilled on or into the device.

- Lint-free cloth
- Mild cleaning agent

NOTE

Observe during cleaning!
No decontamination or cleaning agents are used which could cause a HAZARD as a result of a reaction with parts of the equipment or with material contained in it.

NOTE

Damage to the electronics due to water penetration!
Ingress of water can damage electronic components of the device and thus lead to failure of the device.

- Clean the outside of the device with a damp cloth only
- Prevent water from entering the device

► The device is switched off and disconnected from the mains voltage.
1. Allow the unit to cool down to room temperature.
2. Completely drain the bath fluid.
3. Clean the surface of the device with a damp cloth.

☝ Some dish detergent may also be used for cleaning. If in doubt, ask technical service for alternative cleaning mediums.

✓ The device has now been cleaned.

7.5 Cleaning condenser

From time to time, the condenser on the front of the device should be cleaned to maintain full cooling capacity.

CAUTION

Risk of fire with flammable refrigerants!

If the device contains a flammable refrigerant, there is a risk of fire if the refrigerant circuit leaks.

- Do not damage the refrigerant lines
- Do not damage the condenser fins
- If refrigerant escapes, switch off the device immediately, keep open flames and sources of ignition away, and ventilate the room well

► The device is switched off.

1. Allow the device to cool down to room temperature.
2. Take the venting grid off the front of the device.

3. Use a vacuum cleaner to carefully vacuum the dirt off the condenser.

☝ Make sure that the fins of the condenser are not damaged.

4. Place the venting grid back on.

✓ The condenser is cleaned.

7.6 Device storage

Take your device out of operation if you have not used it for a long time or, for example, it is to be sent to Technical Service for repair. Follow the procedure described to ensure that your device continues to function reliably even after being stored for a long period.

► The device is switched off and disconnected from the mains voltage.
1. Empty all system components completely.
2. Clean the device.
3. Carefully dry the device and all its system components, e.g. with compressed air.
4. Close all connections.
5. Store the device in a dust-free, dry and frost-free location.

✓ The device is protected and can be safely stored there. It can be put into operation again as needed.

7.7 Technical Service

If the unit shows faults you cannot resolve, please contact our Technical Service.

JULABO Technical Service
Tel.: +1(610) 231-0250 Option 3
Fax: +1(610) 231-260
Email: Service@julabo.us

Before sending a device to Technical Service, the following points must be observed:
- Clean and decontaminate the device properly to avoid endangering service personnel.
- Include a brief description of the fault.
- Package the device safely for shipment.

7.8 Warranty

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.

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.

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.

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.

8 Disposal

8.1 Device disposal

When disposing of the device, the applicable country-specific guidelines must be observed.

CAUTION

Risk of fire with flammable refrigerants!
If the device contains a flammable refrigerant, there is a risk of fire if refrigerant leaks.

- Do not open the refrigerant circuit
- Have the device disposed of by a certified company in accordance with national or regional regulations

► The circulator combination is switched off and disconnected from the mains voltage.

1. Allow the device to cool down to room temperature.
2. Disconnect all power cables and, if necessary, data cables from the circulator and cooling machine.
3. Remove the circulator.
4. Completely drain the cooling machine.
5. Dispose of the device by giving it to an authorized disposal company.

☝ Disposed of the device in household waste, or similar facilities for the collection of domestic waste, is not permissible.

✓ The cooling machine is correctly disposed of.