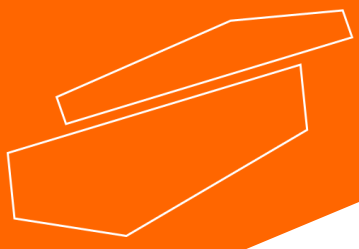
lbx instruments

RC-1 Recirculating Chiller

Please read the User Manual carefully before use, and follow all operating and safety instructions!



user manual

english

Manual de usuario

EN

RC-1 Recirculating Chiller

Important Notice

This instrument is designed for laboratory usage only. Please read this manual carefully before installing or operating this equipment. The instrument shall not be modified in any way. Any modification will void the warranty and may result in potential hazard. We are not responsible for any injury or damage caused by any non-intended purposes and modifying the instrument without authorization.

Service

In order to guarantee this equipment works safely and efficiently, it must have a regular maintenance. In case of any faults, do not try to repair it yourself. If help is needed, you can always contact your supplier or Labbox via **www.labbox.com**.

Please provide the customer care representative with the following information:

- Serial number
- Description of problem
- Your contact information

Warranty

This instrument is warranted to be free from defects in materials and workmanship under normal use and service, for a period of 12 months from the date of invoice. The warranty is extended only to the original purchaser. It shall not apply to any product or parts which have been damaged on account of improper installation, improper connections, misuse, accident, or abnormal conditions of operation.

For claim under the warranty please contact your supplier.

INITIAL NOTES

Before starting up the recirculator, we want to thank you for your trust in us by acquiring this device. We recommend that you read and follow the steps detailed in the instructions.

This manual is designed to provide the necessary information for the installation, startup, and maintenance of the recirculators.
Installation and special maintenance must be carried out by qualified technical personnel. The manufacturer will not accept any responsibility if the user does not follow these instructions.

OPERATING TESTS

The recirculator you have acquired comes prepared for its proper functioning, and the result is certified through a rigorous quality control test.

Note: The photographs/pictograms shown in the manual are for illustrative purposes only, and they may not exactly correspond to your model.

1. INSTALLATION

1.0 LOCATION

The recirculator must not be tipped over. If necessary, some recirculators can be tilted on the side indicated on the packaging. If no side is indicated, it cannot be tilted. You must wait at least 2 hours after placing it in an upright position before starting it up.

It is advisable to unpack the recirculator as soon as possible and check for any possible damages caused during transportation. If it has been damaged, you must notify the carrier and record the damages on the delivery note.

To move it to the installation site, you can use a hand truck or pallet jack while ensuring that the recirculator remains balanced. Depending on the model, the recirculator may be equipped with wheels or rollers to facilitate its placement.

The area where the recirculator is placed must be clear and clean, avoiding that the fan of the refrigeration unit absorbs materials that could later accumulate on the condenser fins, reducing the system's efficiency. It should not be located outside buildings and must be protected from rain and direct sunlight.

Keep the area around the unit free of obstacles to ensure proper airflow. It should be installed in an area with a volume of at least 12m^3. The cooler should not be installed in areas that obstruct passage, such as hallways, emergency exits, etc.

This machine has a refrigerant charge of group 3, which is less than 150 grams. Therefore, it can be installed in any type of establishment without additional safety measures, as established by the EN-60335-2-89 standard.

Devices classified as climate class 7 are suitable for the following ambient temperature: maximum 35°C and relative humidity of 75% HR. Those of climate class 4 are suitable for the following ambient temperature: maximum 30°C and relative humidity of 55% HR.

The recirculator, in its final placement, should be positioned 7cm away from the wall at the back and 30mm away from the sides.

1.1 GENERAL CONNECTION

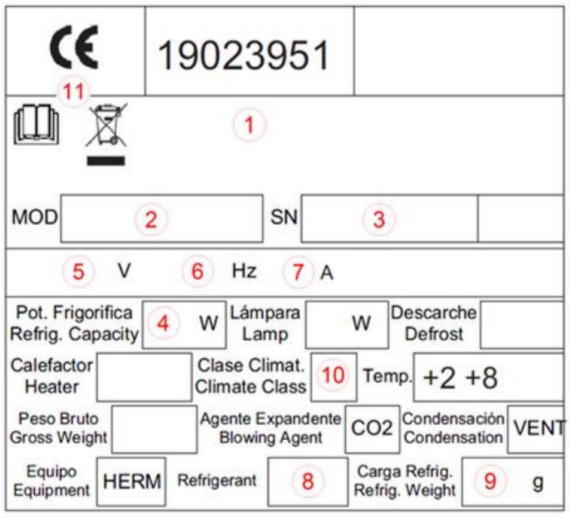
Before connecting the recirculator to the power outlet, ensure that the voltage and frequency of the electrical supply match the values indicated on the appliance's nameplate.

It is essential that the electrical installation where the recirculator will be connected has an EARTH CONNECTION, as well as proper protection with circuit breakers and residual current devices (RCDs).

Verify that the power supply cable's section is appropriate for the power consumption that the recirculator will handle.

1.2 NAMEPLATE

Explanation of the nameplate accompanying your equipment.
NAMEPLATE



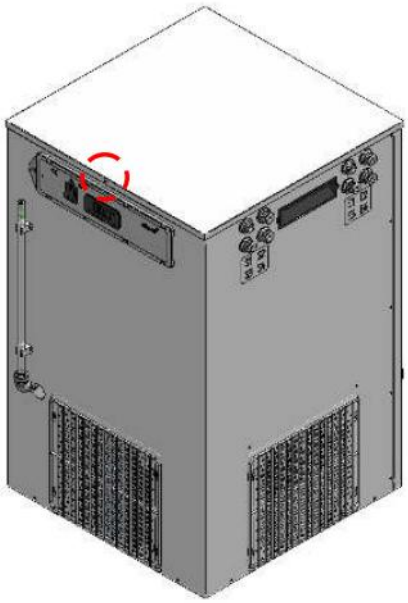
NUMBER	DESCRIPTION
1	MANUFACTURER COMPANY
2	MODEL
3	SERIAL NUMBER
4	REFRIGERATING POWER WATTS
5	OPERATING VOLTAGE
6	FREQUENCY
7	NOMINAL CURRENT INTENSITY
8	REFRIGERANT GAS TYPE
9	GRAMS OF REFRIGERANT GAS
10	CLIMATIC CLASS
11	REGULATIONS/NORMS

Note: This plate is for illustrative purposes only.

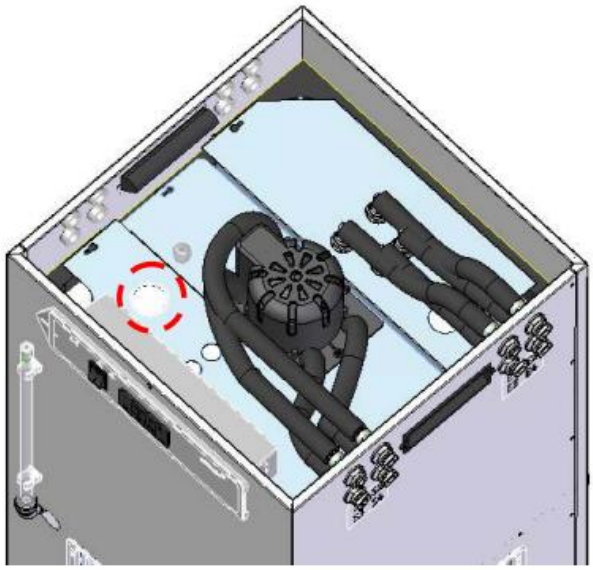
1.3 START-UP

Before plugging in the recirculator, fill the tank with water or water+glycol, depending on its intended use, and connect all necessary pipes according to the outlets to be used (1 — 4).
IMPORTANT:
Use water for positive temperatures.
Use a water+glycol mixture for negative temperatures. Follow the glycol manufacturer's recommended proportions.

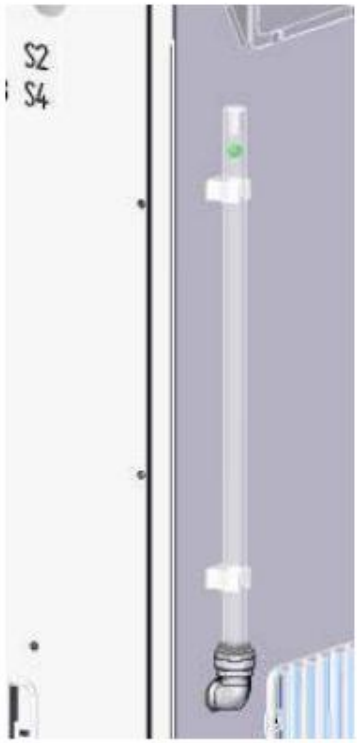
To do this, remove the screw that secures the countertop and pull it upward.



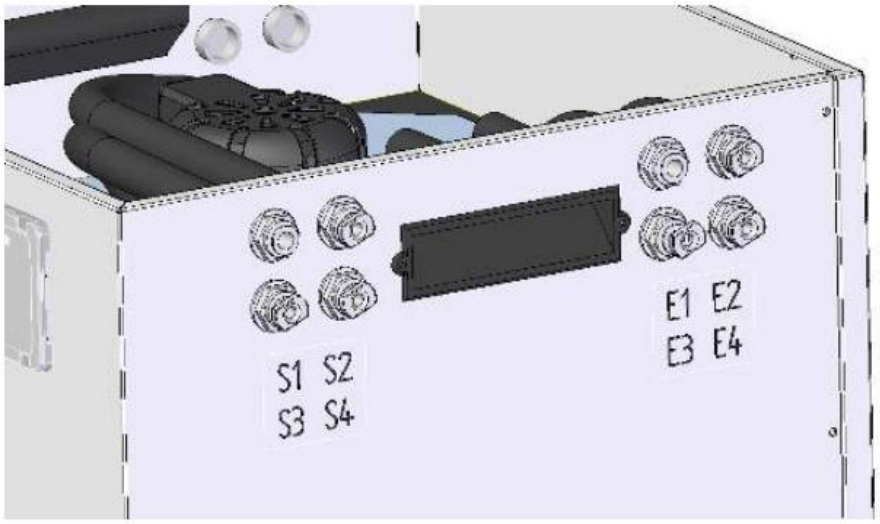
Remove the cap from the tank cover to fill the tank with water or water+glycol.



Fill the tank until the level indicator's sphere located on the front of the recirculator reaches its maximum position. The recirculator is equipped with an overflow inside so that in case the liquid overflows, the device does not suffer any damage. This excess liquid will be evacuated through the transparent tube located at the back of the recirculator.



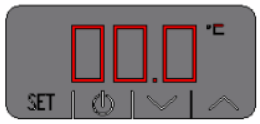
The recirculator is shipped from the factory with all internal pipes connected. You only need to connect the external pipes that will link the recirculator to the cooling device at the outlets (S1, S2, S3, and/or S4) and inlets (E1, E2, E3, and/or E4) (remove only the caps from the inlets and outlets to be used). Use insulated pipes with an outer diameter of 3/8" to prevent condensation. To do this, simply apply slight pressure with the pipe into the quick connector, and it will create a secure and sealed connection.



IMPORTANT: Before proceeding, ensure that all connections are correctly made, and any unused inlets/outlets have their caps properly connected to prevent leaks.

Once all connections are completed, plug the equipment into the electrical supply and turn on the main switch located on the front electrical box to the "I" position. The agitation-boost pump will start operating.

To adjust the desired "SET POINT" on the digital thermostat (default set at 5°C), follow these steps:
1- Press any button for 3 seconds to unlock the keyboard.
2- Once unlocked, press the "SET" button.
3- Select the desired cut-off temperatura with the keys .
4- Press the "SET" button again to confirm the chosen temperature.



Flow rate:

1 cooling line open, 3 closed		
Volume (L)	Time (s)	Flow rate per line (L/min)
3	25	7.2

4 cooling lines open, 1 measured		
Volume (L)	Time (s)	Flow rate per line (L/min)
3	17	10

4 cooling lines open, all measured			
Volume (L)	Time (s)	Flow rate per line (L/min)	Total flow rate (L/min)
6.5	10	9.75	39

2. USAGE AND MAINTENANCE RESTRICTIONS

CAUTION! Risk of fire and explosion with the flammable refrigerant R600a/R290.

WARNING! Do not store explosive substances, such as aerosol cans with flammable propellants, inside this appliance.

Ensure that you follow the information related to handling, maintenance, and disposal of the device, especially concerning flammable refrigerants and flammable gas used for expansion in insulators used in the appliance.

WARNING! Keep all ventilation openings on the appliance or the built-in structure free from obstructions.

WARNING! Do not use mechanical devices or other means to accelerate the defrosting process.

WARNING! Do not damage the refrigerant circuit.

WARNING! Do not use electrical appliances inside the compartments for storing the appliance's products unless they are of the type recommended by the manufacturer.

Regularly inspect the power plug and power cord. If the power cord is damaged, it must be replaced by the manufacturer, authorized service agents, or qualified persons to avoid hazardous situations.

WARNING! Incorrect use of the appliance can cause injuries! Do not use the appliance improperly; use it for its original purpose and always follow the instructions in this manual.

The weighted A-weighted sound pressure level emission is less than 70 dB(A).

WARNING! Unplug the appliance from the power supply during cleaning or maintenance tasks and when replacing any components. The plug must be removed in a way that an operator can verify from any accessible point that the plug remains disconnected. If this is not possible due to the appliance's design or installation, a disconnecting device with a locking system in the isolated position should be provided.
Do not use accessories other than those supplied with the appliance or recommended by the manufacturer. They could pose a safety risk to the user and cause damage to the appliance. Use only original components and accessories.
Installation, operation, cleaning, and maintenance tasks of the appliance must be carried out only by trained and competent personnel who are familiar with these instructions.
Have the electrical components of the appliance regularly inspected by a qualified professional. **Risk of electric shock!** Do not attempt to repair the appliance yourself. In case of a malfunction, repairs should be carried out only by qualified personnel.

WARNING! Do not disassemble or modify the appliance in any way. Fires or malfunctions resulting from such actions can cause injuries.

Protect the appliance, its power cord, and the power plug from heat, dust, direct sunlight, water drips, and splashes. Keep the electrical components away from hot surfaces and exposed flames.
Place the appliance on a wide, level, dry, clean, and stable surface capable of supporting the combined weight of the appliance and its contents.
If the power cord overheats, stop using the appliance and disconnect it from the power outlet.
Dry the appliance and all accessories before connecting it to the power supply and before storing it.
This appliance is not designed to be controlled by an external timer or a separate remote control system.
Connect the power plug to an easily accessible electrical outlet to quickly disconnect the appliance from the power supply in case of an emergency. Pull the power plug from the electrical outlet to completely disconnect the appliance. Use the power plug as the disconnect device.
The appliance's power plug must have its own independent electrical outlet. The use of adapters can cause overheating or fire.
Connect the appliance only to properly grounded electrical outlets. Avoid using extension cords.
The appliance must be correctly installed and positioned according to these instructions before use.
Do not place the appliance under direct sunlight or near heat sources as this will hinder the cooling process.
The refrigerant and the flammable gas used for expansion in the appliance's insulators require special disposal procedures. When disposing of them, seek information from your maintenance agent or similarly qualified personnel.
Avoid installation near heaters and devices that generate steam, such as combined vapors.
If the plug is intended to be disconnected, it must be clearly indicated that the disconnection of the plug must be such that an operator can verify from any accessible point that the plug remains disconnected.

WARNING: The refrigerator contains propane (R290) or isobutane (R600a) as the refrigerant, which is a natural gas highly environmentally friendly but flammable. While transporting and installing the appliance, ensure that no part of the refrigerant circuit is damaged.

Procedure if the refrigerant circuit is damaged:

- Avoid open flames and sources of ignition at all costs.
- Ensure that the room where the appliance is located is well-ventilated.

The manufacturer is not responsible for any operations not mentioned in this manual. All recommendations and warnings must be followed.

Electrical Safety

1) Ensure that the rated voltage indicated on the rating label matches the voltage of the power supply.
2) Do not operate any appliance with a damaged power cord or power plug, even if it is faulty or has been damaged in any way.
3) Protect the cable against any damage.
   Avoid letting it hang over sharp edges, do not crush or bend it. Keep the power cord away from hot surfaces, and make sure no one can trip over it.

3. MAINTENANCE

Through these guidelines, we aim to provide you and our technical support service with assistance to ensure that the recirculator continues to provide you with excellent service throughout its lifespan.
We will cover the cleaning that you can perform yourself, as well as a brief machine check before contacting the technical service. We hope you find it helpful.

3.0 CLEANING TO BE PERFORMED BY THE USER

The first cleaning should be done with water and non-abrasive neutral detergent, using a wet sponge or cloth. Rinse with clean water, avoiding direct water jets.

Monthly (recommended) cleaning of the condenser using a soft brush. Keep in mind that the cleaner it is, the more energy savings you will achieve. The frequency of cleaning will depend on the characteristics of the environment.

The refrigerator should be cleaned after unpacking and before connecting it. The following guidelines are provided for this purpose:

- Disconnect the refrigerator before starting the cleaning process.
- Clean the interior and exterior using water and a non-abrasive neutral detergent, aided by a sponge or cloth to prevent the formation of odors. Rinse with clean water, avoiding direct water jets. Thoroughly dry the refrigerator after cleaning.
- Never use steam cleaning machines, solvents, or abrasive detergents as they can damage your appliance.
- Cleaning Frequency: Monthly (recommended)
- Monthly (recommended) cleaning of the condenser using a soft brush. Keep in mind that the cleaner it is, the more energy savings you will achieve. The cleaning frequency will depend on the characteristics of the environment.

3.1 QUICK GUIDE FOR FAULT DETECTION

Problem	Probable Cause	Action
The cooler does not cool.	No electrical power.	Make sure the plug, fuse, and electrical connection are working.
	The “SET POINT” is set at too high a temperature.	Ensure that the SET POINT is set to the desired temperature.
	The machine is out of refrigerant.	Call the technical service.
	The sensors or thermostat are not functioning correctly.	Call the technical service.
The compressor does not stop.	The unit is in an excessively hot area or airflow through the condenser is restricted.	Relocate the unit to another place and/or correct the cause of restricted airflow.
	The temperature sensor is not submerged in water or water+glycol.	Ensure that the tank is filled. You can easily check it by observing the level indicator on the front.

3.2 DISPOSAL OF OLD DEVICES

For detailed information about recycling this product and its packaging, please contact your local city office, waste disposal service, or the manufacturer through their service agent. By ensuring that this product and its packaging are disposed of properly, you will help prevent potential negative consequences for the environment and human health that may result from improper disposal.

The packaging consists of wooden pallets, cardboard/plastic pieces, and stretch film. Cardboard, paper, plastic pieces, and films can be disposed of for recycling in your curbside collection containers or at local recycling facilities. Wooden pallets can be reused or disposed of for energy recovery

Recycling Information

1. Based on the environmental policy objectives in accordance with the Waste Electrical and Electronic Equipment (WEEE) directives of the European Union (EU), which aim to preserve, protect, and improve the quality of the environment, safeguard human health, and use natural resources wisely and rationally. As an end user, you are kindly requested to:

- If the appliance has stopped working, try to determine if it can be repaired before disposing of it. If you have doubts, please contact your distributor or supplier for more information about possible repairs for your appliance.
- If the appliance has reached the End of Life (EOL) and cannot be repaired or reused, do not discard it as unclassified waste. Instead, ensure that it is properly collected, identified, and labeled as WEEE (Waste Electrical and Electronic Equipment) by an authorized company for valorization and recycling. Note: Disposing of electronic and electrical appliances through unauthorized channels and incineration causes environmental issues. When obsolete materials are not recycled, new products require processing of raw materials, resulting in a significant loss of resources. The energy consumption and transportation involved in these processes are harmful to the environment.
- To aid in the recovery and recycling process of this appliance, do not manipulate or break its components before it is collected. Disassembling the appliance can reduce its recycling potential and, more importantly, pose risks to your safety and the environment if the product contains hazardous components.

2. The symbol shown in the following figure, which is also present on the product label inside the appliance, indicates that electrical and electronic equipment must be collected separately, following the WEEE directives of the European Community (EC).

3. Lastly, comply with the current recycling laws applicable to your community and country.

Nota importante para los aparatos electrónicos vendidos en España

Instrucciones sobre la protección del medio ambiente y la eliminación de aparatos electrónicos:

Los aparatos eléctricos y electrónicos marcados con este símbolo no pueden ser eliminados en forma de residuos urbanos.

De conformidad con la Directiva 2012/19/UE, los usuarios de la Unión Europea de aparatos eléctricos y electrónicos, tienen la posibilidad de devolver sus RAEE para su eliminación al distribuidor o fabricante del equipo después de la compra de uno nuevo. La eliminación ilegal de aparatos eléctricos y electrónicos es castigada con multa administrativa.

Remarque importante pour les appareils électroniques vendus en France

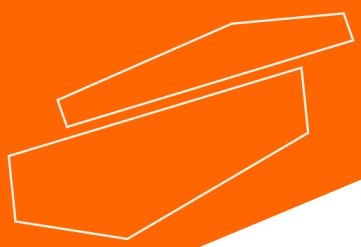
Informations sur la protection du milieu environnemental et élimination des déchets électroniques :

Les appareils électriques et électroniques portant ce symbole ne peuvent pas être jetés dans les décharges.
En réponse à la règlementation, Labbox remplit ses obligations relatives à la fin de vie des équipements électriques de laboratoire qu'il met sur le marché en finançant la filière de recyclage de ecosystem dédiée aux DEEE Pro qui les reprend gratuitement (plus d'informations sur www.ecosystem.eco).
L'élimination illégale d'appareils électriques et électroniques est punie d'amende administrative.

Nota importante per le apparecchiature elettroniche vendute in Italia

Istruzioni sulla protezione ambientale e sullo smaltimento dei dispositivi elettronici:

Le apparecchiature elettriche ed elettroniche contrassegnate con questo simbolo non possono essere smaltite come rifiuti urbani.
In conformità con la Direttiva 2012/19 / UE, gli utenti dell'Unione Europea di apparecchiature elettriche ed elettroniche hanno la possibilità di restituire i propri RAEE per lo smaltimento al distributore o al produttore di apparecchiature dopo averne acquistato uno nuovo. La rimozione illegale di apparecchiature elettriche ed elettroniche è punibile con una sanzione amministrativa.



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