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User's Manual

CentriVap® micro IR Vacuum Centrifugal Concentrators

Models
77010 Series

To receive important product updates,
complete your product registration card
online at **register.labconco.com**

Please read the User's Manual before operating the equipment.

Warranty

Labconco Corporation provides a warranty to the original buyer for the repair or replacement of parts and reasonable labor as a result of normal and proper use of the equipment with compatible chemicals. Broken glassware and maintenance items, such as filters, gaskets, light bulbs, finishes and lubrication are not warranted. Excluded from warranty are products with improper installation, erratic electrical or utility supply, unauthorized repair and products used with incompatible chemicals.

The warranty for CentriVap® micro IR Vacuum Centrifugal Concentrators will expire one year from date of installation or two years from date of shipment from Labconco, whichever is sooner. Warranty is non-transferable and only applies to the owner (organization) of record.

Buyer is exclusively responsible for the set-up, installation, verification, decontamination or calibration of equipment. This limited warranty covers parts and labor, but not transportation and insurance charges. If the failure is determined to be covered under this warranty, the dealer or Labconco Corporation will authorize repair or replacement of all defective parts to restore the unit to operation. Repairs may be completed by 3rd party service agents approved by Labconco Corporation. Labconco Corporation reserves the rights to limit this warranty based on a service agent's travel, working hours, the site's entry restrictions and unobstructed access to serviceable components of the product.

Under no circumstances shall Labconco Corporation be liable for indirect, consequential, or special damages of any kind. This warranty is exclusive and in lieu of all other warranties whether oral, or implied.

Returned or Damaged Goods

Do not return goods without the prior authorization from Labconco. Unauthorized returns will not be accepted. If your shipment was damaged in transit, you must file a claim directly with the freight carrier. Labconco Corporation and its dealers are not responsible for shipping damages.

The United States Interstate Commerce Commission rules require that claims be filed with the delivery carrier within fifteen (15) days of delivery.

Limitation of Liability

The disposal and/or emission of substances used in connection with this equipment may be governed by various federal, state, or local regulations. All users of this equipment are required to become familiar with any regulations that apply in the user's area concerning the dumping of waste materials in or upon water, land, or air and to comply with such regulations. Labconco Corporation is held harmless with respect to user's compliance with such regulations.

Contacting Labconco Corporation

If you have questions that are not addressed in this manual, or if you need technical assistance, contact Labconco's Customer Service Department or Labconco's Product Service Department at 1-800-821-5525 or 1-816-333-8811, between the hours of 7:30 a.m. and 5:30 p.m., Central Standard Time.

Part #7539801, Rev. A
ECO K940

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Chapter 1: Introduction

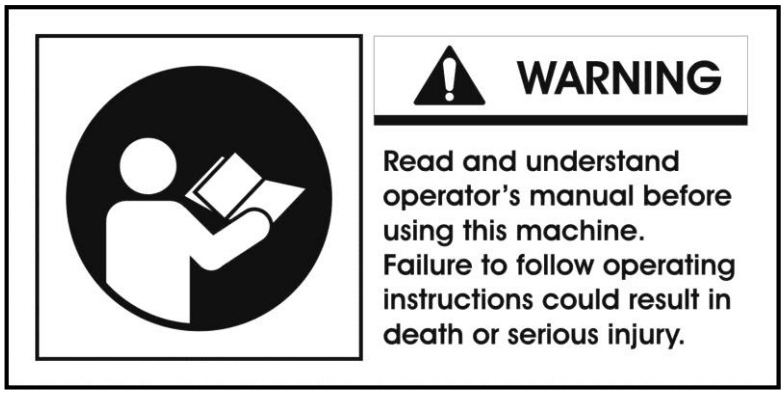
Congratulations on your purchase of a Labconco CentriVap® micro IR Vacuum Concentrator.

The CentriVap micro IR Concentrator uses centrifugal force with heat and vacuum to rapidly evaporate and condense solvents from biological and analytical samples. Centrifugation eliminates bumping and foaming as vacuum is applied and also concentrates the solute in the bottom of the vial. This allows recovery of solutes from sample volumes as small as a few microliters. The concentrator is equipped with two separate heaters to speed evaporation by warming the chamber during processing. The clear lid heater uses radiant heat to efficiently heat samples under vacuum conditions. An additional heater is provided for applications were samples maybe sensitive to radiant heat. A PTFE coated diaphragm vacuum pump is included which requires no maintenance. The vacuum pump pulls vapor out through the center of the chamber to minimize cross contamination. A glass trap is also provided to condense and collect solvent exiting the chamber. The CentriVap micro IR Concentrator has a standby function to preheat or maintain the chamber temperature. A safety switch prevents the concentrator from starting when the lid is in the open position and a latch prevents the lid from being opened while the rotor is turning. The compact, low profile design allows the concentrator to be placed on a bench top or other laboratory work surface. The CentriVap micro IR Concentrator also comes standard with a CentriZap IR LED strobe light for viewing the samples during the run.

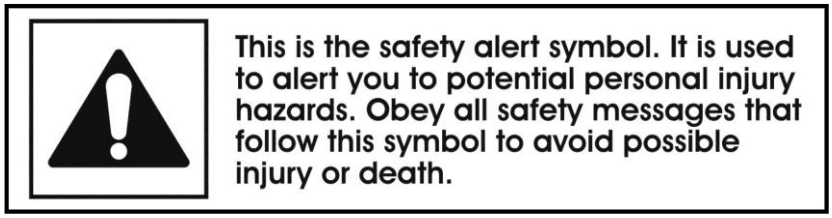
The microprocessor controls the operation of the heaters from 35°C to 65°C. The rotor speed of 1700 RPM and vacuum down to 120 mbar provides excellent regulation and reproducibility of protocols.

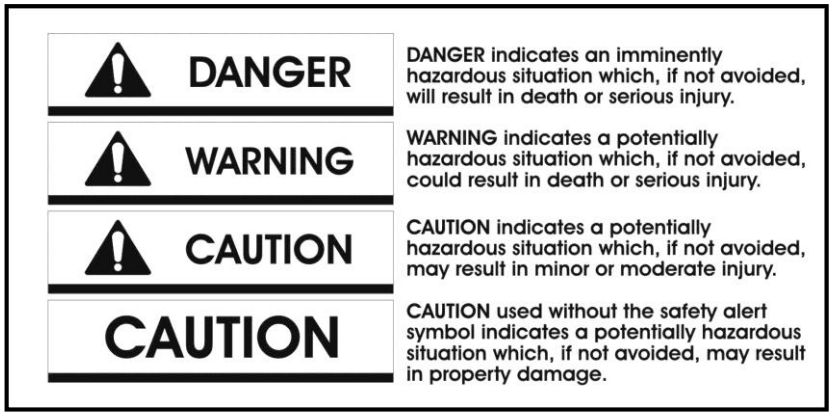
Safety Symbols

Your CentriVap micro IR Concentrator was designed with safety in mind, however conditions may exist that could be hazardous.



Throughout this manual potentially hazardous conditions are identified using the following words and symbols.





It is important that you understand the warnings listed throughout this manual before you operate the CentriVap micro IR Concentrator.

Warning: Precautions for installation

Connect to proper supply voltage.
Verify that the supply voltage matches the voltage and hertz written on serial tag. Failure to do so could damage the unit or affect performance.

Do not operate in environment with relative humidity exceeding 80% for temperatures up to 88°F (31°C), decreasing linearly to 50% relative humidity at 104°F (40°C). Doing so could cause electric leakage or corrosion.

Do not expose unit to direct sun light or high temperatures.
The recommended indoor operating temperature is 20°C - 30°C.

Do not use flammable substances near the product. Doing so could create a fire hazard.

Provide a minimum space of 7.8 inches (20cm) behind the unit for clearance of the power cord.

Install unit on solid level surface. Failure to do so can result in excessive vibration.

Do not lay the unit down on its sides or top. Doing so can result in damage to the unit.

Secure lid and any other moveable parts when moving the unit. Failure to do so can result in injury or damage to the unit.

When moving the unit always lift, do not slide. Failure to do so may result in damage to the unit.

Warning: Precautions for use.

Do not disassemble, or attempt to repair the unit without proper training, or personal injury or damage to the unit could occur.

Do not use the product for anything other than what it was intended for, or personal injury or damage to the unit could occur.

Do not use flammable sprays near the product. Doing so could cause fire.

Protect the control panel from spills by wiping off any water or solvent with a clean dry cloth. Failure to do so could cause an unsafe condition or create a fire hazard.

Do not clean the product with excessive quantities of water, thinner, benzene or petroleum-based products. Failure to do so could cause an unsafe condition or create a fire hazard.

Chapter 2: Prerequisites

Before you install your CentriVap micro IR, you need to prepare your site for installation. Carefully examine the location where you intend to install your CentriVap. You must be certain that the area is level and of solid construction. In addition, an exhaust means must be provided. An electrical source must also be located near the installation site.

Carefully read this chapter to learn:

- The electrical supply requirements.
- The exhaust requirements.
- Space requirements.

Refer to *Appendix C: CentriVap micro IR Specifications* for complete CentriVap electrical and environmental conditions, specifications and requirements.

Electrical Requirements

The CentriVap micro IR Concentrator requires a grounded electrical outlet. This outlet requires a 15 Amp circuit breaker or fuse for models rated at 115V (60 Hz). An 8 Amp circuit breaker or fuse is required for models rated at 230V (50/60 Hz). Various models are available for use in different locations throughout the world. Each has a unique plug suitable for the specific location. See CentriVap Components in Chapter 3 for detail plug specifications. If the plug supplied with the CentriVap Does not match the available receptacle, remove this plug and replace it with an approved plug of the suitable style.

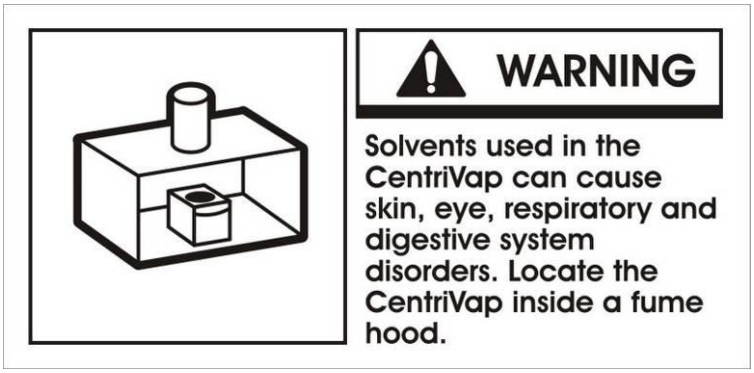
It is recommended that an emergency switch for disconnecting the power in the case of a malfunction be located remote from the CentriVap micro IR, preferably outside the room in which the unit is housed, or adjacent to the exit from that room.

Location and Exhaust Requirements

The CentriVap micro IR Concentrator should be located on a surface that is stable, flat and level.

WARNING: The CentriVap Concentrator should be located within a fume hood if hazardous or flammable solvents are used. Heating of materials could lead to the liberation of hazardous gases. In all cases, regardless of the solvent used, it is strongly recommended that the vacuum pump is vented in a fume hood. A glass trap is included with the unit to minimize the exhausting of solvents into the atmosphere but if flammable solvent are used a secondary trap is recommended. See Chapter 6 for available accessories. The use of the glass traps does not negate the need to exhaust the vacuum pump into a fume hood. Failure to properly vent the CentriVap will expose personnel to potentially harmful chemicals.

The CentriVap has not been evaluated by an approval agency for the use of biological, radio toxins or flammable liquids or materials.



Space Requirements

Refer to *Appendix C: CentriVap micro IR Specifications* for dimensional drawings of the CentriVap micro IR.

No person or any hazardous material should be within 12 inches of the CentriVap Concentrator while it is operating.

Chapter 3:
Getting Started

Now that the site for your CentriVap micro IR is properly prepared, you are ready to unpack, inspect, install, and test the unit. Read this chapter to learn how to:

- Unpack and move your CentriVap micro IR.
- Set up your CentriVap micro IR.
- Connect the electrical supply source to your CentriVap micro IR.
- Properly exhaust your CentriVap micro IR.
- Safely use solvents with your CentriVap micro IR.

Unpacking Your CentriVap micro IR

Carefully unpack your CentriVap micro IR and inspect it for damage that may have occurred in transit. If your CentriVap is damaged, notify the delivery carrier immediately and retain the entire shipment intact for inspection by the carrier.

The United States Interstate Commerce Commission rules require that claims be filed with the delivery carrier within fifteen (15) days of delivery.

NOTE: Do not return goods without the prior authorization of Labconco. Unauthorized returns will not be accepted. If your CentriVap micro IR was damaged in transit, you must file a claim directly with the freight carrier. Labconco Corporation and its dealers are not responsible for shipping damage.

Do not discard the carton or packing material for your CentriVap micro IR until you have checked all of the components and installed and tested the unit.

CentriVap micro IR Components

As previously mentioned, the CentriVap micro IR System is available in 115V or 230V. Locate the model of CentriVap you received in the following table. Verify that the components listed are present and undamaged.

Catalog #	Product Description
7701020	CentriVap micro IR Concentrator – 115V – USA
1334500	Power Cord with NEMA 5-15P Plug
7548500	Rotor 1.5ml x 24
7539801	User's Manual
7548900	Wrench, Rotor
7549000	CentriZap micro IR LED Strobe Light
7701030	CentriVap micro IR Concentrator – 230V – EU
1336100	Power Cord with CEE 7/7 Plug
7548500	Rotor 1.5ml x 24
7539801	User's Manual
7548900	Wrench, Rotor
7549000	CentriZap micro IR LED Strobe Light
7701035	CentriVap micro IR Concentrator – 230V – UK
1332600	Power Cord with BS 1363 Plug
7548500	Rotor 1.5ml x 24
7539801	User's Manual
7548900	Wrench, Rotor
7549000	CentriZap micro IR LED Strobe Light
7701037	CentriVap micro IR Concentrator – 230V – CHINA
1332700	Power Cord with CHI-10P Plug
7548500	Rotor 1.5ml x 24
7539801	User's Manual
7548900	Wrench, Rotor
7549000	CentriZap micro IR LED Strobe Light

If you do not receive one or more of the components listed for your CentriVap micro IR, or if any of the components are damaged, contact Labconco Corporation immediately for further instructions.

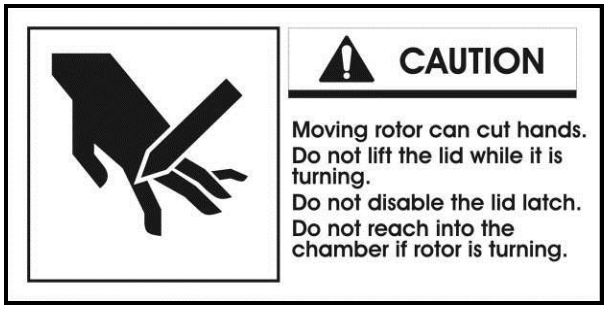
Setting Up Your CentriVap micro IR

After you verify receipt of the proper components, move your CentriVap micro IR to the level and sturdy location where you want to install it. There is no need to secure the CentriVap micro IR Concentrator to the work surface. Then, follow the steps listed below.

Emergency Access Into the Chamber

The CentriVap micro IR is designed to prevent access to the chamber in the event of a power disruption. If it is necessary to open the lid when there is no electrical power connected to the unit, you can unlock the latch by pulling on cable release located in the top left-hand rear corner of the back panel. Pulling the cable out will unlock the lid latch mechanism. While holding the latch open, raise the lid with the other hand.

CAUTION: Never attempt to defeat the latch or open the lid while the CentriVap micro IR is running. Personal injury can result from moving parts and chemicals.



Electrical Connection

Plug the power cord into the receptacle on the back of the CentriVap micro IR Concentrator and plug the other end into a suitable power receptacle.

Rotor Installation

The CentriVap micro IR Concentrator comes with a 1.5ml rotor installed. If a different rotor is required you may remove the standard rotor and replace it with one of the other available rotors. To remove the rotor, loosen the left handed 19mm hex nut using the rotor wrench. The rotor nut is left handed so turn the nut clockwise to remove. Once the nut is removed the rotor can be lifted off of the drive hub. Place the alternate rotor on the drive hub making sure the drive pins are properly engaged with the drive holes in the rotor. Replace the 19mm hex nut by turning counter-clockwise; secure the nut using the rotor wrench. Do not over tighten the hex nut.

IMPORTANT: Do not leave the rotor wrench in the chamber. Do not use a rotor if it shows any signs of damage.

Installing a CentriZap™ micro IR Strobe Light

An LED strobe light comes standard with each CentriVap micro IR Concentrator. This light will enable you to see the samples as they are rotating in the chamber.

Attach the connector on the strobe light harness into the receptacle on the back of the CentriVap micro IR marked “STROBE.”

To use the strobe light while the unit is operating, press the pushbutton on the light and shine the light on the samples in the rotor.

Chemical Resistance of CentriVap micro IR Components

Your CentriVap micro IR Vacuum Concentrator is designed to be chemical resistant to compounds that are commonly used in the concentration processes. However, by necessity, the CentriVap is comprised of a number of different materials, some of which may be attacked and degraded by certain chemicals. The degree of degradation is obviously dependent on the concentration and duration of exposure. Some major components of the CentriVap that are susceptible to degradation are as follows:

		Acids								Bases		Solvents													
COMPONENT	MATERIAL	Acetic Acid 20%	Boric Acid	Formic Acid	Hydrobromic Acid 20%	Hydrochloric Acid 20%	Nitric Acid 20%	Sulfuric Acid 10%		Ammonium Hydroxide		Acetone	Acetonitrile	Chloroform	Dimethyl Formamide	Dimethyl Sulfoxide (DMSO)	Ethanol	Ethyl Acetate	Hexanes	Isoproponal	Methanol	Methylene Chloride		Toluene	Water
Chamber Hub/nut	NI-Chrome plate	D		D	D	D	D					A			D		A		A	A	A			A	A
Chamber	PTFE coated Aluminum	A	A	A	A	A		A		A		A	A	A	A		A	A	A	A	A	A		A	A
Rotor	PTFE coated Aluminum	A	A	A	A	A		A		A		A	A	A	A		A	A	A	A	A	A		A	A
Lid Gasket	Silicone	C	A	C	D	D		D		A		D	D	D	A		C	C	C	A	A			D	A
Tubing	Silicone	C	A	C	D	D		D		A		D	D	D	A		C	C	C	A	A			D	A
Motor shaft	Stainless Steel	C	C	C	D	D	A			A		A	A	A	A		A	A	A	A	A	A		A	A
Bearings	Stainless Steel	C	C	C	D	D	A			A		A	A	A	A		A	A	A	A	A	A		A	A
Vacuum pump	EPDM	A	A	A	A	A	C			A		D	D	D			A	C		C	C	D		D	A
	FPM	C	A	A	A	A	A			D		D	D	A			A	A	A	A	A	C		A	A
	PPS	A	A	A	A	D	A			A		A		A	A			A	A	A	A	A		A	A
	PTFE	A	A	A	A	A		A		A		A	A	A	A		A	A	A	A	A	A		A	A

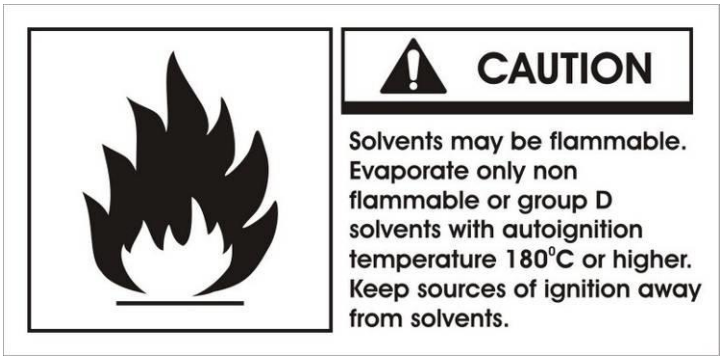
A- Acceptable
C-Moderate Degradation-Questionable use
D-Severe Degradation-Infrequent use recommended-immediate thorough cleaning required.

When using compounds in the CentriVap micro IR that are hostile to the materials of construction, it is imperative that the equipment is appropriately maintained.

- After each run, clean up all residues, spills and materials that might have splashed in the chamber using agents suitable for the substance involved.
- Remove the contents and clean the glass trap after each use.

Solvent Safety Precautions

CAUTION: The CentriVap micro IR is not classified as "explosion proof." It has been designed with safety as a primary consideration and should be used in a prudent manner using "good laboratory practices." It has been designed for use with compounds as described in the United States National Electrical Code Class I, Group D. The heater may be programmed to run as hot as 65°C, however, the heater elements may be hotter. An over temperature protection device limits the heater to a maximum temperature of 80°C. It is important that the solvents used are compatible with these temperatures. Do not evaporate solvents that have an autoignition temperature below 180°C. Do not evaporate solvents that are classified as Group A, B, or C by the National Electrical Code. Evaporate only non-flammable or Group D solvents with autoignition temperatures 180°C or above. Use of other compounds could cause an explosion.



CAUTION: Solvents used in the CentriVap micro IR may be flammable or hazardous. Use extreme caution and keep sources of ignition away from the solvents. When using flammable or hazardous solvents, the CentriVap micro IR should be operated inside a fume hood.

If a sample is spilled in the chamber it must immediately be cleaned up. Hazardous materials such as strong acids or bases, radioactive substances and volatile organics, must be handled carefully and promptly cleaned up if spilled.

Do not store flammable or hazardous solvents within 12 inches (300 mm) of the CentriVap micro IR.

IMPORTANT: The disposal of substances used in connection with this equipment may be governed by various Federal, State or local regulations. All users of this equipment are urged to become familiar with any regulations that apply in the user's area concerning the dumping of waste materials in or upon water, land or air and to comply with such regulations.

Chapter 4:
Using Your CentriVap micro IR

After your CentriVap micro IR has been installed as detailed in *Chapter 3: Getting Started*, you are ready to begin using your CentriVap. Read this chapter to learn how to:

- Set operating parameters.
- Operate the controls.
- Properly select and position glassware inside your CentriVap micro IR.
- Understand the display.
- Interrupt a cycle after it has begun.

NOTE: Do not store or stack supplies or equipment on top of the CentriVap micro IR.

Planning

Thoroughly understand procedures and the equipment operation prior to beginning work. The unique performance of the CentriVap micro IR is dependent upon the proper balance of heat, vacuum and centrifugal force. If the proper balance is not established, it is possible to damage or lose a portion of the sample. Therefore, if you are unfamiliar with the CentriVap micro IR or are attempting a new protocol, it may be helpful to make a trial run using a representative sample.

Sample Vial Selection

Normally, sample vials should be filled no more than approximately half full. Select the size of the sample vial so it is compatible with the rotor and the desired sample size. Vials should not be loose in the rotor. Rotors are available with holes for various size vials. Refer to *Chapter 6: Accessories for your CentriVap micro IR Concentrator* for available rotor sizes.

Loading Glassware into the CentriVap micro IR

Smooth operation of the CentriVap micro IR is dependent upon proper balance of the machine. Therefore, if less than a full load of samples is run, it is important to load samples in a fairly symmetrical manner distributing the weight of the samples evenly in the rotor.

Temperature Setting Guidelines

The evaporation rate achieved by the CentriVap micro IR is dependent upon a variety of factors. These include the nature of the solvent, the temperature set point, the temperature mode and the pressure in the vacuum system.

The Centrivap micro IR was designed to quickly evaporate small samples at elevated temperatures. The temperature can be set from 35°C to 65°C. As a general guideline, to speed the evaporation process, the CentriVap temperature should be set as high as possible as long as the temperature will not damage the sample or cause the sample to bump. Typically the fastest evaporation rates will be obtained using the IR heat mode, IR/Heat second, then Heat. At lower temperatures, depending on the mode of heat and the type of samples, vapor can sometimes condense inside the chamber slowing the evaporation process. For instance, at temperatures below 50°C aqueous samples can begin to condense inside of the chamber, becoming worse at lower set points. When evaporating at lower temperatures we recommend running in the IR/Heat mode. This mode distributes the heat more evenly around the chamber reducing the potential for condensation. As always when attempting a new protocol, it is recommended that a trial run be made.

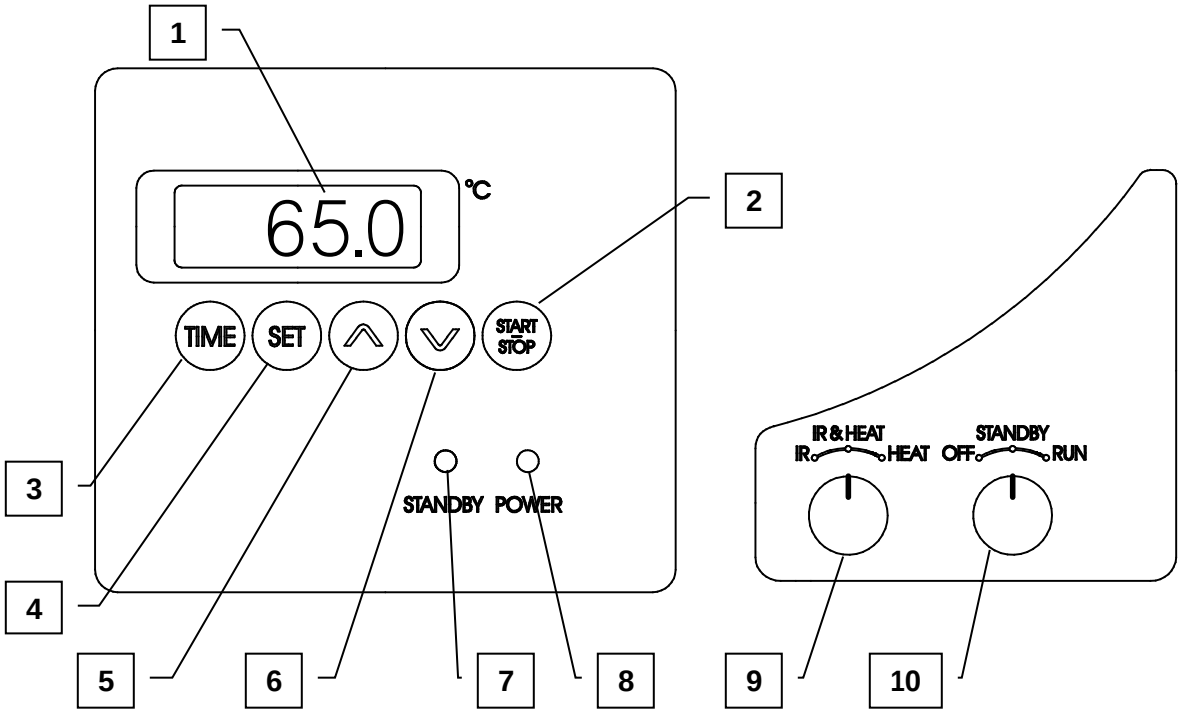
Time Setting Guidelines

The CentriVap micro IR Concentrator has a timer that can be set from 00:00 to 99 hours and 59 minutes. The run time setting is used to turn the concentrator off after a set period of time. This stops the rotation, turns off the heater, vacuum pump and bleeds vacuum from the system. The 00:00 setting allows the unit to run at the set point temperature until manually turned off.

The tables in *Appendix C: CentriVap micro IR Specifications* indicate approximate times required to evaporate various common solvents. Actual times must be determined by the user.

CentriVap micro IR Controls

The control panel for the CentriVap micro IR is shown below with a description of its functions.



1. Display – Shows set point parameters and actual measured conditions.
2. Start/Stop Button – Used to start or stop a run and reset the timer.
3. Time Button – Used to display time remaining.
4. Set Button – Use to program temperature and time.
5. Increase Button – Use to increase temperature and time in set up mode.
6. Decrease Button – Use to decrease temperature and time in set up mode.
7. Standby Light – Indicates that the selected heater is on and cycling.
8. Power Light – Indicates the unit is in Standby or Run mode.
9. Heat Mode Selector – Use to select IR, IR/Heat, or Heat only modes.
10. Run Mode Selector – Use to select Off, Standby (Preheat) or Run modes.

Operating the CentriVap micro IR Controls

Change "Temperature" and "Run Time" Set Point:

To change the temperature set point, press the "SET" button. The current temperature set point will flash on the display. Press the increase or decrease button until the desired temperature set point is displayed. Press "SET" button and the current hour set point will flash. Press the increase or decrease button until the desired run hours (00: to 99:) is displayed. Press "SET" button and the current minutes set point will flash. Press the increase or decrease button until the desired run minutes (:00 to :59) is displayed. Press the "SET" button and save will flash on the display. The new program is now entered, the display will show the current chamber temperature. Setting the run time to 00:00 will turn off the program timer. With the timer off the unit will operate at the set point temperature until manually turned off.

The temperature set point range is 35°C to 65°C.

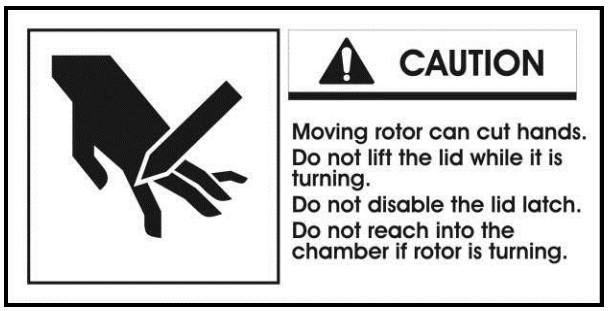
The time set point range is 00:00 (on) to 99:59 (99 hrs 59 min.)

Preheat:

To preheat the chamber, program the desired temperature and time. Make sure the chamber door is closed. Select the desired heat mode. IR/HEAT is recommended for preheating. Turn the Run Mode Selector to Standby. The heaters will raise the chamber temperature to the programmed set point. The actual chamber temperature will be displayed. The chamber will continue to preheat until either the "START/STOP" button is pressed or the mode selector is turned to the off position. Opening the lid will also turn the heater off.

Operating the CentriVap micro IR

CAUTION: To avoid personnel injury; Do not operate the CentriVap micro IR if the lid is scratched or nicked, or shows signs of damage. A damaged lid could fail under vacuum.



While the CentriVap micro IR Concentrator is operating, do not lean on the lid, and do not place hazardous materials within 12 inches (305mm).

1. Turn "ON" the CentriVap micro IR power switch located on the right side of the back panel. Turn the run mode switch to "STANDBY."
2. Program the desired temperature set point and run time.
3. Preheat the chamber if desired.
4. Place samples in vials. Normally the vials should be no more than half full. Place vials in the rotor. **Use caution as the lid and rotor could be hot.**
5. Close the lid.
6. Turn the Run mode selector switch to "RUN." The rotor and vacuum pump will start. The display will show the actual chamber temperature.
7. Set point parameters can be altered at any time during a run.
8. If the run time set point is used, at the end of the set time the display will show "END."

9. Select “OFF” or “STANDBY” to terminate operation if the CentriVap micro IR rotor and to release the vacuum. Selecting “OFF” will turn the system off and reset the timer. Selecting “STANDBY” will turn the vacuum pump and rotor off and pause the timer.
10. When the evaporation is complete, allow the rotor to stop moving, lift the lid and remove the samples. **Use caution as the lid and rotor could be hot.**

Operational Notes

Turn the mode switch to “OFF” before turning the power switch off. When the CentriVap micro IR power is turned on, the program returns to the same mode that it was in when the power was turned off. The timer will reset.

Pressing the “START/STOP” during a run will turn the system off and reset the timer. Pressing it again will restart the program from the beginning.

To display the time remaining press the “TIME” button.

Interrupting a Cycle After it has Begun

To interrupt the cycle during a run, select “STANDBY.” This shuts off the rotor, vacuum pump, releases vacuum and unlatches the lid. After the rotor stops, the lid may be opened. If it is necessary to re-start the CentriVap micro IR, close the lid and select “RUN.” The cycle resumes operation at the same set point parameters and the timer continues to count down from the time at which the cycle was stopped.

Safety Precautions

Special precautions must be observed if the materials used in the CentriVap micro IR Concentrator are known to be hazardous, toxic, radioactive, or contaminated with pathogenic microorganisms. These actions should include but are not limited to the following:

- Refer to the World Health Organization Laboratory Biosafety Manual, paying special attention to information about centrifuges and the handling of hazardous materials.
- Operate or vent the CentriVap micro IR Concentrator inside a suitable fume hood or ventilation device. Load rotors in a ventilation device.
- Periodically inspect all parts of the CentriVap micro IR Concentrator including the lid, gasket, chamber, plumbing components and rotors.

Chapter 5: Maintaining Your CentriVap micro IR

Under normal operation, the CentriVap micro IR requires little maintenance. The following maintenance schedule is recommended. Before servicing disconnect electrical power. Special precautions must be observed if materials used in the CentriVap micro IR Concentrator are known to be hazardous, toxic, radioactive or contaminated with pathogenic microorganisms. Before servicing, the CentriVap micro IR Concentrator must be suitably decontaminated. Wear appropriate eyewear, gloves and other safety apparel.

As needed:

Before using any cleaning or decontamination method except those recommended by the manufacturer, users should check with the manufacturer that the proposed method will not damage equipment.

1. Clean up all spills; remove liquids from the chamber. Clean or decontaminate all surfaces using agents suitable for the substance spilled.
2. Clean lid and gasket using soft cloth, sponge or chamois and a mild, non-abrasive soap or detergent.
3. At the end of the run, liquid collected in the glass traps should be removed. To empty the trap, remove the glass from the mounting bracket, remove the silicone stopper. Dispose of the liquid in accordance with all codes. Reinstall the silicone stopper and replace the glass trap to its mounting bracket.
4. To prolong the life of the vacuum pump and to optimize its performance, it is important to purge all liquid from within it. Once the concentration process is completed and the glass trap has been emptied, open the CentriVap micro IR lid and turn the Mode selector switch to "ON." The pump will operate and will draw air through the system. The rotor will not turn with the lid open. The length of the liquid purge time is dependent on the volatility of the solvents used. Once all of the liquid is purged from the vacuum lines, turn the mode selector switch to "OFF."
5. Check rotors for loose or missing parts. Tighten or replace as required. Do not use defective rotors.
6. Inspect the chamber to insure that there are no cracks or structural damage. Call Labconco if defects exist.

7. Check the continuity of the protective earth ground between the ground terminal on the power inlet and a bare metal housing panel. Contact Labconco if there is no continuity.
8. Repair any defects to the surface where the unit is installed.

Monthly:

1. The rubber and silicone components on the CentriVap may eventually deteriorate and require replacement. The effective life of those parts depends upon both their usage and the surrounding environment. Check all hoses and gaskets and replace any that show signs of hardening, permanent set or deterioration.
2. Using a soft cloth, sponge or chamois and a mild, non-abrasive soap or detergent, clean the glass lid.
3. Using a soft cloth, sponge, or chamois and a mild, non-abrasive soap or detergent, clean the exterior surfaces of the unit. Liquid spray cleaners and polishes may be used on the exterior surfaces. Do not use solvents to remove stains from the exterior surfaces as they may damage the finish.

Chapter 6:
Accessories for Your CentriVap micro IR

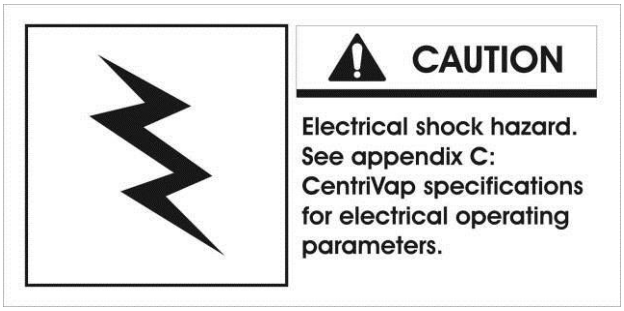
The following accessories are available for the CentriVap micro IR Concentrator.

PART #	DESCRIPTION
7548400	Rotor, .5 ml x 24 Holds (24) 0.5 ml microcentrifuge tubes
7548500	Rotor, 1.5 ml x 24 Holds (24) 1.5 ml microcentrifuge tubes
7548600	Rotor, 10 ml x 16 Holds (16) 10ml 18mm x 65mm vials
7548700	Rotor 15 ml x 12 Holds (12) 15ml 20mm x 70mm vials
7548800	Rotor 30 ml x 8 Holds (8) 30ml 30mm x 73vials
7548300	Secondary Glass Trap Assembly

Chapter 7: Troubleshooting

Refer to the following if your CentriVap micro IR fails to operate properly. If the suggested corrective actions do not solve your problem, contact Labconco for additional assistance.

CAUTION: Disconnect power before corrective action is taken.



PROBLEM	CAUSE	CORRECTIVE ACTION
Unit will not operate	**Unit not connected to electrical power**	**Connect unit to proper electrical receptacle.**
	Circuit breaker blown	**Correct electrical problem and reset circuit breaker.**
	Lid open	**Close lid.**
Excessive vibration	**Sample vials not located symmetrically in rotor**	**Reposition sample vials.**
Sample odor in lab	**Vent hose exhausting into lab area**	**Redirect hose to fume hood.**
Evaporation rate is reduced	**Heater inoperable**	**Contact Labconco.**
	Vacuum pump failure	**Check pump.**
	Liquid in vacuum line	**Clear vacuum line**

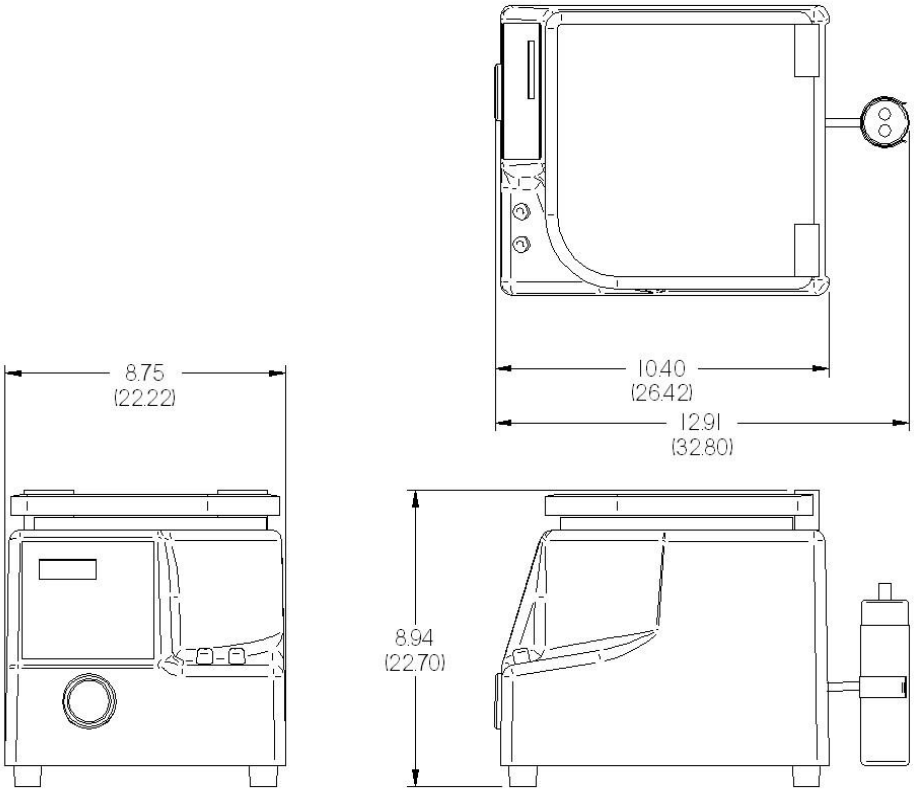
PROBLEM	CAUSE	CORRECTIVE ACTION
Evaporation rate is reduced (continued)	**Obstruction in hose**	**Remove obstruction or replace hose.**
	Lack of adequate vacuum	**See below.**
	Temp set point too low	**Increase temperature set point.**
No vacuum/poor vacuum	**Liquid in glass trap**	**Empty trap.**
	Leaks in lines or connectors or gasket	**Locate and repair.**
	Foreign material on lid gasket	**Clean gasket and lid.**

Appendix A:
CentriVap micro IR Components

The following pages list components that are available for your CentriVap micro IR. The parts shown are the most common replacement parts. If other parts are required, contact Product Service.

Quantity	Part No.	Description
1	7549000	CentriVap micro IR Strobe Light
1	7549100	Drive Motor
1	7549200	Control Board IR Pus
1	7549300	SS Relay Set micro IR
1	7549400	Display board micro IR
1	7549500	Vacuum Pump micro IR
1	7549600	Transformer, 100VA
1	7549700	Transformer, 50VA
1	7549800	Fan Motor micro IR
1	7549900	Selector Switch
1"	1624100	Silicone Tubing
1	7548200	Lid Gasket

Appendix B:
CentriVap micro IR Dimensions



Appendix C:
CentriVap micro IR Specifications

This Appendix contains technical information about the CentriVap including specifications, environmental operating conditions, wiring diagrams and evaporation rates.

Electrical Specifications

- Nominal amperage for 115V CentriVap (model 7701020) (including vacuum pump): 5A
- Nominal amperage for 230V CentriVap (models 7701030,-35,-37) (including vacuum pump): 3A
- Frequency (all models): 50/60 Hz.
- Phase: Single
- Heater power: 300 watts
- Rotor Speed: Up to 1,700 RPM
- The vacuum pump is capable of achieving an ultimate vacuum pressure of 160 MBAR

Environmental Conditions

- Indoor use only.
- Maximum altitude: 6562 feet (2000 meters).
- Ambient temperature range: 41° to 104°F (5° to 40°C).
- Maximum relative humidity: 80% for temperatures up to 88°F (31°C), decreasing linearly to 50% relative humidity at 104°F (40°C).
- Main supply voltage fluctuations not to exceed ±10% of the nominal voltage.
- Transient overvoltages according to Installation Categories II (Overvoltage Categories per IEC 1010). Temporary voltage spikes on the AC input line that may be as high as 1500V for 115V models and 2500V for 230V models are allowed.
- Used in an environment of Pollution degrees 2 (i.e., where normally only non-conductive atmospheres are present). Occasionally, however, a temporary conductivity caused by condensation must be expected, in accordance with IEC 664.

Evaporation Rates

Solvent	Tube Size (ml)	Number of Samples	Sample Size (ml)	Temp (C)	Time to Dry (min.)	Heat Mode
Methanol	1.5	24	1	35	104	IR
	1.5	24	1	35	110	IR/Heat
	1.5	24	1	50	59	Heat
	1.5	24	1	65	36	Heat
	1.5	24	1	65	32	IR
	1.5	24	1	65	33	IR/Heat
Water	1.5	24	1	50	240	IR
	1.5	24	1	50	330	IR/Heat
	1.5	24	1	60	225	Heat
	1.5	24	1	60	145	IR
	1.5	24	1	60	180	IR/Heat
	1.5	24	1	65	129	IR
Isopropanol	1.5	24	1	40		IR
	1.5	24	1	50	49	IR/Heat
	1.5	24	1	60	34	IR/Heat
	1.5	24	1	60	30	IR
	1.5	24	1	65	31	IR/Heat
Ethanol	1.5	24	1	40	270	IR/Heat
	1.5	24	1	50	60	IR/Heat
	1.5	24	1	60	39	IR/Heat
	1.5	24	1	65	32	IR/Heat