CENTRIVAP™ CONSOLE

78120-00 (115V)
78120-01 (230V)

INSTRUCTION MANUAL

Form 78303 Printed in U.S.A.

LABCONCO® CENTRIVAP™ CONSOLE

TABLE OF CONTENTS

LABCONCO® CENTRIVAP™ CONSOLE

WARRANTY POLICY

We are committed to providing our customers with quality equipment and service after the sale. Part of this objective involves keeping you informed of changes and new product additions. We therefore request that you take a moment to fill out the warranty registration card so we may know your location as well as some of the reasons that prompted you to purchase our products.

Labconco Corporation warrants products of its manufacture for one year, from receipt of the equipment by the purchaser, against defects in materials and workmanship. This limited warranty covers parts and labor but not transportation and insurance charges. In the event of a warranty claim, contact the dealer who sold you the product. If the cause is determined to be a manufacturing fault, the dealer or Labconco Corporation will repair or replace all defective parts to restore the unit to operation. **Under no circumstances shall Labconco Corporation be liable for indirect, consequential or special damages of any kind.** This statement of warranty may be altered by a specific published amendment. No individual has authorization to alter the provisions of this warranty policy or its amendments. Lamps and expendable items are not covered by this warranty. Damage due to corrosion or accidental breakage are also not covered.

WARNING: The disposal of substances used in connection with this equipment may be governed by various federal, state or local regulation. 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.

SHIPPING CLAIMS

If a shipment is received in visibly damaged condition, be certain to make a notation on the delivering carrier's receipt and have his agent confirm the damage on your receipt. Otherwise the damage claim may be refused.

If concealed damage is discovered, notify the carrier immediately and retain the entire shipment intact for inspection. Interstate Commerce Commission rules require that claims be filed with the carrier within 15 days after delivery.

NOTE: Do not return goods. Goods returned without prior authorization will not be accepted. Labconco Corporation and its dealers are not responsible for shipping damage. Claims must be filed directly with the freight carrier by the recipient. If authorization has been received to return this product, by accepting the approval, the user assumes all responsibility and liability for biological and chemical decontamination and cleaning prior to return. Labconco reserves the right to refuse delivery of any products which do not appear to have been properly cleaned and/or decontaminated.

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COMPONENTS SHIPPED

Carefully check the contents of each carton for damage that might have occurred during transit. Do not discard packing materials or cartons until all components have been checked against the following components list and the equipment has been set up and found to operate.

As shipped, the CentriVap Console should contain the following:

Catalog No.	Description
78120-00	CentriVap Console (115V/60Hz)
	...Or
78120-01	CentriVap Console (230V/50Hz)
78303	Instruction Manual
78164	Rotor for (54) 1.5 ml Vials
78152	Solvent Trap Insert

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INTRODUCTION

The CentriVap Console combines centrifugal force with vacuum to rapidly evaporate solvents from biological or analytical samples. Centrifugation eliminates bumping and foaming as vacuum is applied and concentrates the solute in the bottom of the vial. This allows recovery of solutes from sample volumes as small as a few microliters. The unit is equipped with a 300 watt heater to speed evaporation by warming the chamber to 40°C during processing. An insulating fiberglass barrier reduces heat generated by magnetic coupling from being transferred into the sample chamber. When the heat mode is selected, the start up of the vacuum pump is delayed 5 minutes to allow more efficient heat transfer to the samples. A hexagonal rotor capable of holding (54) 1.5 ml vials is included. A second rotor capable of holding (18) 1.5 ml vials may be added. Optional rotors for 12mm x 75mm tubes and 50ml centrifugal tubes are also available.

The built-in cold trap protects the vacuum pump by trapping moisture, vapors and corrosive fumes as they evaporate from the samples. The high speed condensing unit and the low temperature refrigerant reduce the temperature of the cold trap to -60°C in 30 minutes. The stainless steel trap is used for aqueous and organic solvents. The optional glass trap should be used for corrosive solvents. A secondary trap is supplied to protect the vacuum pump (not supplied) from most vapors which might pass through the cold trap. The CentriVap is supplied with a cartridge for trapping solvents. Other cartridges are available for trapping water, acids and radioisotopes.

LABCONCO® CENTRIVAP™ CONSOLE

SPECIFICATIONS

A. CONCENTRATOR

HEATER:	300W, built-in tubular heater controlled at 40°C with over-temperature protection
POWER INPUT:	115VAC, 1 phase, 60 Hz, 8.5 amp (Model 78120-00) 230VAC, 1 phase, 50 Hz, 4.3 amp (Model 78120-01) (Current ratings without vacuum pump)
DRIVE:	Belt drive coupled with magnetic drive
CONTROLS:	Rocker switches & rotary valves
MOTOR ROTATION:	Up to 1800 RPM
LID:	Abrasion resistant acrylic
CHAMBER:	Double impregnated, epoxy coated aluminum casting
CABINET:	Epoxy coated steel
DIMENSIONS:	36 3/4"H x 24"D x 18"W (93.3cm x 61.0cm x 45.7cm)
SHIPPING WEIGHT:	167 lb. (75.7 kg)
VACUUM GAUGE:	Atmosphere to 5 microns
ROTORS:	(54) 1.5 ml vials (std) (18) 1.5 ml vials (opt) (30) 12 x 75 mm tubes (opt) (5) 50 ml tubes (opt)

B. PRIMARY COLD TRAP

TEMPERATURE:	-60°C
REFRIGERATION:	1/4 HP condensing unit
STAINLESS STEEL TRAP:	1 liter
GLASS TRAP INSERT: (Optional)	1 liter

C. SECONDARY TRAP

INSERTS:	Solvent (Std) Water (Opt) Acid (Opt) Radioisotope (Opt)

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FEATURES AND CONTROLS

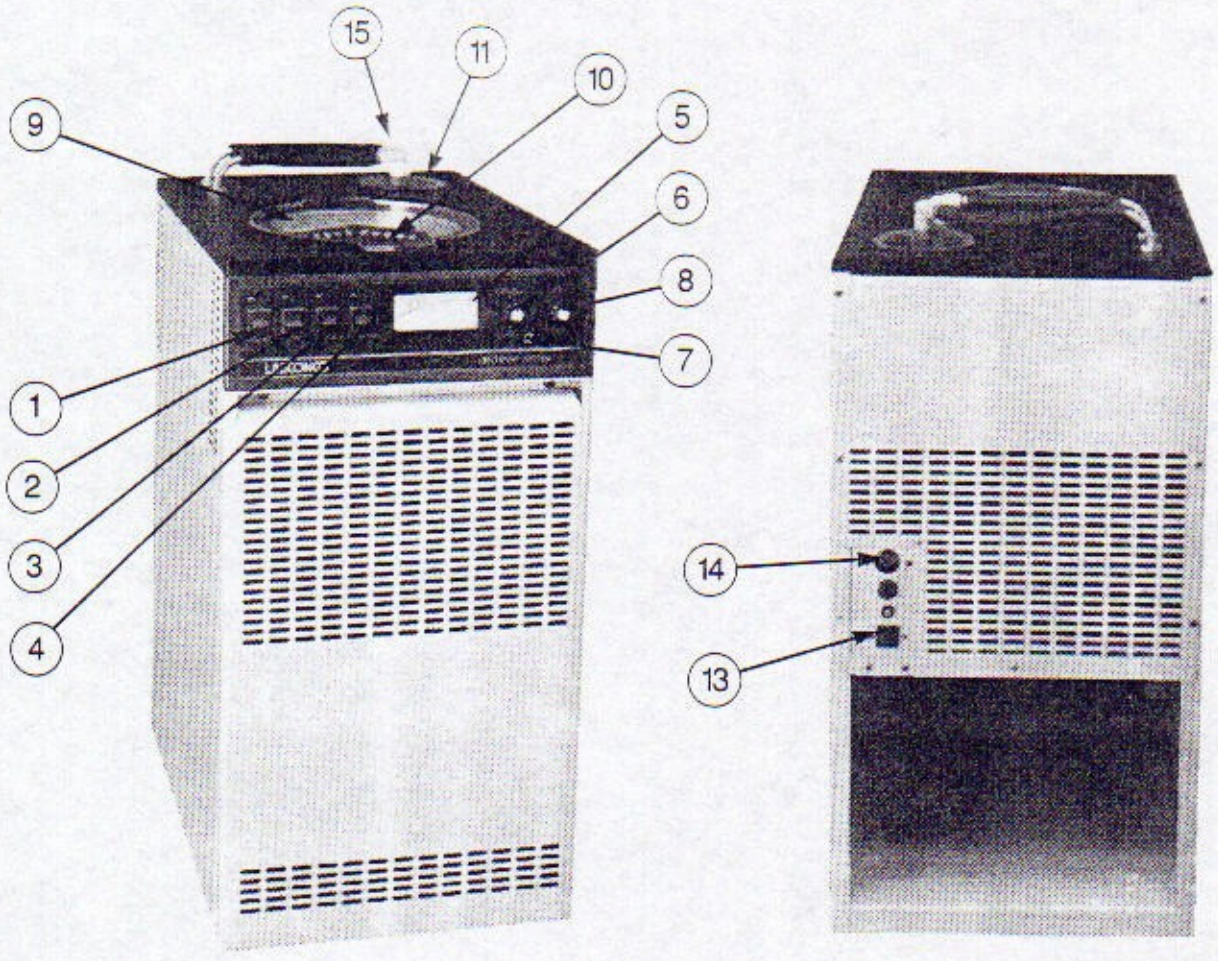


Figure 1

LABCONCO® CENTRIVAP™ CONSOLE

FEATURES AND CONTROLS (CONT.)

(1) **Refrigeration Switch** -Activates the refrigeration system that cools the cold trap.

(2) **Rotor Switch** - Activates the rotation of the rotor and turns on the vacuum pump.

(3) **Heater Switch** -Activates the heater used for warming the samples. When both the rotor and heater switches are turned on, the start up of the vacuum pump is delayed 5 minutes to allow time for the samples to be efficiently warmed.

(4) **Vacuum Switch** - Activates the vacuum pump independently from the rotor operation control.

(5) **Vacuum Gauge** - Indicates the system vacuum in microns when the vacuum pump is operating.

(6) **Vacuum Control Knob (labeled 'Concentrator')** - Rotating the vacuum control knob so the indicator points to "Vacuum" directs vacuum to the CentriVap chamber. Rotating the vacuum control knob so the indicator points to "Off" isolates the chamber from the vacuum pump and maintains the existing vacuum in the chamber. Rotating the vacuum control knob so the indicator points to "Vent/Backfill" releases the vacuum in the chamber.

(7) **Vent/Backfill Port** - The chamber vacuum is released through this port. An inert gas may be introduced into the chamber through this port when the Vacuum Control Knob is positioned to the Vent/Backfill position.

(8) **Vacuum Control Knob (labeled 'Auxiliary')** - Rotating the vacuum control knob so the indicator points to "Vacuum" directs vacuum to the auxiliary vacuum port on the rear of the cabinet. Rotating the vacuum control knob so the indicator points to "Off" isolates the auxiliary vacuum port from the vacuum pump and maintains existing vacuum in any device connected to the auxiliary vacuum port. Rotating the vacuum control knob so the indicator points to "Vent" releases vacuum in any device that is connected to the auxiliary vacuum port.

(9) **Clear Acrylic Lid** -Permits samples to be examined without opening the lid. Never attempt to open the lid unless the rotor is completely stopped. If the lid is inadvertently raised while the rotor is turned on, power to the motor will be interrupted and the rotor will stop. A neoprene gasket provides sealing between the lid and the chamber.

(10) **Rotor** - Holds sample vials or tubes during concentration. The rotor is belt driven for smooth, quiet operation and is magnetically coupled.

(11) **Stainless Steel Trap** - Cooled to -60°C, this trap collects the solvent that is evaporated from the sample. When evaporating corrosive chemicals the optional glass trap should be inserted into the stainless steel trap.

FEATURES AND CONTROLS (CONT.)

(12) **Secondary Trap -** (Item 19 shown on Figure 10, page 26) Protects the vacuum pump by trapping most vapors which may pass through the Cold Trap. The CentriVap is equipped with a cartridge for trapping solvents. Other cartridges are available for water, acids and radioisotopes.

(13) **Vacuum Pump Receptacle** - Provides electrical power receptacle for the vacuum pump. Pump operation is delayed 5 minutes when the heater mode is selected.

(14) **Auxiliary Vacuum Port** - Provides a means to connect auxiliary equipment to the primary cold trap, secondary trap and vacuum source. The Vacuum Control Knob (labeled 'Auxiliary') controls vacuum to this port. To capture vapors in the primary cold trap the refrigeration system must be activated.

(15) **Quick Disconnect Fittings** - Provides a quick and easy means to disconnect hoses from the glass trap accessory at the end of a run.

Refer to Replacement Parts (Figure 10, page 26) for the following items:

(16) **Neoprene Gasket** (Item 10 shown on Figure 10) - Provides a sealing surface between the chamber and acrylic top.

(17) **300W Heater** (Item 3 shown on Figure 10) - Provides heat to chamber controlled at 40°C when activated.

(18) **Thermally Protected Motor** (Item 8 shown on Figure 10) - Provides protection from motor overheating.

(19) **Epoxy - Fiberglass Heat Shield** (Item 43 shown on Figure 10) - Non-conducting plate minimizes heat generated by the magnets from reaching the sample chamber.

(20) **Safety Switch** (Item 11 or 41 shown on Figure 10) - Prevents start-up when lid is open or cuts power to motor if lid is raised.

(21) **Belt-Driven System** (Item 4 shown on Figure 10) - Rotates rotor up to 1800 RPM. Ensures smooth, quiet operation and consistent, even braking action.

(22) **Cooling Coil** (Item 44 shown on Figure 10) - Cools the stainless steel trap to -60°C.

(23) **Optional Glass Trap Insert** (Item 29 shown on Figure 10) - For corrosive systems, this optional glass insert is used within the stainless steel trap.

(24) **Condensing Unit** (Item 15 & 17 shown on Figure 10) - High speed 1/4 HP refrigeration system paired with the low temperature refrigerant reduces temperature of the Cold Trap to -60°C.

(25) **Refrigeration Filter** (Item 46 shown on Figure 10) - Keeps the compressor clean by filtering the refrigerant.

FEATURES AND CONTROLS (CONT.)

(26) **Acrylic Lid - Cold Trap** (Item 20 shown on Figure 10) - Used specifically with the stainless steel trap. Fittings are supplied for 1/2" internal diameter (ID) tubing.

(27) **Cast Aluminum Chamber** (Item 45 shown on Figure 10) - Double impregnated for vacuum integrity and coated for easy cleaning of any spills. Large volume accommodates single or double deck rotors.

INSTALLATION AND SET UP PROCEDURES

A. ELECTRICAL CONNECTIONS

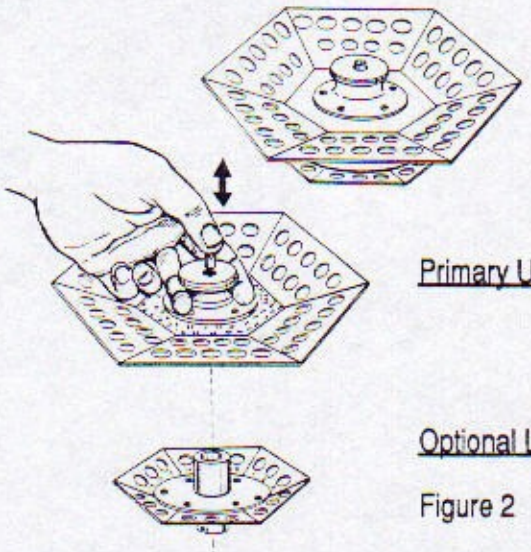
The Labconco CentriVap Console, Model 78120-00, is fully wired with an electrical cord and plug to connect to a standard outlet. For this model, a fused 115V, 60Hz, 1-phase, 20 amp supply is required. The Labconco CentriVap Console, Model 78120-01, is wired without a plug on the end of the electrical cord. For this model, a fused 230V, 50Hz, 1-phase, 10 amp supply and plug are required.

B. VACUUM PUMP

1. Remove the front access panel by unscrewing the two black fasteners located in the upper corners.
2. The vacuum pump fitting must be capable of accepting 1/2 inch ID tubing.
3. Position the vacuum pump on the lower shelf so that the vacuum port is beneath the clearance hole in the right side of the middle shelf.
4. Feed the existing loose tube coming from the secondary trap through the hole in the shelf and attach it to the vacuum port of the pump. Install the hose clamp.
5. Plug the vacuum pump line cord into the receptacle at the back of the cabinet. If the pump is equipped with a power switch, then turn the pump power switch to **"ON"**.

C. ROTOR INSTALLATION

1. Inspect the concentrator and clean any dust from the chamber or other components.
2. Unpack and clean the rotor(s). If the dual rotors are purchased, install the smaller rotor on the shaft and rotate until the slots on the bottom of the rotor engage the pin in the shaft.
3. Place the top rotor over the shaft. Gently push down on the rotor button once to engage and hold the rotor (Figure 2).



Primary Upper Rotor

Optional Lower Rotor

Figure 2

INSTALLATION AND SET UP PROCEDURES (CONT.)

D. COLD TRAP INSTALLATION

1. If your application involves corrosive chemicals, go to step 4, skipping steps 2 and 3.
2. Place the acrylic top fitted with the gasket and quick disconnects over the stainless steel trap.
3. Turn Cold Trap switch to "On" position. Allow at least 30 minutes for the cold trap to come to temperature. **Caution: Labconco recommends the use of the optional glass trap insert for most applications. Please read the following section even if your work does not involve corrosive chemicals.**
4. If using corrosive chemicals and the optional glass trap, measure approximately 200ml ethanol (ethyl alcohol) as a heat transfer medium into the stainless trap.
5. Insert the glass trap into the ethanol filled trap and check to see if the ethanol level is at least 2/3 up the outside of the glass. If not, add ethanol until this level is reached.
6. Fit the glass trap insulation over the two ports in the glass trap and press the insulation down into the console top.
7. Install 90° elbows onto the two glass ports by slowly and gently pushing them on.

CAUTION: Excessive force could break the glass.

8. Remove the two hoses and barb fittings from the existing acrylic cold trap cover by pressing the dark gray collar in and simultaneously pulling the barb fitting out.
9. Push the two barb fittings into the elbows on the top of the glass trap. The left end of the front hose should connect to the center elbow of the glass trap.
10. Turn Cold Trap switch to "On" position. Allow at least 30 minutes for the cold trap to come to temperature.
11. Immediately following a run with the optional glass trap, defrost by running under cold water.

CAUTION: Failure to immediately defrost could break the glass trap.

INSTALLATION AND SET UP PROCEDURES (CONT.)

E. SECONDARY TRAP

The Labconco CentriVap Console comes with a secondary trap and solvent trap insert which must be installed. If acidic, aqueous or radioactive samples are to be evaporated, order the appropriate insert. Then install the chosen insert as follows:

1. Unscrew the clear bottom of the trap.
2. Pull any existing cartridge down from the head to remove it.
3. Press the neck of the new insert into the head until both O-rings are inserted.
4. Reinstall the clear bottom of the trap by screwing it tightly to the head.
5. Properly dispose of used inserts as governed by federal, state or local regulation.

LABCONCO® CENTRIVAP™ CONSOLE

OPERATION

CENTRIVAP CONSOLE

1. Turn the CentriVap Cold Trap switch to "**ON**" for 30 minutes to cool down to operating temperatures. Do not turn on the vacuum or rotor at this time.
2. Load samples into rotor(s).

CAUTION: Do not operate with an unbalanced rotor.

3. Close lid.
4. The vacuum pump should be connected to the timed outlet on the back of the CentriVap Console if the delay feature is desired.
5. Rotate the Concentrator Vacuum Control Knob to "**VACUUM**" and the Auxiliary Vacuum Control Knob to "**OFF**".
6. If heat is desired, turn the Heater switch to the "**ON**" position before turning on the rotor switch. If heat is chosen, the vacuum pump will be delayed for 5 minutes to provide adequate heating to the samples prior to evacuation. If heat is not chosen, the vacuum pump will start when the rotor switch is turned on.
7. Turn rotor switch to "**ON**". If heat was not selected, the vacuum pump will start immediately. If heat was selected, the vacuum pump will start after a five minute delay.

CAUTION: Never attempt to raise the lid unless the rotor is completely stopped.

8. At the end of a run, vent the vacuum by turning the Concentrator Vacuum Control Knob to "**VENT**" and turn the rotor switch to "**OFF**". Do not lift the lid until the rotor is completely stopped and the vacuum is vented.
9. Immediately following a run using the optional glass trap, defrost by running the glass trap under cold water.

CAUTION: Failure to immediately defrost could break the glass trap.

10. At the end of the day, the vacuum line to the pump may also be vented by either turning the Concentrator Vacuum Knob to "**VACUUM**" while the lid is open or by turning the Auxiliary Vacuum Knob to "**VACUUM**" when nothing is attached to the auxiliary port at the rear of the cabinet.

OPERATION (CONT.)

AUXILIARY EQUIPMENT

1. Attach the auxiliary equipment to the auxiliary vacuum port on the rear of the cabinet with a vacuum hose securing the vacuum hose with hose clamps.

2. Turn the CentriVap Cold Trap switch to "On" for 30 minutes to cool down to operating temperature. Do not turn on the vacuum at this time.

3. Rotate the Concentrator Vacuum Control Knob to "Off" and the Auxiliary Vacuum Control Knob to "Vacuum".

4. After the CentriVap Cold Trap switch has been "On" for 30 minutes, the CentriVap Vacuum switch may be turned "On".

5. The auxiliary equipment may now be run.

6. At the end of an auxiliary vacuum run, vent the vacuum by first rotating the Auxiliary Vacuum Control Knob to "Vent" and then turning the CentriVap Vacuum Switch to "Off".

LABCONCO® CENTRIVAP™ CONSOLE

APPLICATIONS

A. HAZARDOUS MATERIALS

Hazardous Solvents/Ammonium Hydroxide - Most of these will condense in the Cold Trap. Install a secondary trap insert for organic solvents (P/N 78152) to capture any vapors and protect the pump.

Hazardous Solutes - These stay in the centrifuge tubes. Handle these tubes with care.

B. RADIOACTIVE SUBSTANCES

To evaporate radioactive substances, install an activated carbon insert (P/N 78150)in the secondary trap and use in conjunction with the Cold Trap. After operating, properly dispose of the insert as radioactive waste.

C. VOLATILE ORGANICS

Organic solvents, such as acetone and chloroform, are very volatile. The Cold Trap operating at -60°C might not be sufficient to collect 100 percent of the vapor; therefore, use of a diaphragm pump which will produce 29" Hg vacuum to evaporate these solvents is required.

CAUTION

When corrosive or volatile organics are used, a secondary trap insert must be placed between the diaphragm vacuum pump and Cold Trap to protect the pump.

D. CORROSIVE SOLVENTS

As a precaution, install an acid insert (P/N 78148) in the secondary trap canister to minimize any acid vapors from entering the pump.

E. PUMP INLET FILTER

Install a pump inlet filter (P/N 14722) on the pump to eliminate any mists.

F. CLEAN ROOM APPLICATIONS

To ensure all exhaust from the pump is eliminated from the room, attach tubing to the oil mist eliminator and route to a vented hood.

G. ROUTINE AQUEOUS APPLICATIONS

Install a secondary trap insert for water vapor (P/N 78149) to protect the pump.

NOTE: Dispose of all **chemicals** and **hazardous** materials in compliance with local codes.

Labconco is not responsible for illegal dumping of any chemicals or materials.

ROUTINE MAINTENANCE

CONCENTRATOR AND COLD TRAP

Before any maintenance is performed, all power switches should be "Off" and the CentriVap should be unplugged from electrical outlets.

1. Do not store any material around or on top of the CentriVap unit. Proper air ventilation is essential.

2. Clean any spills immediately to prevent solvents from accumulating on rotors and inside the chamber.

3. Check oil level of the pump. It should be between "MIN" and "MAX". If the oil level is less than an inch (25.4mm) above "MIN", add oil to proper level.

4. If oil shows cloudiness, particles or discoloration, drain the pump and replace with fresh oil.

5. Check the Cold Trap for condensed or frozen solvents and dispose of them appropriately. Completely empty the trap before the next run. If solvents are frozen in the glass trap, run it under cold water immediately after operating.

6. If the glass trap is used, check to see that the ethanol in the stainless steel trap is free of ice or water. Aspirate or pipet the contaminated ethanol and replace it with 200 ml of fresh ethanol.

7. If the media in the secondary trap has completely changed color, discard and replace with a new insert. For the activated carbon insert used in radioactive applications, no indicator exists. In radioactive applications, the system should be monitored with a Geiger counter.

NOTE:
The user is solely responsible for any radioactive leak.

8. Recheck all connections for a secure fit to prevent leakage.

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DIMENSIONAL DATA

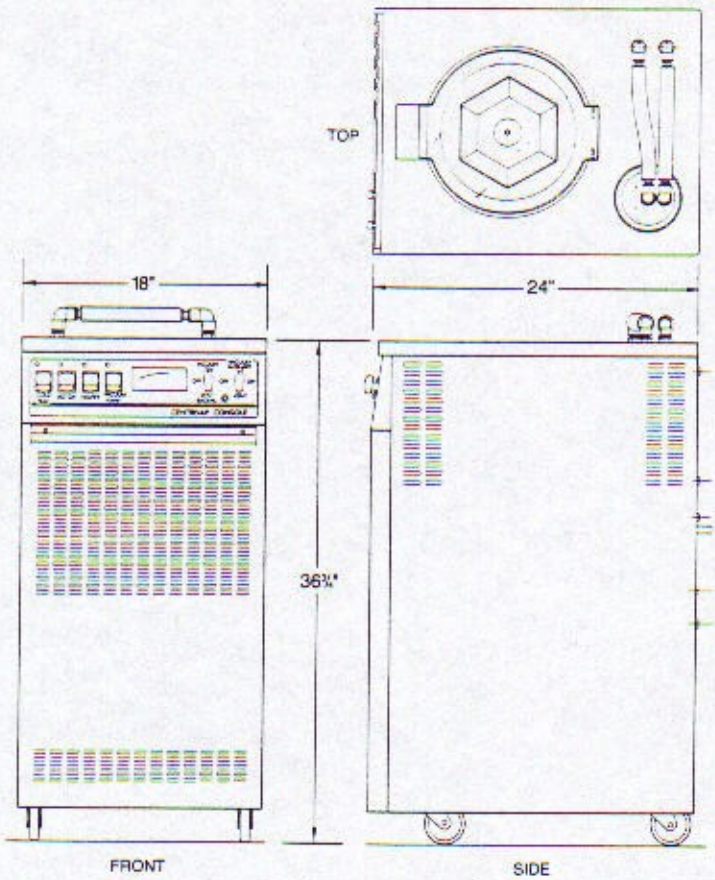

Figure 3

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TROUBLE-SHOOTING CHECKLIST

Problem	Possible Causes	What To Do
1. Lack of adequate vacuum. Gauge reads above 200 microns when chamber is empty (unloaded).	a. Air leak in the tubing .	Check tubing for wear and replace. Tighten all connections.
	b. Pump is not functioning properly.	Check pump by locating a vacuum gauge closer to pump and close off rest of system. Check pump oil for cloudiness or particles and change. If pump is faulty, seek authorized service or replace pump.
	c. Concentrator gasket is not sealing properly.	Check gasket for cleanliness. Adjust gasket as needed.
	d. Secondary trap canister not fitted properly.	Tighten all connections to and from the secondary trap. Tighten clear plastic housing.
	e. Secondary trap insert is spent.	Replace with new insert.
2. Samples take too long to evaporate.	a. Collapsed tubing.	Check for collapsed tubing and replace.
	b. Vacuum reading at concentrator with no load is greater than 200 microns.	Check for seal of gasket and resolve or replace. Check seal at vacuum fitting behind concentrator and tighten.
	c. Obstruction in line.	Trace by blocking various positions and reading gauge which is now placed right before vacuum pump. Remove obstructed tubing and replace.
	d. Quick disconnects not properly seated.	Push quick disconnects to seal.

TROUBLE-SHOOTING CHECKLIST

Problem	Possible Causes	What to Do
3. Recovery of condensate in cold trap is less than normally expected.	a. Cold trap is not ON	Check to make sure switch is ON and condensing unit fan is moving air out the rear of the cabinet. Call Labconco for assistance at 1-800-821-5525.
	b. Cold trap does not cool down.	Turn vacuum pump OFF and allow Cold Trap to cool for at least 30 minutes to reach temperature. -60°C temperature can be checked with a solvent thermometer or digital thermometer.
4. Frequent oil change needed in pump.	a. Secondary trap insert is spent.	Change insert often.
	b. Cold trap is not emptied after each run and dried.	Empty the traps (glass or stainless steel) after each run and replace.
	c. Vacuum too strong for chemical.	Use a secondary trap insert and diaphragm pump to pull 29"Hg.

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SCHEMATIC 115V WITHOUT LID LATCH

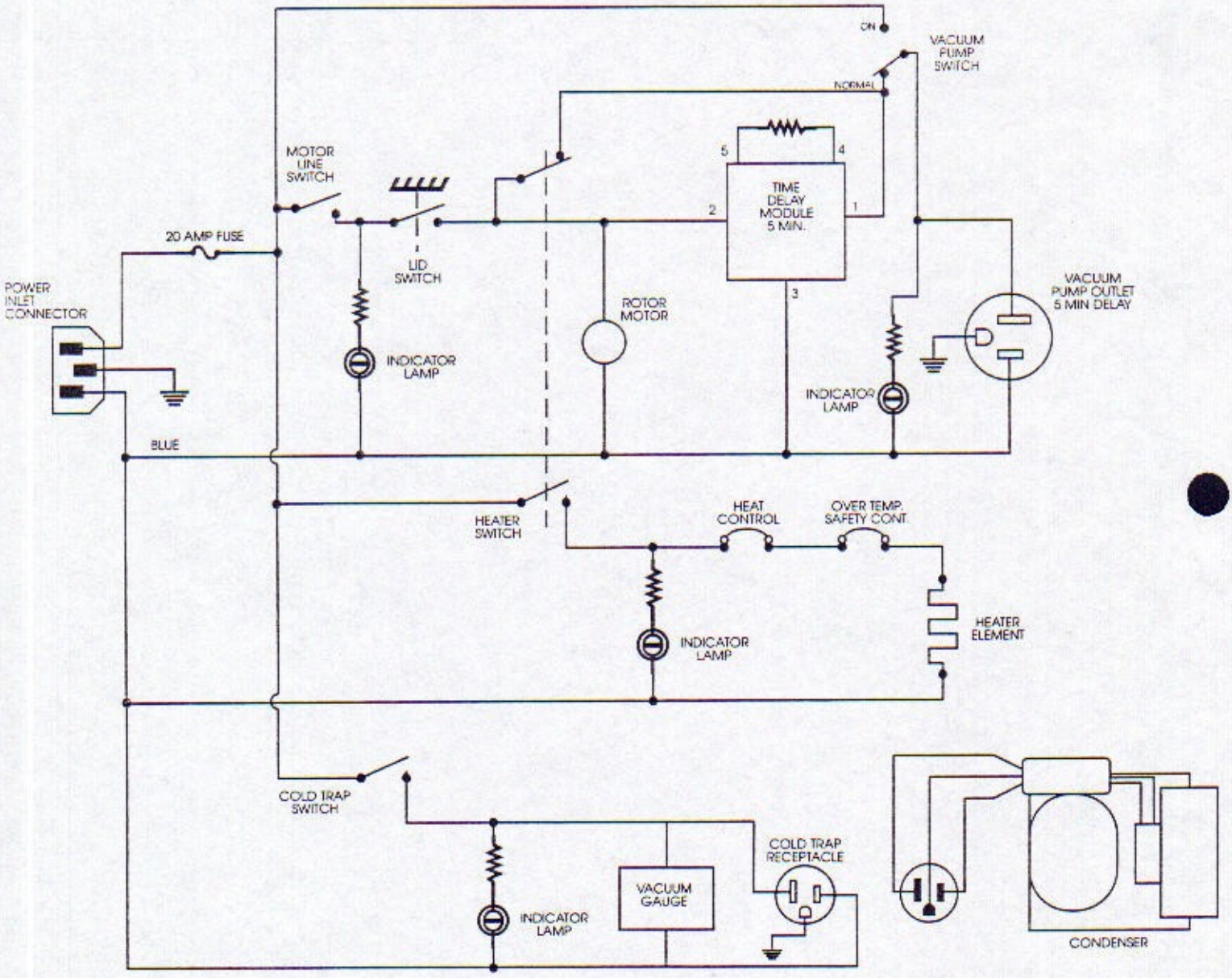

Figure 4

LABCONCO® CENTRIVAP™ CONSOLE

SCHEMATIC
115V
WITH LATCH

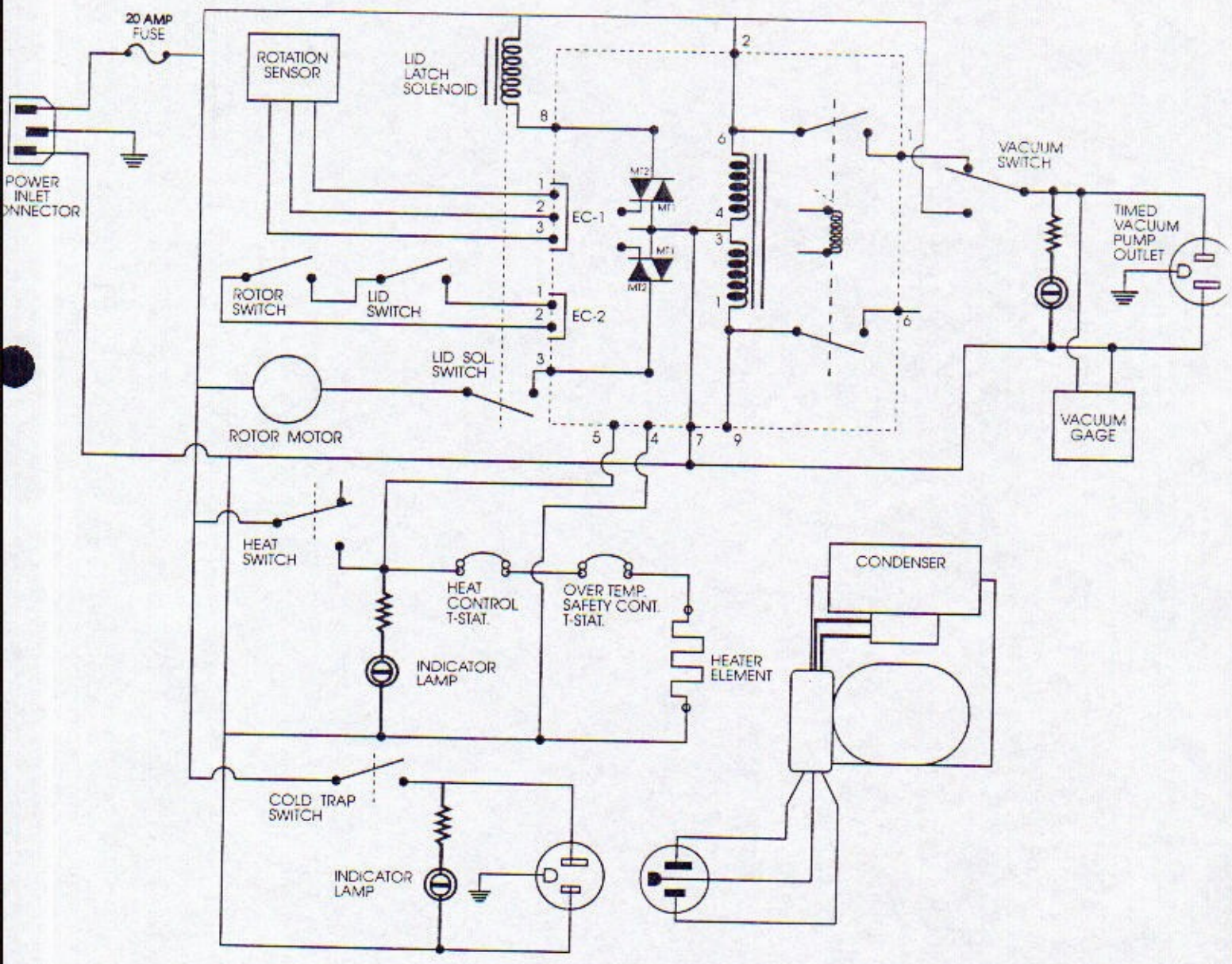

Figure 5

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SCHEMATIC
230V

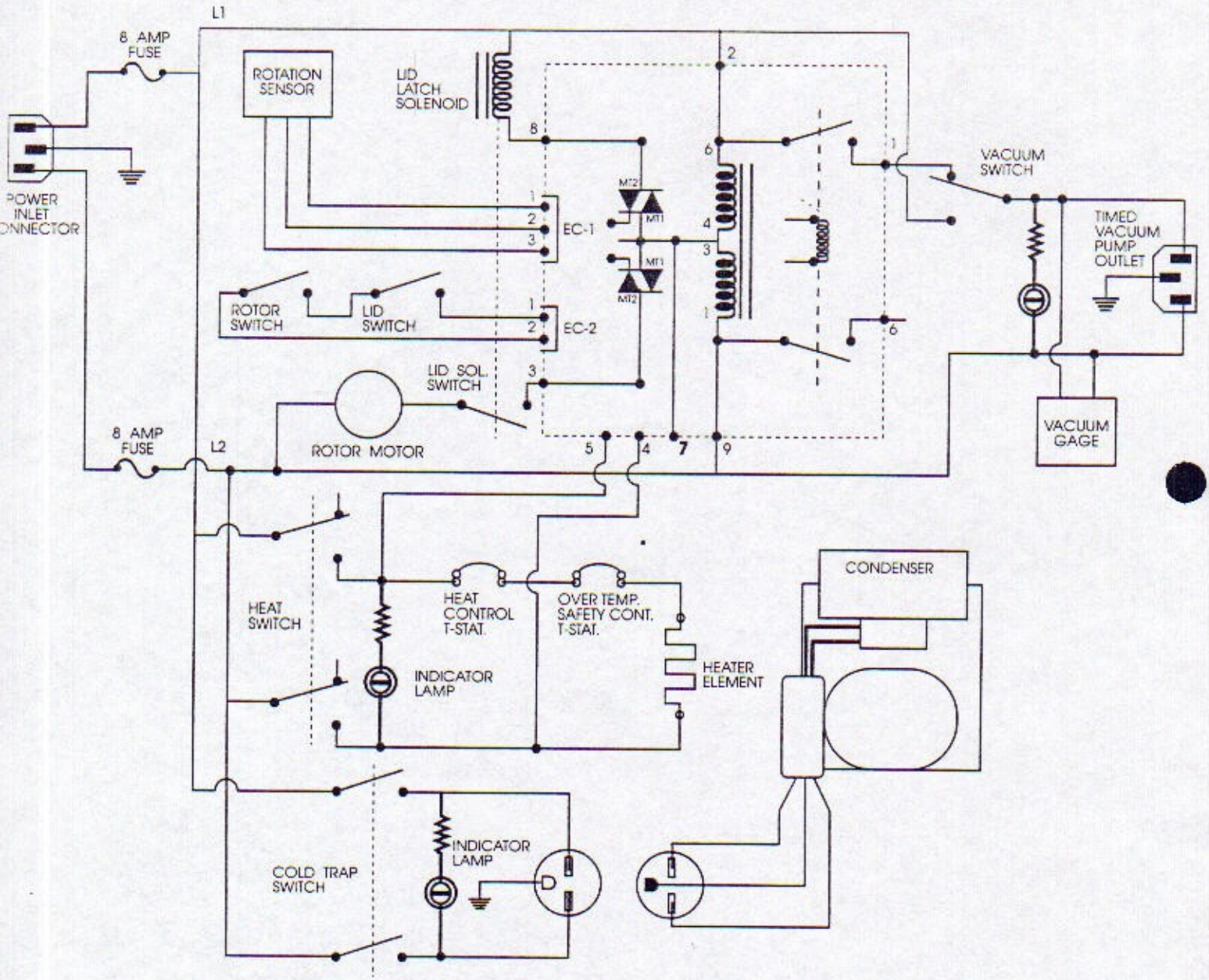

Figure 6

LABCONCO® CENTRIVAP™ CONSOLE

WIRING DIAGRAM
115V WITHOUT
LID LATCH

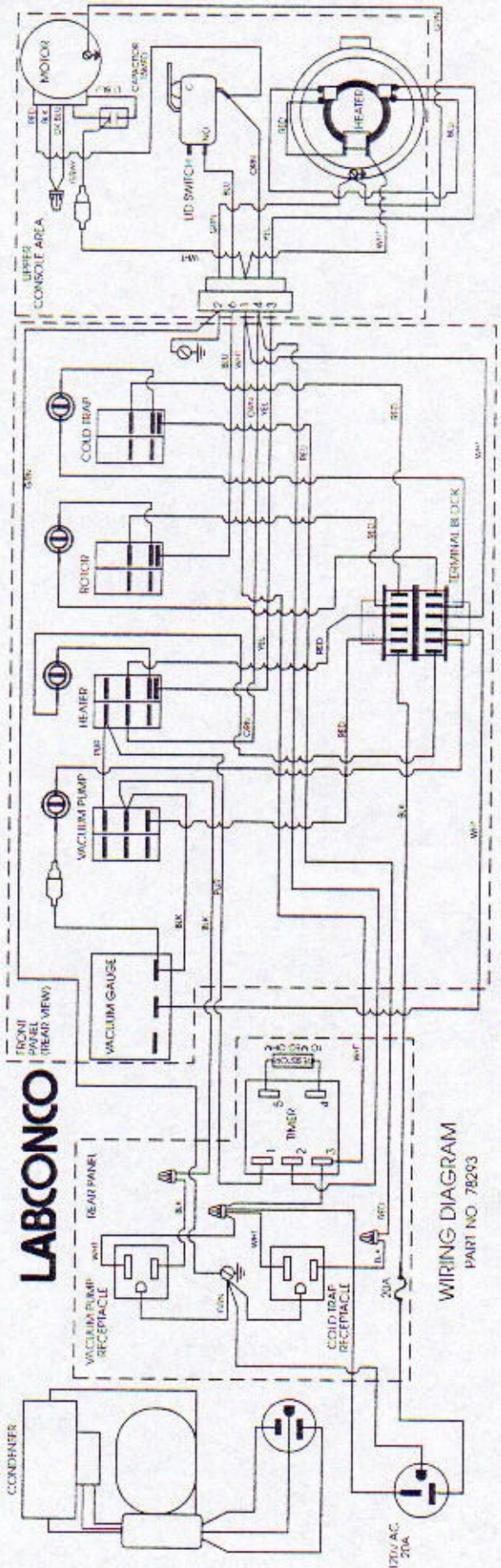

Figure 7

LABCONCO® CENTRIVAP™ CONSOLE

WIRING DIAGRAM
115V WITH
LID LATCH

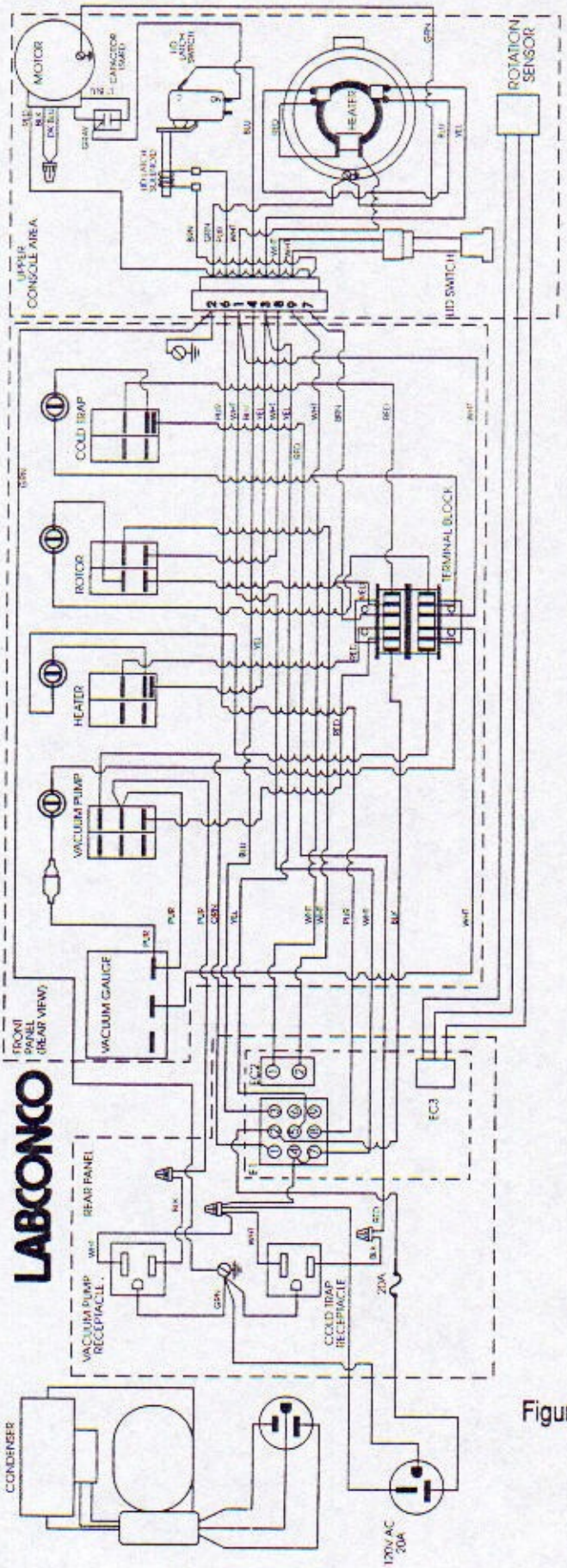

Figure 8

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WIRING DIAGRAM
230V

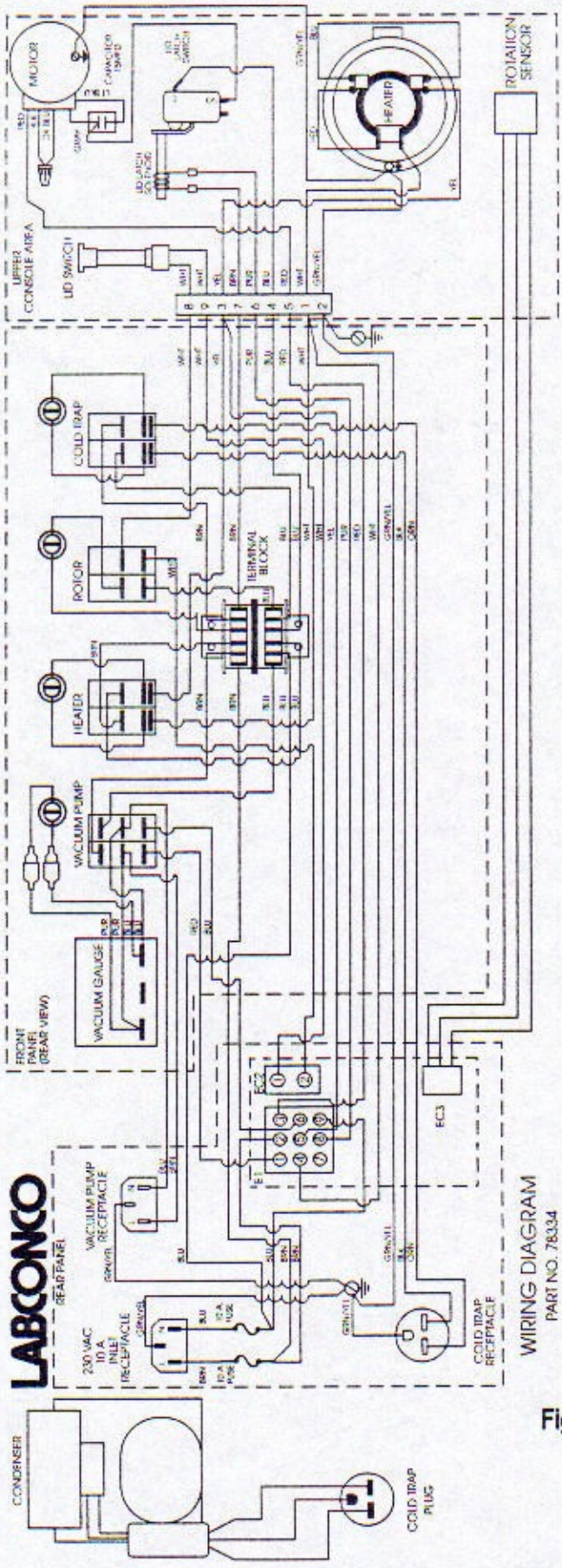

Figure 9

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REPLACEMENT PARTS
CABINET

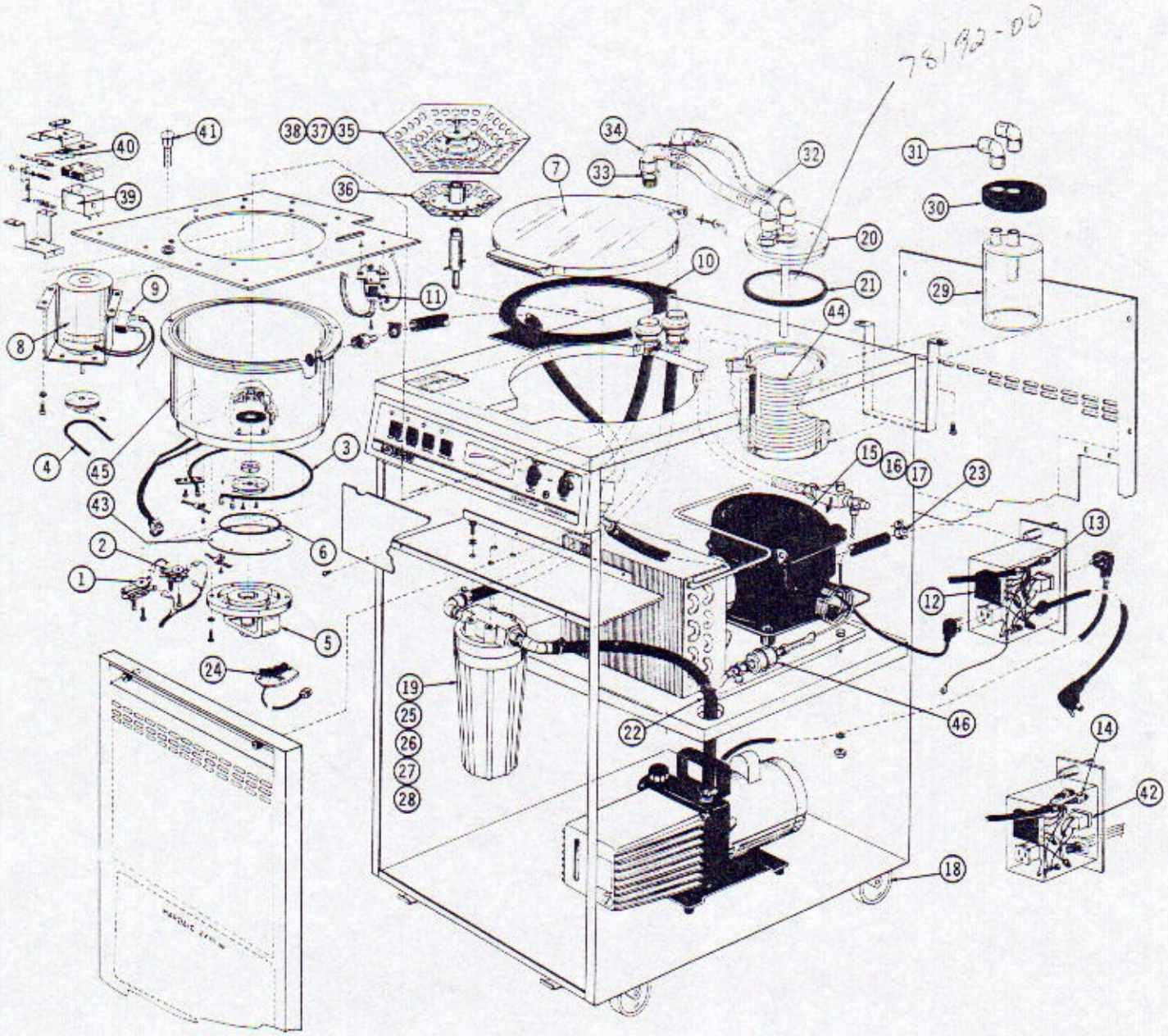

Figure 10

LABCONCO® CENTRIVAP™ CONSOLE

REPLACEMENT PARTS CABINET

Item	Req'd	Model 78120-00 Part No.	Model 78120-01 Part No.	Description
1	1	78255	78255	Thermostat HT
2	1	78254	78254	Thermostat HF
3	1	78230	78230	Heater
4	1	78252	78252	Belt-Drive
5	1	78102	78102	Post Support Assembly
6	1	78250	78250	O-Ring
7	1	78317	78317	Lid
8	1	78297	78297	Motor Assembly
9	1	78295	78295	Capacitor - Motor
10	1	78321	78321	Gasket - Concentrator
11	1	13019	N/A	Switch - Lid (If not equipped with lid latch)
12	1	13343	N/A	Timer - Delay (If not equipped with lid latch)
12	1	78290	78290	Timer - Delay (If equipped with lid latch)
13	1	13498	N/A	Fuse 20A
14	2	N/A	13352	Fuse 10A
15	1	77343	77344	Consensing Unit
16	1	78125	78124	Condensing Module Ass'y (Inc. #15 & 16)
17	11 oz.	76222-01	76222-01	Refrigerant 13 BI
18	4	19414	19414	Caster
19	1	78129	78129	SecondaryTrap Assembly
20	1	78113-001	78113	Lid Cold Trap
21	1	78181	78181	Gasket - Cold Trap
22	4	78286-01	78286-01	Hose Clear 24" Long
23	7	14888	14888	Hose Clamp
24	1	78370	78370	Speed Sensor Ass'y. (if equipped with lid latch)
25	1	78148	78148	Acid Trap Insert
26	1	78149	78149	Water Vapor Trap Insert
27	1	78152	78152	Organic Solvent Trap Insert
28	1	78150	78150	Radioisotope Trap Insert
29	1	78156	78156	Glass Trap
30	1	78197	78197	Insulator
31	2	15445-01	15445-01	Elbow - Union
32	4	15481-01	15481-01	Stem - Tube to Hose
33	2	15487-01	15487-01	Bulkhead - Union
34	2	15489-01	15489-01	Elbow - Plug In
35	1	78164	78164	Rotor 54 x 1.5 ml Microcentrifuge
36	1	78169	78169	Rotor 18 x 1.5 ml Microcentrifuge (lower tier)
37	1	78141	78141	Rotor 12mm x 75mm
38	1	78142	78142	Rotor 50ml concial
39	1	78512	78512-01	Solenoid (if equipped with lid latch)
40	1	13019	13019	Switch-Lid (if equipped with lid latch)
41	1	13020	13020	Switch, Magnetic Reed (if equipped with lid latch)
42	1	12848	13339	Receptacle
43	1	78218	78218	Plate, Magnet Cover
44	1	78179	78179	Evaporator Coil
45	1	78292	78292	Cast Aluminum Pot
46	1	14895	14895	Refrigeration Filter

REPLACEMENT PARTS
CONTROL PANEL

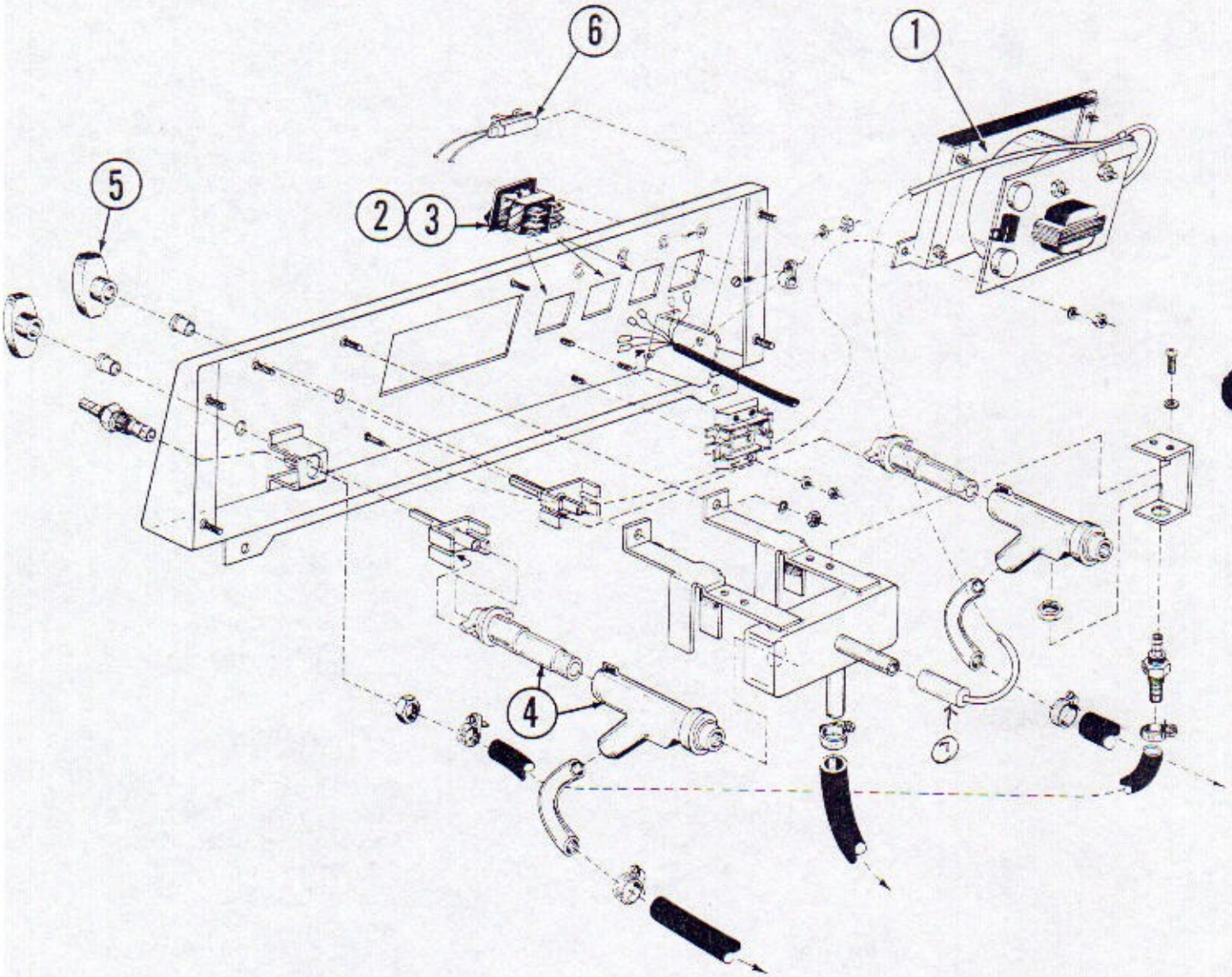

Figure 11

LABCONCO® CENTRIVAP™ CONSOLE

REPLACEMENT PARTS CONTROL PANEL

Item	Req'd	Part No.	Description
1	1	76815	Vacuum Gauge
2	2	13015-00	Switch - Cold Trap, Rotor
3	2	13015-01	Switch - Heater, Vacuum
4	2	75900	Valve Assembly
5	2	78333	Knob
6	4	78273	Lamp Assembly
7	1	13405-00	Vac Sensor

LABCONCO® CENTRIVAP™ CONSOLE

ACCESSORIES

Cat. No.	Description
78169	**Lower Deck Hexagonal Rotor** Capacity for 18 each 1.5ml microcentrifuge tubes.
78141	**3ml Rotor (12mm X 75mm)** Capacity for 30 each 3ml centrifuge tubes.
78142	**50ml Conical Rotor** Capacity for 5 each 50ml centrifuge tubes.
78156	**Glass Insert.** For Cold Trap.
78148	**Acid Trap Insert**
78149	**Moisture Trap Insert**
78150	**Radioisotope Trap Insert**
78152	**Solvent Trap Insert**
14721	**Direct Drive Vacuum Pump** 113 liter/minute pumping capacity with gas ballast. Blank-off pressure 2 x 10^{-4} Torr (0.2 micron). 115VAC, 60Hz, single phase, 6.3 amps.
14677	**Direct Drive Vacuum Pump** 190 liters/minute capacity with gas ballast. Blank-off pressure 2 x 10^{-4} Torr (0.2 micron). 115VAC, 60Hz, single phase, 6.3 amp.
77394	**Direct Drive Vacuum Pump** 113 liter/minute. Same as 14721 except 220/208-230VAC, 50/60Hz, single phase, 3.4 amp operation.
77394-01	**Direct Drive Vacuum Pump** 190 liter/minute. Same as 14677 except 220/208-230VAC, 50/60Hz, single phase, 3.4 amp operation.