WaterPro Mobile

Models 90900, 90901, 90902,
90900-01, 90901-01, 90902-01

INSTRUCTION MANUAL

Form 90944 ECO 7165
Printed in U.S.A.

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Components Shipped

Carefully check the contents of the carton for damage that might have occurred in transit. Do not discard the carton or packaging material until all components have been checked against the following component list and the equipment has been installed and tested

As shipped, the carton should contain the following:

Part Number	Description
90900	115 V, WaterPro Mobile Standard
or	
90901	115 V, WaterPro Mobile for HPLC
or	
90902	115 V, WaterPro Mobile with Ultrafilter
or	
90900-01	230 V, WaterPro Mobile Standard
or	
90901-01	230 V, WaterPro Mobile for HPLC
or	
90902-01	230 V, WaterPro Mobile with Ultrafilter
90944	Manual
90447	Spanner wrench

General Description

The Labconco WaterPro Mobile systems, models 90900 and 90900-01 produce both reverse osmosis and Type I water upon demand. Models 90901 and 90901-01 produce both reverse osmosis and HPLC grade water. Models 90902 and 90902-01 produce reverse osmosis, HPLC grade and ultrafiltered water upon demand.

A dispensing gun delivers Type I water for those laboratory applications requiring this grade. A dispensing valve mounted in front of the unit delivers reverse osmosis water when needed. For models 90902 and 90902-01 another dispensing valve with 0.2 µm filter mounted to the front of the unit delivers HPLC grade water.

The unit is a bowl system that may be placed under the counter or left free standing. The mobility of this unit allows it be relocated easily.

Figure 1 illustrates the appearances of the WaterPro Mobile System.

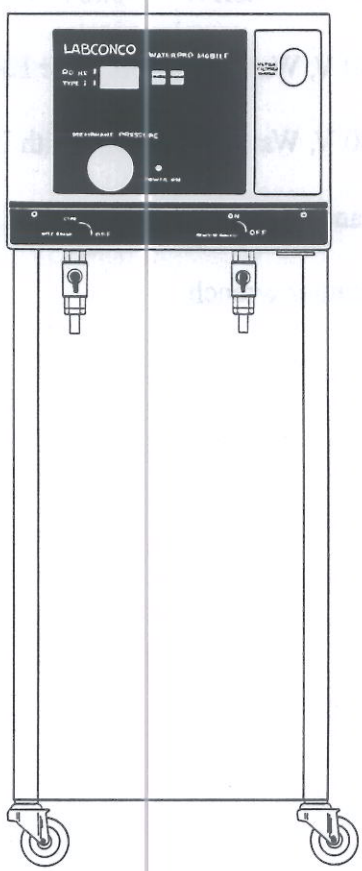


Figure 1

Performance

The WaterPro Mobile Systems utilizes a 20 inch reverse osmosis membrane to eliminate at least 90% of ions and organics in the feed.

The standard version utilizes three nuclear grade deionization cartridges to further purify water to Type I specifications

The HPLC version utilizes as a final cartridge, prior to microfiltration (0.2 µm filter), an organic scavenging cartridge to produce HPLC grade water with a TOC (Total Organic Carbon) of less than 15 ppb.

The ultrafilter version utilizes deionization, organic scavenging and ultrafiltration to produce HPLC grade water as well as ultrafiltered water in addition to the reverse osmosis treated water available in all versions.

Reverse osmosis utilizes a pressure greater than the osmotic pressure to 'force' the flow from the more concentrated to the less concentrated or purer side. The result is treated water or permeate which is greatly reduced in ionic and organic content. The concentrated portion of this separation, known as the reject is flushed to drain. The pressure utilized in this system is 120 psi.

The deionization cartridge contains a mixture of basic and acidic nuclear grade resin. The ions for exchange are the hydrogen and hydroxyl ions. The ions left in solution after reverse osmosis treatment, are exchanged to sub ppb (parts per billion) levels when passed through the resin cartridge. This results in Type I purified water.

The organic adsorption cartridge, scavenges trace levels of organics in the deionized water resulting in significantly reduced organic levels in the purified water.

The ultrafilter, rated at a molecular weight cut off of 10,000 Daltons removes pyrogens for those applications sensitive to endotoxins.

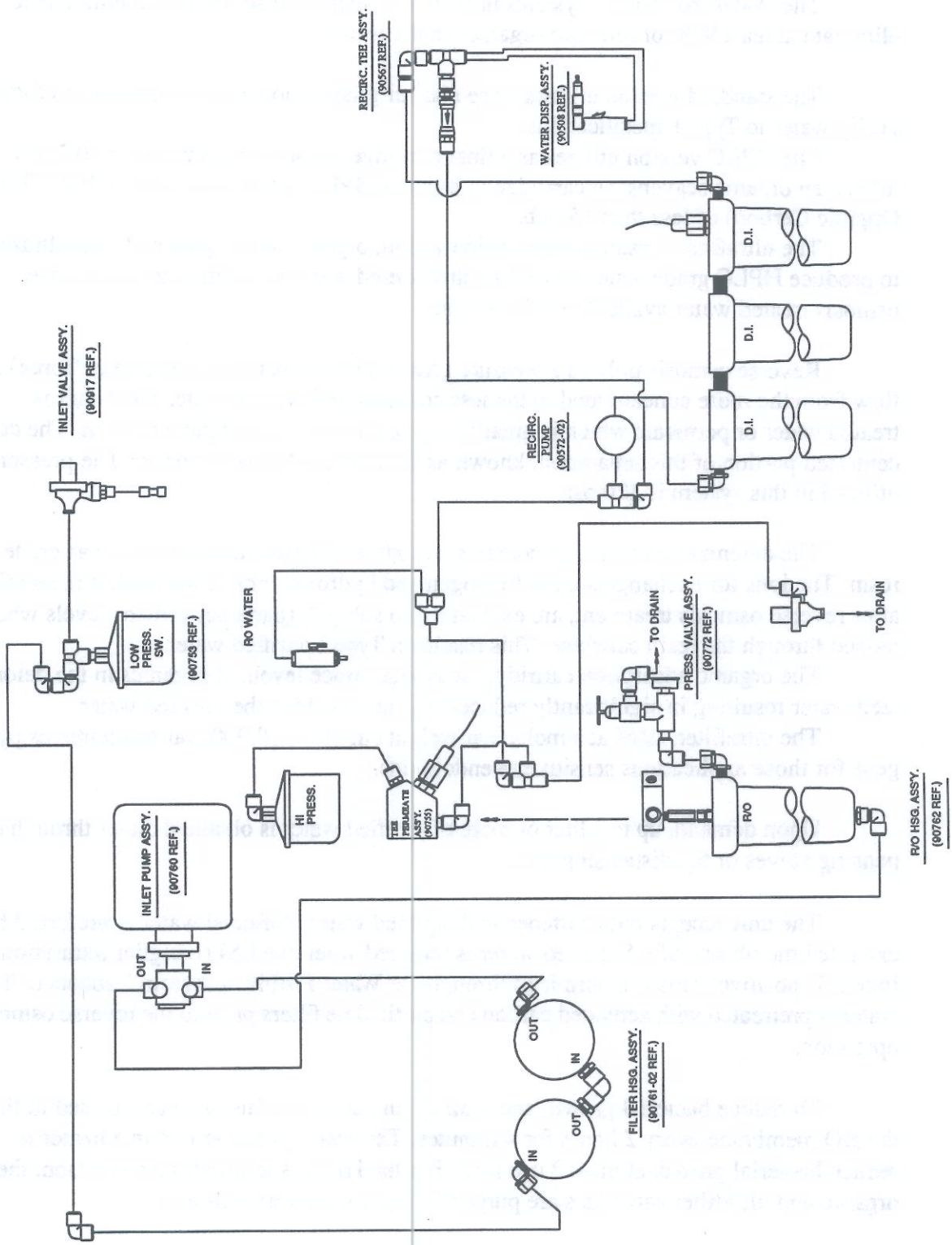
Upon demand, up to a liter or more of purified water is obtained either through dispensing valves or the dispensing gun.

The unit accepts both softened and tap feed water. Softened water is preferred for extended membrane life. Softened water is required when the LSI (Langlier Saturation Index) is positive. This is determined through the Water ProFile test from Labconco. The water is pretreated with activated carbon and particulate filters prior to the reverse osmosis operation.

To reduce bacterial growth and scaling, an automatic flush is incorporated to flush the RO membrane every 2 hours for 4 minutes. The type I gun is seated in a heater to reduce bacterial growth at the 0.2 µm filter. For the HPLC and ultrafiltered version, the organic and ultrafilter cartridges are purged for 1 minute every 4 hours.

Figures 2, 3 and 4 shown the flow diagrams of the Standard Mobile System, HPLC Mobile System and Ultrafiltered Mobile System respectively.

STANDARD MOBILE SYSTEM



Figure

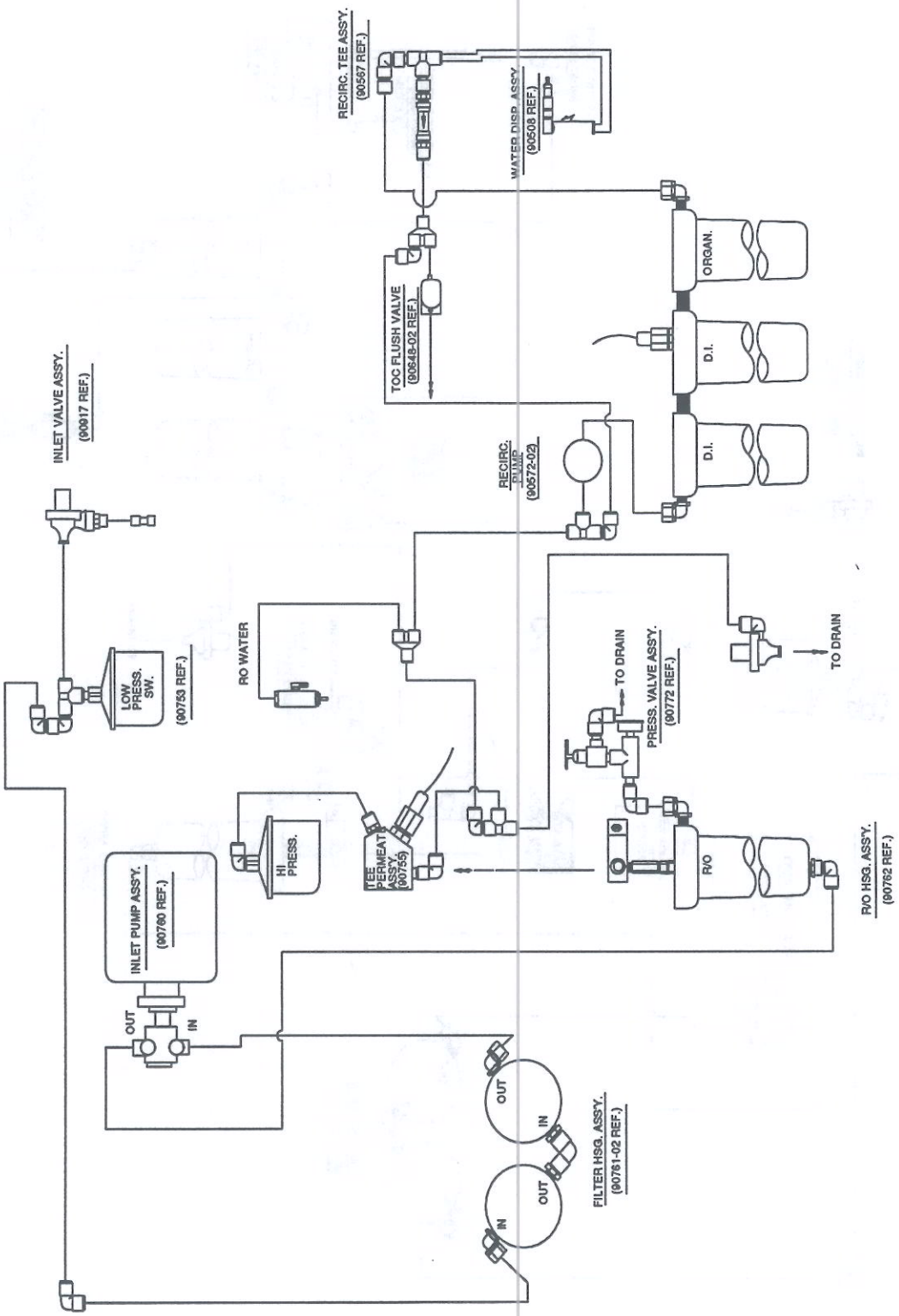

RECIRC. TEE ASS'Y.
(90567 REF.)
WATER DISP. ASS'Y.
(90508 REF.)
TOC FLUSH VALVE
(90548-02 REF.)
ORGAN.
D.I.
D.I.
RECIRC. PUMP
(90572-02)
INLET VALVE ASS'Y.
(90017 REF.)
LOW PRESS. SW.
(90753 REF.)
RO WATER
TO DRAIN
PRESS. VALVE ASS'Y.
(90772 REF.)
TO DRAIN
HI PRESS.
TEE PERMEAT ASS'Y. (90755)
R/O
R/O HSG. ASS'Y.
(90762 REF.)
INLET PUMP ASS'Y.
(90760 REF.)
OUT
IN
OUT
IN
OUT
IN
FILTER HSG. ASS'Y.
(90761-02 REF.)

Figure 3

ULTRAFILTERED MOBILE SYSTEM

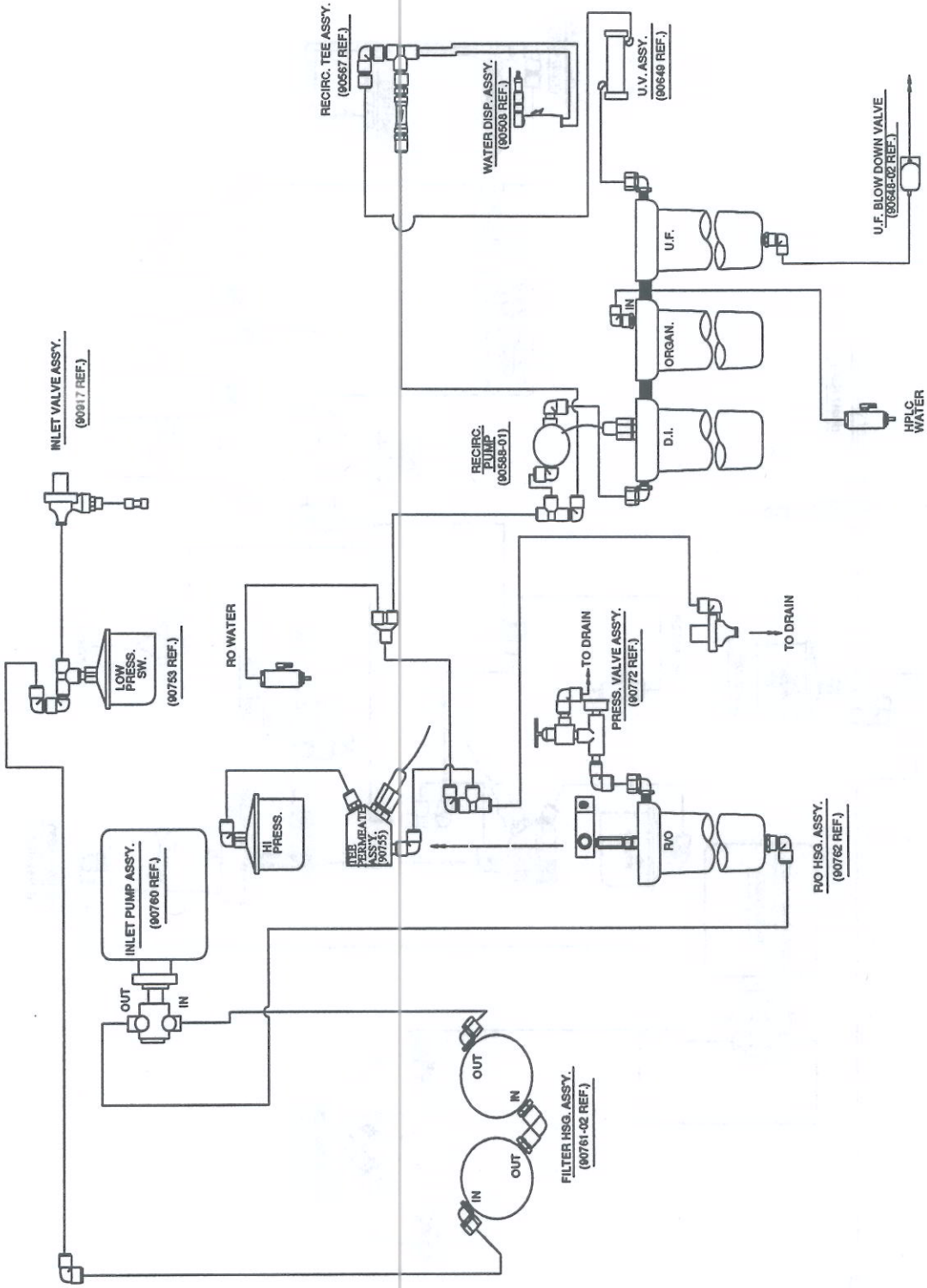


Figure 4

Component Identification

(1) **Pressure Gauge.** The pressure gauge indicates the RO back pressure.

(2) **RO Dispensing Valve.** This dispensing valve dispenses RO purified water upon demand.

(3) **Inlet Valve.** This inlet valve allows feed water to enter the system.

(4) **Pressure Regulator.** This regulator is preadjusted at Labconco resulting in the 120 psi back pressure of the RO.

(5) **Recirculation Pump.** The recirculating pump moves water continuously through the polishing section when the display switch is 'ON' and intermittently during the flush cycle when the display switch is OFF.

(6) **High Pressure Switch.** The switch controls the pressure of the system by deactivating the inlet valve when there is not demand for purified water.

(7) **Conductivity Sensor.** This senses the conductance of the ions in the RO permeate and is read as microsiemen µs.

(8) **Flush Valve.** The flush valve opens and dispenses water from the RO every two hours for 4 minutes.

(9) **Resistivity Sensor.** The sensor transmit resistivity (reciprocal of conductivity) readings of the polishing side to the PC board. This is recorded in Meg Ohm-cm.

(10) **Dispensing Gun.** The dispensing gun delivers bacteria free Type I, HPLC grade or ultrafiltered water depending on which system is used.

(11) **Check Valve.** The 10 psi check valve installed in the RO housing prevents damage to the membrane due to permeate back pressure.

(12) **Low Pressure Switch.** The pressure switch senses low inlet pressures and deactivates the pump. It serves as protection for the pump.

(13) **Rotary Vane Pump (Inlet Pump).** The pump boosts the pressure to the RO.

(14) **Dispensing Valve HPLC.** The valve delivers bacteria free HPLC grade water to the user with 0.2 µm filter installed.

Component Identification (Con't)

(15) **Permeate Tee.** This manifold eliminates the usage of numerous fittings thus reducing the potential for leakage.

(16) **TOC Flush Valve.** This valve purges the organic adsorption cartridge for 1 minute every 4 hours to keep TOC levels low. (On models 90901 and 90901-01)

(17) **UF Flush Valve.** The valve allows the ultrafilter to be purged every 4 hours for 1 minute to clean the membrane. (On models 90902 and 90902-01)

(18) **UV Lamp.** This 254 nm germicidal lamp kills bacteria in the ultrafiltered model.

(19) **Prefilter.** The 20 inch housing contains a prefilter made of carbon and polymeric fibers rated at 3 - 6 microns.

(20) **Carbon/Prefilter.** The 20 inch housing contains a radial flow carbon cartridge for extra carbon capacity.

(21) **RO.** The 20 inch housing contains a thin film composite membrane.

(22) **Deionization.** The 20 inch housing on the polishing side contains a mixed bed nuclear grade deionization cartridge.

(23) **Deionization.** In the standard and HPLC Mobile Systems, this houses a 20 inch mixed bed nuclear grade cartridge.

(24) **Organic Adsorption.** In the ultrafilter Mobile System, this houses a 20 inch organic adsorption cartridge.

(25) **Deionization.** In the Standard Mobile System, this houses a 20 inch mixed bed nuclear grade cartridge.

(26) **Organic Adsorption.** In the HPLC System, this house a 20 inch organic adsorption cartridge.

(27) **Ultrafilter.** In the Ultrafiltered System, it houses a 20 inch ultrafilter.

(28) **Heater.** The heater retards bacterial growth at the tip of the microfilter.

Component Identification

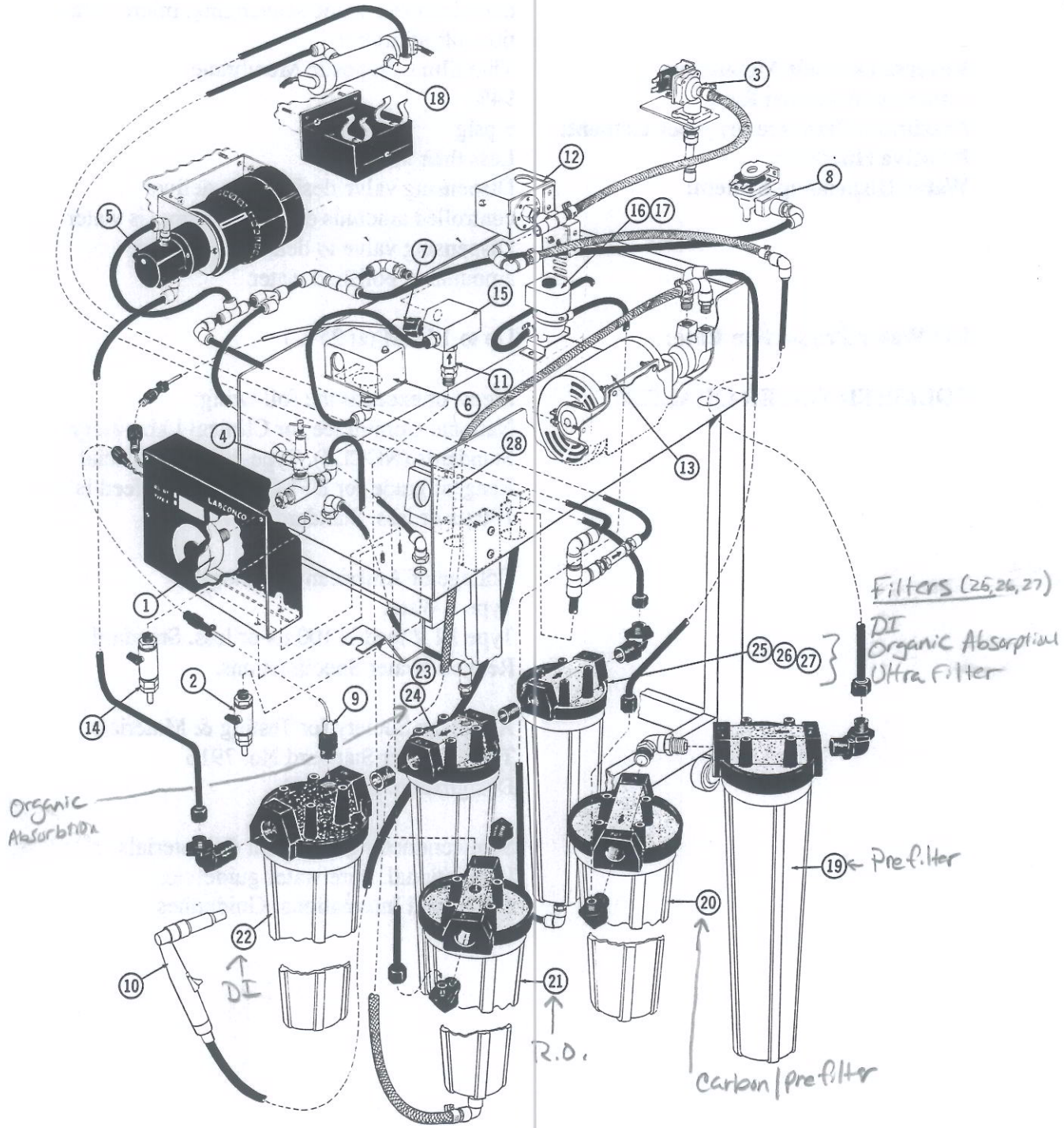


Figure 5

RO SPECIFICATIONS

Technology:	Reverse osmosis, carbon adsorption, deionization organic scavenging, microfiltration, ultrafiltration
Reverse Osmosis Membrane:	Thin film Composite Membrane
Minimum Rejection Rate:	94%
Maximum Pressure drop per element:	6 psig
Relative Humidity:	Less than 80%
Water Dispensing System:	Dispensing valve designed to deliver controlled amounts of reverse osmosis water. Dispensing valve to deliver controlled amounts of polished water.
RO Water Production Rate:	Up to 1 LPM (at 25°C)
POLISHED WATER QUALITY:	Meets or exceeds the following: National Committee for Clinical Laboratory Standards (NCCLS). Type 1 Water, Special Reagent grade for HPLC, Type III if feed is 100 µs or less. Standard C3-A2. College of American Pathologist. Type 1 Water Type III if feed is 100 µs or less. Standard Reagent Water Specifications. American Society for Testing & Materials. Type 1 Water Standard No. 7916 Designation: D1193-91 Semiconductor Equipment & Materials International. Pure water guidelines 1992 Semi International Guidelines

INLET WATER SPECIFCATIONS:

Temperature:	10° - 35° centigrade (50° - 95° Fahrenheit)
pH:	4 - 10
Water Pressure and Flow:	30 - 100 psi (2 - 7 bar) 2 gallons/min. (7.6 liters/min)
Maximum Silt Density Index:	5 SDI
Turbidity:	≤ 1 NTU
Langlier Saturation Index*:	Negative (if positive requires water softener pretreatment)
Maximum Ion Concentrations:	
Iron (Total):	0.1 ppm (mg/L)
Maganese:	0.1 ppm
Free Chlorine:	0.5 ppm

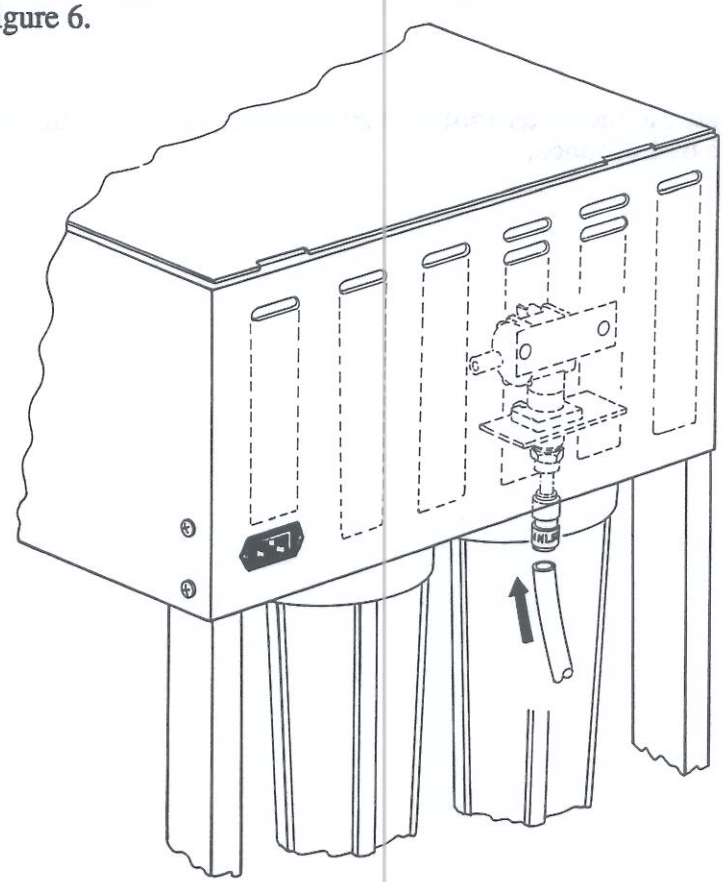
*LSI is indicated in the Water ProFile water analysis. Test recommendations will be made by Labconco.

Preparation

Do not remove Mobile System from its shipping box until it is ready to be placed in its final location. Call Labconco at (800) 821-5525 or (816) 333-8811 or return the business reply card to obtain your Water ProFile test kit. Pretreatment of the feed water, if required, will be recommended after analysis.

Location

The Mobile System should be placed close to a water source and drain. The unit can be placed under counter, or free standing. If desiring to place on a counter top, casters must be removed. The unit will only fit on counter tops without upper cabinets. A vinyl sheet or tape may be placed over holes previously containing castors to protect the bench surfaces. Direct drain lines to a drain and secure. One drain line is connected to the flush valve; the other is connected to the flow restrictor for draining reject water. Insert black polyethylene tubing supplied with unit into fitting labeled 'inlet' and connect to feed water. See Figure 6.



To Remove Casters For Benchtop: Place a padded material or fold up units carton on the floor. Carefully lower the unit on one side. Place a screwdriver between caster and frame of unit. Turn screwdriver to pop caster out. See Figure 7. Repeat the above procedure for all four casters. Store casters for later use, if needed.

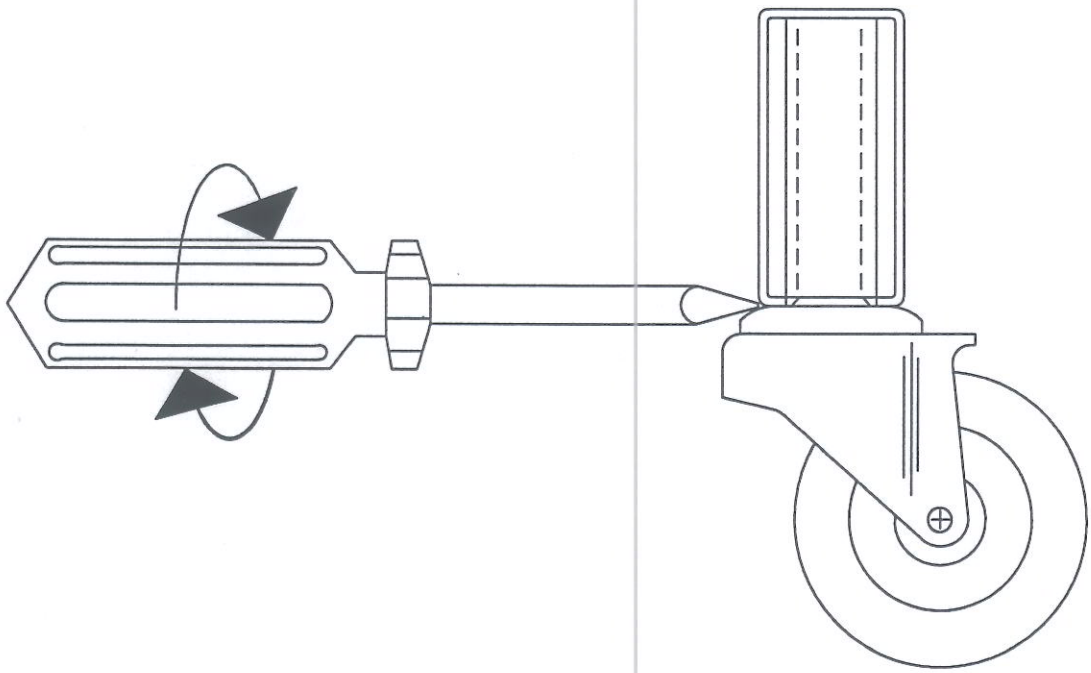


Figure 7

Utility Connections

The electrical outlet should be rated at 115 VAC, 60 Hz, 15 Amps for models 90900, 90901 and 90902 (230 VAC, 50 Hz, 10 Amps for models 90900-01, 90901-01 and 90902-01) and be dedicated to the Mobile System only.

All plumbing connections to the system should be easily accessible and have an in line, shut-off valve should disconnection be required.

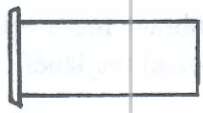
Refer to "Inlet Water Specifications" section for feed water requirements.

Figure 7

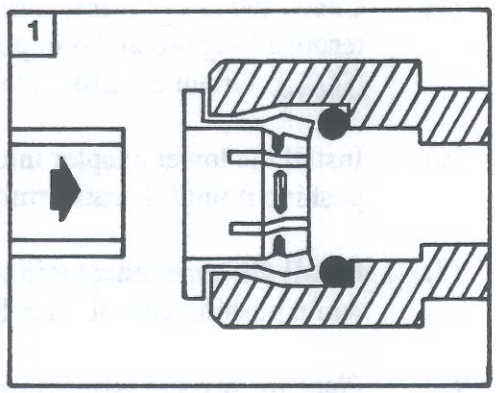
Tubing Installation

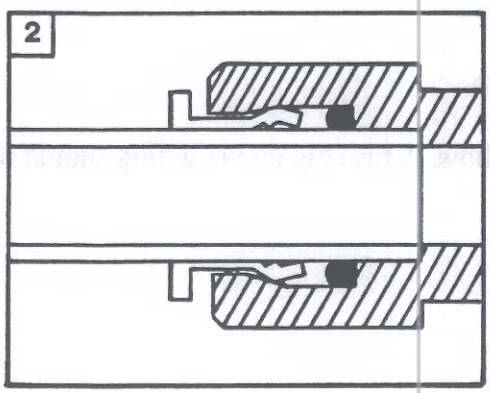
The tubing connectors used in the WaterPro Mobile Systems have been selected for their dependability and ease of installation. A detailed drawing of a typical connection is shown in Figure 8.

For flexible tubing, be sure to insert a tube support. Rigid tubing does not require the use of a tube support.



1. Tubing should have tube support inserted if flexible.
2. Moisten the end of the tubing with water and insert straight into the fitting until the tubing bottoms on the fitting shoulder.
3. To remove the tubing from the fitting, press the gray collar in and pull the tubing straight out.





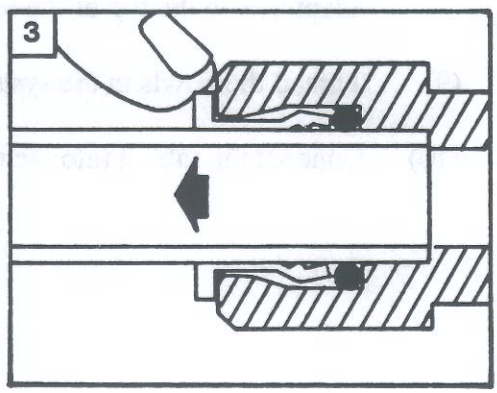


Figure 8

RO Membrane/Ultrafilter Installation

(1) Install prefilter in bowl. (See Figure 10)

(2) Install carbon/prefilter in middle bowl on right side of system. (See Figure 10)

(3) Remove the tubing from the connector in the bottom of the bowl by pressing the gray collar back towards the connector and pulling the tubing straight out. (See Tubing Installation.

NOTE: Reverse osmosis membrane has a yellow border around the label. The ultrafilter has a blue border around the label

(4) With the Spanner Wrench supplied, remove the first bowl on the right side of the unit designated for the RO membrane and the last bowl on the left designated for the ultrafilter (Models 90902 and 90902-01). Figure10

(5) Center the lower spacer disk over the support post in the bottom of the bowl. Centering a long rod and dropping the disk over it will ease the installation.
NOTE: Orient the disk in the bowl so that the slots are upward. (See Figure 9)

(6) Install the lower adaptor into the bottom of the RO membrane (or ultrafilter) by pushing it until it seats firmly.

(7) Install the upper adaptor in the top of the RO membrane (or ultrafilter) by twisting while pushing until it seats firmly.

(8) Place the reverse osmosis membrane (or ultrafilter) in the bowl such that the upper adaptor is in the top of the bowl.

(9) Thread the bowls in the system.

(10) Connect the tubing into the elbow. A firm tug on the tubing should not pull it out.

RO MEMBRANE/ULTRAFILTER INSTALLATION

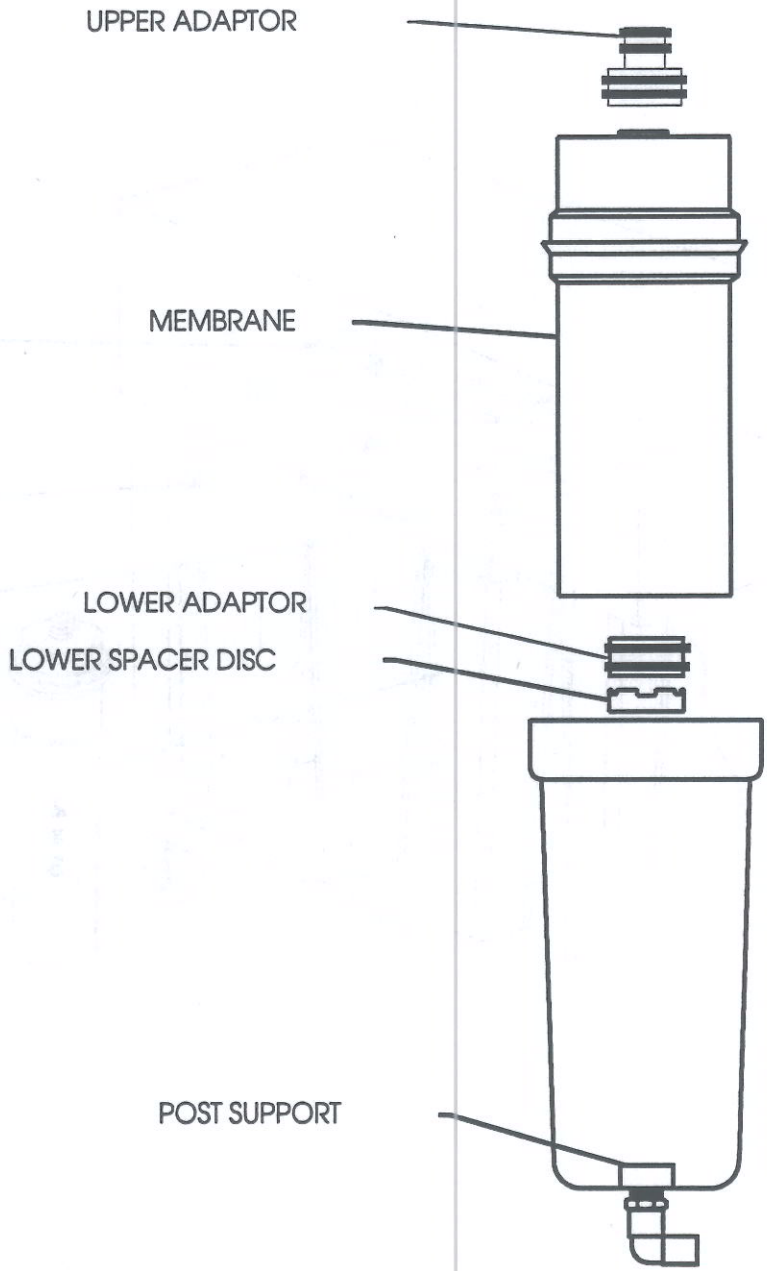


Figure 9

CARTRIDGE INSTALLATION

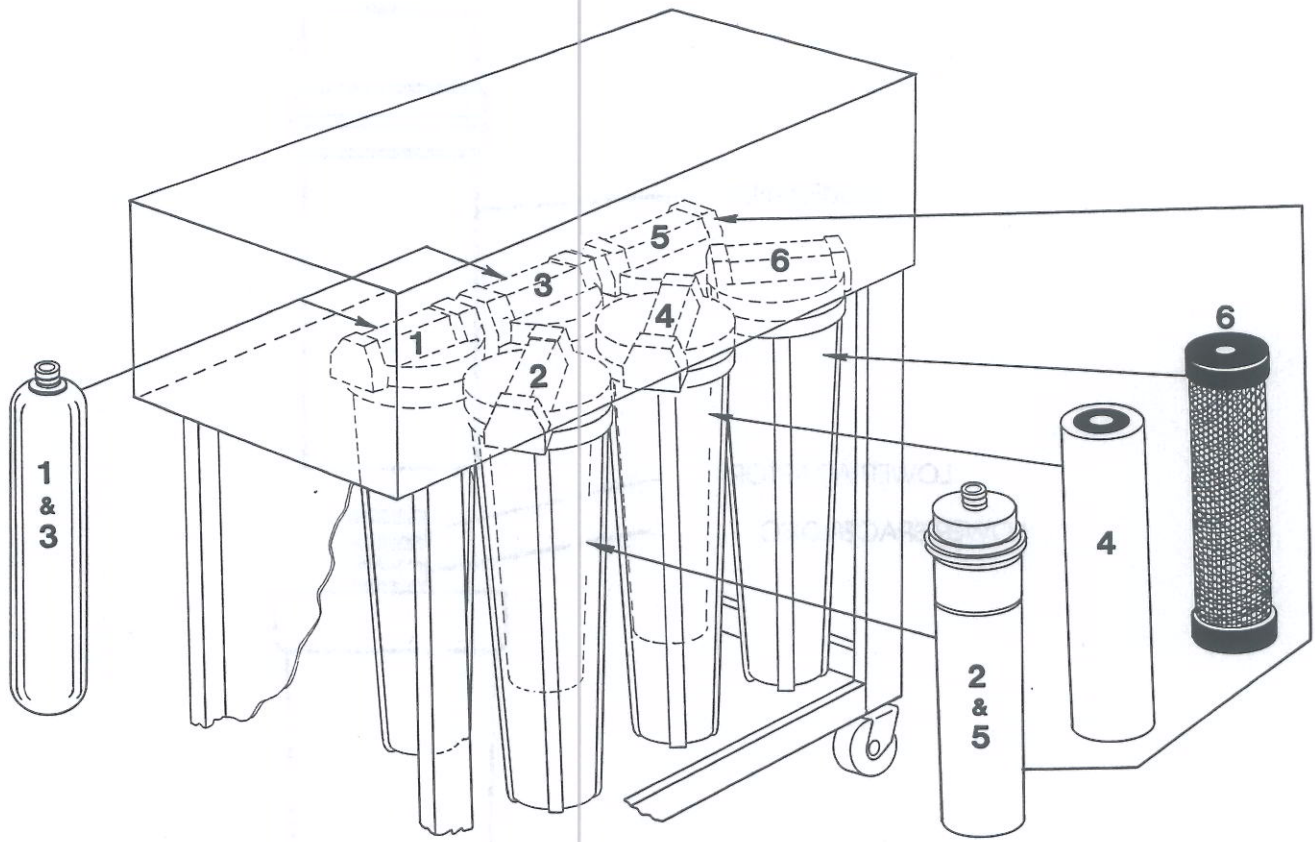


Figure 10

Cartridge Installation

NOTE: If the Mobile System is new or being reactivated after storage, do not install the polishing loop cartridges as of yet (left side of unit except for ultrafilter). Refer to the "Initial Start-Up Section" for further instructions, before proceeding. Failure to do so may prematurely exhaust the deionization cartridges.

(1) Figure 10 depicts the cartridge installation for ultrafiltered units. Models 90902 and 9090201.

(2) The table below shows the schedule of cartridge installation corresponding to the numbers on Figure 10.

MODEL #	DESCRIPTION OF UNITS	(FROM FIGURE 10) CARTRIDGE #	CARTRIDGE P/N
90900/90900-01	WaterPro Mobile Std.	1	90073-01 20" Deionization
		2	90787 Reverse Osmosis
		3	90073-01 20" Deionization
		4	90594 (2 in Kit 90622) 20" carbon/prefilter
		5	90073-01 20" Deionization
		6	90927 20" Prefilter
90901/90901-01	WaterPro Mobile for HPLC	1	90073-01 20" Deionization
		2	90787 Reverse Osmosis
		3	90073-01 20" Deionization
		4	90594 (2 in Kit 90622)
		5	90533 20" Organic Adsorption
		6	90927 20" Prefilter
90902/90902-01	WaterPro Mobile w/ultrafilter	1	90073-01 20" Deionization
		2	90787 Reverse Osmosis
		3	90533 20" Organic Adsorption
		4	90594 (2 in Kit 90622) 20" carbon/prefilter
		5	90489 Ultrafilter
		6	90927 20" Prefilter

Cartridge Replacement Schedule

Routine maintenance of your WaterPro Mobile System plays an extremely important role in the longevity of the reverse osmosis membrane, booster pump, and other major components.

Regular replacement of both the prefilter and the carbon/prefilter cartridges at recommended service intervals will extend the operational lifetime of the reverse osmosis membrane and other components.

Prefilter (90927)

Replace every two months or sooner. If more than 500 gallons of feed water have been processed.

Carbon/Prefilter (Kit 90622)

Replace every two months, or sooner, if more than 500 gallons of feed water have been processed. Flush out carbon fines per "Initial Start-Up" instructions.

Reverse Osmosis (90787)

Replace every 2 - 3 years or if damaged. Also replace when the flow rate drops 80% below normal operation. Check normalized flow at 25°C.

Deionization 90073-01 and Organic Adsorption 90533

Replace all polishing loop cartridges at the same time, when the polished water quality becomes unacceptable.

Ultrafilter 90489

Should only need replacement every 2 - 3 years, or if damaged.

- Pretreat feed water appropriately as indicated by Labconco water test to extend the life of the RO membrane.

- Change prefilters frequently as stated in this manual to prevent free chlorine from destroying the RO membrane.

- Ensure that the unit is connected to electrical service according to local and national electrical codes. Failure to do so may create a fire or electrical hazard.

- Do not remove or service any electrical components without first disconnecting the system from the outlet.

- Preserve RO membrane whenever unit is unplugged for more than a week without usage per instructions under "Preserving RO Membrane".

- System performance and cartridge life span are directly related to the feed water quality. It is important to establish feed water quality before operating the unit.

- The Mobile Systems should never be connected to non-potable, unprocessed surface, well water systems or to in-house distilled or deionized water systems. The use of inappropriate inlet water supplies will damage the unit. Inlet water should be from municipal water treatment facilities.

- When available, ground fault interruption circuitry should be used to help minimize the risk of shock from electrical system failure.

- Connect systems to cold water service only. Connection to a hot water supply will irreversibly damage the reverse osmosis membrane.

- Any additional tubing used in the inlet supply, not furnished by Labconco, must withstand the water pressure of the plumbing system. Soft flexible tubing (vinyl) should never be used because of its potential for rupturing.

Thoroughly understand procedures and equipment required before beginning work. Prefiter, carbon/prefilter and RO membrane cartridge should already be installed. Refer to "Cartridge Installation" Section.

Initial Start-Up

- Pretreat feed water recommended by Labconco based upon Water ProFile test.
- Remove tubing from bottom of RO housing (first bowl on right side of unit with front of unit facing the user).
- Turn display switch to the OFF position.
- Direct the tubing which fits into the bottom of RO housing to drain to flush out any carbon fines.
- Turn feed water valve ON. This will start unit.
- Run water to drain for 5 minutes with display OFF.
- Turn feed water OFF.
- Reattach the RO tubing to the elbow. A firm tug on the tubing should not pull it out.
- Connect a drain line to the RO dispensing valve and route to drain (Dispensing gun should be closed).
- Turn feed water ON to start unit. Turn display OFF.
- Open RO dispensing valve for one hour. (Be sure prefilter and carbon/filter are in place). Close the valve and open the dispensing gun (without the final filter installed) and direct to drain to purge the ultrafilter for one hour. If unit is not equipped with an ultrafilter skip to next step.
- At the end of the hour, close the feed water valve. This will turn the inlet pump and valve OFF. After water ceases from the gun, install the polishing loop cartridges per "Cartridge Installation Section".
- Turn the feed water ON. After a steady flow of water is dispensed from the gun, close it and check for any leak around the housings. Hand Tighten as required.

- Remove the final filter from its plastic bag and orient it as shown by the flow direction on its label.

- There are two versions of dispensing guns. One requires loosening the dispensing gun by 1/2 to 1 full turn and pushing the filter inlet firmly into the body until it stops. Hand tighten the fitting. For units with HPLC grade dispensing valve, loosen the black fitting as above and insert the filter.

- For the other version, a threaded filter is provided which threads directly into the dispensing end against an O-ring.

- Turn the dispensing gun ON and direct water to drain for 15 minutes. If an ultrafilter unit, direct water to drain through the HPLC valve for an additional 5 minutes.

- Turn display ON to recirculate and turn valve or gun OFF.

- After installing new cartridges, the water quality monitor will display a gradual increase in resistivity (Type 1 Water) during recirculation.

- After installing new cartridges, or when the system is new, the rinse up time may be as long as 24 hours before the resistivity equals or exceeds Type 1 specifications.

  NOTE: When activating a new system, or one that has been in storage, the system will initially be full of air, which will cause the water quality display to operate erratically or incorrectly. This is common, and the display will resume normal operation when all of the air has been displaced from the system.

  NOTE: When installing or servicing cartridges in the polishing station, air may be introduced into the system which will cause the water quality display to operate erratically or incorrectly. This is common, and the display will resume normal operation when all of the air has been displaced from the system.

Start-Up

- Plug unit into electrical outlet. (Should be connected at all times)
- Turn feed water valve ON. (Should be left on at all times)
- Turn display switch ON.
- Open dispensing valve or gun to vessel to be filled and dispense.

Automatic Flush Valve

The unit is equipped with a flush valve. The flush valve automatically opens every 2 hours and flushes the RO. In order for the flush valve to work, keep the unit plugged into an electrical outlet at all times.

TOC Flush Valve

On the Mobile HPLC unit, a flush valve automatically opens every 4 hours for a minute to dilute the purified water.

Ultrafilter (UF) Flush Valve

On the Mobile Unit with ultrafilter, a flush valve automatically opens every 4 hours for a minute to clean the ultrafilter.

Shut Down

When changing the filter or cleaning the unit, do the following:

- Unplug unit from electrical unit.
- Turn feed valve OFF.
- Turn dispensing valve and gun to ON position to drain water and relieve pressure.

Under normal operation, your unit will require little routine maintenance. The following schedule is recommended.

Follow The Shut Down Procedure

Weekly

- Change prefilter and carbon/prefilter if more than 500 gallons of feed water have been processed. Carbon fines must be flushed per "Initial Start-Up" instructions.
- Clean unit of any dust.
- Preserve unit if unplugged for more than one week.
- Change polishing cartridge if resistivity is below 10 Meg Ohm-cm continuously.

Semi-Monthly

- Change final filter (0.2 micron)

Monthly

- Change prefilter and carbon/prefilter once every two months.
- All weekly activities.

Annual

- Clean RO membrane.
- Disinfect unit.
- Change polishing cartridges except for ultrafilter.
- All monthly activities

Biennial (once every two years)

- Replace RO membrane if the normalized (flow rate at 25°C) flow rate has decreased by 20% or more with the same line pressure. See Chart on Page 40.
- Replace ultrafilter.
- All annual activities.

KIT #	DESCRIPTION
90787	RO Membrane Kit Includes one each RO membrane and adaptor package
90923	Start up kit for Standard Mobile Includes one each prefilter, one each carbon/prefilter, three each deionization cartridge, two each 0.2 micron final filter
90924	Start up kit for HPLC Mobile Includes one each prefilter, one each carbon/prefilter, two each deionization, one each organic adsorption, two each 0.2 micron final filter
90925	Start up kit for Ultrafiltered Mobile Includes one each prefilter, one each carbon/prefilter one each deionization, one each organic adsorption, two each 0.2 micron final filter
90622	Replacement carbon/prefilter contains two each

PART #	
90927	20" Prefilter, combination carbon
90594	20" carbon/prefilter 1 of 90622
90786	RO Membrane

Sanitization

Sanitization is necessary when the RO element becomes biologically fouled. Biological fouling of the RO is an obstruction due to living or dead bacterial on the membrane surface. This may occur if the RO is left stagnant without flushing or operation for more than a week.

If Biological fouling occurs, the unit should be sanitized with 0.1% (wt/wt) formaldehyde as follows: 0.1% sodium bisulfite may be used in place of formaldehyde. Do not store in bisulfite solution.

(1) Collect approximately 4 liters of RO purified water in a container set aside.

(2) Disconnect the unit by unplugging it from the outlet. Shut off the feed water valve.

(3) Relieve the water pressure in the unit by opening the dispense valve or dispensing gun and directing the water to drain.

(4) Remove both 20" prefilter and 20" carbon/prefilter cartridges. Do not remove RO membrane. Also remove all cartridges from polishing loop (except for the ultrafilter) including final 0.2 micron filters.

(5) Carefully wash inside the prefilter bowl, carbon/prefilter bowl and polishing bowls with liquid detergent using a clean sponge or cloth. Rinse out the bowls several times to remove any residue.

(6) Prepare 0.1% formaldehyde in the RO purified water collected in Step 1.

CAUTION: Use only chlorine-free water. Use of chlorinated tap water will degrade and destroy the RO membrane.

(7) Install a new 20" prefilter cartridge (P/N 90927) in the empty, clean 20" bowl. See "Cartridge Installation" Section.

CAUTION: Prepare and handle solutions in well ventilated areas. Wear protective clothing, gloves and eye protection. Dispose of excess or spillage properly.

(8) Fill carbon/prefilter bowl (middle bowl on right with front of unit facing user) with 0.1% formaldehyde. Fill the middle bowl in the polishing loop with the rest of the solution. Leave ultrafilter in its bowl.

(9) Reinstall the bowls in their correct position.

Sanitization (Con't)

(10) Plug the unit into the electrical outlet. Reopen the feed water valve.

(11) Unit will start. Leave the dispensing valve and gun closed. The unit will fill and automatically shut off.

(12) Allow the unit to stand for 1 hour.

(13) If the system will not be in use for an extended time, leave the formaldehyde solution in the system.

(14) If the system is to be returned to service, flush the residual solution from the vessel for 1 hour by attaching a hose to the dispensing valves then the gun and routing to drain as well as opening the dispensing valve and activating unit.

Both inorganic and organic fouling are indicated when either or both of the following occur:

- The normalized (temperature corrected) product flow rate drops by 20 percent.
- The microsiemens of the permeate rises noticeably.

Inorganic Fouling (Scaling)

Inorganic fouling is caused by mineral scale such as:

- Calcium carbonate
- Calcium sulfate
- Barium sulfate
- Strontium sulfate

as well as ions such as

- Iron or manganese

Inorganic fouling can be cleaned with the following recommended solution:

0.5% HC1 with a final pH of 2.

Procedure

(1) Collect approximately 4 liters of reverse osmosis water in a container set aside for use in preparing the cleaning solution

Procedure (Con't)

CAUTION: Use chlorine-free water to prepare the cleaning solutions. The use of chlorinated tap water will destroy the reverse osmosis membrane.

(2) Disconnect the Mobile System from the electrical power source by unplugging the unit.

(3) Shut off feed water valve.

(4) Relieve the water pressure in the unit by opening the dispensing gun and directing the water to drain.

(5) Remove the carbon/prefilter cartridge and discard the water. Remove all cartridges from the polishing loop as well as 0.2 micron final filter.

(6) Fill the carbon/prefilter bowl approximately 3/4 full with the cleaning solution.

(7) Reinstall the bowl.

(8) Close the dispensing valves and gun and open the feed water valve.

(9) Plug the unit into an electrical outlet, activate the unit and allow it to operate until it automatically shuts off.

(10) Disconnect the unit from the electrical outlet and allow the membrane to soak for at least 2 hours.

(11) Relieve the pressure by opening the dispensing gun.

CAUTION: Do not attempt to remove the acid-filled bowls when the system is pressurized.

(12) Carefully remove the prefilter bowl and dispose of the water appropriately.

CAUTION: The water in the bowl contains cleaning solution. Handle and dispose of properly.

(13) Install new prefilter and carbon/prefilter cartridges. See "Cartridge Installation" Section.

(14) Connect hose to the dispensing valve and route to drain. Activate the unit by connecting the unit to an electrical outlet. Leave the dispensing valve open and direct water to drain for 60 minutes.

Procedure (Con't)

(15) At the end of the hour, open the dispensing gun and direct water to drain for 30 minutes. Relieve the pressure by opening dispensing valve (or dispensing gun) and directing water to drain.

(16) Install all new cartridges as well as final filters and purge for 15 minutes.

(17) Close dispensing valves and gun. Start the unit by plugging it into the outlet and opening feed water valve. The Mobile System is now ready for normal operation.

Organic Fouling

Organic fouling can be caused by silt, bacterial slime or any other organic materials.

The following recommended cleaners may be used:

- Sodium hydroxide 0.5%
- Sodium dodecyl sulfate 0.1% (Adjust pH to 11.5 with HCl if necessary)
- Trisodium phosphate, 1%
- Sodium-tripolyphosphate, 1%
- Tetra sodium EDTA, 1% (Adjust pH to 11.5 with HCl if necessary)

For cleaning procedure, follow steps 1 through 17 under Inorganic Fouling.

Preserving RO Membrane

If the system will not be in use (without electricity) for over a week, preserve with 0.1% formaldehyde.

(1) Collect approximately 4 liters of RO purified water in a container set aside.

(2) Disconnect the unit by unplugging it from the outlet. Shut off the feed water valve.

(3) Relieve the water pressure in the unit by opening the dispensing valve or dispensing gun, and directing the water to drain.

(4) Remove both 20" prefilter and 20" carbon/prefilter cartridges and all cartridges in polishing loop. Do not remove RO membrane or ultrafilter if installed.

Preserving RO Membrane (Con't)

(5) Carefully wash inside the prefilter bowl, carbon/prefilter bowl and all polishing bowls with liquid detergent using a clean sponge or cloth. Rinse out the bowls several times to remove any residue.

(6) Prepare 0.1% formaldehyde in the RO purified water collected in Step 1.

(7) Install a new 20" prefilter cartridge (P/N 90927) in the empty, clean 20" bowl. See "Cartridge Installation" Section.

(8) Fill the carbon/prefilter bowl with the 0.1% formaldehyde. Fill the middle bowl on the polishing side with preservative if the ultrafilter is installed.

(9) Reinstall the bowls in their correct position.

(10) Plug the unit into the electrical outlet. Reopen the feed water valve. Turn display "OFF".

(11) Allow it to operate for 5 - 10 seconds.

(12) Close off feed water, and disconnect from electrical source.

Top Panel Removal

(1) Locate the two black screw covers on the front panel.

(2) Using a straight screwdriver pop off the black covers.

(3) Using a Phillips screwdriver, remove the two screws holding the front panel.

(4) Retain the plastic collars with the screws.

(5) Remove three screws in the back and save.

(6) Lift up on the cover to remove.

Prefilter And Carbon/Prefilter Replacement

NOTE: (Prefilter - change at least once every two months. Carbon/Prefilter change at least once every two months.

(1) Disconnect unit and relieve the pressure by opening dispensing valve or gun.

(2) With the spanner wrench provided, remove the prefilter and carbon/prefilter bowls. See "Cartridge Installation" Section.

(3) Remove the old cartridges.

(4) Discard water in bowls.

(5) Clean and dry bowls with mild soap and water.

(6) Insert new prefilter and carbon/prefilter and place bowl on unit.

(7) Hand tighten bowls in place. Do not use wrench to tighten as this may damage the bowls.

UV Lamp Replacement
(UF Systems P/N 90902, 90902-01)

The UV lamp should be replaced annually. To replace the lamp, use the following procedure.

(1) Unplug the unit and remove the cover by removing the screws. See 'Panel Removal' Section

(2) Remove the lamp by gently prying off either of the white lamp sockets at each end of the reactor body. Carefully slide the lamp out of the reactor by pulling on the attached lamp socket. Remove and discard the old lamp and install a new lamp by reversing these steps .

Bypassing RO Flush Valve Operation

To prevent RO flush valve from operating, use the following procedure:

(1) Unplug the unit.

(2) Loosen all screws and lift up on cover. Locate valve in back of unit. Refer to Figure 5 , Item #8.

(3) Unplug the two leads on the valve and tape individually with electrical tape.

(4) Reassemble the unit.

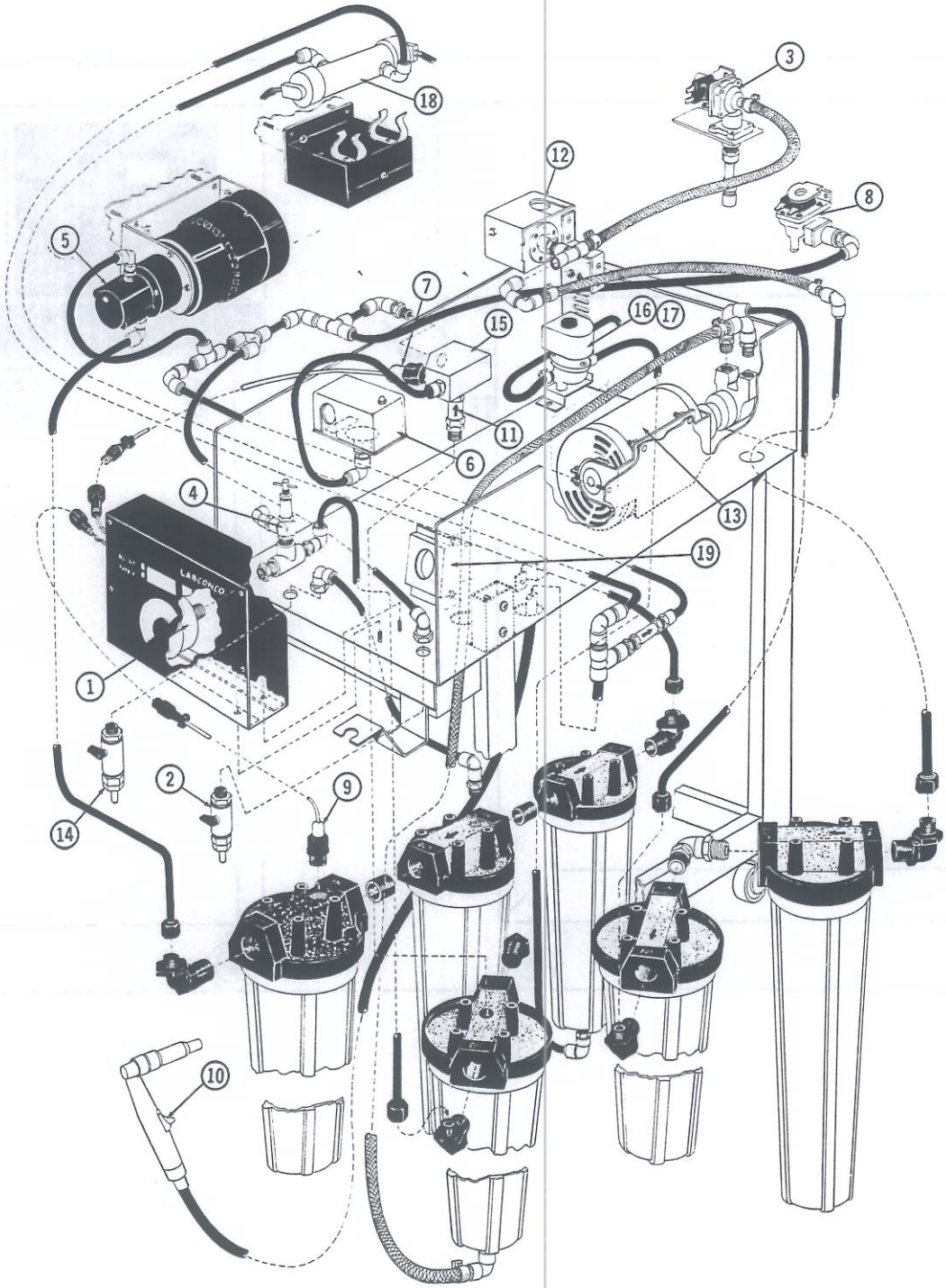
Final Filter Replacement

It is recommended that the final filter be replaced every 2 - 3 weeks, when there is an unacceptably high passage of bacteria through the filter, or when the flow rate drops below an acceptable level. The filter should be replaced, following the steps outlined in the INITIAL START-UP SECTION.

ITEM #	QUANTITY	PART #	DESCRIPTION
1	1	90547-01	Pressure Gauge Assy.
2, 14	1	13629	RO Dispensing Valve/HPLC-grade valve
3	1	90756	Inlet Valve Assy, 115 V
3	1	90756-01	Inlet Valve Assy, 230 V
4	1	13609	Pressure Regulator
5	1	90126	(Std./HPLC) Recirculation Pump, 115 V
5	1	90126-01	(Std./HPLC) Recirculation Pump, 230 V
5	1	90588	Recirculation Pump - ultrafilter 115 V
5	1	90588-01	230 V Recirculation Pump - ultrafilter
6	1	90915	High Pressure Switch
7, 9	2	90607	Conductivity/Resistivity Cell
8	1	90759	RO Flush Valve
10	1	90508	Dispensing Gun Assy.
11	1	13633	Check Valve
12	1	90753	Low Pressure Switch
13	1	90760	Inlet Pump Assy, 115 V
13	1	90760-01	Inlet Pump Assy, 230 V
15	1	90779	Tee Permeate
16	1	90648-02	TOC Flush Valve Assy.
17	1	90648-02	UF Flush Valve Assy.
18	1	90649	UV Assy.
19	1	90178	Heater Assy.

ELECTRICAL

QUANTITY	PART #	DESCRIPTION
1	13345	Power Cord 125 V
1	13341	Power Cord 230 V
1	90842	PC Board Assy.


1
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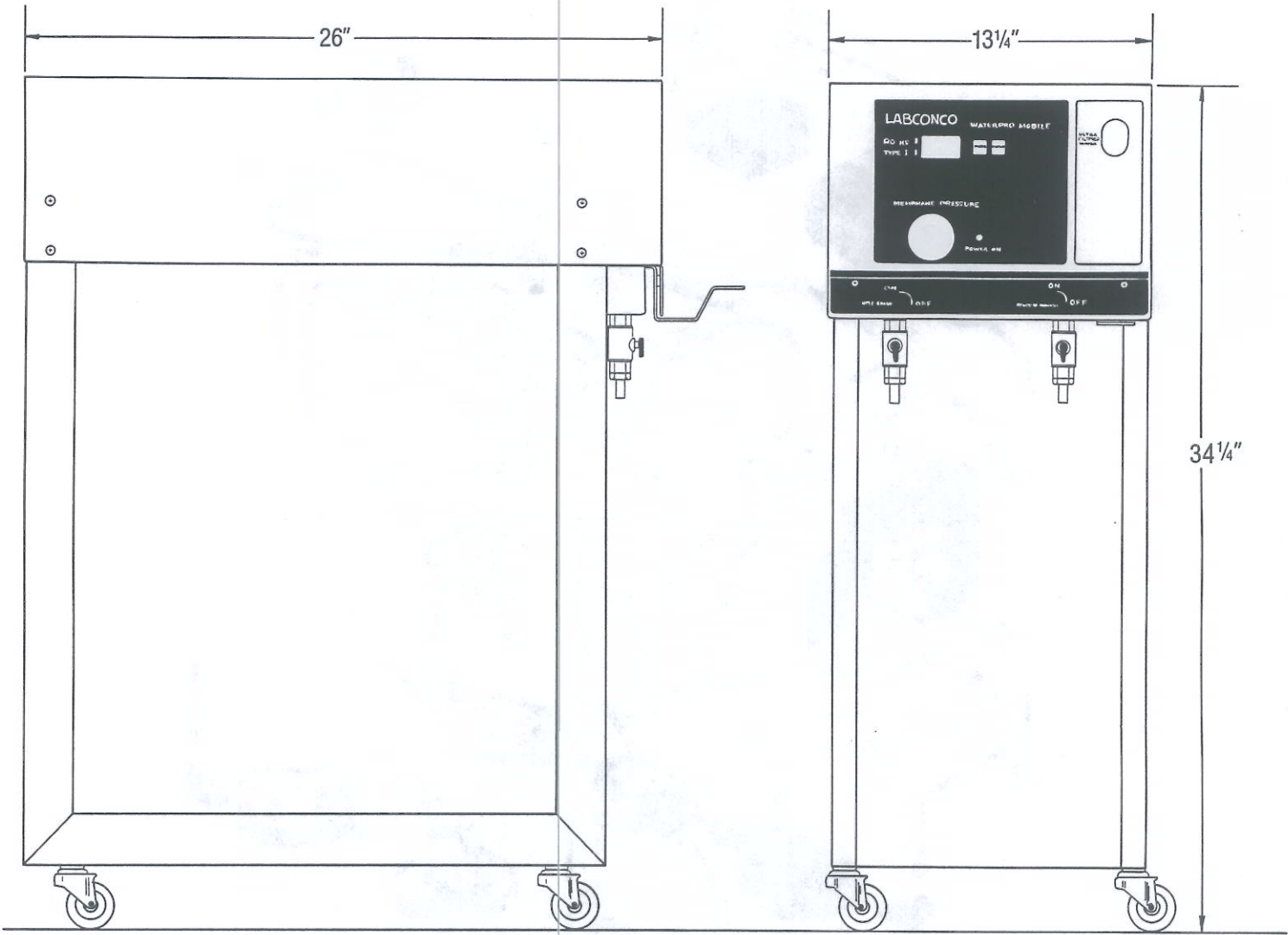
LABCONCO


26"
13¼"
34¼"
LABCONCO
WATERPRO MOBILE
ON
OFF

MODEL	ELECTRICAL REQUIREMENTS
90900	115 VAC - 60 Hz 1 Phase - 10 Amps
90900-01	230 VAC - 50 Hz 1 Phase - 5 Amps
90901	115 VAC - 60 Hz 1 Phase - 10 Amps
90901-01	230 VAC - 50 Hz 1 Phase - 5 Amps
90902	115 VAC - 60 Hz 1 Phase - 10 Amps
90902-01	230 VAC - 50 Hz 1 Phase - 5 Amps

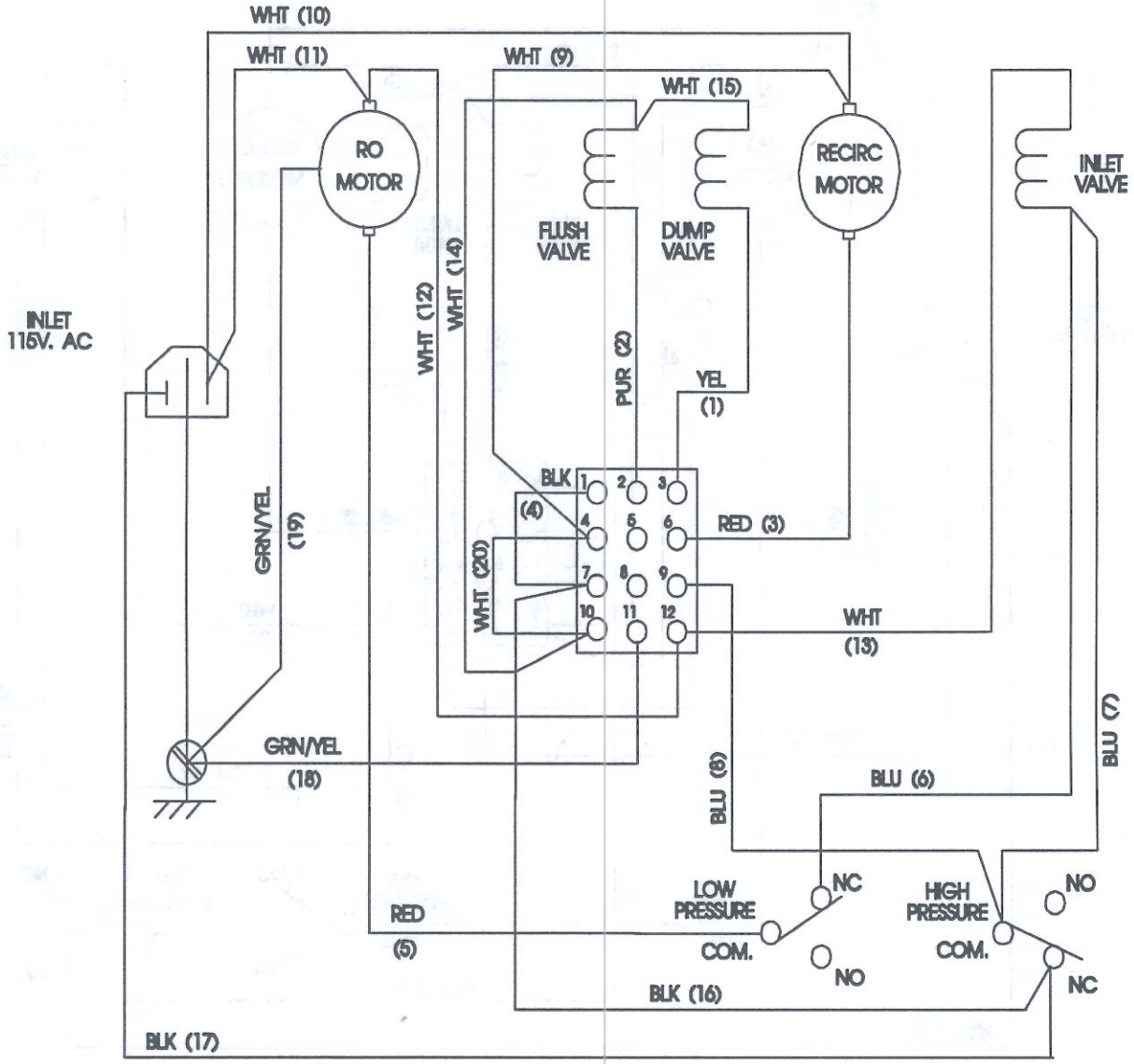
R/O Production Rates Versus Feed Water Temperature

R/O Production Rates in Liters/Minute

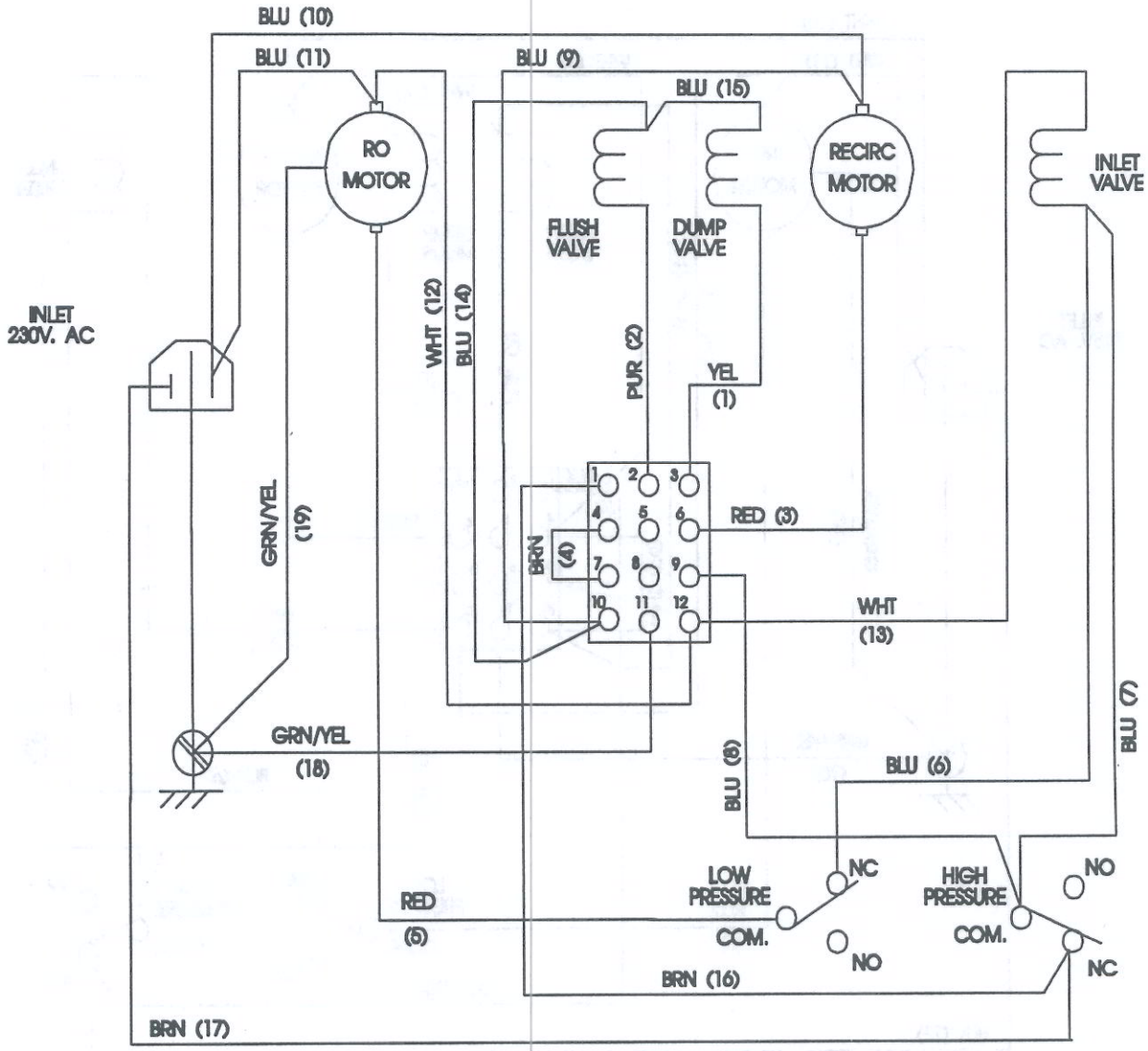
Temperature C																
30	0.58	0.69	0.80	0.92	1.04	1.15	1.27	1.38	1.50	1.61	1.73	1.84	1.96	2.07	2.19	2.30
29	0.56	0.67	0.78	0.90	1.01	1.12	1.23	1.34	1.46	1.57	1.68	1.79	1.90	2.02	2.13	2.24
28	0.55	0.65	0.76	0.87	0.98	1.09	1.20	1.31	1.42	1.53	1.64	1.74	1.85	1.96	2.07	2.18
27	0.53	0.64	0.74	0.85	0.95	1.06	1.17	1.27	1.38	1.48	1.59	1.70	1.80	1.91	2.01	2.12
26	0.52	0.62	0.72	0.82	0.93	1.03	1.13	1.24	1.34	1.44	1.55	1.65	1.75	1.85	1.96	2.06
25	0.50	0.60	0.70	0.80	0.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	2.00
24	0.49	0.58	0.68	0.78	0.87	0.97	1.07	1.16	1.26	1.36	1.46	1.55	1.65	1.75	1.84	1.94
23	0.47	0.56	0.66	0.75	0.85	0.94	1.03	1.13	1.22	1.32	1.41	1.50	1.60	1.69	1.79	1.88
22	0.46	0.55	0.64	0.73	0.82	0.91	1.00	1.09	1.18	1.27	1.37	1.46	1.55	1.64	1.73	1.82
21	0.44	0.53	0.62	0.70	0.79	0.88	0.97	1.06	1.14	1.23	1.32	1.41	1.50	1.58	1.67	1.76
20	0.43	0.51	0.60	0.68	0.77	0.85	0.94	1.02	1.11	1.19	1.28	1.36	1.45	1.53	1.62	1.70
19	0.41	0.49	0.57	0.66	0.74	0.82	0.90	0.98	1.07	1.15	1.23	1.31	1.39	1.48	1.56	1.64
18	0.40	0.47	0.55	0.63	0.71	0.79	0.87	0.95	1.03	1.11	1.19	1.26	1.34	1.42	1.50	1.58
17	0.38	0.46	0.53	0.61	0.68	0.76	0.84	0.91	0.99	1.06	1.14	1.22	1.29	1.37	1.44	1.52
16	0.37	0.44	0.51	0.58	0.66	0.73	0.80	0.88	0.95	1.02	1.10	1.17	1.24	1.31	1.39	1.46
15	0.35	0.42	0.49	0.56	0.63	0.70	0.77	0.84	0.91	0.98	1.05	1.12	1.19	1.26	1.33	1.40
14	0.34	0.40	0.47	0.54	0.60	0.67	0.74	0.80	0.87	0.94	1.01	1.07	1.14	1.21	1.27	1.34
13	0.32	0.38	0.45	0.51	0.58	0.64	0.70	0.77	0.83	0.90	0.96	1.02	1.09	1.15	1.22	1.28
12	0.31	0.37	0.43	0.49	0.55	0.61	0.67	0.73	0.79	0.85	0.92	0.98	1.04	1.10	1.16	1.22
10	0.29	0.35	0.41	0.46	0.52	0.58	0.64	0.70	0.75	0.81	0.87	0.93	0.99	1.04	1.10	1.16
9	0.28	0.33	0.39	0.44	0.50	0.55	0.61	0.66	0.72	0.77	0.83	0.88	0.94	0.99	1.05	1.10
8	0.26	0.31	0.36	0.42	0.47	0.52	0.57	0.62	0.68	0.73	0.78	0.83	0.88	0.94	0.99	1.04
7	0.25	0.29	0.34	0.39	0.44	0.49	0.54	0.59	0.64	0.69	0.74	0.78	0.83	0.88	0.93	0.98
6	0.23	0.28	0.32	0.37	0.41	0.46	0.51	0.55	0.60	0.64	0.69	0.74	0.78	0.83	0.87	0.92
5	0.22	0.26	0.30	0.34	0.39	0.43	0.47	0.52	0.56	0.60	0.65	0.69	0.73	0.77	0.82	0.86

To read this chart: For example, if your regular Flow rate is 1.00 liter at 25°C, read the 25°C in the left column, move across the page to the 1.00. If the temperature of the water is now 19°C, locate 19°C on the left side and move across into the same column as the 1.00. The flow rate Will now be 0.82 LPM (820ml/min).

115 V Mobile Systems
All Models



230 V Mobile Systems
All Models



PROBLEM	CAUSES	CORRECTIVE ACTION
Display reads 0.	RO conductivity sensor disconnected from wiring harness	Connect sensor to harness from circuit board
	Air gap	Purge unit until air is expelled by opening the dispensing valve
Increase in µs (microsiemen) reading	High inlet TDS	This is normal with increased inlet TDS. RO µs increases as we;;
	RO membrane scaling or other deposits	Clean membrane per instructions in RO Cleaning Section
Excessively high µs	RO membrane fouled Biofilm formed	Clean RO membrane per instructions in RO Cleaning Section
	RO poisoned. Chlorine damage	Replace RO membrane and prefilters per Installation Instructions
Pilot light not on	Unit not plugged into outlet	Plug Mobile System into appropriate electrical service
	Circuit breaker tripped	Reset circuit breaker
	Unit not plugged into outlet	Plug unit into appropriate electrical service

PROBLEM	CAUSES	CORRECTIVE ACTION
RO microsiemen µs reading not displayed	Display switch not ON	Turn display switch ON
	Switch wiring is disconnected	Replace board
Inlet Valve does not	Feed water valve (manual is closed	Open feed water valve
	Inlet valve disconnected or defective	Unplug unit, connect wiring or replace inlet valve
Low flow rate at at valve or gun	Final filter is blocked is blocked	Replace final filter
	Low outlet temperature	RO production rate drops with decrease in temperature
	Kinked line in system	Trace and straighten line
	Decrease in RO backpressure	Adjust pressure regulator to 120 psi
Type 1 Display Reads .0	Deionization cartridge is exhausted	Replace deionization cartridges

PROBLEM	CAUSES	CORRECTIVE ACTION
Type 1 Display reads 'HI'	Sensor disconnected	Connect sensor to board
	Air in system	Purge all air from system by opening dispensing gun and directing water to drain
Polished water will not rinse up to desired quality after 24 hours	Cartridges are past expiration date	The shelf life of cartridges is two years from the day of manufacture. Replace the expired cartridges with new ones. Check the manufactured date.
	Cartridges installed in the wrong sequence	Install the cartridges as described in "Cartridge Installation" Section.
	Water is bypassing the cartridges	Ensure that the O-rings at the top of the deionization cartridges and the post at the top of the canister are intact
Reduced cartridge	Cartridges are past expiration date	Check the manufactured date on the cartridge package. The shelf life of cartridge is two years from the day of manufacture. Replace the expired cartridges with new ones.
	Feed water quality has changed	If the source is tap water, supplied are subject to seasonal variations in quality, or the source of the tap water may have changed. Submit a sample to Labconco for analysis by the Water ProFile System

PROBLEM	CAUSES	CORRECTIVE ACTION
Reduced cartridge life (Con't)	Recirculation pump is defective	Replace recirculation pump
Water Quality Display acting erratically	New cartridge installed in system	Purge all of the air out of the polishing system
	Air trapped in resistivity cell	Purge all of the air out of system by opening the dispensing gun and directing to drain
	Deionization cartridge is exhausted	Replace the deionization cartridge
	Polishing loop resistivity cell is defective	Replace cell
Recirculation pump is very noisy	Air in system	Turn display OFF (This turns off the pump as well). Allow water to be dispensed out of dispensing gun and valve before turning display ON Do not run pump dry
Main Pump cycles ON and OFF	Insufficient feed water pressure or flow	See Inlet Water Specifications for range. Inlet pressure should be at least 30 psi
	Partically open feed valve	Feed valve should be be fully open
	Plugged prefilters or carbon/filters	Change both filters

PROBLEM	CAUSES	CORRECTIVE ACTION
Main Pump cycles ON and OFF (Con't)	Kinked or restricted tubing in system	Trace and straighten tubing as required

*May need to contact Labconco for interpretation of date code. (1-800-821-5525)

WATERPRO MOBILE OPERATING LOG

Customer Name_____ Model Number_____

Date Installed_____ Serial Number_____

Unit Location_____

Date							
RO µS							
RO psi							
Type I Resistivity							
Type I Flow rate from dispensing gun							
(After reservoir empty) RO Flow Rate							
Reject flow out of drain line							
(Change once every 2 months) Prefilter changed							
(Change once every two months Carbon/prefilter changed							
Polishing Loop DI changed							
Ultrafilter Changed (if available)							
Membrane Cleaned							
% Conversion RO Flow Rate x 100 RO Flow Rate + Reject Flow Rate							

NOTE: Make additional copies of this log and keep records filed.

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 product 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 circumstance 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 such as filters are not covered by this warranty. Damage due to corrosion or accidental breakage are also not covered.

WARNING: 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 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.

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 or pilferage is discovered, notify the carrier immediately and retain the entire shipment intact for inspection. Interstate Commerce Commission rules require that the claim 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 this approval, the user assumes all responsibility and liability for biological and chemical decontamination and cleansing. Labconco reserves the right to refuse delivery of any products which do not appear to have been properly cleaned and/or decontaminated prior to return.

If you have any questions that are not addressed in this manual, or if you need technical assistance, please contact Labconco's Customer Service Department at either (800) 821-5525, or (816) 333-8811, between the hours of 8:00 a.m. and 5:00 p.m. Central Standard Time.