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NOTE: Changes in labeling formula differing in substance from that accepted in connection with this registration must be submitted to and accepted by the Registration Division prior to use of the label in commerce. In any correspondence on this product always refer to the above U.S. EPA registration number.

On the basis of information furnished by the registrant, the above named pesticide is hereby Registered/Reregistered under the Federal Insecticide, Fungicide, and Rodenticide Act.

A copy of the labeling accepted in connection with this Registration/Reregistration is returned herewith.

Registration is in no way to be construed as an indorsement or approval of this product by this Agency. In order to protect health and the environment, the Administrator, on his motion, may at any time suspend or cancel the registration of a pesticide in accordance with the Act. The acceptance of any name in connection with the registration of a product under this Act is not to be construed as giving the registrant a right to exclusive use of the name or to its use if it has been covered by others.

This product is conditionally registered in accordance with FIFRA section 3(c)(7)(A) provided that you:

1. Submit and/or cite all data required for registration/reregistration of your product under FIFRA section 3(c)(5) and section 4 when the Agency requires all registrants of similar product to submit such data.
2. Add the phrase, "EPA Registration No. 68158-1 to your label before you release the product for shipment.
3. Make the following labeling revisions:
 - a. On the cartridge label in the precautionary section, include the statement "Persons with thyroid problems and pregnant women should consult their physician prior to use". (Note that this statement is required on the labeling for all iodinated cartridges).

The following comments apply to the manual.

- b. On page 2, in the first sentence, last paragraph, revise "a replaceable iodine resin, bactericidal filter" to read "a replaceable bactericidal iodine resin cartridge".



ATTACHMENT IS APPLICABLE

SIGNATURE OF APPROVING OFFICIAL

DATE

- c. Either delete the words "Operation & Maintenance &" on page 4 or place the heading "Directions for Use" & the misuse statement "It is a violation of Federal Law to use this product in a manner inconsistent with its labeling" above "Operation & Maintenance".
 - d. On the page identified as Figure 1, item 3 under "Filters" change "Iodine resin bactericidal filter" to "Iodinated resin bactericidal cartridge".
4. Submit five (5) copies of your final printed labeling before you release the product for shipment. Refer to the A-79 Enclosure for a further description of final printed labeling.

A stamped copy of the label is enclosed for your records.

For our records submit a revised Formulator's Exemption Form and replace "USP Grade CAS 7553-56-2" under product name with "Pentapure Water Purification and Disinfection Resin".

If these conditions are not complied with, the registration will be subject to cancellation in accordance with FIFRA section 6(e). Your release for shipment of the product constitutes acceptance of these conditions.

Sincerely yours,



Ruth Douglas
Product Manager (32)
Antimicrobial Program Branch
Registration Division (7505C)

ACC ED
with COMMENTS
in EPA letter Dated:

MAR 28 1995

Under the Federal Insecticide,
Fungicide, and Rodenticide Act as
amended, for the pesticide
registered under EPA Reg. No.

68158-1



PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS & DOMESTIC ANIMALS

CAUTION: May cause eye and skin irritation. Avoid direct contact with eyes, skin or clothing. Wear goggles and plastic gloves when handling. Wash thoroughly after handling, including clothing.

STATEMENT OF PRACTICAL TREATMENT (FIRST AID)

IF SWALLOWED: If conscious, drink large quantities of water, transport to hospital and observe for signs of iodine toxicity. If no hospital is available, induce vomiting, drink large quantities of water, and observe for adverse reaction. If unconscious or convulsing, transport to hospital immediately. Never give anything by mouth to an unconscious person.

IN CASE OF CONTACT WITH EYES:

Wash thoroughly with water for 15 minutes. If irritation persists, see a physician.

IN CASE OF CONTACT WITH SKIN:

Wash with mild soap and water. If irritation persists, see a physician. Contaminated clothing should be washed before reuse.

ENVIRONMENTAL HAZARDS

This product is toxic to fish. Do not discharge into lakes, streams, ponds, or public water, unless in accordance with a NPDES permit. For guidance, contact the regional office of the Environmental Protection Agency.

Iodinated Resin Cartridge

For use with Lil'Pure, Porta'Pure, and Porta'Mate Water Purification Systems as a Microbiological Water Purifier
FOR EMERGENCY USE ONLY

ACTIVE INGREDIENT:

Iodine* 46%

INERT INGREDIENT: 54%

*bound to strong base anion exchange resin

KEEP OUT OF REACH OF CHILDREN

CAUTION

This product causes irritation to skin and eyes. In case of contact flush thoroughly with water. If irritation persists, consult a physician. Wear protective goggles and clothing when handling this product.

DO NOT CONTAMINATE

DO NOT ALLOW TO FREEZE

DO NOT EXPOSE TO DIRECT SUNLIGHT

EPA Reg. No. 68158-

Manufactured by: **Water Solution Technologies, Inc.**
Ste B5-239
Oceanside, CA 92054
Phone: (619) 945-2850
Fax: (619) 438-4262

Contents: Contains one iodinated resin cartridge

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Operation and Service Manual

for

Lil'Pure[®] Porta'Pure[™], Porta'Mate[™]

Water Purification Systems

Potable Water

Utilizing

Iodination Bactericidal Technology

WATER SOLUTION TECHNOLOGIES, INC.

I. WARNINGS:

- * DO NOT operate or store this unit at temperatures below 40 degrees F or 4 degrees C. If the unit will be exposed to freezing temperatures, follow the instructions in the Operations Manual.
- * DO NOT operate this unit without the brine tube (E) and the Product water tube (D) connected.
- * DO NOT disconnect any hose while the unit is in operation.
- * DO NOT attempt to process water that is warmer than 130 degrees F or 54 degrees C.
- * DO NOT attempt to process water that has been heavily chlorinated.
- * DO NOT attempt to process water that contains large amounts of chemical additives such as water from the radiator of a motor vehicle that contains anti-freeze.
- * DO NOT attempt to process water that contains large amounts of sediment such as muddy river water.
- * DO NOT attempt to process water that has a TDS level above 3,000 ppm.
- * DO NOT substitute WST filter cartridges with any other manufacturers cartridges. Use only WST replacement parts.
- * DO NOT operate this unit without the correct filters installed in the correct positions.
- * DO NOT reuse old filter cartridges. When a cartridge is replaced, follow disposal instructions on cartridge label.

SECTION I. INTRODUCTION

Your new Drinking Water Purification System incorporates the most advanced technology for processing water to insure a supply of safe, microbiologically, potable water. By applying several purification and filtration technologies in distinct, separate, and replaceable modules, specific water contaminants can be effectively and economically treated to eliminate downstream residuals or suspended materials, both organic, inorganic, and microbial. This flexibility to the water treatment process design allows this technology to be readily adapted to effectively treat virtually all water contaminants from almost any fresh or brackish water source. As stated earlier, this water treatment system design is flexible, so that an optional, reverse osmosis (RO) module may be incorporated after pre-filtration, to enhance reduction of both suspended and dissolved contaminants. Following pre-filtration and RO (if desired), the product water being treated is then iodinated, leaving a controlled residual level that precludes microbial recontamination of the water storage tank and distribution piping, thereby eliminating the largest problem in point-of-use (POU) design of the recontamination of the purified water. The purified water can then pass through a deiodinating module prior to consumption thereby eliminating any residual iodine. (See Fig. 1)

THE SUBJECT TECHNOLOGY

- A. A U.S. Patent (No. 5,269,919) was granted in late 1993 for the "Self-Contained Water Treatment System";
- B. Has been tested at the University of Arizona, Dept. of Microbiology & Immunology according to the U.S. EPA Guide Standard & Protocol for evaluation of microbiological water purifiers, that of potable applications, geometric average removal exceeded, for:
 - a. Bacteria-Klebsiella terrigena: >99.9999%
 - b. Virus-Polio virus type 1(rota virus SA-11): >99.99%
 - c. Cryptosporidium oocysts. >99.9%

SECTION II. SPECIFICATIONS

YOUR DRINKING WATER PURIFICATION SYSTEM IS DIVIDED INTO THREE (3) FUNCTIONAL SEGMENTS:

Segment A (Fig. 2) optional pump motor and pre-filter, MECHANICAL FILTRATION/REDOX/ACTIVATED CARBON.

The sediment prefilter will remove the larger particles such as silt, rust and scale. Its 5 micron (equal to 0.0002 inch) nominal rating helps to give maximum life to the (optional) RO membrane. The KDF Redox material and activated carbon in the prefilter will remove any chlorine that may be present in the feed water. This pretreatment is also necessary for membrane protection.

Segment B (Fig. 3) THE OPTIONAL RO MEMBRANE:

This membrane is designed to reduce the dissolved mineral content of the water. Minerals picked up in the environment by the water are measured as Total Dissolved Solids (TDS). In the RO process, dissolved minerals are separated from the incoming water (Feed Water) to produce the product water (the Permeate). The excess minerals are rinsed to drain (the Reject Water). The membrane is a specially constructed, fully aromatic polyamide film and is classified as a Thin Film Composite (TFC).

The spiral wound construction of the RO membrane provides maximum surface area for water production and is less susceptible to fouling by particulate matter, turbidity and colloidal materials.

Segment C (Fig. 4) MICROBIAL TREATMENT & WATER STORAGE:

The product water then passes through a replaceable iodine resin, bactericidal filter which imparts from .5 to 3 ppm of iodine into the water. The water then flows into a specially designed pressurized storage tank. The purified water from the storage tank then passes through a specially designed iodine removal filter which reduces the residual iodine virtually below detectable level.

SECTION II. SPECIFICATIONS

TABLE A - QUALIFIED SYSTEM PERFORMANCE - LIL'PURE, PORTA'PURE, PORTA'MATE WATER PURIFICATION SYSTEMS

Because the performance of an optional RO membrane is highly dependent upon pressure, temperature, total dissolved solids (TDS) in the source water, the following should be used for comparison purposes only. Also, the various models, based upon the same basic design and technology, vary in their housing configurations and production capacity, and each will be accompanied by a specific specification chart which will indicate product water production, replaceable cartridge capacities, and manufacturer's recommended maintenance and replacement schedule.

<u>MODEL: 25 gals/day opt/RO</u>	<u>TFC - 25D</u>
Production	25 ±5 gpd (76-114 lpd)
TDS Reduction	80-95%
Reject water flow	3-4 x product flow
Percent Recovery (w/o optional boost pump/batch recycling)	20-30%
Product Storage Capacity	2-30 gals.

TABLE B - RECOMMENDED OPERATING LIMITS FOR SOURCE WATER

<u>SPECIFICATIONS</u>	<u>TFC MEMBRANE</u>
Water Pressure	40-125 psi (275-860kPa)
TDS	2000 ppm (also mg/l) max
Temperature	40-110°F (4-43°C)
pH	5-10
Hardness	Less than 10 gpd or soften
Iron	Less than 0.1 ppm (also mg/l)
Manganese	Less than 0.05 ppm (also mg/l)
Hydrogen Sulfide	None
Bacteria, Virus, Oocysts	* Copy of EPA, Univ of Arizona test data available from manufacturer

SECTION III - OPERATION & MAINTENANCE & DIRECTIONS FOR USE

It is a violation of Federal Law to use this Product in a manner inconsistent with its labeling.

A. Normal Operation

1. It is normal for the Total Dissolved Solids (TDS) of the water to be higher than normal during the first 5 gallons of operation, this is due to the sanitizing solution and the new filters. After this water is rinsed to drain, the TDS removal rate should stabilize at a value of greater than 75%. Source water pressure, temperature, and TDS affects the production rate and quality of product water. (an optional TDS meter will more accurately indicate and measure the System's performance)
2. The Drinking Water Purification System produces water at relatively slow rates, it can take up to six hours or more to fill the Holding Tank. Normal operation is to let the Holding Tank fill with water and then draw water as is needed.

When the pressure in the Holding Tank falls to a given pressure (as the water is being used) the Automatic Shut Off Valve (ASO Valve) will start water production and the system will refill the Holding Tank. When the Holding Tank is full and no water is being used, the ASO Valve will automatically shut off the source water to conserve water.

The more water that is used (up to the capacity of the system) the better the Drinking Water Purification System will function.

B. START - UP & FLUSHING THE SYSTEM

NOTE: The optional RO membrane is shipped with a preservative in it (10% sodium metabisulfite). This will be rinsed out in the system flushing process. Allow the Holding Tank to fill and discard the first three full tanks of product water. It can take up to 6 hours to fill a typical 2 gallon Holding Tank.

*** Do not use the first three full tanks of product water.**

1. When a new system is initially installed or when the replaceable cartridges have been changed, the following procedure must be adhered to:
 - a. Before source water is activated to pressurize the system, the product water outlet faucet must be opened to allow the system to be purged of trapped air, expect air and carbon finds (very fine black powder) from the activated carbon filter cartridges to be rinsed out. This is normal on start-up and after carbon filter change out. Allow water to flow for several minutes then close product water dispensing faucet valve.

C. CHANGING FILTERS

THIS WATER PURIFICATION SYSTEM CONTAINS FILTERS WHICH MUST BE REPLACED AT REGULAR INTERVALS TO MAINTAIN PROPER PERFORMANCE. USE ONLY FACTORY APPROVED FILTERS.

1. The various filter cartridges have different recommended operational life expectancies. The following chart will indicate the recommended intervals for change out of the different filter cartridges. (See Fig. 1 for designation of the different filter cartridges) The following chart is based upon an assumption that the Water Purification System will be operated at 1/2 of its' 24 hour rated production capacity. In the event the System is operated continuously, then the time intervals quoted would be diminished by 50%.

CARTRIDGE CHANGE-OUT CHART

<u>FILTER #</u>	<u>CHANGE EVERY</u>	<u>APPROX. GAL/LTRS PRODUCED</u>
1	6 months	900 gal (3,420 ltrs)
2	6 months	900 gal (3,420 ltrs)
3	12 months	1,800 gal (6,840 ltrs)
4	6 months	900 gal (3,420 ltrs)
5	24 months	3,600 gal (13,680 ltrs)

* NOTE: The above chart is for a 25 gallon per day System utilizing an optional reverse osmosis (RO) filter cartridge. Each individual model with its different product water production rate will be accompanied by the appropriate application and specification data sheet.

** NOTE. Each of the various filter cartridges have different shelf lives and different storage requirements. The manufacturer strongly recommends that the following guide should be adhered to in order to insure the System will operate according to manufacturer's specifications

D. FILTER FUNCTION AND DESCRIPTION

1 SEDIMENT FILTER

The Sediment Filter is designed to filter out all particulates from the source water down to a size of 5 microns. Since 5 microns is smaller than the human eye can see, even water that appears clear can contain high levels of suspended silt and sediment. It is important that the suspended particles be removed from the source water in that the most prevalent cause of system plugging and premature failure of the optional RO is these suspended particles. Silt and sediment levels in water supplies vary not only from source to source, but will vary seasonally depending on rain run off and its effect on surface waters

- * Unlimited shelf life, no special storage precautions
DO NOT REMOVE SAFETY INSERT CAPS UNTIL READY FOR USE

2 CHLORINE REMOVAL/REDOX

The source water may contain certain chemicals (i.e. chlorine, etc.) that have a damaging effect on both the RO membrane and the bactericidal filter media which are removed by this filter technology.

- Unlimited shelf life, no special storage precautions
DO NOT REMOVE SAFETY INSERT CAPS UNTIL READY FOR USE

#3 BACTERICIDAL CARTRIDGE

This cartridge contains the iodinated resin that imparts the iodine into the product water which then acts as a bactericidal agent on the microbials that may be present.

- 12 months shelf life (consult factory date stamp)
DO NOT REMOVE SAFETY INSERT CAPS UNTIL READY FOR USE

#4 IODINE REMOVAL/POST-CARBON CARTRIDGE

After the product water passes through the iodinated/bactericidal cartridge it is stored with residual iodine which prevents any recontamination thus allowing extended period of storage. Trace amounts of iodine are necessary in the human diet, but concern that too much iodine would have an adverse health effect. The EPA regulations concerning water purification equipment requires the removal of the iodine residual prior to human consumption and that is the function of this proprietary designed filter.

- Unlimited shelf life, store in dry environment
DO NOT REMOVE SAFETY INSERT CAPS UNTIL READY FOR USE

#5 RO/REVERSE OSMOSIS FILTER

The RO membrane is specially constructed, fully aromatic polyamide film and is classified as a Thin Film Composite (TFC). The spiral wound construction of the RO membrane provides maximum surface area for water production and is less susceptible to fouling by particulate matter, turbidity and colloidal materials.

The RO membrane is designed to reduce the dissolved salts, mineral content of the water that may be picked up by the water from the environment. These are measured as Total Dissolved Solids (TDS). In the Reverse Osmosis process the TDS materials are separated from the source water to produce a product water and the excess rejected solids are rinsed to drain.

- 6 months shelf life if stored at room temperature, refrigerate if possible thereby extending shelf life to 12 months
DO NOT REMOVE RO CARTRIDGE FROM SEALED SHIPPING BAG OR REMOVE INSERT CAPS UNTIL READY FOR USE
- ** DO NOT ALLOW TO FREEZE

SECTION IV. TECHNICAL DATA

A. Water Quality

1. Water quality is normally measured with a special meter that measures the water's ability to conduct electricity. The more dissolved solids in the water, the higher the conductivity. The results are usually reported in **Parts per Million (ppm)** or **Milligrams per liter (mg/l)** of **Total Dissolved Solids (TDS)**. (Although technically they are not exactly equal, in most discussions ppm = mg/l.) There are two (2) optional TDS measuring devices available. The first being a permanently installed unit and the other being a hand held portable unit. For availability and pricing contact your dealer or the manufacturer. **NOTE;** Manufacturer strongly recommends the utilization of either of these units so as to accurately monitor the systems' performance.
2. RO Membranes (optional) are rated by the amount of dissolved solids that are rejected. This rating is a ratio of the TDS in the source water to the TDS in the product water and is reported as **Percent Rejection**. If the source water contained 100 ppm of TDS, 90 ppm have been rejected and the reject ratio is 90%.
3. Water quantity is termed **Flux** or **Product Water Rate** and is measured as the amount of water produced in one day. It is reported as **Gallons per Day (gpd)** or **Liters per Day (ml/min)**.
4. The flow of water to drain is the **Reject Water Rate** and is measured as **Gallons per Day (gpd)** or as **Milliliters per Minute (ml/min)**.

Milliliters per minute x 38 = gallons per day

EXAMPLE: The drain flow will fill a graduated cylinder to the 150 ml mark in one minute.

150 ml/min. x 38 = 57 gpd

If the container available measures ounces, use the following conversion.

Ounces per minute x 11.2 = gallons per day

EXAMPLE The product flow will fill 2-1/2 ounces in two minutes

2.5 oz. + 2 min. = 1.25 oz/min - 1.25 oz/min x 11.2 = 14 gpd

5. The **Reject Ratio** is the amount of water produced compared to the amount of water flowing to drain

EXAMPLE The product rate is 14 gpd. The reject rate is 56 gpd = 56/14

Reject Ratio = 4 or 4 to 1

- 6 The **Percent Recovery** is another way to measure the amount of water produced as compared to the amount actually used
 $\% \text{ Recovery} = \text{Product Rate} / \text{Source Rate} \times 100\%$

EXAMPLE

The product water rate is 14 gpd, The drain water rate is 56 gpd

NOTE: The total flow or source water rate into the system is the sum of the product flow and the drain flow.

Source Rate = 14 gpd + 56 gpd = 70 gpd

$\% \text{ Recovery} = 14\text{gpd}/70\text{gpd} \times 100\%$, $\% \text{ Recovery} = .20 \times 100\%$ or 20%

B. Water Pressure and Temperature

1. The performance of Reverse Osmosis (RO) membranes is affected by two key factors: Temperature of the source water and the net driving pressure across the membrane. These two factors must be taken into account when looking at membrane performance. The performance of membranes is rated at a given driving pressure and at 77° F or 25° C. The amount of water (flux rate) that is produced by increasing the pressure is in direct proportion to the net increase or decrease in net pressure. For all practical purposes, if the driving pressure is doubled, the amount of flux will be doubled assuming the water temperature and flow across the membrane remains the same.

If the feed water temperature is increased there will be an increase in water produced. Conversely, if the feed water temperature is decreased, productivity will be decreased.

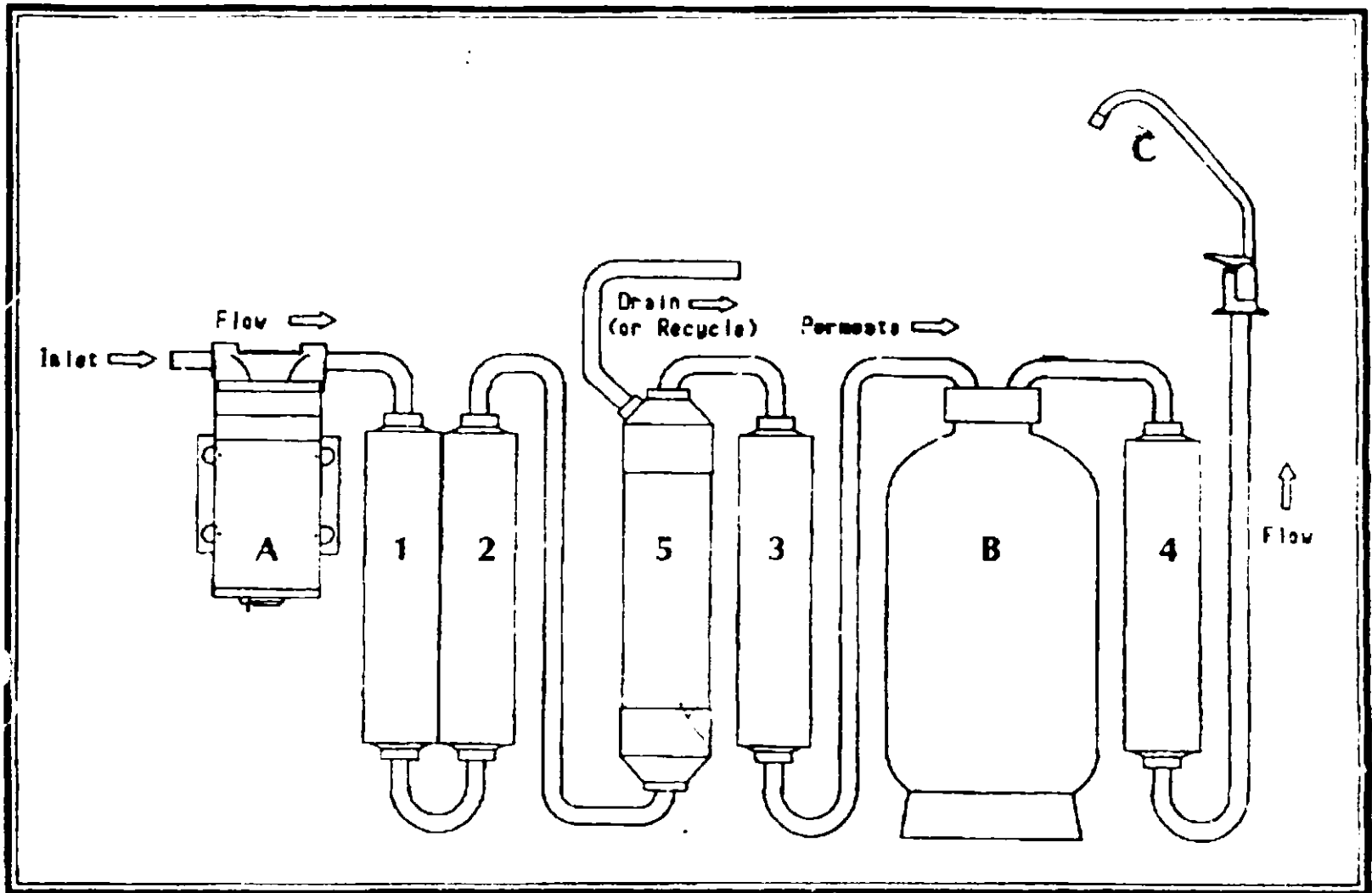
The salt flow through a membrane does not change with pressure, therefore an increase in pressure results in a lowering of the salt passage quotient

Coefficients of permeate and salt passage show about the same increase with temperature. Therefore, no change in salt passage quotient is seen with temperature increase

1/1/20

TROUBLE SHOOTING GUIDE

PROBLEM	POSSIBLE CAUSE & SOLUTION
Low quality & low production of product water	Check source water inlet pressure, must be above 40 psi Check sediment filter for fouling & replace. If problem not solved by the above then replace RO membrane.
Low pressure at dispensing faucet	Heavy water use, holding depleted. Allow holdtank to refill (adding a second holding tank will increase storage capacity). Deiodinating/carbon post-filter plugged, replace post-filter Air precharge in holding tank is too low, empty water from holding tank & with the faucet open adjust the air pressure to 7-10 psi range.
High Total Dissolved Solids (TDS) in the product water	Low source water pressure, check, should be above 40 psi. RO membrane expended, replace RO membrane No drain flow, drain restrictor clogged, clear or replace drain restrictor. The ASO valve is not closing, repair or replace ASO valve The source water TDS has increased, this will give a corresponding increase in product water TDS New in-line carbon filters installed, flush with several full tnks of product water
Taste & odors in the product water	The in-line deiodinating/carbon post-filter cartridge is exhausted & should be replaced Increase in product water TDS. refer to high TDS solution above Product water & drain water lines are reversed, correct plumbing



- COMPONENTS:**
- A.) Pump (optional)
 - B.) Holding Tank
 - C.) Drinking Water Dispensing Faucet (without Iodine)

- FILTERS:**
- 1.) 5 Micron Sediment Prefilter
 - 2.) Chlorine Removal Filter
 - 3.) Iodine Resin Bactericidal Filter
 - 4.) Iodine Removal Filter
 - 5.) Reverse Osmosis Membrane

Figure 1

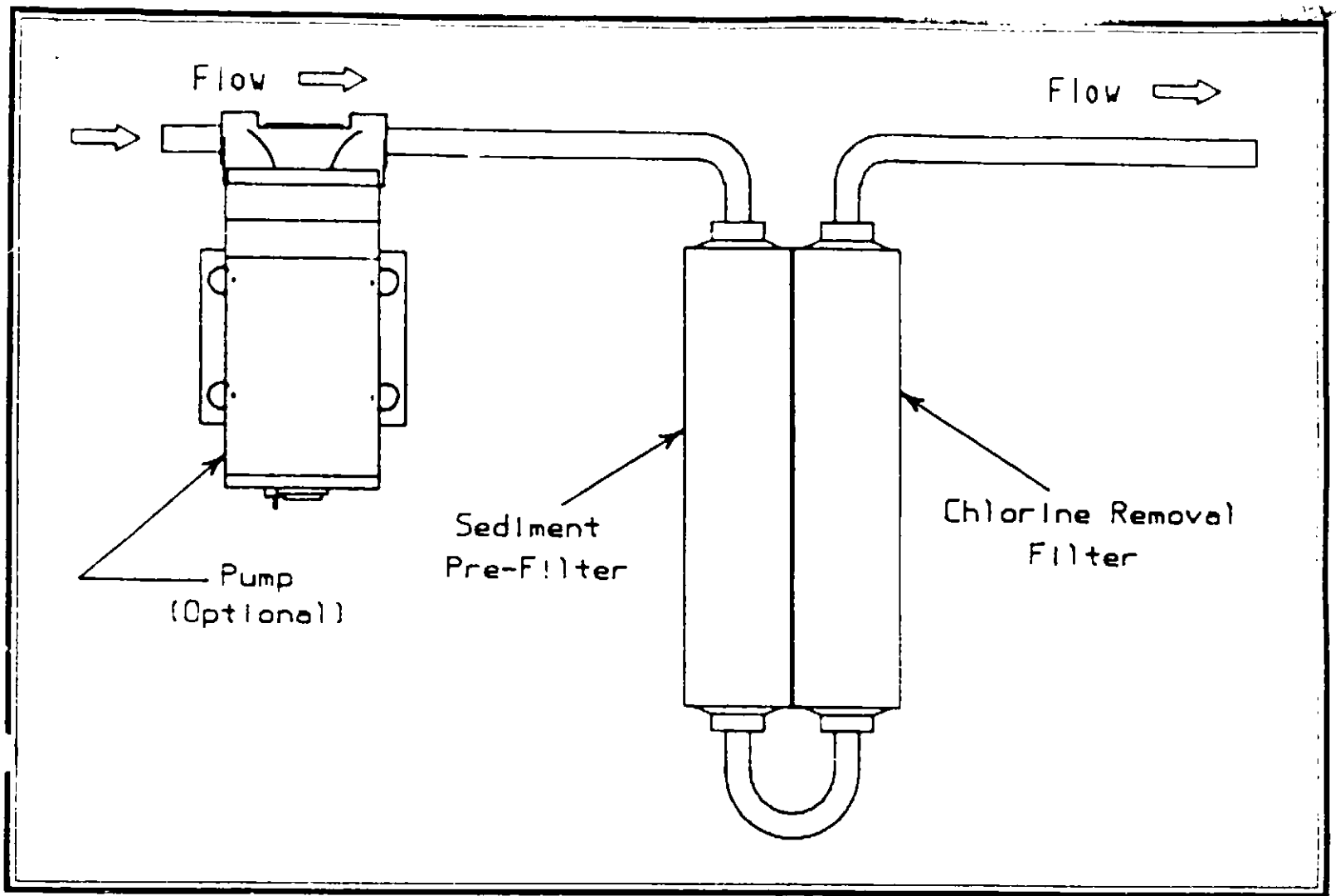


Figure 2

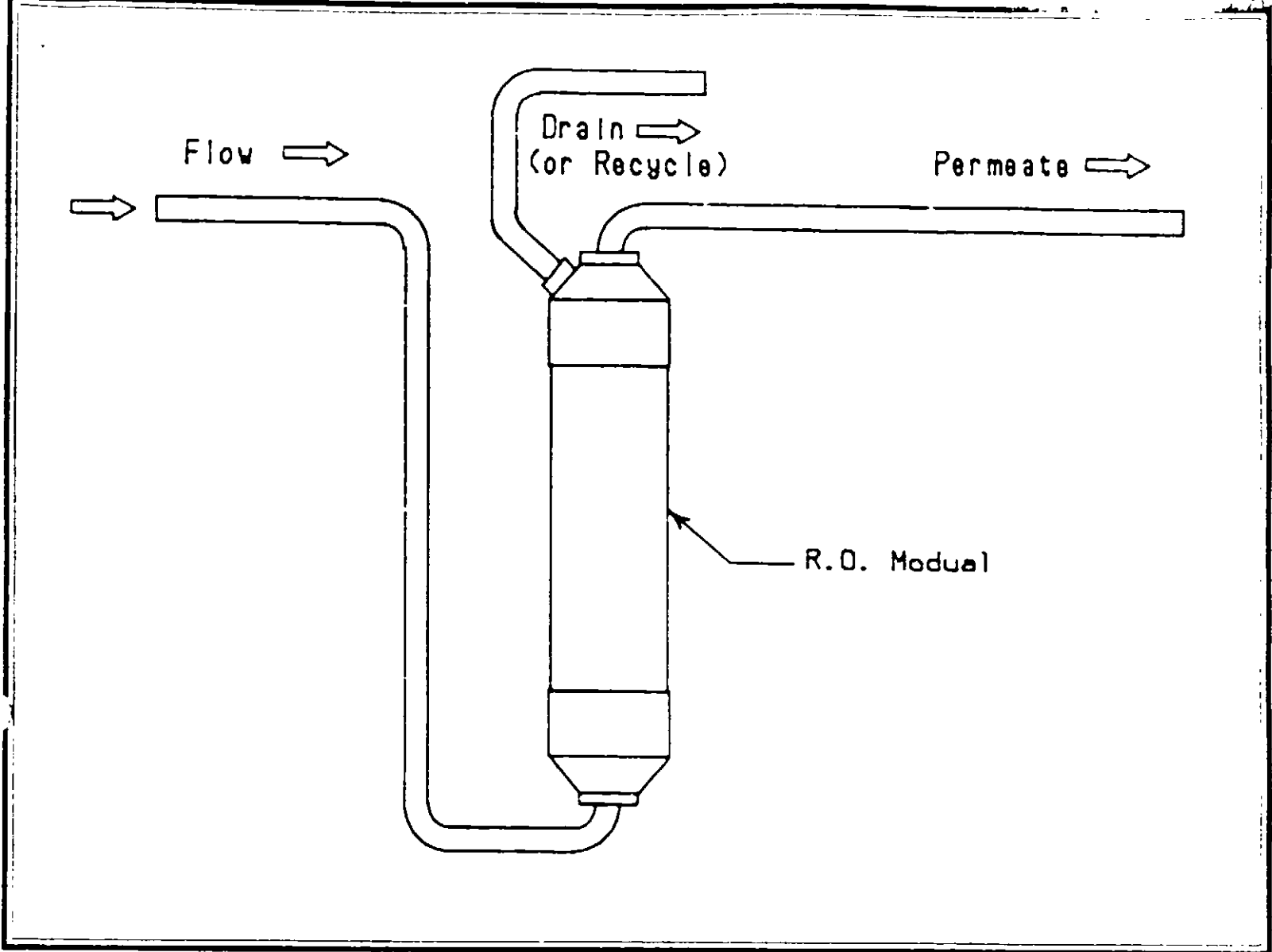


Figure 3

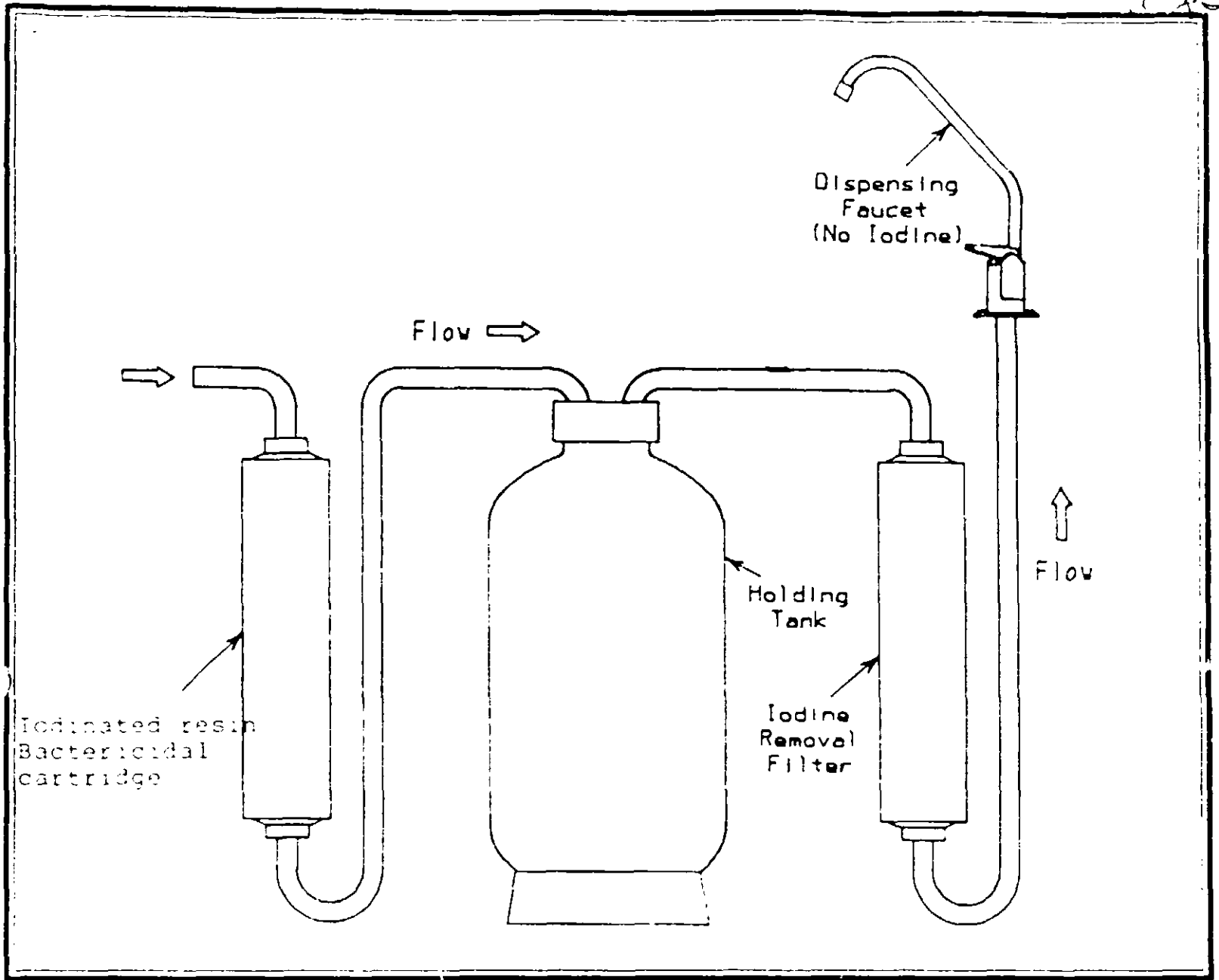


Figure 4

Holding Tank Detail

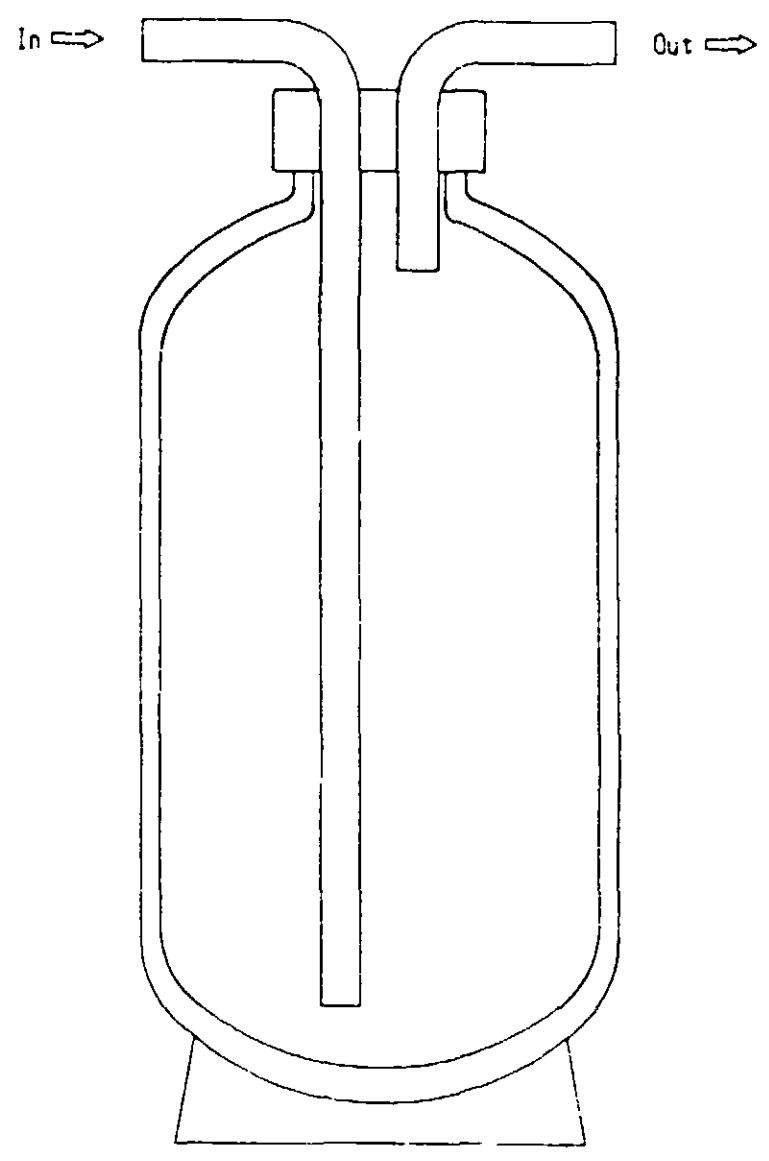


Figure 5

DRINKING WATER PURIFICATION SYSTEM

ONE YEAR LIMITED WARRANTY

WST, INC. warrants its Drinking Water Purification System to be free from defects in materials and workmanship for a period of one year from the date of purchase when installed and operated within recommended parameters.

WST, INC. will repair or replace at its discretion any defective component. This warranty does not cover the disposable sediment and carbon cartridges whose service life depends on feed water conditions. The Drinking Water Purification System is warranted for one year. If the required prefilter conditions to the membrane are not followed the membrane will not be warranted.

CONDITIONS OF WARRANTY

The above warranty shall not apply to any part of the Drinking Water Purification System that is damaged because of occurrences including but not limited to neglect, misuse, alteration, accident, misapplication, physical damage, or damage caused by fire, act of God, freezing or hot water. If the unit is altered by anyone other than WST, INC. the warranty is void.

To obtain warranty service: (A) contact your local dealer who supplied the unit, or (B) contact the factory for the dealer nearest you. It is the obligation of the owner to pay for shipping or travel charges to return the defective part.

This is the sole warranty made by WST, INC. with respect to the Drinking Water Purification System. No other warranties, expressed or implied, are given including merchantability or fitness for a particular purpose, incidental or consequential damages, or other losses.

This exclusion applies to the extent exclusion is permitted by law:

No person or representative is authorized to assume for WST, INC. any liability on its behalf, or in its name, except to refer the purchaser to this warranty.

This warranty gives you specific legal rights, you may also have other rights which vary from state to state.



Manufacture: Water Solution Technologies, Inc.
Ste B5-239
Oceanside, CA 92054
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