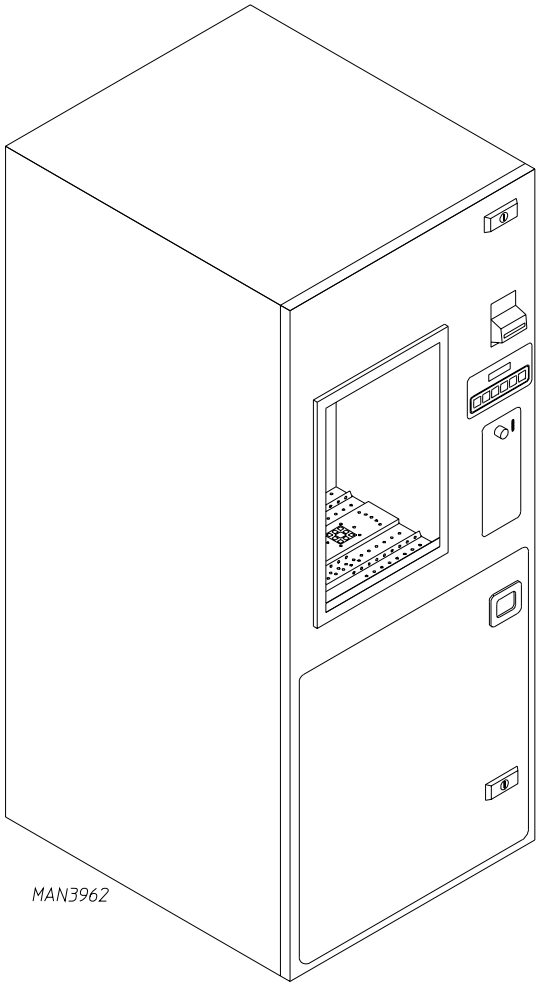
AD-840
Installation/Operator's Manual



For replacement parts, contact the distributor from which the dryer was purchased or
American Dispensing Corporation
88 Currant Road
Fall River MA 02720-4781
Telephone: (508) 678-9000 / Fax: (508) 678-9447
E-mail: techsupport@amdry.com

052798OC/cj

ADC Part No. 182730

Retain This Manual In A Safe Place For Future Reference

American Dispensing Company products embody advanced concepts in engineering, design, and safety. If this product is properly maintained, it will provide many years of safe, efficient, and trouble-free operation.

ONLY properly licensed technicians should service this equipment.

OBSERVE ALL SAFETY PRECAUTIONS displayed on the equipment or specified in the installation/operator's manual included with the water vending machine.

WARNING: UNDER NO CIRCUMSTANCES should the door switch or the heat circuit devices ever be disabled.

We have tried to make this manual as complete as possible and hope you will find it useful. **ADC** reserves the right to make changes from time to time, without notice or obligation, in prices, specifications, colors and material, and to change or discontinue models.

Important

For your convenience, log the following information:

DATE OF PURCHASE _____ **MODEL NO.** **AD-840**

DISTRIBUTORS NAME _____

Serial Number(s) _____

_____

_____

Replacement parts can be obtained from your distributor or the **ADC** factory. When ordering replacement parts from the factory, you can FAX your order to **ADC** at (508) 678-9447 or telephone your orders directly to the **ADC** Parts Department at (508) 678-9000. Please specify the water vending machine **model number** and **serial number** in addition to the **description** and **part number**, so that your order is processed accurately and promptly.

IMPORTANT

YOU MUST DISCONNECT and LOCKOUT THE ELECTRIC SUPPLY BEFORE ANY COVERS or GUARDS ARE REMOVED FROM THE MACHINE TO ALLOW ACCESS FOR CLEANING, ADJUSTING, INSTALLATION, or TESTING OF ANY EQUIPMENT per OSHA (Occupational Safety and Health Administration) **STANDARDS.**

CAUTION

LABEL **ALL** WIRES PRIOR TO DISCONNECTION WHEN SERVICING AD-840. WIRING ERRORS CAN CAUSE IMPROPER AND DANGEROUS OPERATION.

FOR YOUR SAFETY

THE SYSTEM IS SHIPPED WITH A PRESERVATIVE SOLUTION MADE OF SODIUM BISULFITE (IN THE WINTER MONTHS) GLYCERINE. MAKE SURE THE SYSTEM IS THROUGHLY PURGED BEFORE LETTING ANYONE DRINK THE DISPENSED WATER.

REFER TO THE INSTALLATION SECTION ON PURGING PROCEDURE.

CAUTION

Never look directly into the unprotected parts of the U.V. chamber when there is power to the sterilizer. Serious burns to the eyes and skin may result. Always unplug power to the sterilizer before working on it.

IMPORTANT

Please observe all safety precuations displayed on the equipment and specified in the installation and operator's manual included with the AD-840.

IMPORTANT

The wiring diagram for the water vending machine is located on the inside right wall of the machine.

Water vending machines **must not** be installed or stored in an area where it will be exposed to water or weather.

Table of Contents

SECTION I

IMPORTANT INFORMATION

A. RECEIVING and HANDLING

The water vending machine is shipped in a protective stretch wrap cover with protective cardboard corners and top cover (or optional box) as a means of preventing damage in transit. Upon delivery, the water vending machine, packaging material and wooden skid should be visually inspected for shipping damage. If any damage is noticed, inspect further before delivering carrier leaves.

Water vending machines damaged in shipment.

1. **ALL** water machines **should be** inspected upon receipt and before they are signed for.

2. If there is suspected damage or actual damage, the trucker's receipt **should be** so noted.

3. If the water vending machine is damaged beyond repair, it **should be** refused. Those water vending machines which were not damaged in a shipment **should be** accepted, but the number received and the number refused ***must be*** noted on the receipt.

4. If you determine that the water vending machine was damaged after the trucker has left your location, you should call the delivering carrier's freight terminal immediately and file a claim. The freight company considers this concealed damage. This type of freight claim is very difficult to get paid and becomes extremely difficult when more than a day or two passes after the freight was delivered. It is your responsibility to file freight claims. Water vending machines and parts damaged in transit **cannot** be claimed under warranty.

5. Freight claims are the responsibility of the consignee, and claims ***must be*** filed at the receiving end. **ADC** assumes no responsibility for freight claims or damages.

6. If you need assistance in handling the situation, please contact the **ADC** Traffic Manager at (508) 678-9000.

IMPORTANT: The water vending machine ***must be*** transported and handled in an upright position at all times.

B. SAFETY PRECAUTIONS

IMPORTANT: Refer to this manual before making any repairs or adjustments, or doing any maintenance on this machine.

IMPORTANT: For owners who do not personally maintain the machine, it is their responsibility that the operator has been properly instructed and is fully aware of the manual contents. This is important in the safe handling and efficient operation of the machine.

IMPORTANT: Follow maintenance schedule rigorously. Careless maintenance may lead to component failure and increase operating costs significantly.

CAUTION: DO NOT make any alteration or modification in the wiring or plumbing of this machine. Such alterations may result in injury, illness, or death to maintenance personnel, operators or users of this machine.

WARNING: DO NOT allow machine to freeze. Freezing will irreparably damage components in the machine.

NOTE: NEVER LOOK DIRECTLY INTO THE UNPROTECTED PARTS OF THE U.V. CHAMBER WHEN THERE IS POWER TO THE STERILIZER. SERIOUS BURNS TO THE EYES AND SKIN MAY RESULT. ALWAYS UNPLUG POWER TO THE STERILIZER BEFORE WORKING ON IT.

NOTE: THE SYSTEM IS SHIPPED WITH A PRESERVATIVE SOLUTION MADE OF SODIUM BISULFITE AND (IN THE WINTER MONTHS) GLYCERINE. MAKE SURE THE SYSTEM IS THOROUGHLY PURGED BEFORE LETTING ANYONE DRINK THE DISPENSED WATER. SEE SECTION ON INSTALLATION PROCEDURES.

DISCLAIMER

The information contained in this document is subject to change without notice.

American Dispensing Company shall not be liable for technical or editorial omissions made herein; nor incidental or consequential damages resulting from the furnishing, performance or use of this material.

SECTION II

SPECIFICATIONS/COMPONENT IDENTIFICATION

A. SPECIFICATIONS

Reverse Osmosis (R.O.) Membrane Capacity	1,200 gallons*	4.542.2 liters*
R.O. Pump	3/4 HP	.55 kw
Dispensing Pump	3 gal/min	11.36 liters/min
Drain Pump	3 gal/min	11.36 liters/min
Voltage Available	120-240 v / 1Ø / 50 / 60 Hz	
Water Inlet Size	1/2 N.P.T.	
Drain Outlet Size	1/2 N.P.T.	
Storage Tank Size	25 gallons	94.6 liters

* These specifications are calculated at 2,000 ppm, total sodium chloride solution at 77º F/25º C feed water temperature and 160 psi/11.24 kg/cm^2 R.O. Pump pressure.

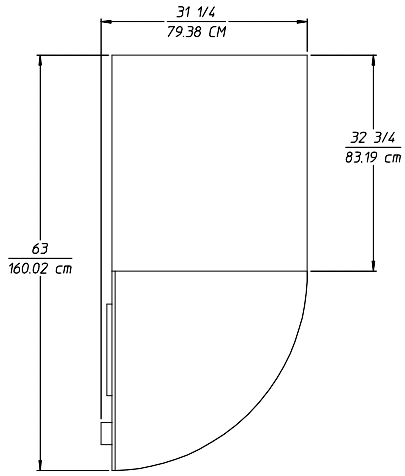
**** MUST BE CONNECTED TO A MINIMUM 3/4" N.P.T. INLET WATER SUPPLY**

MINIMUM PRESSURE/INLET FLOW RATE

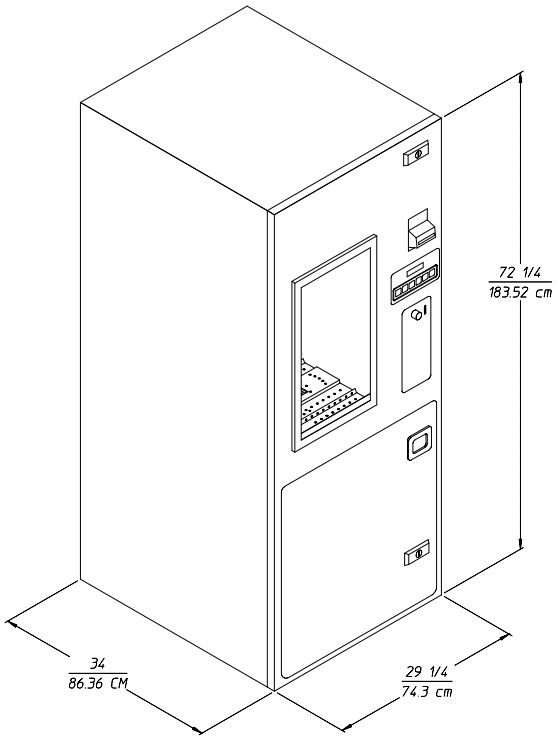
Four gallons a minute at 35 psi back pressure or the equivalent of nine gallons per minute at a free flowing 1/2" N.P.T. outlet at the intended location of the machine. This test should be conducted with all other equipment connected to the same water line running to reflect true flow.

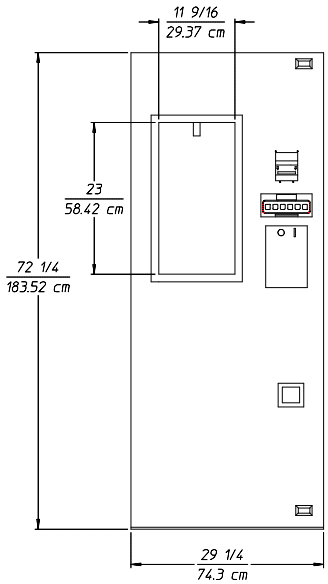
MAXIMUM WATER PRESSURE

Eighty psi. Install a pressure regulator if incoming water pressure exceeds this level. High inlet pressure will irreparably damage filter housings and cause leaks in the system.



PLAN VIEW





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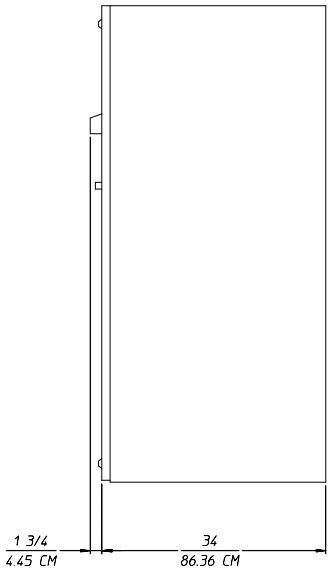
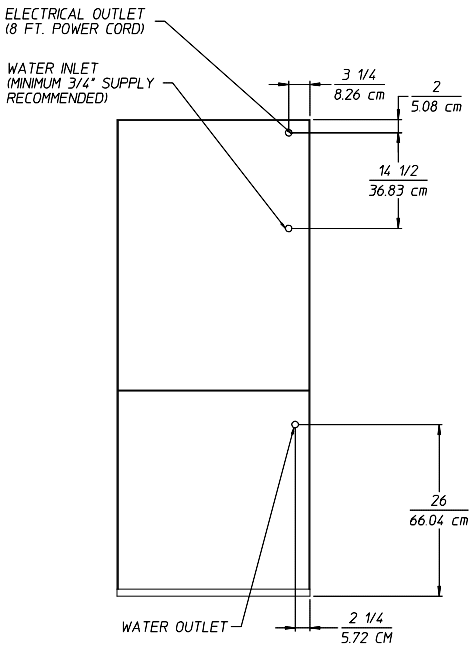
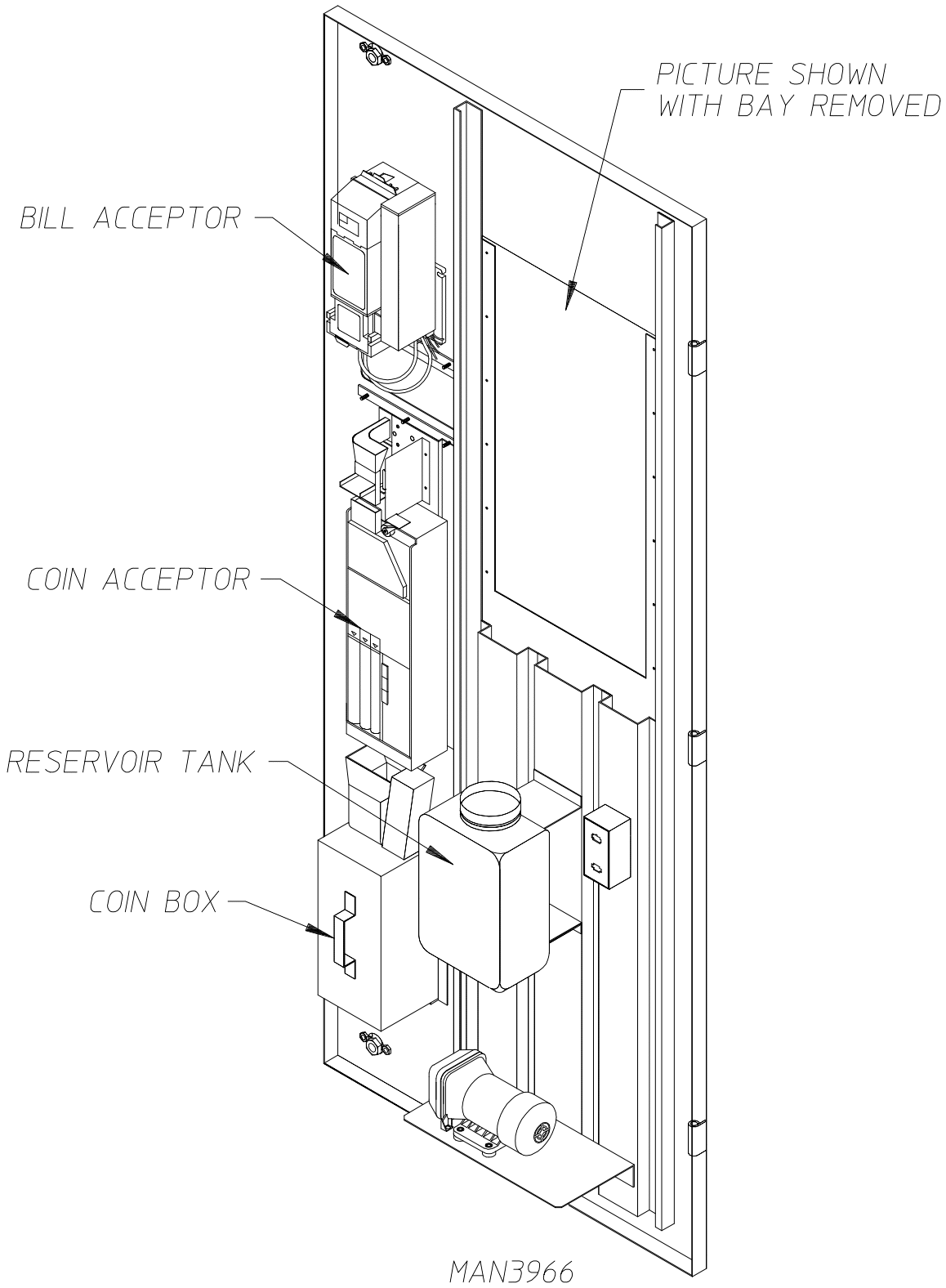
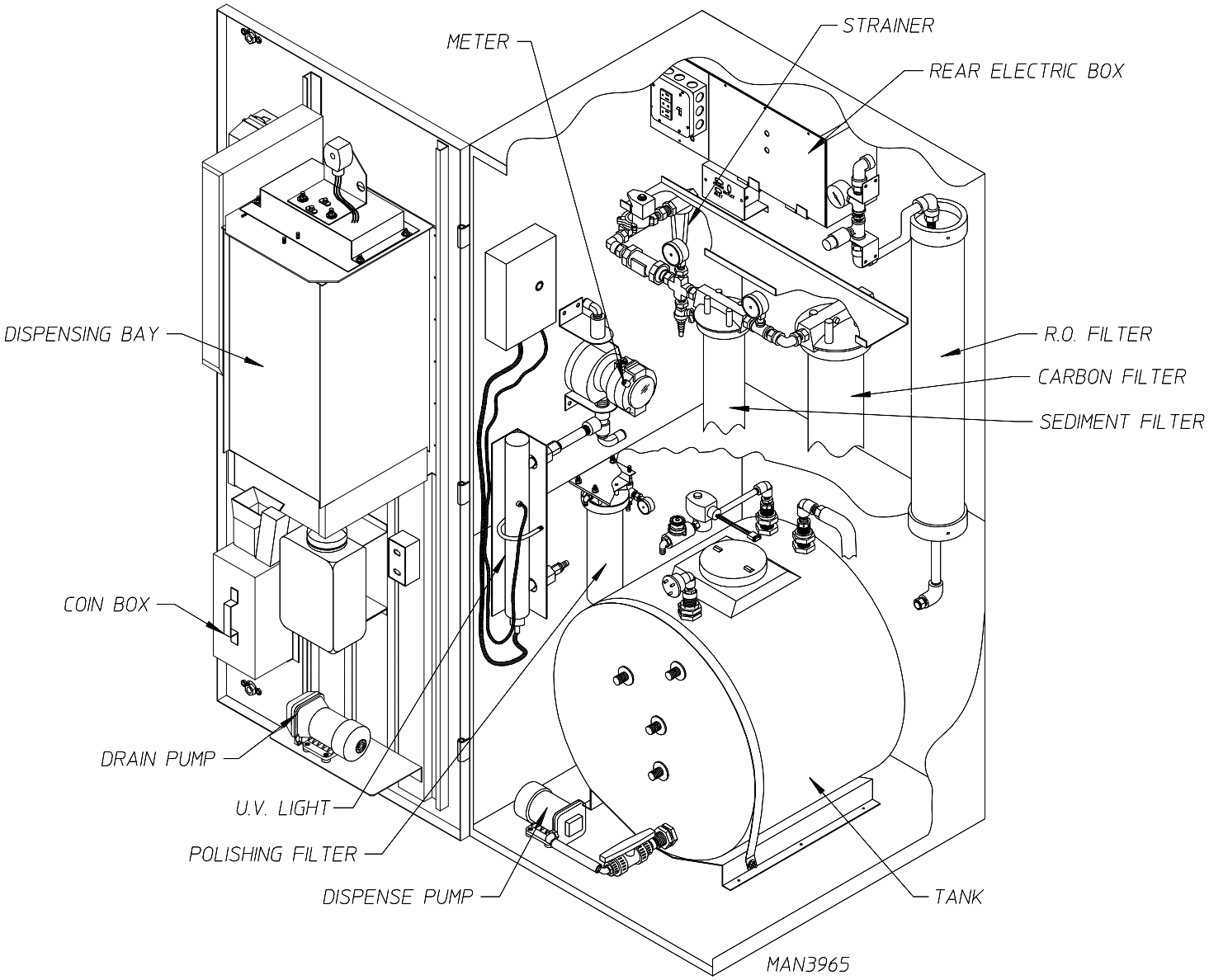




BACK VIEW


PICTURE SHOWN
WITH BAY REMOVED
BILL ACCEPTOR
COIN ACCEPTOR
RESERVOIR TANK
COIN BOX
MAN3966


METER
STRAINER
REAR ELECTRIC BOX
DISPENSING BAY
R.O. FILTER
CARBON FILTER
SEDIMENT FILTER
COIN BOX
DRAIN PUMP
U.V. LIGHT
POLISHING FILTER
DISPENSE PUMP
TANK
MAN3965

SECTION III

INSTALLATION PROCEDURES

Installation should be performed by competent technicians in accordance with local and state codes. In the absence of these codes, the installation must conform to applicable American National Standards; National Electric Code ANSI/NFPA NO. 70 - LATEST EDITION.

A. LOCATION REQUIREMENTS

WARNING: Feed water must come from inspected, approved water system only. Source must microbiologically safe drinking water.

1. The water vending machine must be installed on a sound level floor capable of supporting its weight. It is recommended that carpeting be removed from the floor that the water vending machine is to rest on.

2. The water vending machine must not be installed or stored in an area where it will be exposed to water and weather.

3. Provisions for adequate water supply must be provided as noted in this manual (see Water Supply in Section III C.)

4. Plumbing should be performed in accordance to local, state and federal codes. (see Section III D. Feed Water and Drainage Plumbing).

5. Provisions must be made for adequate clearances for servicing and for operation as noted in this manual (see Enclosure Requirements in Section II A).

B. SYSTEM DESCRIPTION

Thank you for purchasing the model AD-840 water vending machine. It is made by American Dispensing Company and is one of the most advanced water vending machines on the market today. It is microprocessor-based and programmable. It interacts with the customer and owner through two LED displays and a membrane keypad. The AD-840 purifies water through a five-step process:

Incoming water first passes through a 10 micron absolute SEDIMENT FILTER. This means that suspended solids larger than .01 mm (or about forty-thousands of one inch) such as slit and fine sand are removed.

Water then passes through a CARBON FILTER. This removes chlorine, odor and a variety of organic contaminants, such as chloroform and pesticide residue. The AD-840 uses a carbon filter with an extruded carbon core and an inner filtration wrap. This combination ensures that, unlike a conventional granular activated carbon (g.a.c.) filter, there is no channeling or bypassing, and no release of fine carbon particles.

Water is then pumped through a thin film composite **reverse osmosis (R.O.) membrane** at about 160 psi. The R.O. membrane removes over 90 % of a variety of salts and inorganic materials found in water, such as dissolved salts of sodium, lead, nitrate; it removes typically over 99% of radioactivity, like radon. Actual rejection rate will depend on feed water chemistry, temperature and its total dissolved solid content.

Water is then stored in an atmospheric water tank, sealed except for an air vent which is protected from dust and airborne bacteria by a **submicron air filter**.

When your customer selects a vend, water will be pumped through a combination sediment/carbon POLISHING FILTER which removes any remaining taste and sediment, and an ULTRAVIOLET (U.V.) STERILIZER which sterilizes the water.

To keep the stored water fresh and sterilized, the water in the storage tank is recirculated through the polishing filter and the U.V. sterilizer periodically.

Safety is our prime concern and it is designed into the machine. At the inlet and outlet of the R.O. membrane, a comparator reads the total dissolved solid rejection rate, an indicator of the performance of the membrane. If the rejection rate falls below a certain level, the microprocessor will shut the machine down. The same logic applies to the U.V. sterilizer, where a true U.V. sensor continually monitors the disinfecting power of the light and shuts down the machine when the U.V. level is not high enough.

There is also overflow and leakage protection. The sensors are located on the base of the machine, in the drain tank of the dispensing bay and in the water storage tank. These sensor detect overflow or leakage and will shut off whatever components are necessary.

C. WATER SUPPLY

The following conditions are required for optimum performance:

WARNING: FEED WATER MUST COME FROM INSPECTED, APPROVED WATER SYSTEMS ONLY. SOURCE MUST BE MICROBIOLOGICALLY SAFE DRINKING WATER.

1. MINIMUM PRESSURE/INLET FLOW RATE

Four gallons a minute at 35 psi back pressure or the equivalent of nine gallons per minute at a free flowing 1/2" N.P.T. outlet at the intended location of the machine. This test should be conducted with all other equipment connected to the same water line running to reflect true flow.

2. MAXIMUM WATER PRESSURE

The maximum water pressure is 80 psi. Install a pressure regulator if incoming water pressure may exceed this level. High inlet pressure will irreparably damage filter housing and cause leaks in the system.

3. TEMPERATURE

This machine should be kept in an environment between 40 and 108° F. Exposing the machine to freezing temperatures will irreparably damage the components.

4. MINERAL CONTENT

Pretreatment of incoming water is recommended if hardness exceeds 150 ppm or 9 grains per gallon, or if iron levels exceed .05 ppm. Membrane will still function with high mineral content water, but yield will drop substantially, membrane cleaning is required more frequently, and membrane life will be shortened significantly, increasing overall operating costs.

D. FEED WATER AND DRAIN PLUMBING

1. Inlet and outlet of the machine is 1/2" N.P.T., female threads. Use for connection only sanitary plumbing materials appropriate for drinking water.

NOTE: Minimum 3/4" N.P.T. inlet water supply.

2. Drain outlet should have a minimum of a two-inch air gap at the point of discharge. Follow **ALL** applicable plumbing codes when making connections.

E. ELECTRICAL INFORMATION

1. ELECTRICAL REQUIREMENTS

It is your responsibility to have all electrical connections made by a properly licensed and competent electrician to assure that the electrical installation is adequate and conforms with local and state regulations or codes. In absence of such codes, **ALL** electrical connections, material and workmanship must conform to the applicable requirements of the National Electrical Code ANSI/NFPA NO. 70-LATEST EDITION.

IMPORTANT: Failure to comply with these codes or ordinances and requirements stipulated in this manual can result in personal injury or component failure.

NOTE: Component failure due to improper installation will **VOID THE WARRANTY.**

Each water vending machine should be connected to an independently protected branch circuit. The water vending machine must be connected with copper wire only. Do not use aluminum wire which could cause a fire hazard. The copper conductor wire or cable must be of proper ampacity and insulation in accordance with electric codes for making all service connections.

NOTE: The use of aluminum wire will VOID THE WARRANTY.

2. ELECTRICAL SPECIFICATIONS

AD-840

Electrical Service Specifications (Per Water Vending Machine)

IMPORTANT: 208 VAC and 230 VAC **ARE NOT THE SAME**. When ordering, specify **exact voltage.**

NOTE: A. Fuse ratings are dual-element time-delay current limiting, class RK1 or RK5 **ONLY.**
B. Circuit breakers are thermal magnetic (industrial) type only. For others, calculate/verify correct breaker size according to appliance amp draw rating and type of breaker used.
C. Circuit breakers for 3ø dryers **must be** 3-pole type.

SERVICE VOLTAGE	PHASE	WIRE SERVICE	APPROX. AMP DRAW 50 Hz	APPROX. AMP DRAW 60 Hz	MINIMUM WIRE SIZE*	FUSING Dual Element Time Delay	CIRCUIT BREAKER
120	1ø	2	15	14	12	25	30
208	1ø	2	8	7	14	12	15
230/240	1ø	2	8	7	14	12	15

* AWG Stranded Type Wire for individual lengths less than 100 feet.

IMPORTANT: The water vending machine must be connected to the electric supply shown on the data label that is affixed to the back of the water vending machine, at the upper right hand corner. In the case of 208 VAC or 230/240 VAC, the supply voltage must match the electric service specifications of the data label exactly.

WARNING: 208 VAC and 230/240 VAC ARE NOT THE SAME. Any damage done to water vending machine components due to improper voltage connections will automatically VOID THE WARRANTY.

NOTE: ADC reserves the right to make changes in specifications at any time, without notice or obligation.

F. UNPACKING/SETTING UP

ATTENTION: CHECK STATE AND LOCAL LAWS REGARDING THE OPERATION OF WATER VENDING MACHINES BEFORE INSTALLATION. SOME STATES REQUIRE VENDORS TO NOTIFY THE DEPARTMENT OF PUBLIC HEALTH OR WEIGHTS AND MEASURES CONCERNING THE INSTALLATION OF THE MACHINE. FOLLOW ALL APPLICABLE FEDERAL, STATE AND LOCAL STANDARDS FOR DRINKING WATER INSTALLATIONS.

ATTENTION: BE SURE THE INSTALLATION OF THIS MACHINE COMPLIES WITH ALL LOCAL PLUMBING AND ELECTRICAL CODES.

WARNING: DO NOT CONNECT ELECTRICAL POWER TO MACHINE UNTIL REQUESTED.

1. Remove the wrappings of the vending machine and check for transit damage. Notify carrier if there is damage.

2. Skid can be removed by unscrewing four 5/16" skid bolts at the legs of the machine.

3. Place machine at the intended location and, if required, adjust the 3/4" bolts at the legs until the machine is level and stable.

4. Connect plumbing inlet and outlet lines. Refer to guidelines in the section "SITE REQUIREMENTS."

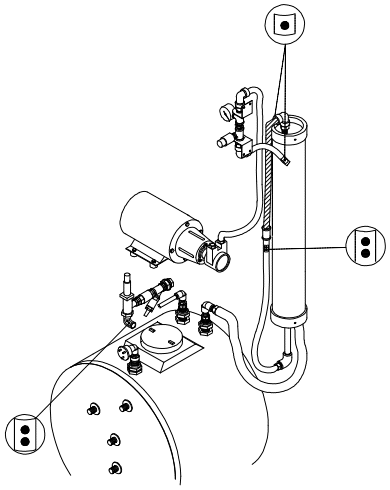
5. Reconnect R.O. membrane (see next page).

ATTENTION

The reverse osmosis membrane in this machine is filled with a preservative solution and plugged for shipping. The two lengths of tubing illustrated below will have to be reconnected before machine start-up. See diagrams below.

Refer to "Miscellaneous Maintenance Technique, Section C" on page 39 of the installation and owner's manual for tubing removal and attachment technique. Push tubing into fittings firmly to prevent leakage.

AS SHIPPED



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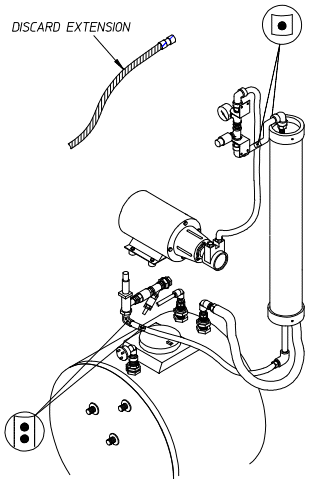
As Shipped

RECONNECTED FOR NORMAL OPERATION



Reconnected for Normal Operation

CAUTION: WEAR PROTECTIVE CLOTHING, GLOVES AND SAFETY GLASSES WHEN RECONNECTING TUBING. THE PRESERVATIVE SOLUTION CONTAINS SODIUM BISULFITE AND GLYCERINE AND MAY CAUSE SKIN AND EYE IRRITATION IN SOME INDIVIDUALS. WIPE UP ALL SPILLS IMMEDIATELY.

6. Open the main water ball valve located inside the cabinet at the water inlet of the machine.

7. Plug machine into the electrical outlet. Refer to guidelines in the section "Electrical Information."

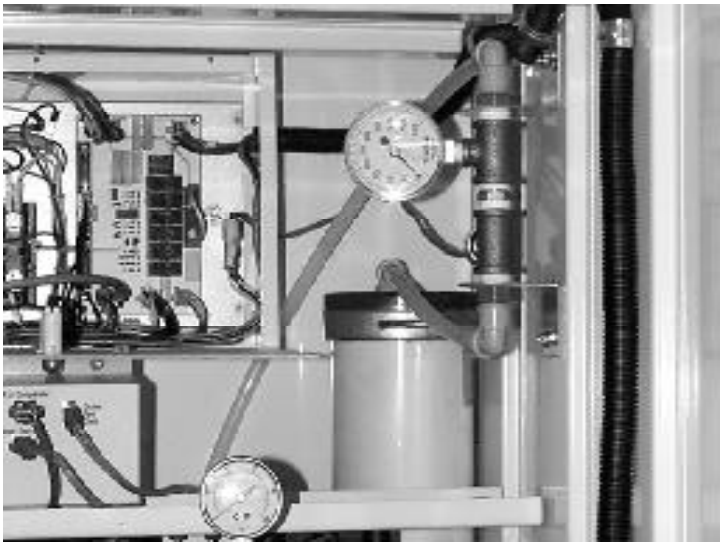
WARNING: THE MACHINE IS SHIPPED WITH A PRESERVATIVE SOLUTION MADE OF SODIUM BISULFITE AND (IN THE WINTER) GLYCERINE. MAKE SURE THE SYSTEM IS THOROUGHLY PURGED BEFORE LETTING ANYONE DRINK THE DISPENSED WATER. SEE STEPS 9 AND 10.

8. The display should blink the message: "SYSTEM" "PURGE" "DO NOT" "DRINK." Purge cycle starts automatically. Clear the dispensing bay of obstacles as water will come out of the dispensing valve and into the drain basin. Discard **ALL** water dispensed until purge cycle is over. Cycle is over when the display blinks "INSERT" and "COIN" or the amount for one gallon.

Several minutes into the purge cycle, check the following:

a) Pressure gauge at the R.O. pump on the base of the cabinet should read between 140 and 180 psi with the pump running (see diagram 1). If it is not within range, adjust back pressure valve to return reading to 160 psi. Back pressure valve is located near the drain outlet. Unscrew cap an loosen lock nut. Turn adjusting bolt into valve for higher back pressure and vice versa. Tighten lock nut and replace cap.

b) Visually note any leaks in the system. When the dispensing valve opens again during purge cycle, check for leaks on the dispensing side at this time.



9. Take a sample of the dispensed water after the purge cycle is over. Smell the water to ensure no odor is present. If there is, dispense water until water is free of odor.

10. The water is ready for vending.

ATTENTION:	**MEASURE THE INITIAL FLOW RATE OF THE PRODUCT WATER FROM THE REVERSE OSMOSIS MEMBRANE WITHIN 24 TO 48 HOURS OF NEW MACHINE OPERATION. SEE SECTION ON R.O. MEMBRANE FOR PROCEDURE. THIS IS IMPORTANT AS IT DETERMINES WHEN MEMBRANE NEEDS TO BE CLEANED IN THE FUTURE.**

ATTENTION:	**TO REDUCE BIOFOULING, IT IS RECOMMENDED THAT A MINIMUM OF 12 GALLONS BE VENDED EVERY 72 HOURS. THE LESS THE IDLE TIME BETWEEN VENDS, THE LESS LIKELY BIOFOULING IS TO OCCUR IN THE R.O. MEMBRANE AND THE FILTERS.**

SECTION IV

SERVICE AND PARTS INFORMATION

A. RESETTING THE MICROPROCESSOR

1. To reset the microprocessor, enter the following sequence into the keypad. The sequence **must be** entered within a 3 second period: 6 gal., 6 gal., 5 gal., 5 gal., 1 gal.

B. SERVICE

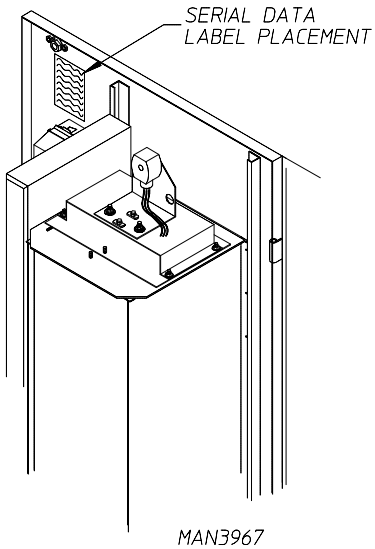
1. Service **must be** performed by a qualified trained technician or service agency. If service is required, contact the distributor from whom the **ADC** equipment was purchased. If the distributor cannot be contacted or is unknown, contact the **ADC** Service Department for a distributor in your area.

NOTE: When contacting the **ADC** Service Department, be sure to give them the correct **model** and **serial numbers** so that your inquiry is handled in an expeditious manner.

C. PARTS

1. Replacement parts **should be** purchased from the distributor from whom the **ADC** equipment was purchased. If the distributor cannot be contacted or is unknown, contact the **ADC** Parts Department for a distributor in your area. Parts may also be purchased directly from the factory by calling the **ADC** Parts Department at (508) 678-9000 or you may FAX in your order at (508) 678-9447.

NOTE: When ordering replacement parts from the **ADC** dealer or the **ADC** factory be sure to give them the correct **model** and **serial numbers** so that your parts order can be processed in an expeditious manner.



SECTION V
WARRANTY INFORMATION

A. RETURNING WARRANTY CARD(S)

1. Before any water vending machine leaves the **ADC** factory test area, a warranty card (**ADC** Part No. 112253) is placed on the left inside wall of the machine. These warranty cards are intended to serve the customer where we record the individual installation date and warranty information to better serve you should you file a warranty claim.

   a. If a warranty card (**ADC** Part No. 112253) did not come with your water vending machine, contact the **ADC** Warranty or Service departments at (508) 678-9000.

B. PARTS

For a copy of the **ADC** commercial warranty covering your particular water vending machine(s), contact the **ADC** distributor from whom you purchased the equipment and request water vending machine warranty form **ADC** Part No. 182700. If the distributor cannot be contacted or is unknown, warranty information can be obtained from the factory by contacting the **ADC** Warranty Department at (508) 678-9000.

NOTE: Whenever contacting the **ADC** factory for warranty information, be sure to have the dryer's **model** and **serial numbers** available so that your inquiry can be handled in an expeditious manner.

C. RETURNING WARRANTY PARTS

ALL water vending machine or parts warranty claims or inquires **should be** addressed to the **ADC** Warranty Parts Department. To expedite processing, the following procedures **must be** followed:

1. No parts are to be returned to **ADC** without prior written authorization ("Return Material Authorization") from the factory.

NOTE: An R.M.A. ("Return Material Authorization") is valid for only sixty (60) days from date of issue.

   a. The R.M.A. issued by the factory, as well as any other correspondence pertaining to the returned parts, **must be** included inside the package with the failed merchandise.

2. Each part **must be** tagged with the following information:

   a. **Model** and **serial numbers** of the water vending machine from which part was removed.

   b. Nature of failure (be specific).

   c. Date of water vending machine installation.

d. Date of part failure.

e. Specify whether the part(s) being returned is for a replacement, a credit or a refund.

NOTE: If a part is marked for a credit or a refund, the invoice number covering the purchase of the replacement part ***must be*** provided.

NOTE: Warranty tags **(ADC** Part No. 450064) are available at "no charge" from **ADC** upon request.

3. The company returning the part(s) must clearly note the complete company name and address on the outside of the package.

4. **ALL** returns **must be** properly packaged to insure that they are not damaged in transit. *Damage claims are the responsibility of the shipper.*

IMPORTANT: No replacements, credits or refunds will be issued for merchandise damaged in transit.

5. **ALL** returns **should be** shipped to the **ADC** factory in such a manner that they are insured and a proof of delivery can be obtained by the sender.

6. **Shipping charges are not the responsibility of ADC. ALL returns *should be* "prepaid" to the factory. Any "C.O.D. or "COLLECT" returns will not be accepted.**

IMPORTANT: No replacements, credits, or refunds will be issued if the claim **cannot** be processed due to insufficient information. The party filing the claim will be notified in writing, either by "FAX" or "CERTIFIED MAIL - Return Receipt Requested," as to the information necessary to process claim. If reply *is not* received by the **ADC** Warranty Department within thirty (30) days from the FAX/letter date, then no replacement, credit, or refund will be issued, and the merchandise **will be** discarded.

SECTION VI

MAINTENANCE SCHEDULE

Maintenance frequency of the vending machine depends on the use of the machine and the feed water quality. The best way to determine when filters and other components should be changed is to keep a log of tests done and the date and gallon reading at which they are done. For additional information on maintenance of the components, please refer to the appropriate sections in the manual.

WARNING: REPLACE COMPONENTS ONLY WITH ORIGINAL FACTORY REPLACEMENTS. COMPONENTS OF DIFFERENT BRANDS MAY NOT WORK PROPERLY WITH OTHER PARTS IN THE MACHINE AND MAY CAUSE DAMAGE TO THEM AND TO THE HEALTH OF YOUR CUSTOMERS.

1. Strainer

Test:	Monitor pressure drop at sediment filter. Clean or replace after 2 psi drop.
Replace/Clean Frequency:	Establish frequency from test, clean at least once a month.
Failure Mode:	Clogged, and cause a pressure drop large enough to shut off the R.O. pump, reducing yield of the R.O. Membrane to a trickle.

2. Sediment Filter

Test:	Visual, change when dirt penetrates more than 2/3 of the filter or when pressure differential is 10 psi or more, whichever is first. CHECK WEEKLY.
Replace/Clean Frequency:	Establish frequency from test, clean at least once a month.
Failure Mode:	Clogged, and cause a pressure drop large enough to shut off the R.O. pump, reducing yield of the R.O. Membrane to a trickle.

3. Carbon Filter

Test:	Use free chlorine test kit. Free chlorine level should be less than .1 ppm. Test at 5 gal., 10,000 gal., 18,000 gal. and after every replacement.
Replace/Clean Frequency:	Replace at any trace of free chlorine (.1 ppm or higher) but no less frequently than once every 20,000 gallons or every three months, whichever comes first.
Failure Mode:	Any chlorine not contained by the carbon filter will leak to the R.O. membrane and cause irreparable damage to it. Always replace the carbon filter before it's time. A damaged R.O. membrane costs over ten times more to replace than a carbon filter.

4. Reverse Osmosis (R.O.) Membrane

Test:	Microprocessor monitors total dissolved solids (TDS removal capability; owner needs to RECORD FLOW RATE OF PRODUCT WATER 24 TO 48 HOURS INTO NEW MACHINE OR MEMBRANE USE. EVERY TWO MONTHS THE FLOW RATE IS TO BE MEASURED and if the rate is lower than the initial rate by at least 15%, temperature compensated, the membrane needs cleaning (see section on R.O. Membrane on page 24).
Replace/Clean Frequency:	Clean at least once a year. See cleaning procedure in section on R.O. membrane. Replace if both acid and alkaline cleaning do not return the flow rate or TDS to normal levels, indicating membrane damage.
Failure Mode:	Clogged, either through mineral or biofouling, thereby reducing yield, or damaged by by chlorine, thereby raising TDS level in the product water.

WARNING: FLUSH ALL REPLACEMENT MEMBRANES BEFORE USING. UNPLUG MACHINE AND FOLLOW STEPS 6 THROUGH 10 OF THE INSTALLATION PROCEDURE REGARDING SYSTEM FLUSHING. (see pages 13 and 14)

ATTENTION: TO REDUCE BIOFOULING, IT IS RECOMMENDED THAT A MINIMUM OF 12 GALLONS BE VENDED EVERY 72 HOURS. THE LESS THE IDLE TIME BETWEEN VENDS, THE LESS LIKELY BIOFOULING IS TO OCCUR IN THE R.O. MEMBRANE AND FILTERS.

5. Vent Filter

Test:	Open cap on filter and visually inspect for dirt accumulation. Check monthly.
Replace/Clean Frequency:	Replace as required and at least once a year. KEEP FILTER DRY. A WET FILTER IS A CLOGGED FILTER.
Failure Mode:	Clogged, and cause the pump to created a vacuum in the water storage tank, which may collapse and crack the tank.

6. Polishing Filter

Test:	Check by tasting the vended water; replace when odor is detected in the dispensed water. Check monthly.
Replace/Clean Frequency:	Replace as required and at least once every three months.

7. Ultraviolet (U.V. Sterilizer)

Test:	Full automatic LED on side of sterilizer indicates strength, and microprocessor will shut vending machine off, if strength of sterilizer light is below the required level. CHECK LED MONTHLY.

Replace/Clean: Clean quartz sleeve and U.V. probe when LED turns yellow or red. If LED does not return to green, replace U.V. lamp. Quartz sleeve and U.V. probe should also be cleaned once every four months and the U.V. lamp replaced at least once a year (see ultraviolet sterilizer section for procedure).

WARNING: NEVER LOOK DIRECTLY INTO THE UNPROTECTED PARTS OF THE U.V. CHAMBER WHEN THERE IS POWER TO THE STERILIZER. SERIOUS BURNS TO THE SKIN AND EYES MAY RESULT.

8. General Maintenance

Test: CHECK FOR LEAKS AFTER THE FIRST DAY OF OPERATION, THEN AFTER THE FIRST WEEK, THEN EVERY MONTH thereafter and reconnect with new teflon tape if necessary. CHECK GENERAL OPERATION OF MACHINE EVERY TWO WEEKS.

Replace/Clean Frequency: CELAN AND DISINFECT CUSTOMER CONTACT SURFACES DAILY (vending bay, nozzle protector and keypad). CLEAN AND DISINFECT DRAIN BAY ONCE A WEEK.

9. Water Quality Test

Test: COLIFORM TEST OF INCOMING AND VENDED WATER EVERY SIX MONTHS. Have test done by a certified testing lab.

The following is a sample maintenance log that should be kept for this machine.

Maintenance procedure	Test result/ cleaning performed	Date/gal reading	Test result/ cleaning performed	Date/gal reading	Test result/ cleaning performed	Date/gal reading	Test result/ cleaning performed	Date/gal reading	Test result/ cleaning performed	Date/gal reading
1) Strainer										
2) Sediment filter										
3) Carbon filter										
4) R.O. Membrane BASE FLOW RATE: _____										
5) Vent filter										
6) Polishing filter										
7) U.V. Sterilizer										
8) Water quality test										

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SECTION VII

FILTER MAINTENANCE

There are three water filters, a strainer and one air filter in every machine. Observe the following procedure when changing filters:

A. WATER FILTER/STRAINER REPLACEMENT

WARNING: FILTER HOUSINGS ARE HEAVY. BE CAREFUL AND ANTICIPATE THE WEIGHT WHEN REMOVING THEM.

1) Before unscrewing the filter or strainer housing to change a filter or strainer, shut off water supplied to the filter and relieve line pressure by opening a nearby valve.

FOR STRAINER CLEANING AND REPLACEMENT (diagram 2) Shut off incoming water supply and relieve pressure opening a nearby valve. Close valve after flow stops.

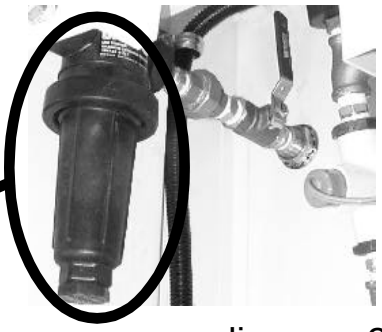


diagram 2

diagram 3

FOR SEDIMENT PREFILTER AND CARBON FILTER replacement, shut off main water valve (diagram 3) and relieve pressure by opening either one of the PVC sampling valves near the filters. Close sampling valve after flow stops.

FOR POLISHING FILTER replacement, shut off the water tank PVC ball valve (diagram 4) and relieve pressure by vending one (1) gallon of water. Unplug dispensing pump from the power outlet (diagram 5) after vend stops.

diagram 4

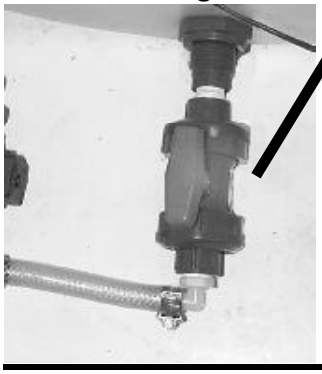
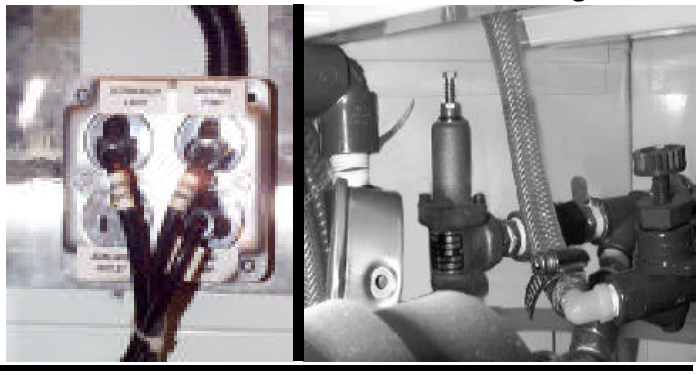


diagram 5



2) Remove and discard old filter.

3) Scrub filter housing clean and rinse with clean water.

4) Insert the new cartridge. There are rubber washers on the top and bottom of the carbon filter. Make sure they stay in place.

5) Filter housing should be screwed on hand tight only. Make sure cartridge filter is lined up with the top and bottom posts in the housing and the o-ring in the housing is clean, properly seated and lubricated.

ATTENTION: O-RING SHOULD BE LUBRICATED WITH FOOD GRADE GREASE ONLY.

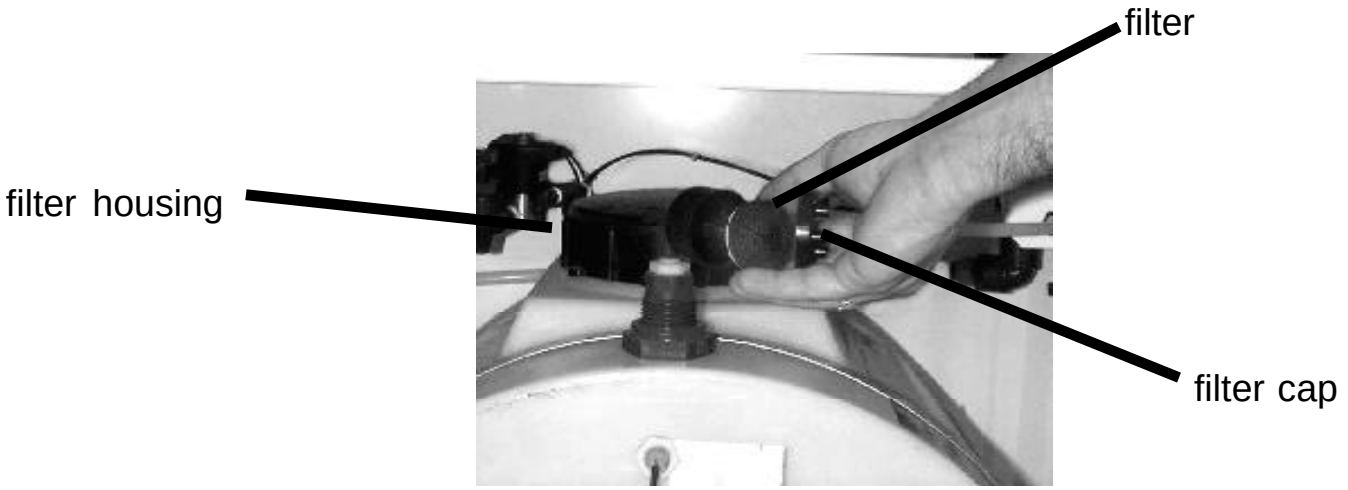
6) Open the water supply valves previously shut off.

AFTER REPLACING THE POLISHING FILTER, plug the dispensing pump back into the power outlet and reset the computer. Then purge air trapped in the system by vending water at the bay until the amount of water dispensed is what it should be. Air trapped in the tubings during filter replacement will cause machine to vend less than it should.

7) Run system and check for leaks around the housing. Perform a free chlorine test if the carbon filter is replaced to check if any leakage around the cartridge is present.

B. AIR FILTER INSPECTION AND REPLACEMENT

1) Cap on filter housing can be snapped off for maintenance check. Remove the sponge-like coarse filter in the housing and inspect filter paper inside for dirt (diagram 6). Replace filter when the white filter paper turns grayish or when coarse filter is clogged



2) To replace, unscrew the complete housing from the elbow fitting and discard. Wrap teflon tape on the threads of the new housing and screw housing on hand tight.

SECTION VIII

REVERSE OSMOSIS (R.O.) MEMBRANE

In normal operation, a reverse osmosis membrane can become fouled by microorganisms, suspended solids and minerals in the water. It is time to clean the membrane when these elements cause a 15% drop in the product water flow rate, after compensating for temperature differences. It is important, therefore, to establish a base flow rate of a new membrane so future measurements can be compared.

This base measurement is taken during the first 24 to 48 hours into the operation of a new membrane. Every two months thereafter, the rate of flow of the product water from the membrane should be measured and compared. It is also important to measure the temperature of the incoming water as the flow rate decreases with temperature decrease. This is normal and should not be confused with membrane fouling.

A. PRODUCT WATER FLOW RATE MEASUREMENT

Tools required:

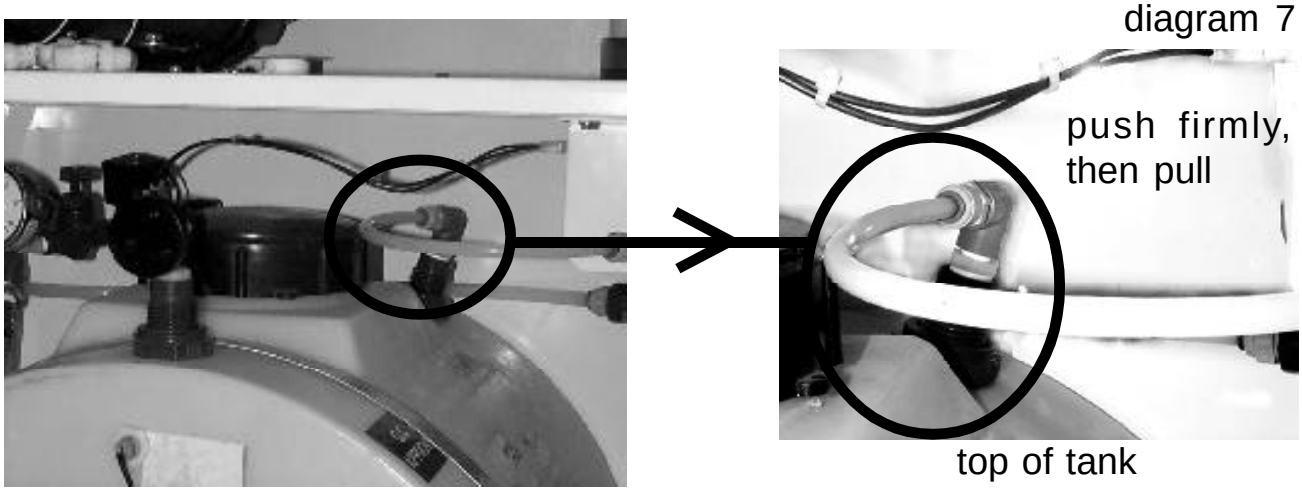
Thermometer for measuring water temperature
One (1) Gallon Container
Stop Watch Calculator

1. We need to establish the incoming water temperature. Check if the R.O. pump on the cabinet base is running. The pressure gauge at the pump should indicate about 160 psi. If the pump is not running, vend water until the pump starts. System does not produce water until water level is below the refill level switch. Wait until pump has run for at least one minute and then take a sample of water from the sampling valve prior to the sediment filter and measure its temperature.

2. Vend three gallons of water to allow the system to charge. During vend, have a stop watch and a gallon jug ready and disconnect the white 3/8" O.D. tubing going into the water storage tank. To disconnect tubing, push down on the ring in the fitting and then pull at the tubing (diagram 7). The water coming out of this tube is the product water from the R.O. membrane. Start the stop watch and measure the time (in seconds) to fill the gallon container with this water.

3. Replace tubing by pushing it back into the fitting completely.

diagram 7



4. Find the temperature correction factor (TCF) from Table 1 on page 26.

5. The base flow rate can be calculated as follows:

BASE FLOW RATE = (TIME IN SECONDS TO FILL ONE GALLON)/(TCF)

EXAMPLE: TCF from table for 68º F is 1.19 and it takes 71 seconds to fill a gallon
base flow rate = 59.66

The base flow rate is the flow rate during the first 24 to 48 hours of the operation of a new membrane and machine. It may be different for every membrane. Write down the base flow rate for your particular machine on your maintenance sheet.

6. We recommend that the product water flow be checked every two (2) months. Follow steps 1 through 4 and obtain a new TCF and a new time (in seconds) to fill one (1) gallon. With the new TCF find the cleaning limit. The membrane needs cleaning when the new time to fill one (1) gallon exceeds the cleaning limit.

CLEANING LIMIT = (new TCF) x (BASE FLOW RATE) x 1.17

EXAMPLE: If the new temperature is 79º F and it now takes 63 seconds to fill a gallon, TCF from Table 1 for 79º F is 0.97 and from the above example, the base flow rate for our membrane is 59.66,

cleaning limit = 0.97 x 59.66 x 1.17
= 67.71

Since it only takes 63 seconds to fill one (1) gallon (less than cleaning limit of 67.71), cleaning is not required yet. It would, however, be prudent to order the cleaning kit at this time.

TABLE 1:
TEMPERATURE CORRECTION FACTOR (TCF)

DEGREES F	TCF	DEGREES F	TCF
40	2.69	76	1.02
41	2.58	77	1.00
42	2.47	78	0.98
43	2.36	79	0.97
44	2.27	80	0.95
45	2.20	81	0.93
46	2.13	82	0.92
47	2.07	83	0.90
48	2.01	84	0.88
49	1.95	85	0.87
50	1.89	86	0.85
51	1.83	87	0.84
52	1.77	88	0.82
53	1.71	89	0.81
54	1.66	90	0.79
55	1.63	91	0.78
56	1.59	92	0.76
57	1.55	93	0.75
58	1.51	94	0.74
59	1.47	95	0.73
60	1.43	96	0.72
61	1.38	97	0.71
62	1.36	98	0.70
63	1.33	99	0.68
64	1.30	100	0.67
65	1.27	101	0.66
66	1.25	102	0.65
67	1.22	103	0.64
68	1.19	104	0.63
69	1.17	105	0.62
70	1.15	106	0.61
71	1.12	107	0.60
72	1.10	108	0.59
73	1.09	109	0.58
74	1.07	110	0.57
75	1.04	111	0.56

B. MEMBRANE CLEANING

WARNING: HANDLE CARTRIDGES WITH CARE. WEAR EYE PROTECTION, GLOVES AND PROTECTIVE CLOTHING WHEN INSTALLING AND REMOVING CLEANING CARTRIDGES.

ATTENTION: WHETHER THE R.O. MEMBRANE NEEDS ACID OR ALKALINE CLEANING WILL DEPEND ON THE TYPE OF FOULANT. ACID CLEANING REMOVES MINERAL SCALING AND ALKALINE CLEANING REMOVES ORGANIC FOULING. IT IS RECOMMENDED THAT ACID CLEANING BE PERFORMED FIRST EVEN IF ALKALINE CLEANING IS DESIRED. IF SYSTEM PERFORMANCE RECOVERS WITH ACID CLEANING, THEN ALKALINE CLEANING IS NOT NECESSARY.

ATTENTION: YOUR DISTRIBUTOR SELLS A CLEANING STARTER KIT, WHICH INCLUDES A 20" HOUSING, TUBING, AN ACID CLEANING CARTRIDGE, AND AN ALKALINE CLEANING CARTRIDGE, FOR SUBSEQUENT CLEANINGS, YOU CAN REUSE THE HOUSING AND THE TUBING AND ORDER ONLY THE CLEANING CARTRIDGES. ON THE CLEANING CARTRIDGE, THE SIDE WITH THE WASHER IS THE SIDE THAT FACES UP.

1. Remove the cap on the back pressure valve and loosen the lock nut on the adjusting bolt (diagram 8).

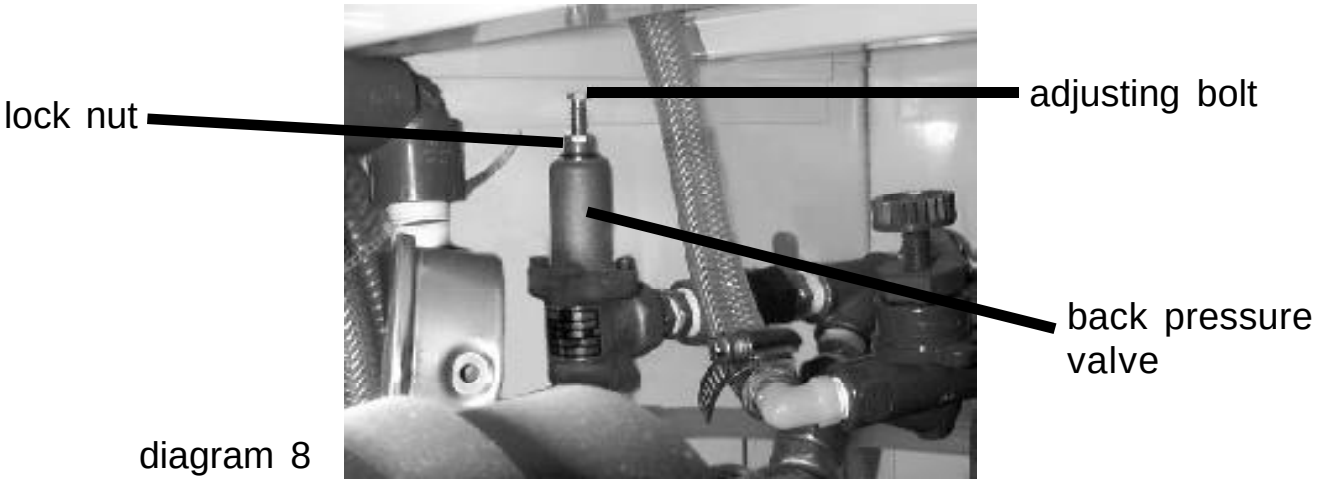


diagram 8

2. Vend enough water from the bay to drop water level to the refill level. This will cause the R.O. pump to operate.

3. With the R.O. Pump (located at the base of the cabinet, diagram 9) running, turn adjusting bolt on the back pressure valve until the pressure shown on the pump gage drops to between 20 and 50 psi. Tighten locknut and replace cap on the back pressure valve. (see diagram 10)

4. Shut off main (diagram 11) and relieve system pressure by opening the PVC sampling valve after the carbon filter (diagram 12). Close sampling valve after the flow stops.

diagram 9

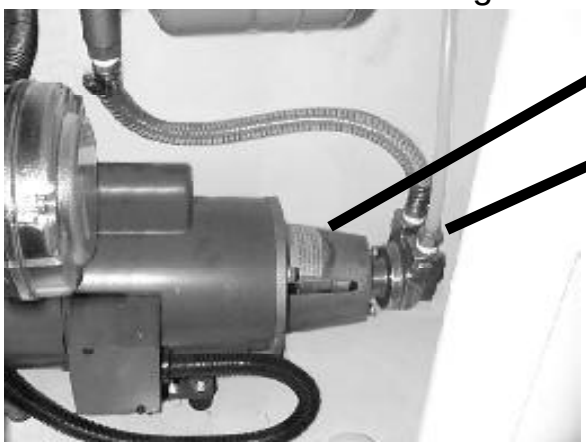
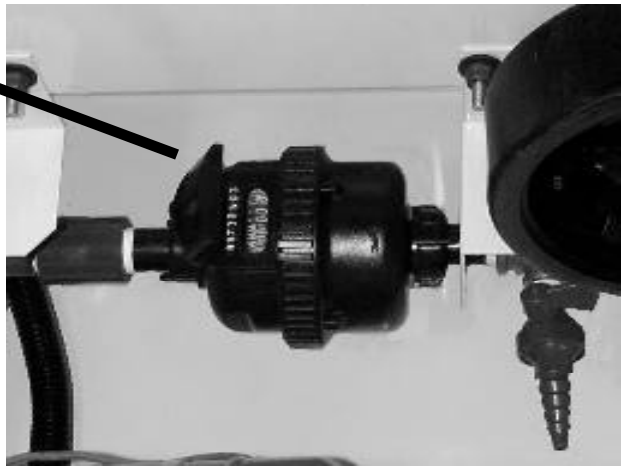


diagram 10

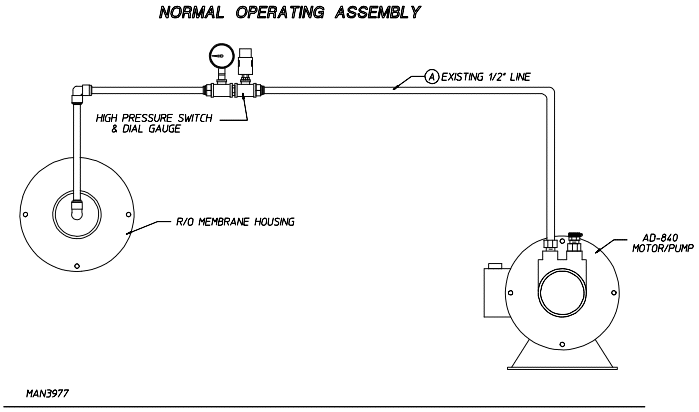
diagram 11

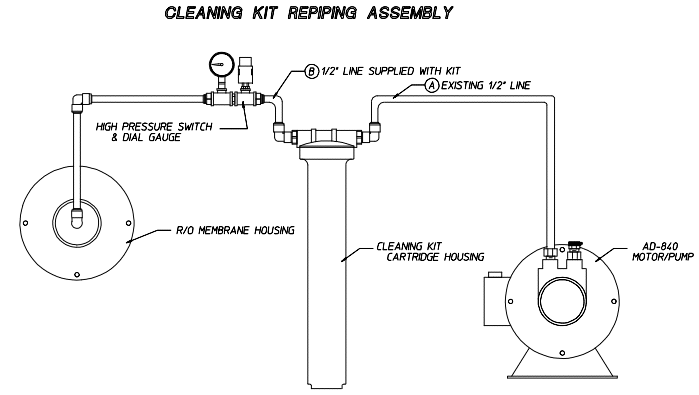
water meter

diagram 12



5. Unplug 1/2" OD tubing at the outlet of the R.O. Pump and plug into the OUTLET of the 20" filter housing. See section C of "Miscellaneous Maintenance Techniques" (page 39) for instructions on tubing removal and assembly. Plug the 1/2" OD tubing at the INLET of the 20" filter housing into the outlet of the pump.





6. Detach the 3/8" OD tubing entering the water storage tank (product tubing). Attach the extended length 3/8" OD tubing supplied in the kit to the cluster and direct the other end of this tubing into the drain bottle.

7. Vend enough water from either bay to cause the R.O. Pump to operate. The machine will not begin to produce water until level is below the refill level switch.

8. Open the main water valve and watch the R.O. Pump. The pump will start in 30 seconds. Wait 30 to 40 seconds and shut off the main water valve.

9. Unplug the vending machine and put up a sign for" cleaning, do not use." Let the membrane soak in the solution for 8 to 16 hours.

10. Open PVC sampling valve after the carbon filter for a few seconds and close it. Remove the 20" housing and reattach the original 1/2" tubing to the outlet of the R.O. pump. Clean and save the 20" housing for the next cleaning and discard the cartridge.

11. Plug vending machine back in and open main water valve. The machine will go through its purge cycle automatically. Wait until the R.O. Pump has run for **AT LEAST TEN MINUTES** before removing cap and loosening the locknut on the back pressure valve. With the pump running, adjust the pressure valve until the pressure on the pump gage reads 160 psi. Tighten the locknut and replace the cap on the valve.

12. Shut off main water valve. Remove and save the extended length 3/8" OD tubing for future cleanings. Reattach the original 3/8" OD tubing to the sampling valve cluster. Open main water valve.

13. Reset the microprocessor.

14. Wait 24 to 48 hours and measure the base flow rate of the cleaned membrane as detailed in steps 1 through 5 of section A (pages 24 to 25). The new base flow should be similar to the original one. If not, alkaline cleaning should be performed. The procedure for alkaline cleaning is the same as for acid cleaning except an alkaline cleaning cartridge is used instead.

C. STORAGE AND SHIPPING OF MEMBRANE

ATTENTION: IF THE MEMBRANE IS TO BE SHIPPED OR IF THE MACHINE IS TO BE LEFT IDLE FOR FIVE DAYS OR MORE, PRESERVATIVES MUST BE ADDED TO THE R.O. MEMBRANE TO KEEP IT MOIST AND FREE FROM BACTERIAL GROWTH.

WARNING: CHLORINE WILL IRREPARABLY DAMAGE THE R.O. MEMBRANE.

1. Vend six gallons of water into a container for mixing the preservative solution. Remember this water is going into the R.O. Membrane and cannot contain chlorine. Water from the sampling valve **AFTER** the carbon filter is also acceptable.

WARNING: OBSERVE ALL RELEVANT PRECAUTIONS WHEN HANDLING CHEMICALS. WEAR PROTECTIVE CLOTHING, GLOVES AND EYE PROTECTION.

2. Disconnect electrical power to the machine.

3. Shut off main water valve at the inlet of the machine.

4. Relieve pressure in the system by opening the sampling valve after the carbon filter. Close it after flow stops.

5. Disconnect 1/2" O.D. tubing at the outlet of the R.O. Pump (diagram 13) and at the inlet of the back pressure regulator (diagram 14). Disconnect the tubing by depressing the ring on the fitting and then pulling at the tubing. Water will begin to flow out from the bottom tubing. Drain the R.O. Housing of water.

6. Fill membrane and housing with a 2% by weight of food grade sodium bisfulfite solution. In months when there is a possibility of freezing, add 20% by weight of glycerine to the solution. This is the equivalent of 2.7 ounces of sodium bisulfite and 27 fluid oz. of glycerine for every gallon of water.

diagram 13

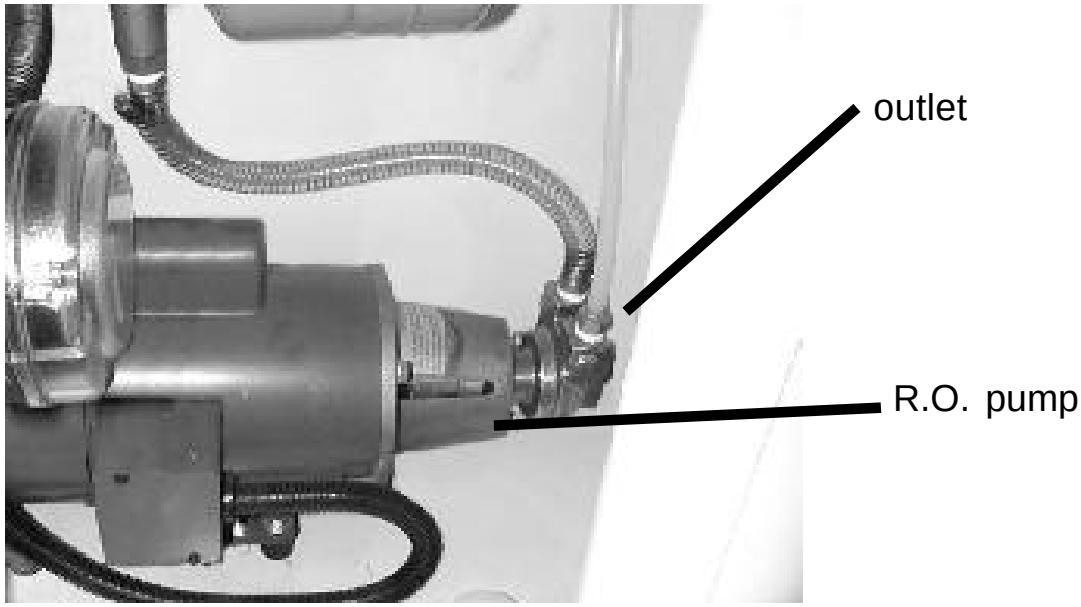
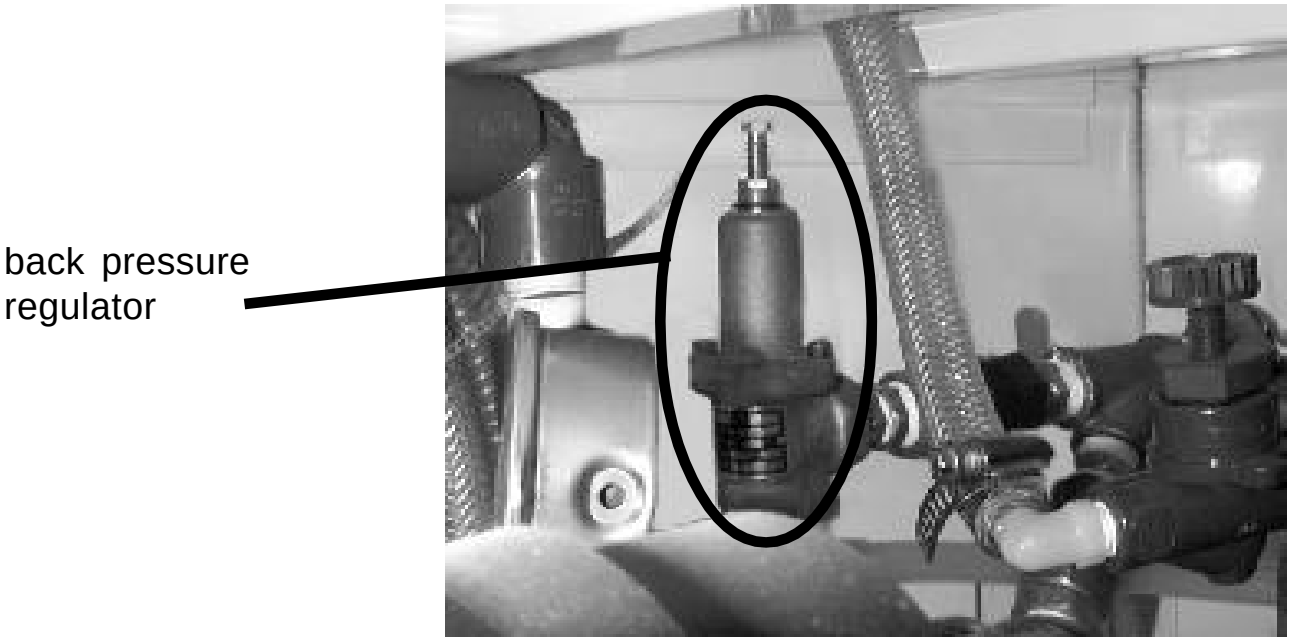


diagram 14



7. Plug all tubing and if shipping, put both membrane and housing into a sealed bag to prevent leakage.

WARNING: FLUSH ALL PRESERVATIVES IN THE MEMBRANE BEFORE USING MEMBRANE AGAIN. UNPLUG MACHINE AND FOLLOW STEPS 6 THROUGH 10 OF THE INSTALLATION PROCEDURE (PAGES 13 THROUGH 14) REGARDING SYSTEM FLUSHING. IT IS IMPERATIVE THAT THE PRESERVATIVES ARE COMPLETELY FLUSHED AND DISCARDED AS SOME INDIVIDUALS MAY BE ALLERGIC TO THEM.

SECTION IX

ULTRAVIOLET (U.V.) STERILIZER

The **UV (ultraviolet) sterilizer** contains a true **UV sensor** that continually monitors the sterilization power of the unit. When the L.E.D. (light emitting diode) display of the sensor changes from green to yellow or red, it is time to clean the **quartz sleeve** and **UV sensor probe**. If the cleaning ***does not*** return the L.E.D. display to green, replace the **UV lamp**. The average life of a **UV lamp** is one year of continuous use. It is also recommended that the **quartz sleeve** and **UV sensor probe** be cleaned once every four months.

WARNING: **NEVER LOOK DIRECTLY INTO THE UNPROTECTED PARTS OF THE *UV CHAMBER* WHEN THERE IS POWER TO THE *UV STERILIZER*. SERIOUS BURNS TO THE EYES AND SKIN MAY RESULT. ALWAYS UNPLUG POWER TO THE *UV STERILIZER* BEFORE WORKING ON IT.**

NOTE: The use of other type of cleaners may be necessary depending upon the minerals or contaminants present.

Vinegar and/or isopropyl alcohol ARE NOT RECOMMENDED for cleaning because they can leave behind a residue that can block the ultraviolet rays from the *UV lamp* and *quartz sleeve*.

NOTE: If the **UV lamp and quartz sleeve** requires cleaning, the **UV sensor probe** will likely require cleaning as well. Refer to the **UV sensor probe** cleaning procedures.

diagram 15

U.V. LIGHT and QUARTZ SLEEVE REPLACEMENT AND CLEANING INSTRUCTIONS

Step 1: Disconnect the power supply and shut off the water supply to the U.V. (ultraviolet) sterilizer. Drain the water from the U.V. chamber.

Step 2: Disconnect the U.V. lamp harness (refer to the illustration [diagram 16] below). Insert a small size screwdriver - *very carefully* - into one of the slots at the side of the black plastic sleeve bolt and *apply gentle pressure* to pry open the snap-in cover of the U.V. lamp harness plug. DO NOT PULL ON THE CORD TO REMOVE THE U.V. LAMP HARNESS, as it will shorten the useful life of the U.V. lamp.

Step 3: Using a small screwdriver, loosen the black plastic sleeve bolt (refer to the illustration [diagram 17] above). Unscrew by hand and *carefully extract* the U.V. lamp and quartz sleeve from the U.V. chamber.

diagram 16

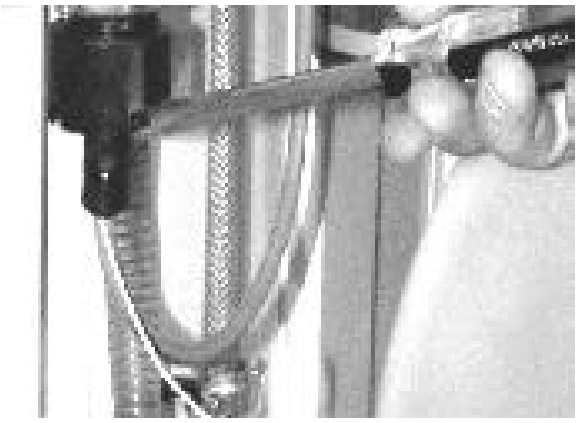
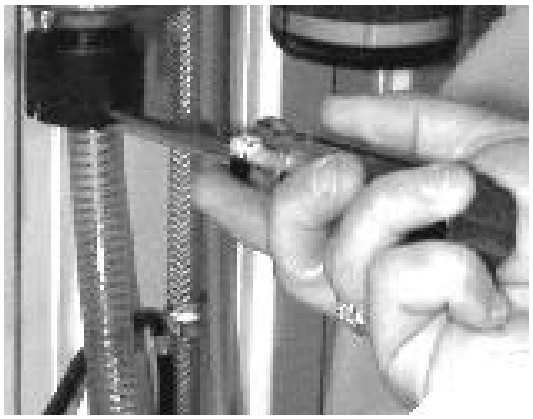


diagram 17



Step 4: Remove the new U.V. lamp and quartz sleeve from the packaging *very carefully*. **IT IS RECOMMENDED** that the new U.V. lamp and quartz sleeve be cleaned prior to assembly to ensure maximum performance. Refer to the instructions for cleaning the **U.V. lamp** and **quartz sleeve. AVOID TOUCHING THE U.V. LAMP and QUARTZ SLEEVE GLASS WITH FINGERS** as skin oils *will impair* the desired ultraviolet radiation. **HANDLE THE U.V. LAMP and QUARTZ SLEEVE BY THE ENDS ONLY.**

NOTE: After the **U.V. (ultraviolet) sterilizer** has been in use for some time the O-ring may lose its shape or may adhere to the **U.V. lamp and quartz sleeve**. A new O-ring (original manufacturer's replacement) **IS STRONGLY RECOMMENDED**. Ensure the O-ring and seating area are clean prior to assembly.

Step 5: Place the new O-ring onto the U.V. lamp and quartz sleeve approximately 2 inches from the electrical pins of the U.V. lamp and quartz sleeve.

Step 6: Align the U.V. lamp and quartz sleeve into the black plastic sleeve bolt locking position, then insert into the U.V. chamber. Thread the black plastic sleeve bolt by hand until it begins to seat on the O-ring, an additional 1/4 turn may be necessary.

NOTE: DO NOT OVERTIGHTEN, as over-compression of the O-ring *will not* improve the seating.

Step 7: Reconnect the U.V. lamp harness. Secure the U.V. lamp harness in place by applying pressure to the rigid black snap-in cover disk so that the disk snaps fully into the black plastic sleeve bolt.

Step 8: Restore the water supply and *check for leaks*.

Step 9: Reconnect the power supply, and check the green monitor light on the side of the case for a steady glow.

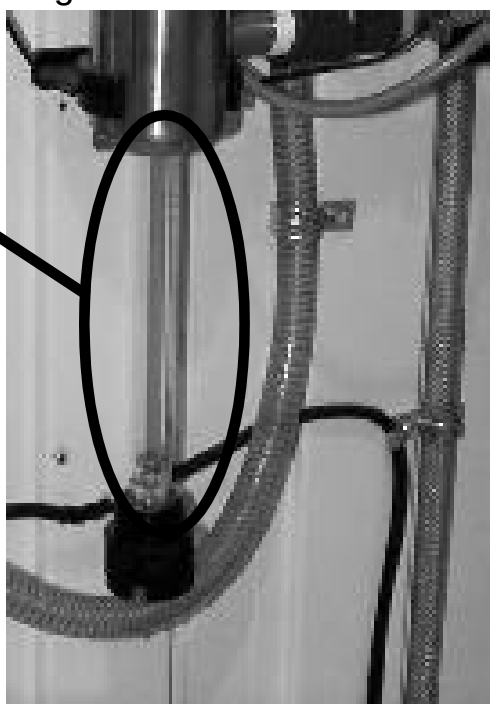
NOTE: The alarm buzzer will sound for a few seconds until the U.V. lamp and quartz sleeve reaches operating conditions.

Step 10: Enter the new U.V. lamp and quartz sleeve replacement date on the replacement label provided and attach the label to the U.V. chamber.

THE U.V. SENSOR PROBE IS FRAGILE and *MUST BE* HANDLED VERY CAREFULLY. The quartz window in the end of **U.V. sensor probe** is made of **high quality glass** and ***may break or chip if mishandled***. **HANDLE THE U.V. SENSOR PROBE BY THE BRASS PARTS ONLY. DO NOT PULL** on the attached cord or the useful life of the **U.V. sensor probe** may be shortened.

diagram 18

diagram 19



THE U.V. SENSOR PROBE IS FRAGILE and *MUST BE* HANDLED VERY CAREFULLY. The quartz window in the end of U.V. sensor probe is made of high quality glass and *may break or chip if mishandled*. **HANDLE THE U.V. SENSOR PROBE BY THE BRASS PARTS ONLY. DO NOT PULL** on the attached cord or the useful life of the U.V. sensor probe may be shortened.

U.V. SENSOR PROBE CLEANING INSTRUCTIONS

Step 1: Disconnect the power and shut off the water supply to the U.V. sterilizer. Drain the water from the U.V. chamber.

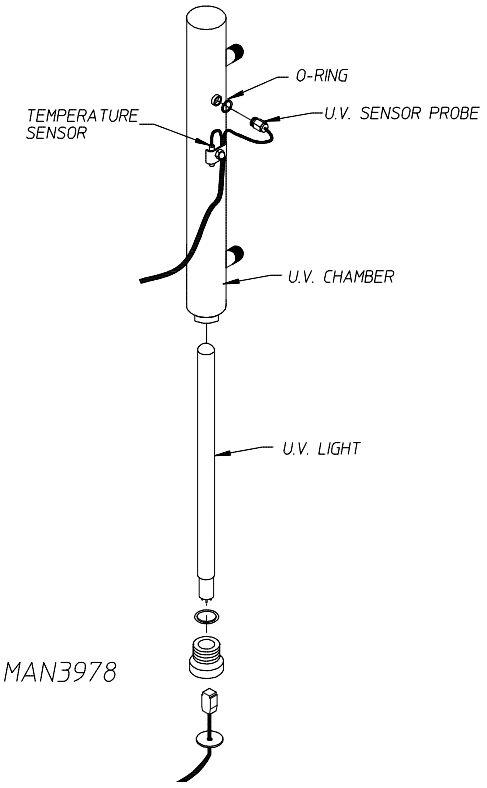
Step 2: Undo the large brass nut holding the U.V. sensor probe in place. A wrench will be required to loosen the nut. Remove the probe with the o-ring. (refer to diagram 20)

Step 3: Clean the quartz window of the U.V. sensor probe with a commercial scale remover (such as Lime-Away or CLR) on a high quality lint-free cotton swab. When using an acidic solution (scale remover) for cleaning, follow the manufacturer's directions for safety. Inspect the window visually to ensure that it is clean, clear and dry.

Step 4: Inspect the rest of the U.V. sensor probe and the metal fitting it inserts in to. Perform any required cleaning. **DO NOT ATTEMPT TO TIGHTEN, LOOSEN, or OPEN THE SEALED U.V. SENSOR PROBE. CONTAMINATION or LOSS OF FUNCTION MAY RESULT.**

Step 5: Inspect the O-ring seal on the U.V. sensor probe and *replace it if damaged or deterioration it found*. **A NEW O-RING (original manufacturer's replacement) IS STRONGLY RECOMMENDED.**

diagram 20



removal of the U.V. sensor probe

Step 6: Assemble the U.V. sensor probe into the U.V. chamber. Tighten the brass nut *finger tight*, then using a wrench, tighten an additional 1/4 turn may be necessary.

DO NOT OVERTIGHTEN, AS DAMAGE TO THREADS MAY RESULT. USE OF PLIERS, PIPE WRENCH, CHANNEL LOCKS, OR VISE GRIPS MAY DAMAGE THE BRASS NUT AND THE THREADED PROBE PORT IN THE **REACTOR CHAMBER.** (SUCH DAMAGE IS NOT COVERED UNDER WARRANTY.)

Step 7: Restore the water supply and check for leaks.

Step 8: Reestablish power to the unit, check the green monitor light on the side of the case for a steady glow.

NOTE: The alarm buzzer will sound for a few seconds until the U.V. lamp and quartz sleeve reaches operating conditions.

U.V. SENSOR PROBE REPLACEMENT INSTRUCTIONS

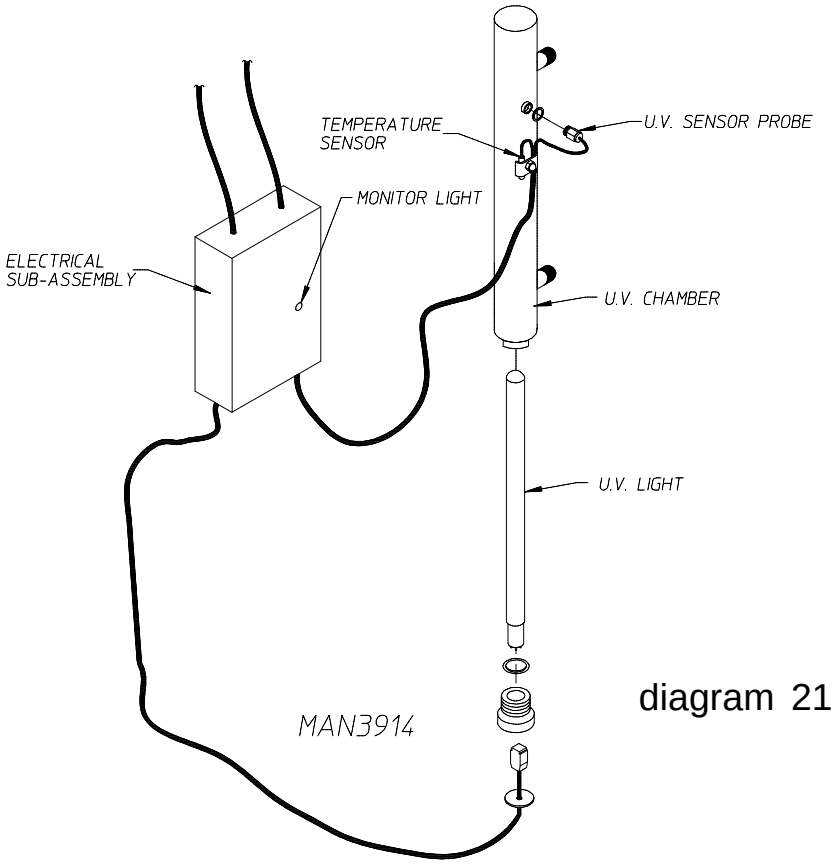


diagram 21

Step 1: Disconnect the power and water supply to the U.V. sterilizer. Drain the water from the U.V. chamber.

a) Remove the two screws, one from each end of the electrical subassembly to remove the cover.

b) Unplug the U.V. sensor probe interface board along with the temperature sensor plug from the relay board.

c) Remove the black wire of the U.V. sensor harness from the ground lug by removing the 3/8" nut.

Step 2: Undo the large brass nut holding the U.V. sensor probe in place also remove the temperature sensor from the U.V. chamber. (refer to illustration [diagram 21]). Use a 7/16" wrench to remove the acorn nut and clip holding the U.V. sensor harness and temperature sensor in place. (refer to illustration [diagram 21]). A 15/16" wrench will be required to loosen the brass nut. Remove the U.V. sensor probe with the O-ring.

Step 3: Unplug the U.V. sensor probe interface board along with the temperature sensor plug from the relay board found in the internal component area.

Step 4: Remove the U.V. sensor probe assembly from the unit.

Step 5: Prior to the replacement of the new U.V. sensor probe assembly clean the quartz window of the replacement U.V. sensor with a commercial scale remover (such as Lime-Away or CLR) on a high quality lint-free cotton swab. When using an acidic solution (scale remover) for cleaning, follow the manufacturer's directions for safety. Inspect the window visually to insure that it is clean, clear and dry.

Step 6: Inspect the rest of the U.V. sensor probe and the metal fitting it inserts into. Perform any other required cleaning prior to the U.V. sensor probe replacement. Do not attempt to tighten, loosen or open the sealed U.V. sensor probe. Contamination or loss of function may result.

Step 7: Reconnect the U.V. sensor probe interface board along with the temperature sensor plug to the relay board.

Step 8: Electrical subassembly cover replacement reverse (step 1, parts A through C).

Step 9: Assemble the U.V. sensor probe into the U.V. chamber. Tighten the brass nut finger tight (an additional 1/4 turn may be necessary).

Step 10: Replace the temperature sensor (flat side towards the chamber). It is required to replace the clip and acorn nut to hold the U.V. sensor harness along with the temperature sensor firmly against the U.V. chamber. Tighten with a 7/16" wrench.

Step 11: Restore the water supply and check for leaks.

Step 12: Reestablish power to the unit, check the green monitor light on the side of the case for a stead glow.

NOTE: The alarm buzzer will sound for a few seconds until U.V. lamp and quartz sleeve reaches operating conditions.

SECTION X

MISCELLANEOUS MAINTENANCE TECHNIQUES

A. DRAIN BAY CLEANING

1. Unplug power to vending machine.

2. Loosen the four screws that hold down the serving shelf (diagram 22).

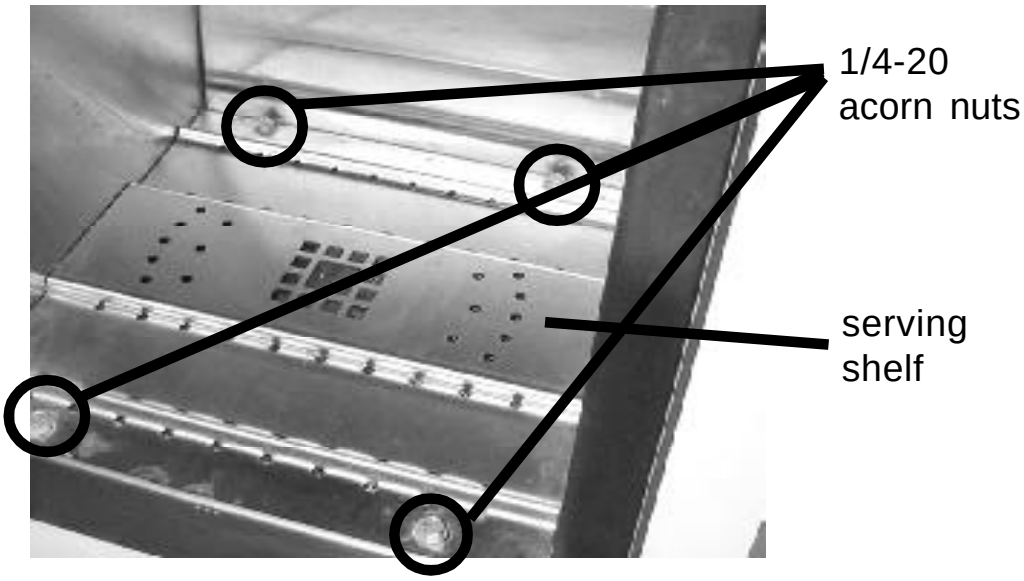


diagram 22

3. Remove grate to gain access for cleaning.

4. Apply power to vending machine and reset microprocessor after cleaning and replacing grate.

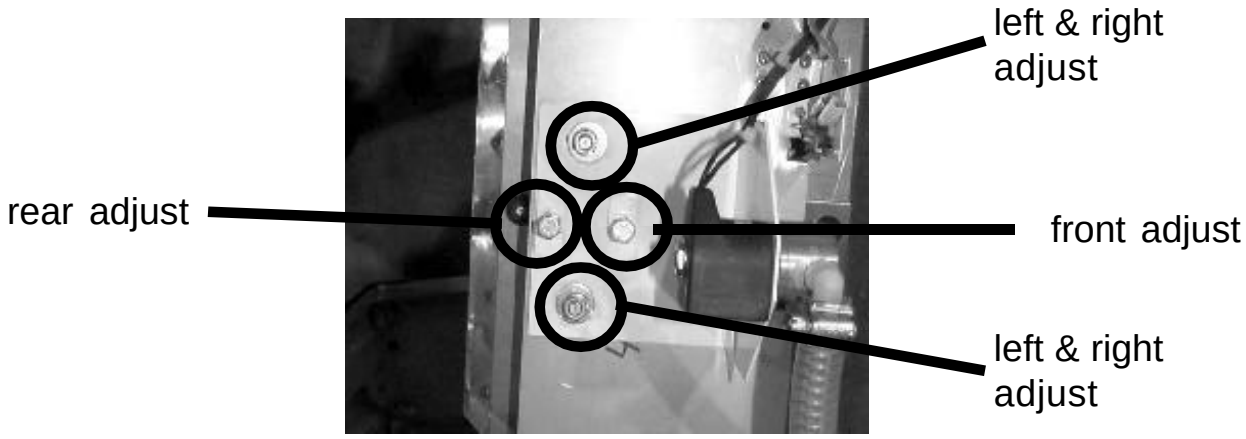
B. VENDING NOZZLE ADJUSTMENT

Dispensing nozzle can be adjusted to direct water into the center of the bay. Nozzles come from the factory already adjusted. If flow is severely off center, it may indicate the machine is not level. Check machine before adjusting nozzles.

1. Determine from the front of the machine which way the nozzle is aiming at. Let's say it is too far right and forward.

2. Open vending machine computer door and stand behind it. Facing the nozzle adjustment bolts, loosen the left and right mounting bolts (diagram 23). Tap solenoid mounting bracket to YOUR LEFT to correct a flow too far to the right and vice versa. (when looking at flow from front of door)

diagram 23



3. Front and read adjustments are corrected by loosening and tightening the front and rear bolts. Loosen the lock nuts on the adjusting bolts. If flow is too far forward, loosen the bolt FARTHER FROM YOU. If bolt is already at the end of its adjustment, then tighten the other bolt. Tighten left sand right mounting bolts before checking flow. Tighten lock nuts when adjustment is completed.

C. TUBING AND FITTING REPLACEMENT TECHNIQUE

There are two types of tubing attachment methods used on this vending machine. One is the push-in type and the other is the plastic clamp type.

PUSH-IN TYPE:

To remove a push-in tubing, push ring on fitting and pull on tubing. (diagram 24 on next page) To reattach, firmly push tubing back into fitting. If tubing-fitting joint leaks because of frequent removal, cut 1/2" off the tubing and reattach.

diagram 24

PIPE JOINTS:

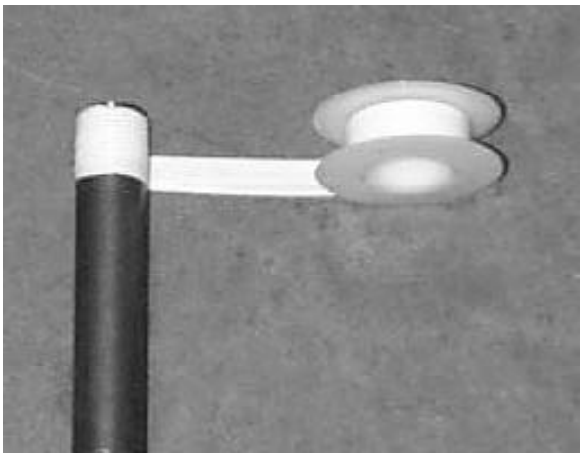
There are pipe threads on a variety of components in the vending machine. The threads on them are sealed with teflon tape to prevent water leakage. If any of these components have been taken out for servicing or if the joint leaks, new teflon pipe thread seal tape needs to be put on.

ATTENTION: USE A STRAP WRENCH TO TIGHTEN OR LOOSEN PLASTIC FITTINGS. DO NOT USE A PIPE WRENCH AS ITS TEETH MAY DAMAGE THE PART.

1. Remove old teflon tape from component or fitting. Be careful not to allow any tape fragments to fall into tubings or fittings as they may get caught in solenoids and pumps, which causes damage to them.

2. Teflon tape should be wrapped around male threads only. Starting at the second thread from the edge, wrap new teflon tape at a clockwise direction, with the threaded end facing you). Overlap half the width of each wrap and circle the threads a minimum of two times. (see diagram 25)

diagram 25



3. Screw component or fitting back into its place. For anything plastic, hand tight plus one to 1 1/2 turns is enough. Check for leaks.

SECTION XI

TROUBLESHOOTING

NOTE: WATER STORAGE TANK WILL NOT FILL UP COMPLETELY. THERE ARE SEVERAL INCHES OF SPACE BETWEEN WATER TANK COVER AND "FULL" WATER LEVEL.

NOTE: THERE IS A 30 SECOND TIME DELAY BETWEEN THE SIGNAL TO START THE R.O. PUMP AND THE ACTUAL RUNNING OF THE PUMP. THIS IS TO PROTECT THE PUMP FROM TURNING ITSELF ON AND OFF REPEATEDLY IN A SHORT TIME AND BURNING ITSELF OUT IN SITUATIONS OF LOW INLET PRESSURE OR HIGH OUTLET BACK PRESSURE.

PROBLEM

1. Water storage tank is not full, and R.O. pump is not running.

CAUSE

A. No water supplied to pump.
B. No power.
C. Excessive outlet pressure. Pressure gauge at the outlet of the pump will indicate 190 psi or more.

CORRECTION

A. Check if there is water going into the machine. Open inlet ball valve if it is shut off. Check operation of inlet solenoid and replace if necessary.

B. Check to see if the machine is plugged in. Check fuses. Also, machine will not run if any one of the three safety switches is activated indicating overflow:

i. at the base of the machine,
ii. at the top of the reservoir tank,
iii. closest to top in the water tank.

Correct overflow situation

C. Check for obstructions in line beyond the pump. Check drain line.

WARNING: THE R.O. PUMP WILL NOT RUN IF THERE IS MORE THAN 190 PSI IN THE LINES BEYOND IT. THIS MEANS THAT BETWEEN THE PUMP AND THE OBSTRUCTION THERE IS AT LEAST 190 PSI IN THE TUBINGS. TAKE ALL PRECAUTIONS AND WEAR EYE PROTECTION WHEN WORKING ON THE PROBLEM.

NOTE: IF SAFETY SWITCH AT THE VERY TOP OF THE WATER TANK IS ACTIVATED, IT INDICATES THE NORMAL "TANK FULL" SWITCH IS NOT FUNCTIONING PROPERLY. REPLACE "TANK FULL" SWITCH (SECOND FROM THE TOP OF THE WATER TANK).

PROBLEM

2. R.O. pump turns on, but without completely filling the tank, shuts itself off and 30 seconds or more later turns itself on again, and repeats the cycle. (Check this if machine is constantly running out of water even though not much is dispensed.)

3. Drain pump will not stop.

4. Drain pump will not run.

5. Drain pump runs but will not pump water.

CAUSE

2. A. Inadequate water inlet pressure or clogged strainer if the gauge before sediment filter is 25 psi or less with the R.O. pump running.
   B. Clogged filters if gauge after sediment filter drop to 20 psi or less after starting at a higher value. Pressure differential between the two gauges at the sediment filter is 10 psi or more.

3. A. Failed or jammed float switch at the bottom of the reservoir tank.

4. A. Drain pump needs about 1" of water before it is activated. If there is enough water, check power to pump.

5. Failed pump.

CORRECTION

2. A. Clean strainer
   B. Unless pressure drop is transient, a bigger pipe may be needed to bring water to the machine. A booster pump capable of 4 gpm at 35 psi supplying water to the machine is also acceptable.
   C. Replace sediment filter. If problem persists replace carbon filter.

3. A. Replace switch/remove obstacle.

4. A. Plug pump in.
   B. Replace/reconnect float switch.
   C. Replace pump.

5. Replace pump.

PROBLEM

6. Dispensing pump runs but will not pump water.

7. Dispensing nozzle leak.

CAUSE

6. A. Water tank valve shut off.
   B. Failed pump.
   C. Failed dispensing/recirculation solenoids.

7. Dirt in solenoid.

CORRECTION

6. A. Open valve.
   B. Replace pump.
   C. Replace solenoid.

7. Clean solenoid.

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4- 09/28/00-50

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