BarnsteadInternational

Diamond™ TII

Type II water system

Operation Manual

Model No.	Description	Voltage
D14031	12 LPH	100V - 240V
D14041	24 LPH	100V - 240V

LT1403X8 • 10/05/06

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Safety Information

Alert Signals

Warning
Warnings alert you to a possibility of personal injury.

Caution
Cautions alert you to a possibility of damage to the equipment.

Note
Notes alert you to pertinent facts and conditions.

Note
The UV lamp contains mercury. If broken or no longer needed, do not dispose of the UV lamp in the trash. Recycle or dispose of the UV lamp as hazardous waste.

Your Barnstead International DIamond TII Type II water system has been designed with function, reliability, and safety in mind. It is your responsibility to install it in conformance with local electrical codes. This manual contains important safety information. You must carefully read and understand the contents of this manual prior to the use of this equipment. For safe operation, please pay attention to the alert signals throughout the manual.

Water purification technology employs one or more of the following: chemicals, electrical devices, mercury vapor lamps, steam and heated vessels. Care should be taken when installing, operating or servicing Barnstead products. The specific safety notes pertinent to this Barnstead product are listed below.

Warnings

To avoid electrical shock, always:

1. Use a properly grounded electrical outlet of correct voltage and current handling capacity.

2. Do not locate the DIamond TII directly over equipment that requires electrical service. Routine maintenance of this unit may involve water spillage and subsequent electrical shock hazard if improperly located.

3. Replace fuses with those of the same type and rating.

4. Do not disassemble water lines or remove cartridges where spilled water could contact equipment that requires electrical service. Electrical shock hazard could result.

5. Power unit OFF before plugging in or unplugging unit.

6. Disconnect from the power supply prior to maintenance and servicing.

To avoid personal injury:

1. Do not use in the presence of flammable or combustible materials; fire or explosion may result. This device contains components which may ignite such materials.

2. Do not use in the presence of highly corrosive substances such as bleach or acid baths; fire may result.

3. This device is to be used with water feeds only. Sanitizing agents must be used in compliance with instructions in this manual. Failure to comply with the above could result in explosion and personal injury.

4. Avoid splashing cleaning solutions on clothing or skin.

5. Ensure all piping connections are tight to avoid chemical leakage.

6. Ensure adequate ventilation.

7. Carefully follow manufacturer's safety instructions on labels of chemical containers and material safety data sheets.

8. This unit is equipped with an ultraviolet lamp. Ultraviolet radiation is harmful to the eyes and skin. Do not attempt to observe the lamp directly.

9. Refer servicing to qualified personnel.

Introduction

Product Overview

The Barnstead DIamond TII is a tap-fed water purification system designed to be simple to use and to provide reagent grade water that exceeds ASTM Type II, and NCCLS/CAP Type I standards. It uses a thin film composite reverse osmosis membrane with pretreatment to produce RO water that is then polished using a two-stage deionization process combined with UV oxidation and a 0.2 micron final filter.

The % of the rejection between incoming and reverse osmosis product water is monitored and an indication is provided to the user if the RO water quality is unacceptable. Incoming and RO pressure are provided by pressure sensors located inside the unit. The DI water purity is continuously sensed by a resistivity cell and displayed on a graphical display.

RO operation is automatic and works independently of the DI system to fill the external reservoir as determined by sensors in the reservoir.

The DIamond TII is not shipped with pretreatment and DI polishing cartridges or a final filter. These must be ordered separately. The start-up kit containing these components can be ordered using part number D502138 for all units.

The electronics can be verified and calibrated utilizing a N.I.S.T. Traceable Calibration Module. See accessory ordering information.

Please read the instructions carefully to ensure that you receive maximum benefit from the DIamond TII. Also, please fill out and return the enclosed warranty registration card as it will help us assure you of proper warranty coverage.

General Usage

Do not use this product for anything other than its intended usage. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

General Specifications

Dimensions and Clearance Requirements

DIamond TII dimensions - 13.5" W X 18.5" D X 19.5" H (34.3 cm X 47.0 cm X 49.5 cm)

Clearances:

Sides - 9" (22.9 cm) minimum to allow for servicing
Above - 3" (7.6 cm) minimum for removal of top cover
Front - 4.75" (12.1 cm) minimum for opening front door

Electrical Requirements

The DIamond TII is equipped with two power cords and corresponding fuses taped to each power cord to be plugged into a grounded electrical outlet of the appropriate voltage.

All models: 100-240 VAC +5% -10%, 47-63 Hz.

Feedwater Requirements[1]

Types[1]	Tap (Potable)
Turbidity	1.0 N.T.U. maximum
Pressure Range	2 bar (30 psig) to 6.9 bar (100 psig)
Temperature Range	4-40°C (39-104°F)
Minimum Inlet Flow Requirements	100 lph
pH	3-10
TDS	600 (max. ppm as $CaCO_3$)
Silt Density Index	<5%
Free Chlorine	<3 ppm
Langlier Saturation Index	<1
Iron (total as Fe)	<0.5 ppm
Silica	<30 ppm

[1]500 ppm NaCl feedwater solution @ 25°C (77°F), @ 4.5 bar (65 psig), 15% recovery. Flow rate and recovery will decrease with lower water temperature and pressure. Barnstead recommends the use of a hot water mixing valve before the RO system for water cooler than 15°C (59°F).

DI Product Water

Quality

Resistivity: ASTM Type II, NCCLS Type I >15 megohm/cm
TOC: <15 PPB
Flow Rate: up to 1 LPM with a new D3750 final filter
Bacteria: Less than 1 CFU/ml
Volumetric Dispense:
Accuracy: ±5%
Repeatability: ±3%

Feedwater suitability must be determined by a water analysis

RO System

Model	RO Product Flow Rate	Recovery
D14031	12 lph ±15% (3.2 gph)	10-20%
D14041	24 lph ±15% (6.3 gph)	20-40%

RO Membrane Performance[1]

	Rejection
Inorganic (minimum)	>90%
Inorganic (typical)	>95%
Particles	>99%
Bacteria	>99%
Organics (>300 MW)	>99%

[1]500 ppm NaCl feedwater solution @ 25°C (77°F), @ 4.5 bar (65 psig), 15% recovery. Flow rate and recovery will decrease with lower water temperature and pressure. Barnstead recommends the use of a hot water mixing valve before the RO system for water cooler than 15°C (59°F).

Environmental Conditions

Operating: 15°C - 30°C; 20% - 80% relative humidity, non-condensing. Installation Category II (overvoltage) in accordance with IEC 664. Pollution Degree 2 in accordance with IEC 664.

Altitude limit: 2,000 meters.
Storage: -25°C - 65°C; 10% to 85% relative humidity.

Declaration of Conformity

Barnstead International hereby declares under its sole responsibility that this product conforms with the technical requirements of the following standards:

EMC:	EN 61000-3-2	Limits for harmonic current emissions
	EN 61000-3-3	Limits for voltage fluctuations and flicker
	EN 61326-1	Electrical equipment for measurement, control, and laboratory use - EMC requirements; Part I: General Requirements
Safety:	EN 61010-1	Safety requirements for electrical equipment for measurement, control, and laboratory use; Part I: General Requirements

per the provisions of the Electromagnetic Compatibility Directive 89/336/EEC, as amended by 92/31/EEC and 93/68/EEC, and per the provisions of the Low Voltage Directive 73/23/EEC, as amended by 93/68/EEC.

The authorized representative located within the European Community is:

Electrothermal Engineering Ltd.
419 Sutton Road
Southend On Sea
Essex SS2 5PH
United Kingdom

Copies of the Declaration of Conformity are available upon request.

Unpacking

Remove the unit from its shipping container and ensure that the following items are removed from the packaging materials before discarding:

1) DIamond TII unit

2) Approximately 6 ft. (1.83 m) of 1/4” (0.64 cm) O.D. drain tubing (TU1190X12) with a 1/4” NPT fitting at one end

3) Approximately 10 ft. (3.05 m) of 3/8” (0.95 cm) O.D. feedwater tubing provided with a quick disconnect insert on one end and a 1/4” NPT fitting on other end (TU1119X7)

4) Two approximately 10 ft. of 3/8” O.D. tubes for fluidically connecting the unit to the storage reservoir. One tube will have an integral shut-off connection (see Quick Disconnect Fittings section of this manual)

5) For Model D14041 only: Membrane Reject 1 to Membrane Feed 2 tube

6) North American power cord with attached (1.6 amp) fuse bag (CRX72)

7) European power cord with attached (0.63 amp) fuse bag (CRX70)

8) UV lamp (LMX13)

9) Hose barb fitting (05930BI) – Attached to unit dispensing valve

10) Tube removal tool (AYX23)

11) Wall Bracket - Unit (BC1190X12)

12) Wall Bracket - Remote Display (BC1190X10)

13) Display Cable (WH1403X4)

14) Blank Display (DL1190X18)

15) Plug Adapter (CEX42)

16) If a DIamond TII storage reservoir (D14061, D14062, D14063, D14064, D14071, D14072, D14073 or D14074) is also purchased, see contents in separate box.

Also required for installation: Customer-supplied fasteners to mount unit and remote display.

Installation

Caution
Wall composition, condition and construction, as well as fastener type, must be considered when mounting this unit. The mounting surface and fasteners selected must be capable of supporting a minimum of 150 lbs.(68 kg). Inadequate support and/or fasteners may result in damage to mounting surface and/or equipment. If you are unsure of mounting surface composition, condition and construction or correct fasteners, consult your building maintenance group or contractor.

Note
Please refer to the “General Specifications” section for clearance requirements.

Warning
Do not locate the DIamond TII directly over equipment that requires electrical service. Routine maintenance of this unit may involve water spillage and subsequent electrical shock hazard if improperly located.

NOTE ********************
The outlet of DIamond TII storage reservoir must be above or at the same level as the inlet of the DIamond TII.
****

Locating Unit

Locate storage reservoir approximately 5 ft. (1.52 m) from the DIamond TII for electrical connections. See DIamond TII storage reservoir manual or customer-supplied reservoir manual for mounting instructions. ***The outlet of DIamond TII storage reservoir must be above or at the same level as the inlet of the DIamond TII.***

Bench Mounting

Place the DIamond TII on a bench top that is accessible to electricity and an atmospherically vented drain.

Wall Mounting

Install the DIamond TII on a wall in a convenient location that is accessible to an atmospherically vented drain and electricity.

1. Locate the wall bracket packed separately from the unit.
2. Using the wall bracket as a template, locate and drill the mounting holes in the wall. A minimum of four (customer-supplied) fasteners will be required — two on the top and two on the bottom.
3. Attach the wall bracket to the wall using customer-supplied fasteners.
4. Remove the locking screws on each side of the wall bracket.
5. Pull the two locking slides on each side of the wall bracket out as far as they will go.
6. Hang the unit on the wall bracket by sliding the mounting pins into the wall bracket slots.
7. Push the locking slides on each side of the wall bracket in as far as they will go.
8. Replace the locking screws.

Note
The removable control panel was not designed to be repeatedly removed from the unit, therefore, you may experience difficulty when attempting to remove it. It is therefore recommended that the control panel be permanently mounted in a remote location or remain intact with the unit.

Caution
Repeated removal and replacement of the control panel from the top cover may eventually cause it to become damaged.

Note
A bracket is available that will allow you to mount the control panel on the bench. If bench mounting is desired, please order bracket AY1367X2.

Note
The protective cover on the rear side panel display connector should remain in place when the display is not remotely located.

Blank panel

Control Panel Wall Mount Bracket

Figure 1: Mounting the Control Panel

Control Panel Mounted in Remote Location

Installing the Control Panel in a Remote Location (See Fig. 1)

For your convenience, the control panel can be removed from the unit and mounted at a convenient location within 10 ft. (3.1 m.) of the unit. To remove the control panel from the unit:

1. Turn the unit OFF and disconnect it from the power supply.

2. Slide the control panel upward about 1/4” (0.64 cm) to 3/8” (0.95 cm) - (just enough to clear connector on top cover), pull forward, and remove. (The control panel fits tightly in the unit so it may be difficult to remove.)

3. Replace the control panel with the blank panel provided with the unit to protect the electrical connector.

4. Using the display wall bracket as a template, locate and drill the mounting holes in the wall. A minimum of two (customer-supplied) fasteners will be required. Attach the wall bracket to the wall using the customer-supplied fasteners.

5. Locate the 25-pin connector on the left side of the unit. Remove the protective cover and store it for future use if the control panel is returned to the top cover.

6. Locate the 10 ft. (3.1 m.) 25 pin M-F cable included with the unit; attach the male end to the 25 pin connector on the left side of the unit, and the other end to the connector on the bottom of the control panel.

7. Tighten the cable screws on each end to secure the cable to the unit and control panel.

8. The control panel may now be mounted on the wall.

9. An accessory bench mounting display bracket (AY1367X2) can be used. Contact Barnstead International to order.

Note
The UV lamp contains mercury. If broken or no longer needed, do not dispose of the UV lamp in the trash. Recycle or dispose of the UV lamp as hazardous waste.

Caution
DO NOT TOUCH THE GLASS PORTION OF THE LAMP! It is recommended that lint-free gloves be worn when handling the lamp. The glass portion must be free of fingerprints, perspiration, etc. Even a light coating of perspiration will reduce the effectiveness of the lamp. If the glass portion of the lamp is touched, clean it with a damp, lint-free cloth: use isopropyl alcohol as required.

Component Installation

UV Lamp Installation (See Fig. 7)

Locate the UV chamber inside the left door of the DIamond TII. Install the UV Lamp as follows:

1. Disconnect the power cord from the unit.

2. Access the left side of the unit by unlatching the screw securing the door with a flathead screwdriver. Open the door.

3. Remove the UV lamp from its packaging. DO NOT TOUCH THE GLASS PORTION OF THE LAMP! It is recommended that lint-free gloves be worn when handling the lamp. The glass portion must be free of fingerprints, perspiration, etc. Even a light coating of perspiration will reduce the effectiveness of the lamp. If the glass portion of the lamp is touched, clean it with a damp, lint-free cloth: use isopropyl alcohol as required.

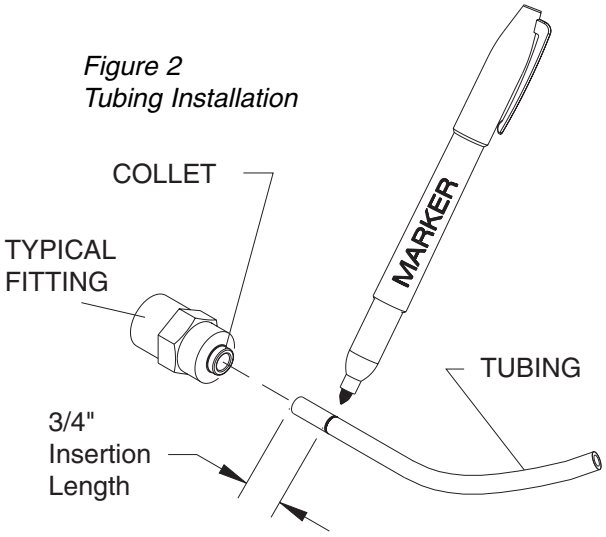
4. Remove black cap by sliding it off of UV chamber.

5. Insert the lamp halfway into the UV lamp chamber and plug it in, then fully insert the lamp into the chamber, and replace black cap.

6. Make sure the UV lamp cable is tucked behind the chamber before closing and relatching the door.

7. Reset the UV lamp timer as directed in the “Resetting Routine Timers” section of this manual.

Figure 2
Tubing Installation



Note
For easier insertion, wet the end of the tubing with water.

Note
Figure 2 and 3 will be used at the connection to the atmospheric drain.

Water Connection Details

Push-to-Connect Fitting Tubing Installation (Refer to Fig. 2)

The following instructions will apply when you need to attach a piece of tubing to your DIamond TII during installation, unless otherwise noted in the installation instructions. To make tubing connections:

1. Make sure the tubing is cut off reasonably square and that no plastic burrs or ridges are present.

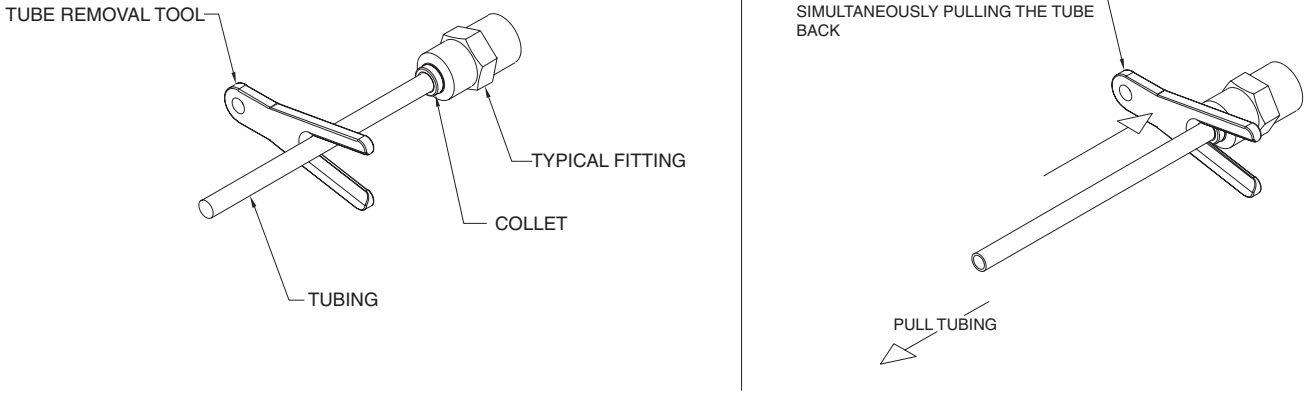
2. Mark from end of tube an insertion length of 3/4” (1.9 cm).

3. Wet the tube end with water and insert the tube straight into the fitting until it bottoms out on the interior shoulder and the insertion mark is no longer visible.

Push-to-Connect Fitting Tubing Removal (Refer to Fig. 3)

1. Using the tool provided (AYX23), push the collet toward the body while pulling on the tubing to release the tube.

Figure 3
Tubing Removal



Tubing Adapter Fittings

1. Completely disassemble the fitting. Refer to Figure 4 to familiarize yourself with the names of the component parts.

2. Make sure the tubing is cut off reasonably square and that no plastic burrs or ridges are present.

3. Place the grab ring and back-up ring in the hex nut in the order and orientation shown in Figure 4. Thread the nut onto the adapter. DO NOT use the o-ring at this time.

4. Push the tubing through the nut until it bottoms out in the adapter.

5. Remove the adapter nut and tubing. Place the o-ring over the tubing. Be careful not to push the back-up ring or grab ring further back on the tubing when installing the o-ring.

6. Install the hex nut on the adapter and hand tighten.

Caution
Do not tighten tube fitting hex nut with a wrench. Tight connections can be easily made by hand.

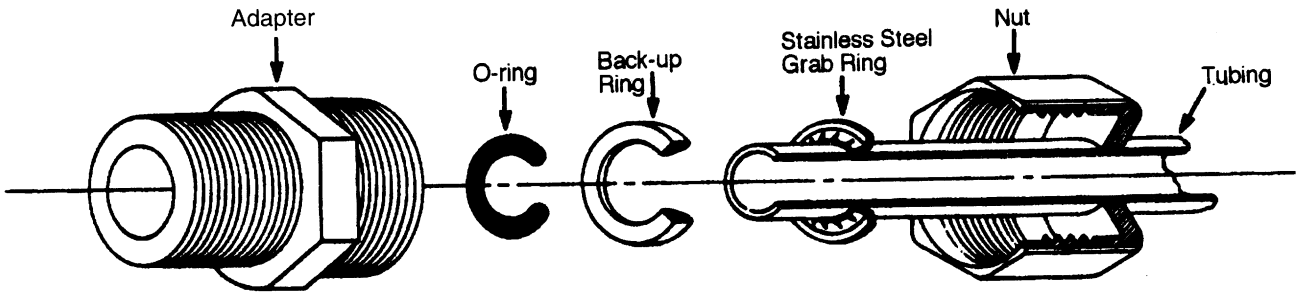


Figure 4: Typical Polypropylene Tubing Adapter Installation

Quick Disconnect Fittings

These fittings are found on the water inlet. (See Fig. 5)
To insert the inlet tubing:

1. Press on the metal thumbpad on the coupling body to ensure the fitting is open.

2. Wet the o-ring on the coupling insert and push into the coupling body until you hear a click. Gently pull on the tubing to ensure it is secure.

3. To remove, press the metal thumbpad to release and pull coupling insert out.

Note
The quick disconnect fittings contain valves and if not properly inserted water will not flow.

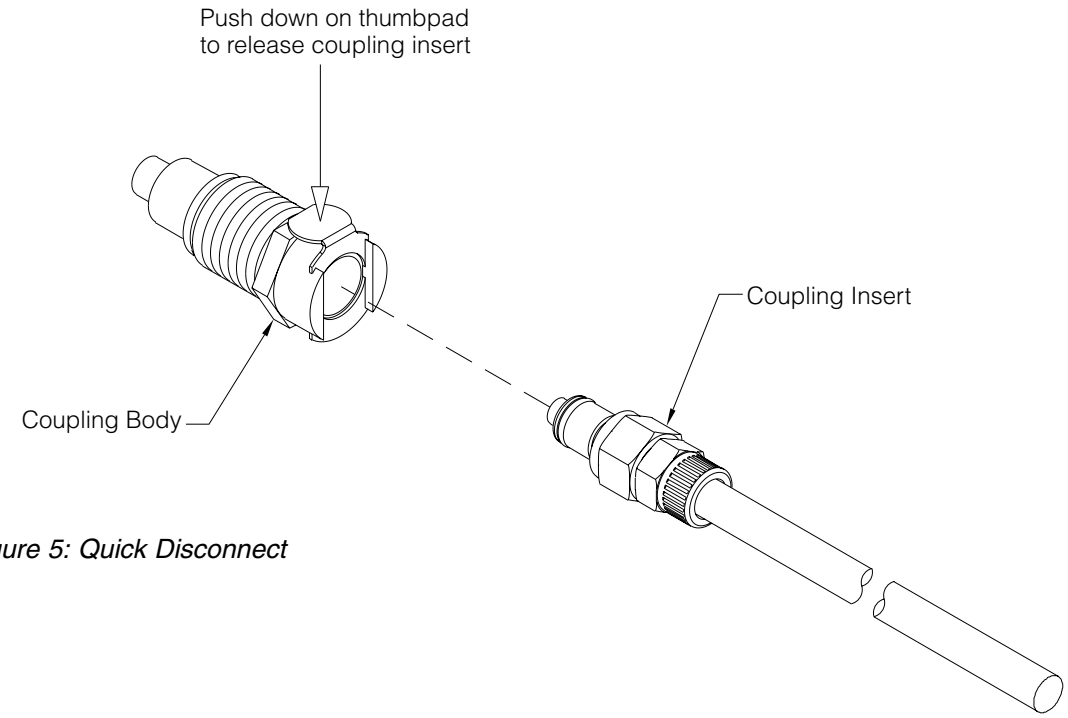


Figure 5: Quick Disconnect

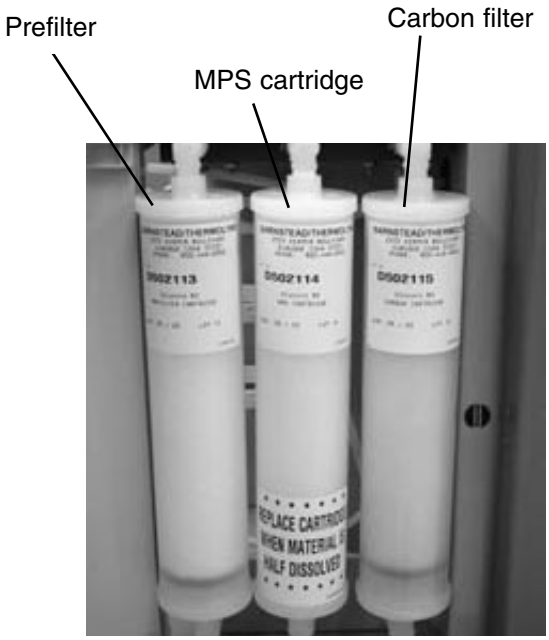


Figure 6: Cartridge Installation

Note
Figure 2 shows the correct sequence of prefilter, MPS and carbon filters. Cartridges must be installed in the correct order to operate properly.

Note
It will be important to replace the MPS cartridge once the material is half dissolved.

Cartridge and Membrane Installation (See Fig. 6)

Your DIamond TII has been shipped with one membrane (for 12 lph unit) or two membranes (for 24 lph unit), that you will install. The Startup Kit (D502138) includes a prefilter, MPS cartridge and carbon filter, and must be purchased separately. To prepare your DIamond TII for operation, disconnect the unit from the power supply if connected.

Prefilter Installation

Particulates can damage your membranes, resulting in premature membrane failure. Therefore, your DIamond TII uses a prefilter to remove particulates from your feed water. Install the prefilter as follows:

1. Open the front left door.

2. Remove the prefilter (Part Number D502113) from its packaging and wet the o-rings with water.

3. Insert the prefilter upright into the left position upper and lower quick disconnects and push until firmly connected. For easier installation, connect bottom first.

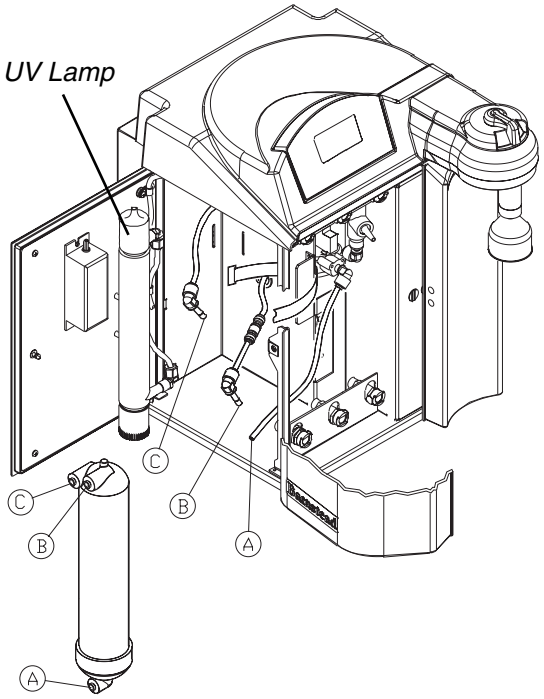
MPS Cartridge Installation

The MPS cartridge contains a slow dissolving anti-scalant material. The anti-scalant material combines with water to prevent scale buildup on the membrane surface.
Install the MPS cartridge as follows:

1. Remove the MPS cartridge (Part Number D502114) from its packaging and wet the o-rings with water.

2. Insert the MPS cartridge upright into the middle position upper and lower quick disconnects and push until firmly connected. For easier installation, connect bottom first.

Figure 7: 12 lph RO Membrane Installation



Carbon Filter Installation

Chlorine can also damage your membranes, resulting in premature membrane failure. Therefore, your DIamond TII uses an extruded carbon filter to remove chlorine from your feed water.

Install the carbon filter as follows:

1. Remove the carbon filter (Part Number D502115) from its packaging and wet the o-rings with water.

2. Insert the carbon filter straight into the right position upper and lower quick disconnect and push until firmly connected. For easier installation, connect bottom first.

RO Membrane Installation (See Fig. 7 - 10)

12 LITER PER HOUR UNITS (1 MEMBRANE)

1. Remove the RO membrane from its packaging. Note the location of the FEED, PRODUCT, and REJECT connections on the membrane. The correct orientation for the installed membrane will be vertical, with the Feed connection on the bottom. See Figure 8.

2. Open the left side door on the DIamond TII.

3. Referencing Figure 7, locate the three unconnected tubes (two with elbows, one without) labeled FEED (A), PRODUCT (B) and REJECT (C). Refer to “Tubing Installation: Figure 2” and mark FEED (A) tubing 3/4” (1.9 cm) from end.

4. Make FEED (A) connection by first wetting the tube with water and pushing it firmly into the membrane connector. See Figure 7.

5. Using the Velcro® strap secure the membrane into the right most position against the bracket.

6. Make the PRODUCT (B) and REJECT (C) connections by first wetting the tube stem of the elbow with water and pushing it firmly into the membrane connector. See Figure 7.

Velcro® is a registered trademark of
Velcro Industries B.V. Ltd Liab Co. Netherlands
Castorweg 22-24 Curacao Netherlands Antilles

Figure 8: Membrane Housing Label

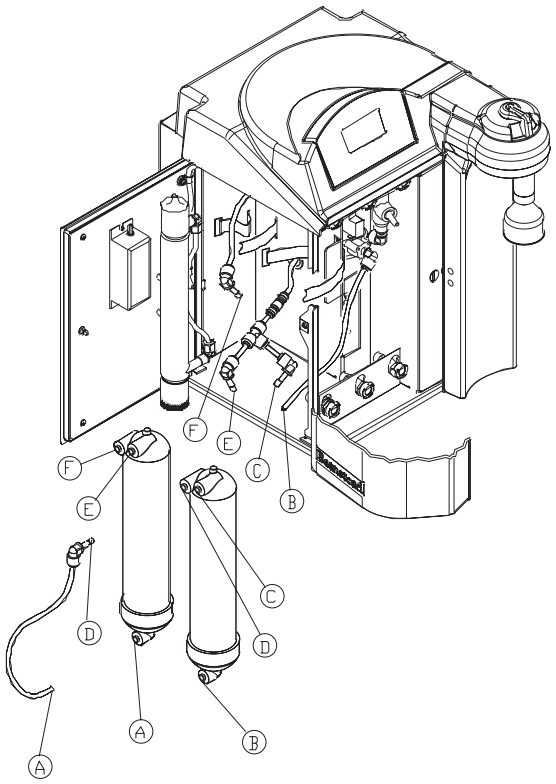


Figure 9: 24 lph RO Membrane Installation

7. The door can remain open until the unit has been operating and you have checked for possible water leaks at the membrane connections.

8. Rinse membrane per the instructions in the "Initial Operation" section of this manual.

24 LITER PER HOUR UNITS (2 MEMBRANES)

1. Remove the RO membranes from their packaging. Note the location of the FEED, PRODUCT, and REJECT connections on the membrane. See Figure 9. The correct orientation for the installed membrane will be vertical with the Feed connection on the bottom. See Figure 8.

2. Open the left side door on the Diamond TII.

3. Locate the four unconnected tubes (three with elbows, one without) labeled FEED 1, PRODUCT, PRODUCT and REJECT 2. Refer to "Tubing Installation: Figure 2" and mark FEED 1 tubing 3/4" (1.9 cm) from end.

4. Find the tube with the elbow labeled FEED 2 and REJECT 1 packaged with the unit. Refer to "Tubing Installation: Figure 2" and mark FEED 2 end of the tube 3/4" (1.9 cm) from end.

5. Make FEED 2 (A) connection by first wetting the tube with water and pushing it firmly into the membrane connector. See Figure 9. Using the Velcro® strap secure the membrane into the left most position against the chassis walls. See Figure 9.

6. Make the FEED 1 (B) connection by first wetting the tube end and push firmly into the membrane connector. Using the Velcro® strap secure the membrane into the right most position against the bracket. See Figure 9.

7. Make the PRODUCT (C) and REJECT 1 (D) connections on right most membrane by first wetting the tube stem of the elbow with water and pushing it firmly into the connector. See Figure 9.

Caution
Do not allow the DIamond TII to operate unless water is available to the unit.

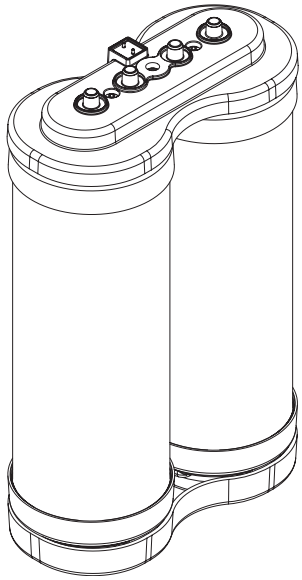
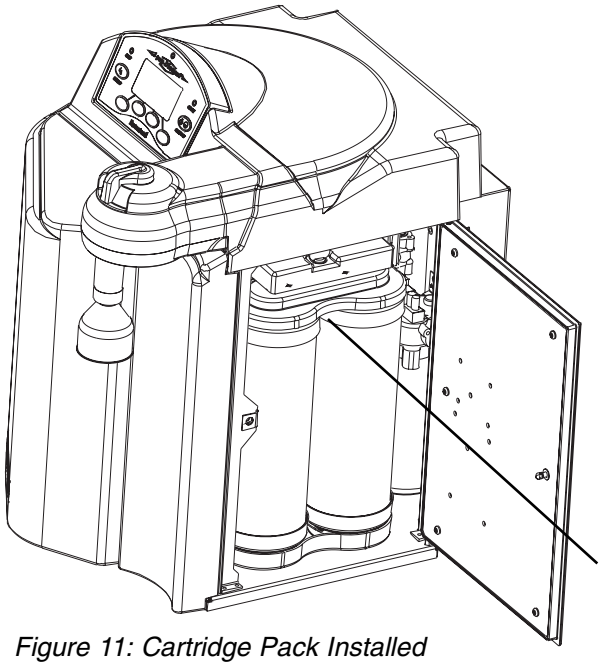


Figure 10: Dual Cartridge Pack



Note orientation of top cartridge pack manifold

Figure 11: Cartridge Pack Installed

8. Make the PRODUCT (E) and REJECT 2 (F) connections on left most membrane by first wetting the tube stem of the elbow with water and pushing it firmly into the connector. See Figure 9.

9. The door can remain open until the unit has been operating and you have checked for possible water leaks at the membrane connections.

10. Rinse membranes per the instructions in the "Initial Operation" section of this manual.

Cartridge Pack Installation

Cartridge packs will come bagged with four manifold connection caps.

Each cartridge pack includes one 0.2 micron absolute final filter.

1. Open right side door. Remove the four caps from the top of the cartridge pack.

2. Verify that each of the four posts on the cartridge pack has an o-ring.

3. Lift unit manifold upward, insert cartridge pack and align the pack so that it mates with the unit manifold.

4. Lower unit manifold until it is flush with the top of the cartridge pack.

5. Hand tighten wing head screw securely.

6. Close door.

7. **DO NOT** install the 0.2 micron filter and bell assembly at this time.

Caution
Do not connect feed water until directed to do so during “Initial Operation.”

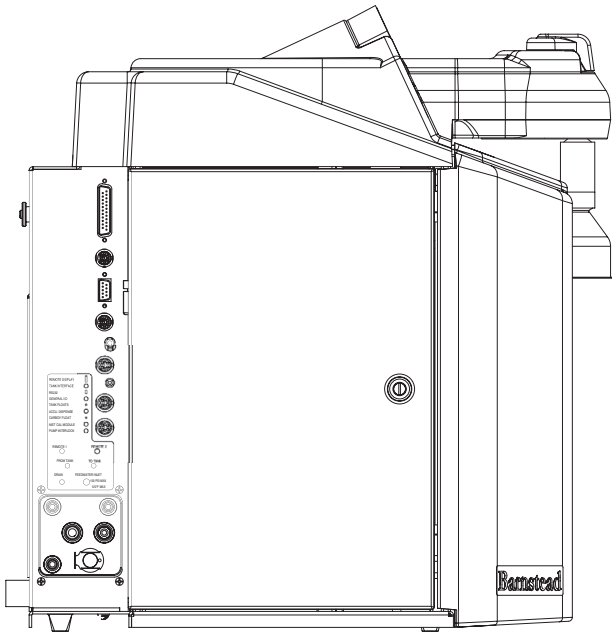


Figure 12: Water and Electrical Connections - Left side view (see label for connection details)

Note
To prevent leaking, push the tubing into the atmospheric drain connection until it bottoms out.

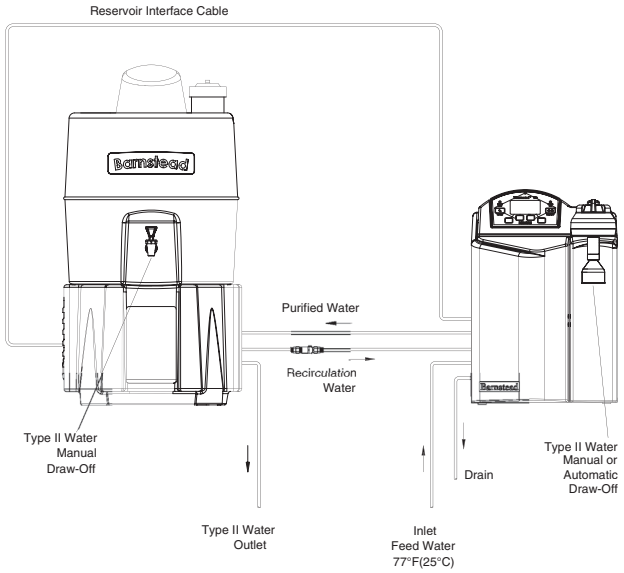


Figure 13: DIamond TII and DIamond TII reservoir system setup

Water Service Connections

Feedwater Connection

1. Locate the length of 3/8” (0.95 cm) O.D. tubing provided with a quick disconnect insert on one end and a 3/8” (0.95 cm) O.D. X 1/4” (0.64 cm) NPT tubing adapter on the other.

2. Install the tubing adapter onto your incoming water line. Refer to Figure 4. We recommend a customer supplied shut off valve be installed in your feedwater line. The quick disconnect insert will be inserted into the feedwater inlet on the lower left corner in the rear of the DIamond TII during the Initial Operation.

Atmospheric Drain

The RO reject and flush water is sent to drain through this connection.

1. Locate the drain water tubing. This is the 1/4” (0.64 cm) O.D. tubing that is approximately 6 ft. (1.83 m) long with a 1/4” O.D. x 1/4” N.P.T. tubing adapter on one end. The atmospheric drain fitting is located on the lower left corner in the rear of the DIamond TII.

2. Install the tubing adapter into an atmospherically vented drain and route the tubing to the DIamond TII drain connector, ensuring that there are no kinks.

3. Take the tubing end that has no fitting, wet the tube end with water and insert the tube straight into the unit drain connector until it bottoms out. Refer to section **Push-to-Connect Fitting Tubing Installation** for more explicit details.

Reservoir Connection

Refer to the DIamond TII Storage Reservoir manual. If an alternate reservoir is being used, refer to “Reservoir Type” in the “System Options” section of this manual.

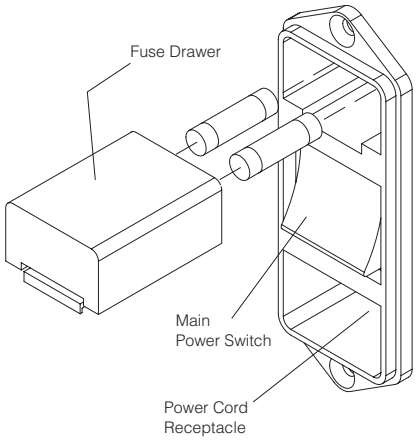


Figure 14: Power Connections

Warning
Power unit OFF before unplugging unit.

Power Connections

1. The power cord connection is located on the upper right corner on the right side of the unit (see Fig. 15).

2. Determine which power cord you need (this will be based on your country and outlets available in your lab). Both North American and European power cords are provided with the unit.

3. Remove the fuse drawer, install the fuses included with the power cord to be used, and reinstall drawer (see Fig. 20).

4. Verify power switch is turned off and attach receptacle end of power cord into the power socket.

5. Plug other end of power cord into facility power.

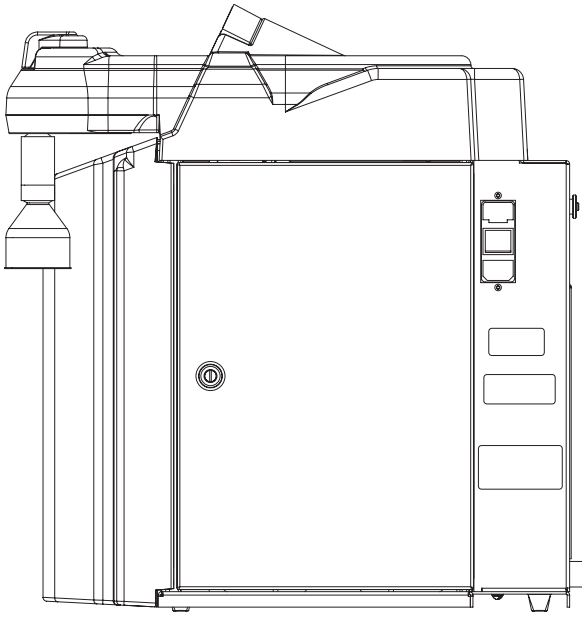


Figure 15: Electrical Connections - Right side view

Optional Accessories

Optional accessories for this unit include an N.I.S.T. Traceable Calibration Module, standard remote dispenser, Accu DIspense volumetric remote dispenser, dispense overflow cutoff float and printer. If you purchased a standard or Accu DIspense volumetric remote dispenser, refer to their respective operator's manuals for installation instructions.

Optional Accessory Ordering Information

Description	Catalog No.
N.I.S.T. Calibration Module	E1403X5
Remote Dispenser (Manual)	D11981
Accu DIspense Volumetric Remote Dispenser	D13661
Serial Cable for Communication with Computer	WHX18
Printer (120-240 VAC system)	AY1137X1
Printer Replacement Paper Roll	AY669X4
Dispense Overflow Cutoff Float	AY1367X1
Bench Top Display Holder	AY1367X2
Hot Water Mixing Valve	D7427
Pump Interlock Cable for NANOpure DIamond	AY1403X3
Sanitization Block with Tubing	BK1403X2

Caution
This accessory is not intended for use with small containers as its weight could cause small, lightweight containers to tip over.

Note
If an auto dispense is stopped by the AY1367X1, the DIamond TII will change modes to normal recirculation.

Dispense Overflow Cutoff Float

Accessory AY1367X1 (overflow float with 6 ft. [1.83 meter] cable) is designed as a user option to ensure automatic dispensers (time or volumetric) do not overflow carboy style containers. This accessory can be especially helpful if the actual volume of a container is unknown. It can also protect against overflows if the entered/stored volume of a previous container has not been changed and is set for a volume greater than the carboy being filled. Finally, the accessory can be useful for automatic time dispenses as it is usually difficult to ensure the set time will equal a specific volume of water.

1. Prior to initiating an automatic dispense (timed or volumetric), plug AY1367X1 into connector on the back left side of the DIamond TII.

2. Position carboy to be filled and place float assembly on open neck of carboy. Position float assembly such that it will not interfere with product water stream being dispensed into carboy.

3. Initiate Auto Dispense as described in the “Automatic Dispensing” section of this manual. If during the auto dispense the float is lifted by the rising water, the auto dispense will immediately be stopped and an error message will be displayed momentarily.

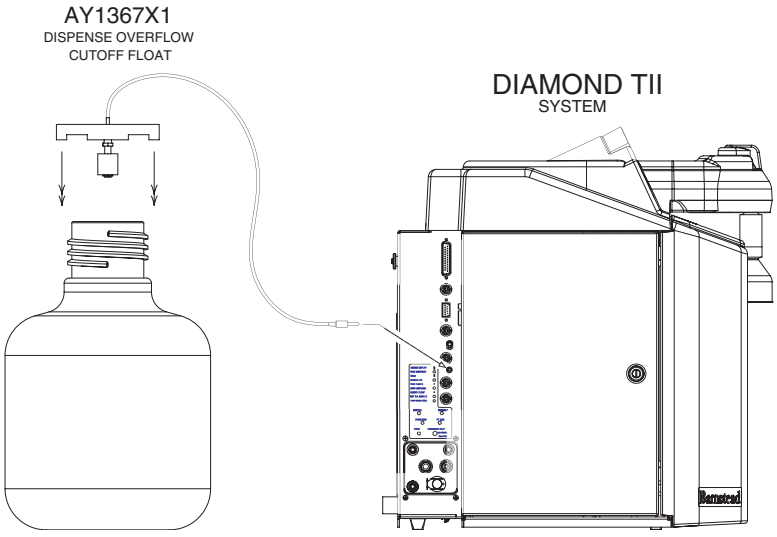


Figure 16: AY1367X1 Dispense Overflow Cutoff Float

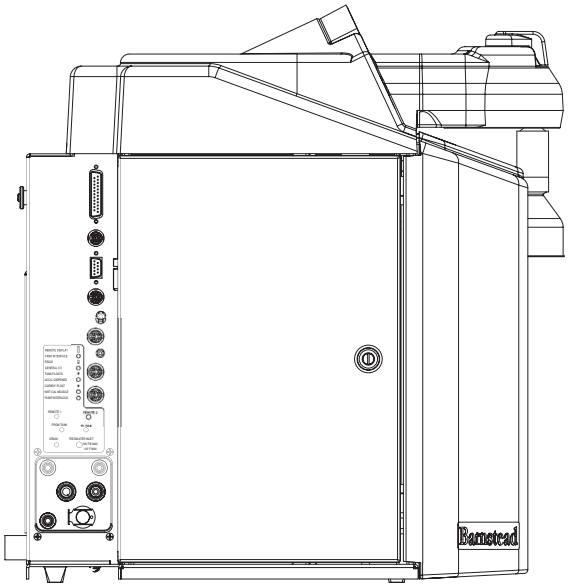


Figure 17: N.I.S.T. Calibration Module Connection

Performing an Electronic Calibration Using the Optional N.I.S.T. Calibration Module

If you purchased the optional N.I.S.T. calibration module (Catalog No. E1403X5) you can perform a calibration of the DIamond TII product purity sensing electronics traceable to N.I.S.T. standards.

1. Press MENU. Scroll to “DI OPTIONS” and press OK. Scroll to NIST Calibration and press OK, then follow screen prompts.

The N.I.S.T. calibration module will connect to the NIST CAL MODULE port in the back left of the DIamond TII, refer to Figure 12.

Note
The calibration (in progress) may take up to two minutes to complete.

Manual Remote Dispenser and Accu DIspense Volumetric Remote Dispenser

Refer to the Operating Instructions for your manual remote dispenser (LT1198X1) or Accu DIspense volumetric remote dispenser (LT1366X11).

Warning
Do not use in the presence of flammable or combustible materials; fire or explosion may result. This device contains components which may ignite such materials.

Note
The removable control panel was not designed to be repeatedly removed from the unit, therefore, you may experience difficulty when attempting to remove it. It is therefore recommended that the control panel be permanently mounted in a remote location or remain intact with the unit.

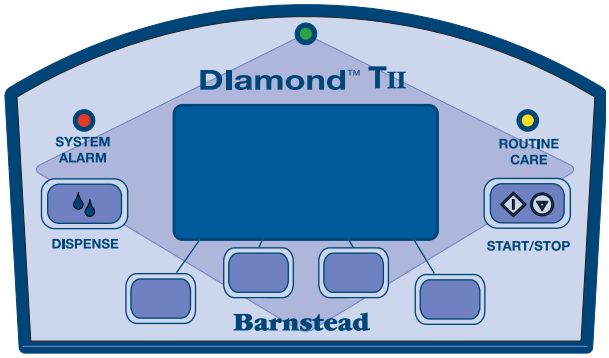


Figure 18: Diamond TII Control Panel

Control Panel

The Diamond TII is controlled through a panel which incorporates buttons to control its functions. This control panel utilizes a graphical display to show system information and the purity of the product water. The intensity of the display may be adjusted according to user preference. Refer to “Setting System Options.”

Three LED’s located on the control panel will illuminate to inform you of the system status as follows:

- Green LED (top center of the display):
  Solid ON - system is running
  Blinking - system is in STANDBY

- Red “System Alarm” LED:
  Solid ON - Something in the system is causing an error and must be corrected. To diagnose, press MENU and select System Alarm.

- Yellow “Routine Care” LED:
  No error exists, but care of product is recommended at this time. To diagnose, press MENU and select Routine Care.

The control panel can be removed from the unit and remotely mounted. Please refer to “Installing the Control Panel in a Remote Location” in the “Installation” section of this manual for more information about how to remove the control panel from the unit.

Buttons

When the main power switch is on, the buttons on the control panel function as follows:

1. **START/STOP**: When the unit is in the IDLE Mode or STANDBY Mode, pressing the START/STOP switch will put the DI operation of the unit in the RUN Mode, turning the DI pump and UV lamp on. The RO operation will automatically turn on in RUN Mode to fill the reservoir as needed. When the unit is in the RUN Mode pressing the START/STOP switch will put the DI and RO operation of the unit into the Idle Mode. When the unit is in any of the flush or

auto dispense modes, pressing the START/STOP switch will return the unit to the mode it was in prior to initiating a flush.

2. **DISPENSE** allows you to automatically deliver water from the unit. Please refer to “Automatic Dispensing” in the “User Settings” section of this manual for more information.

Four blank buttons appear on the control panel and perform various functions as defined on the display throughout operation. See the “Operation” section for more detailed descriptions.

Initial Operation

Warning
Use a properly grounded electrical outlet of correct voltage and current handling capacity.

Warning
This device is to be used with potable water feeds only. Cleaning agents must be used in compliance with instructions in this manual. Failure to comply with the above could result in explosion and personal injury.

Warning
Be sure to connect the tubing supplied with the sanitization block and route securely to an atmospheric drain to prevent spillage as the system will use this tubing to automatically drain the bleach water from the system.

Avoid splashing sanitizing solution on clothing or skin.

Ensure all piping connections are tight to avoid leakage.

Ensure adequate ventilation.

Carefully follow manufacturer's safety instructions and material safety data sheets.

This device to be used with water feeds only.

Sanitizing agents must be used in compliance with instructions in this manual. Failure to comply with the above could result in explosion and personal injury.

All the RO prefilters and RO membranes should already be installed at this point. If they have not, refer to "Cartridge and Membrane Installation" earlier in this manual.

RO Membrane Rinse

When new RO membranes are installed in the DIamond TII, the membranes should be rinsed to remove all traces of preservative from the membranes. Tubing will be disconnected from the unit during this procedure. It is necessary to drain the storage reservoir before proceeding with RO membrane rinse up. Consult your DIamond TII reservoir manual or customer-supplied reservoir manual for instructions on draining the reservoir.

1. Connect feedwater to feedwater inlet.
2. Turn on power to unit.
3. Place the unit in IDLE mode.
4. Press MENU and use the arrows to scroll to "RO Options", press OK. Scroll to "Membrane Rinse" and press OK. The rinse procedure will last two hours.
5. Follow the prompts on the screen to rinse membranes.

System Sanitization Procedure

Prior to beginning the sanitization procedure ensure the the DIamond TII is attached to a suitable reservoir and that all water and electrical connections between the DIamond TII and the reservoir are in place. The system should be sanitized before first use, before a new cartridge pack is installed, or whenever the one-year sanitization timer expires. Once set up, the sanitization procedure will run automatically. It is best to perform the procedure when the system or water will not be required as the entire procedure can take up to 16 hours to complete. A BK1403X2 sanitization block will be needed, this is included in the D502138 start up kit. You will also need a quantity of household bleach per the chart on following page. Do not use bleach with added fragrances. Sanitize your DIamond TII system as follows:

1. Press the "Menu" key, and use the up and down arrow keys to select "Sanitization".

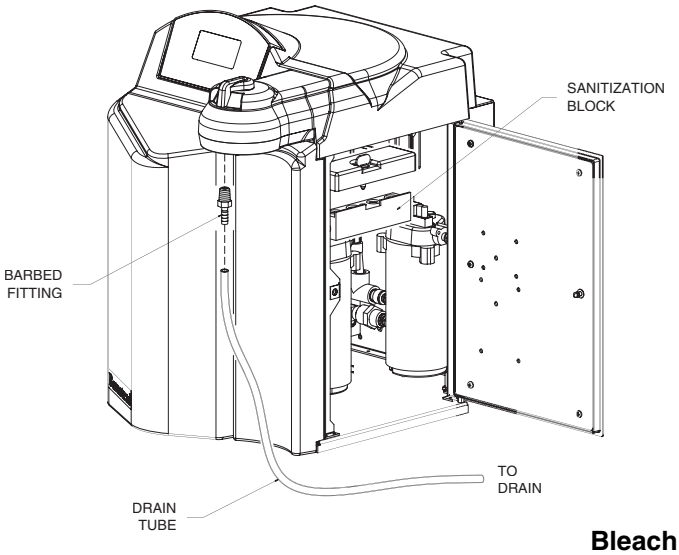


Figure 19: Sanitization Procedure

2. Follow the prompts on the screen. These will guide you through the process. It is very important that the steps are followed in order for the sanitization to be successful. Be sure to connect the tubing supplied with the sanitization block and route securely to an atmospheric drain to prevent spillage as the system will use this tubing to automatically drain the bleach water from the system. It is also important that any equipment connected to the optional distribution loop be disconnected from the loop and the lines plugged to prevent bleach from entering those systems or leaking from the distribution loop.

3. When prompted to add bleach, add per the following chart:

Bleach Concentration	**Amount needed for 30L reservoir**	**Amount needed for 60L reservoir**
3%	240 mL (1 cup)	480 mL (2 cups)
5.25% – 6%	120 mL (1/2 cup)	240 mL (1 cup)

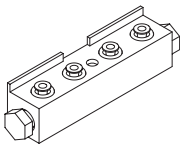


Figure 20: BK1403X2 Sanitization Block

Once the bleach has been added, if the sanitization cycle is cancelled the system will not be available until it thoroughly rinses all of the bleach from the reservoir and tubing. This will take up to 8 hours.

To complete the sanitization, the system will automatically fill the reservoir and recirculate the bleach solution through the reservoir and system for 6 hours. It will then completely drain the solution from the reservoir and tubing by dispensing it through the system dispenser. The reservoir will then be automatically refilled and water which will be re-circulated through the system and again dispensed out the system dispenser to rinse out all remaining bleach.

Once the sanitization is complete, the screen will prompt you to install a new cartridge pack (see Cartridge Pack Installation section of this manual), and will then begin filling the reservoir for normal use. Never install a used cartridge pack into a sanitized system to avoid re-introducing bacteria.

Cartridge Pack Rinse Up

1. If not already installed, install the hose barb into the fitting in the dispense valve.

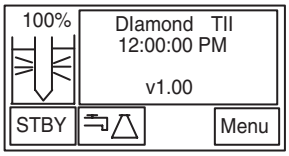
2. Turn unit on and from STANDBY press the START/STOP button to begin unit operation.

3. Rinse approximately 3 liters of water through the dispense valve to drain.

4. Close the dispense valve.

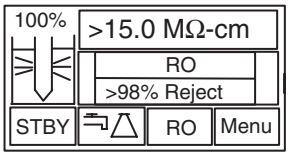
5. Remove the hose barb from the dispense valve and proceed to the **0.2 Micron Final Filter Replacement** section of this manual. Retain hose barb for further use.

6. Place unit in RUN mode until desired purity is achieved.



Idle Mode Screen

Note
Do not put unit into IDLE mode or turn off the DIamond TII during non-work hours. Doing so will allow bacterial growth and other contamination of the water in the system. As a result, the system will require a lengthy rinse-up period at the beginning of the work day to achieve high-quality product water.



Run Mode Screen

Operational Modes

Idle Mode

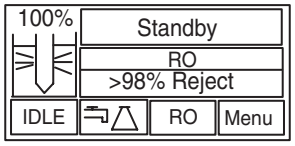
When the unit is first powered on, it will be placed in IDLE mode. IDLE mode indicates the unit is powered and waiting to be placed into STANDBY by pressing the STBY button, or can be placed in RUN by pressing the START/STOP button.

Run Mode

In RUN mode, the pump recirculates water through the cartridges and the UV lamp. It is recommended that the DIamond TII be left in RUN mode during the day. In RUN mode, the purity meter display indicates the resistivity (temperature compensated to 25°C) of the water available for dispensing.

1. From IDLE or STANDBY press the START/STOP button to put the unit in RUN mode. The DIamond TII's pump will begin to run and display the resistivity of the water in megohm-cm.

Note
Each time the RO system automatically turns ON, in RUN or STANDBY mode, the RO membrane will flush water to the drain for 30 seconds prior to filling the reservoir.



Standby Mode Screen

Note
If the unit is in STANDBY and power to the unit is turned off or lost, the unit will return to STANDBY once power is restored.

Note
Press the START/STOP switch to cancel a flush.

2. Allow the water's resistivity to rise to the desired purity before dispensing water.

Also in the RUN mode, the RO operation automatically turns on to fill the reservoir as needed.

Standby Mode

In STANDBY Mode, the DI pump will operate for ten minutes out of every hour (i.e 50 minutes off, 10 minutes on). Every fourth time that the pump turns on, the UV lamp will also turn on for 10 minutes (i.e 3 hours 50 minutes off, 10 minutes on). This will allow the unit to produce high quality water quickly upon being placed in the RUN Mode. It is recommended that the DIamond TII be placed in STANDBY mode during non-work hours. At the end of the work day, press the STANDBY switch to place the unit in STANDBY mode. Also in STANDBY mode, the RO operation automatically turns on to fill the reservoir as needed.

Flush Mode

Automatic Flush (RO Membrane)

In the Run or Standby Modes, the DIamond TII will initiate a four minute automatic flush of the RO membrane once every three hours and fifty-six minutes of operation. This prevents buildup on the RO membrane. A timer in the DIamond TII counts the hours power is applied to the unit. When the timer reaches three hours and fifty-six minutes, the DIamond TII initiates a four minute flush if the unit is in the RUN or STANDBY Modes. If the unit is in IDLE, the automatic flush will occur immediately after the START/STOP switch is pressed and RUN Mode entered. The timer will reset to zero when the four minute automatic flush is completed.

Manual Flush (RO Membrane)

A four minute manual flush of the RO membrane can be initiated through the RO Options in the MENU. During the four minute flush, water is sent to drain through the drain tubing and the display will show remaining minutes. After the timed flush has ended, the DIamond TII will return to

the mode (IDLE, RUN or STBY) it was in when you initiated the flush. To initiate a flush:

1. Choose MENU and scroll to RO Options. Press OK.

2. Choose Manual Flush and press OK.

Normal Operation

1. Turn the system power ON by depressing the main power switch to the “I” position.

2. The system electronics will initialize and check its calibration. (All units have been factory calibrated.) The unit will enter STANDBY mode. If needed, the RO system will begin operating to fill the reservoir.

3. From STANDBY, press the START/STOP switch on the control panel to enter the RUN mode. The unit’s pump will begin to run.

4. The display will then begin reading resistivity of the system product water. Initially it will read “PROCESSING” while the DI meter is initializing.

5. Allow the water’s resistivity to rise to the desired purity before dispensing water.

6. The system should be left in RUN during the work day.

Dispensing Water

Use the dispense knob for manual dispensing or press the DISPENSE switch for volumetric or timed dispensing. See “Automatic Dispensing.”

Note
Volumetric dispensing is based upon total fluid volume entering the DIamond TII. Point of dispensing accuracy will be compromised if you are dispensing water volumetrically while simultaneously dispensing water manually through the remote dispenser accessory.

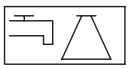
Note
Once Volumetric or Timed Dispensing values are set, they will remain in memory until changed by the user. To turn the dispense method OFF, select "OFF" in the "Dispense Method" menu.

Note
When the RO operation is automatically turned on, RO water will be put into the reservoir. Anytime the RO purity falls below the user-selected % rejection setting the System Alarm LED will illuminate.

Automatic Dispensing

This feature is accessible from any screen when the volumetric dispensing icon is an available switch.

1. Place a container under the dispenser.

2. Press the volumetric dispensing icon.  The screen will show current settings for Remote Volumetric, Unit Volumetric, Timed Dispense or OFF. Press MODE to choose setting and use the up and down arrows to set volume or time.

Timed Dispensing
UP arrow: increments by 5 minutes
DOWN arrow: Decrement by 1 minute
Maximum: 30 or 60 minutes depending on reservoir volume
Minimum: 1 minute

Volumetric Dispensing
UP arrow: 250ml up to 1 liter, then increments of 5L
DOWN arrow: Decrement by 250 ml up to 1L, then decrement by 1L
Maximum: 30L or 60L depending on reservoir volume
Minimum: 250 ml

Reservoir Replenishment

If the water level is below 75%, the external reservoir will begin automatically refilling in either RUN mode or STANDBY mode by the self-contained RO system. The water level in the reservoir is determined by internal sensors in the reservoir. Once the water level fills up to the full level, the RO system will enter STANDBY mode.

User Settings

Setting the Displayed Language

1. Upon power up, press any of the four buttons below the display when the display shows “LANGUAGE.”

Or, if the unit’s power is already on:

1. Press MENU and scroll to the LANGUAGE screen and press OK.

2. Press the UP or DOWN arrow to select the language desired and press OK.

Note
Time format is 12 hour, and date format is day/month/year.

Setting the Time and Date

1. Press MENU and scroll to the SET TIME screen and press OK. Using the arrow keys, select time and press OK.

2. Scroll to the SET DATE screen and press OK. Using the arrow keys, select date and press OK.

Setting the Low Product Purity Alarm

The Low Product Purity Alarm monitors the purity of the product water at the system dispense point. The alarm is adjustable from 1.0 mΩ-cm (1.0µS/cm) to 15.0 MΩ-cm (.067µS/cm), the factory default is 1.0 MΩ-cm. To adjust the alarm:

1. Press MENU. Scroll to DI Options and choose Purity Alarm.

2. Use the up and down arrows to set the low alarm. Press OK to accept settings.

The alarm will alert the user when the product purity falls below the product purity alarm level by illuminating the SYSTEM ALARM LED. See details by pressing MENU and choosing System Alarm. See the “Error Conditions” section later in this manual to interpret the error.

Setting the RO % Reject Alarm

The RO % Reject Alarm monitors RO membrane performance and can be set between 65% and 90% reject. Factory default is 75%. To adjust the alarm:

1. Press MENU. Scroll to RO Options and choose Low Reject Alarm. Use the up and down arrows to set the low alarm. Press OK to accept settings.

The alarm will alert the user when the RO % reject falls below the % reject alarm level by illuminating the SYSTEM ALARM LED. See details by pressing MENU and choosing System Alarm. See the “Error Conditions” section later in this manual to interpret the error.

Setting the Feedwater Chlorine Level

To ensure that the RO membrane(s) in the DIamond TII are not damaged by free chlorine in the feedwater, the system electronics tracks the amount of chlorine processed by the carbon prefilter (D502115) and alerts the user when the carbon capacity is exhausted. There are three selectable levels of free chlorine content, the factory default is the highest level. If you know the free chlorine level of your feedwater supply, you can set this level through the DIamond TII menu:

1. Press MENU. Scroll to RO Options and choose Chlorine Level. Use the up and down arrows to set the appropriate chlorine level in ppm. Press OK to accept settings.

If you do not know the free chlorine level of your feedwater, the setting should be left at the factory default highest level to avoid damage to the RO membrane(s).

Setting System Options

See procedures in the table below to choose system options.

Options	Procedure
Auto Standby	MENU ⇢ SYSTEM OPTIONS ⇢ AUTO STANDBY STATE ⇢ Scroll to and set start time ⇢ OK ⇢ Scroll to and set stop time ⇢ OK
Unit Under Counter	MENU ⇢SYSTEM OPTIONS ⇢ UNIT UNDER COUNTER ⇢ Choose ON or OFF ⇢ OK
Display Contrast	MENU ⇢SYSTEM OPTIONS ⇢ DISPLAY CONTRAST ⇢ Adjust up and down to desired contrast ⇢ OK
Set Units	MENU ⇢SYSTEM OPTIONS ⇢ SET UNITS ⇢ Choose desired units in each screen ⇢ OK
Printer Attached	MENU ⇢SYSTEM OPTIONS ⇢ PRINTER ATTACHED ⇢ Choose YES or NO ⇢ OK
Reservoir Type	MENU ⇢SYSTEM OPTIONS ⇢ RESERVOIR TYPE ⇢ Choose DIAMOND TII or ALTERNATE ⇢ OK

Auto Standby Timer

The AUTO STANDBY Timer can be set so that the unit will automatically be placed in STANDBY and come back out of STANDBY and be placed into RUN mode at a set time each day.

Unit Under Counter

(Factory set to “OFF”)
This option will lock out any type of automatic dispense out of the unit (Accu DIspense accessory D13661 will still operate normally.) This will prevent accidental dispensing from the unit if it is located under a counter or similar area such that the unit dispenser is not in site of the user but the display is (i.e. remote mounted display.)
NOTE: When “UNIT UNDER COUNTER” is set to “ON,” Auto Dispense will not be available from the main unit dispenser.

Display Contrast

The DIamond TII display can be adjusted based on the user's preference.

Set Units

The DIamond TII can display readings in a variety of units. Use this option to set desired units.

Printer Attached

The DIamond TII can print readings to an optional printer accessory (AY1137X1).

Reservoir Type

The DIamond TII has been designed to interface with the DIamond TII storage reservoir, as well as other reservoirs. If a reservoir other than a DIamond TII storage reservoir will be used, the Reservoir Type must be set to "Alternate." This will configure the DIamond TII system to communicate with a normally-open "high" float and a normally-closed "medium" float in the alternate reservoir to control the reservoir replenishment. Optional accessories AY1403X4 and AY1403X2 are available for connecting alternate reservoirs to the DIamond TII. Contact Barnstead International customer service for connection details.

Computer/Printer Setup

Connecting DIamond TII to Computer and Communicating Through the RS-232 Port Using Hyperterminal or Procomm

Hyperterminal

RS-232 Capture Instructions

1. Connect the 9 pin serial cable (part no. WHX18) from the DIamond TII RS-232 port on the back left side of the unit to (COM2:) port or (COM1:) port on back of computer.

2. Press MENU and use the up and down arrows until display reads, “SYSTEM OPTIONS.”

3. Press OK.

4. From the “Printer Attached” display, press the up or down arrow for “NO”.

5. Press OK.

6. Now, during the normal recirculation mode, date, time, purity and temperature readings will be sent to the computer once per minute.

7. Run your Microsoft Windows program. Open Hyperterminal (located in the accessories directory), give your setting a name and choose a symbol.

8. In the “Connect Using:” box, select (COM2:) or (COM1:), depending on your computer, and press OK.

9. Using the selection boxes in the next screen, configure the options as 9600 baud, 8-bit, No parity, 1 stop bit, Flow Control: None.

10. To receive data to a file, select Transfer and capture text. Accepting default will put the file which you name in the c:/windows directory called capture.txt and the file will be an ASCII text file.

Note
Due to character set differences, hyperterminal may display the Ω symbol as ê. Also, the ° symbol may be displayed as ø.

11. You should see the data on the computer screen.

12. When you are finished storing data from the DIamond TII, save your file. You can exit Hyperterminal or set up a new experiment.

13. Hyperterminal data can be manipulated and graphed in Excel®.

Procomm

1. Connect the 9 pin serial cable from the DIamond TII RS-232 port on the back left side of the unit to (COM2:) port or (COM1:) port on back of computer.

2. Press MENU and use the up or down arrows until the display reads, “SYSTEM OPTIONS.”

3. Press OK.

4. From the “Printer Attached” display. Press the up or down arrows for “NO”.

5. Press OK.

6. The unit will now, during the normal Recirculation mode send a purity and temperature reading to the computer once per minute.

7. Open DOS window and change directory to procomm directory.

8. Open procomm executable.

9. Press ALT-F10 for configuration screen.

10. Enter into Line Settings screen by typing ALT-P.

11. Type in 11 <Enter>, sets parameters as 9600, 8, N, 1.

12. Type in 21 <Enter>, sets to (COM2:) or (Type in 20 <Enter>, sets to (COM1:), depending on your computer.

13. Type in 24 <Enter>, saves settings.

14. Press ESC to exit setup menu.

15. Procomm is now ready to accept input from the DIamond TII.

16. To begin downloading a file, Type ALT-F1, and give the file an appropriate name when prompted.

The optional printer (part no. AY1137X1) provides a paper tape record for future reference.

During normal recirculation, the printer prints date, time, purity and temperature readings once every minute.

Connecting and Starting the Printer

1. Make sure the printer and DIamond TII are turned OFF.

2. Connect the DIamond TII to the printer via the RS232 port on the back left side of the unit. Use the tan printer cable included with the Epson printer. Plug the printer power cord into an electrical outlet.

3. Turn power on to the DIamond TII and printer.

4. Press MENU and use the up or down arrows until display reads, “SYSTEM OPTIONS.”

5. Press OK.

6. From the “Printer Attached” display, press the up or down arrow for “YES”.

7. Press OK.

8. Press the BACK arrow twice to return to the STANDBY mode.

9. During normal recirculation mode, a purity and temperature reading will be printed once every 12 minutes.

Maintenance and Servicing

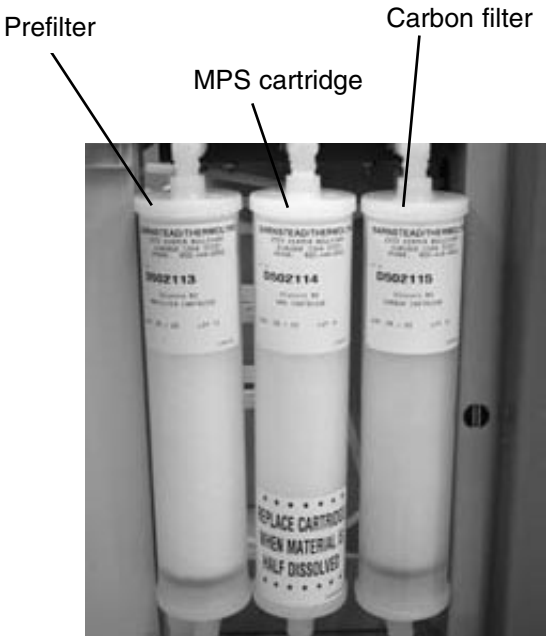


Figure 21: Cartridge Orientation

System Sanitization

Frequency of sanitization will vary, depending on quality of feedwater and usage. Sanitization is necessary if residual deposits are evident inside the reservoir, or if a new 0.2 micron final filter clogs rapidly. For sanitization procedure, see “System Sanitization Procedure” in the “Initial Operation” section of this manual.

Prefilter Replacement

The prefilter is designed to remove particles from your incoming water source. It is impossible to predict expected life. After 1 year of service or as a pressure drop is detected by the unit, the display will alert the user to replace prefilter. All pressure sensor data can be obtained in the RO Options screen. The pressure differential represents the difference between the prefilter inlet pressure and the prefilter outlet pressure. Before replacing the prefilter, ensure that all power and water are disconnected from the unit.

1. Remove the prefilter (see Fig. 21) by first pressing the upper and lower thumb buttons on the quick disconnect fittings.

2. Remove the prefilter by pulling the cartridge straight out.

3. Replace the prefilter by following the instructions located in the “Prefilter Installation” section of this manual.

4. Reset the prefilter timer by following the “Timers” section of this manual.

MPS Replacement

The MPS cartridge incorporated in your DIamond TII is designed to prevent scale buildup on the membrane(s). This cartridge must be replaced when the anti-scalant level is approximately half dissolved. At this point, the quantity of anti-scalant entering the water is insufficient to effectively prevent scale accumulation on the membrane(s). Before replacing the MPS cartridge, ensure that all power and water are disconnected from the unit.

1. Remove the MPS cartridge by pressing the upper and lower thumb buttons on the quick disconnect fittings.

2. Remove the MPS cartridge by pulling the cartridge straight out.

3. Replace the MPS cartridge by following the instructions located in the “MPS Cartridge Installation” section of this manual.

Carbon Replacement

The carbon filter incorporated in your DIamond TII provides a combination of filtration and chlorine removal. There is a timer built into the DIamond TII which will alert you when the carbon requires replacement. When the “Routine Care” light illuminates the carbon filter may need to be replaced. To find out the reason for the lit LED, choose MENU, scrolling to the “Routine Care” screen. Before replacing the carbon filter, ensure that all power and water are disconnected from the unit.

Warning
Carefully follow manufacturer’s safety instructions on labels of chemical containers and material safety data sheets.

1. Remove the carbon filter by first pressing the upper and lower thumb buttons on the quick disconnect fittings.

2. Remove the carbon filter by pulling the cartridge straight out.

3. Replace the carbon filter by following the instructions located in the “Carbon Filter Installation” section of this manual.

4. Reset the carbon timer by following the “Timers” section of this manual.

Cartridge Pack Replacement

Note
Remember, used cartridges can be recycled; See P.U.R.E. information packed with your new cartridges.

The frequency with which you will need to sanitize your unit and replace your cartridge pack is dependent on your feed water’s characteristics, your purity requirements and your usage. Sanitize your DIamond TII and replace the cartridge pack when the product water purity drops below acceptable levels of resistivity, when organic levels become too high, or if a new 0.2 micron filter clogs rapidly after installation even though the cartridge pack was thoroughly rinsed before the 0.2 micron filter was installed.

The simple-to-use sanitization block is available from Barnstead International (Catalog Number BK1403X2). This is used to effect a complete cleaning.

1. Turn off the DIamond TII and disconnect it from the power supply.

2. Disconnect the quick connect fitting in the tubing connected to the “FROM TANK” port.

3. Open the right side door.

4. Loosen the wing head screw on the cartridge manifold.

5. Remove the exhausted cartridge pack by lifting the unit manifold and pulling the cartridge pack out.

6. Sanitize the system per the instructions in the “Operation” section of this manual.

7. Reconnect the quick connect fitting in the tubing connected to the “FROM TANK” port.

8. Install new cartridge pack according to the instructions in the “Installation” section.

9. Reset the cartridge pack timer by following the “Timers” section of this manual.

10. Proceed to “Cartridge Pack Rinse Up” in the “Operation” section of this manual.

RO Membrane Replacement
(See Fig. 7 thru 9)

It is recommended to replace RO carbon prefilter when replacing the RO membrane. (See the “Carbon Filter Installation” section of this manual.)

1. Turn off the DIamond TII and disconnect it from the power supply.

2. Disconnect inlet feedwater connection.

3. Locate the RO membrane(s) inside the left

access door. and carefully unhook the Velcro® strap(s) that secure it (them).

4. Remove the old membrane(s) by disconnecting the reject and product tubing from the top of the membrane and the feed water connection from the bottom. See “Water Connection Details” for tubing removal instructions.

5. Install new membranes per the “RO Membrane Installation” section of this manual.

6. Reattach power cord and feedwater supply.

7. Reset the membrane timer by following the “Timers” section of this manual.

8. Proceed per “Membrane Rinse Up” section earlier in this manual.

0.2 Micron Final Filter Replacement

Note
It is suggested that PTFE tape be applied to the threads of the 0.2 micron final filter to ensure a tight seal.

Replace the 0.2 micron final filter whenever any of the following conditions occur: the product water flow rate is reduced, when you experience bacteria break through, when cartridges are replaced, or when system is sanitized. The 0.2 micron final filter is shipped assembled with a bell. To replace the 0.2 micron final filter assembly:

1. Remove the old 0.2 micron final filter assembly by turning it to the left to unscrew it from the dispense valve.

2. Remove the new 0.2 micron final filter assembly from its bag and insert it into the dispense valve. Gently tighten, turning the filter to the right.

3. Open the dispense valve and flush at least 3 liters of water through the 0.2 micron final filter.

Fuse Replacement

1. Turn off the DIamond TII and disconnect it from the power supply.
2. Pull out the fuse drawer located in the power entry module.
3. Remove old fuses and replace with fuses of the same type and rating. (See **Replacement Parts** section.)
4. Replace fuse drawer.
5. Reconnect the unit to the power supply.
6. Operate normally.

Note
When the lamp is burned out or disconnected, the System Alarm LED will illuminate. Press MENU and scroll to System Alarm for details.

UV Lamp Replacement

The ultraviolet lamp requires periodic replacement. Lamp life will vary according to the number of times the DIamond TII is turned on and off. Lamp life is based on the DIamond TII being operated in the normal recirculating mode during regular working hours and then placed in the Standby mode during off hours. Every fourth time the pump goes on in the Standby mode, the UV light will go on. If the DIamond TII is cycled between the RUN and STANDBY modes during the workday, this will result in a shorter lamp life. Therefore, it is recommended that the DIamond TII be left in the normal RUN mode during regular working hours.

To replace the UV lamp see “UV Lamp Installation” procedure in this manual.

Resetting Routine Timers

See procedures in the table below to reset routine timers.

Timer	Procedure
Prefilter Timer	MENU ⇢TIMERS ⇢ PREFILTER ⇢ [Display shows time remaining in days] RESET⇢ Are you sure? ⇢ YES/NO
MPS Timer	MENU ⇢TIMERS ⇢ MPS ⇢ [Display shows time remaining in days] RESET⇢ Are you sure? ⇢ YES/NO
Carbon Timer	MENU ⇢TIMERS ⇢ CARBON ⇢ [Display shows time remaining in days] RESET⇢ Are you sure? ⇢ YES/NO
Reservoir Vent Timer	MENU ⇢TIMERS ⇢ RESERVOIR VENT ⇢ [Display shows time remaining in days] RESET⇢ Are you sure? ⇢ YES/NO
Membranes Timer	MENU ⇢TIMERS ⇢ MEMBRANES ⇢ [Display shows time remaining in days] RESET⇢ Are you sure? ⇢ YES/NO
Cartridge Pack Timer	MENU ⇢TIMERS ⇢ CARTRIDGE PACK ⇢ [Display shows time remaining in days] RESET⇢ Are you sure? ⇢ YES/NO
System UV Timer	MENU ⇢TIMERS ⇢ SYSTEM UV ⇢ [Display shows time remaining in days] RESET⇢ Are you sure? ⇢ YES/NO
Reservoir UV Timer	MENU ⇢TIMERS ⇢ RESERVOIR UV ⇢ [Display shows time remaining in days] RESET⇢ Are you sure? ⇢ YES/NO
System Sanitization Timer	MENU ⇢TIMERS ⇢ SANITIZATION ⇢ [Display shows time remaining in days] RESET⇢ Are you sure? ⇢ YES/NO

Prefilter, MPS, Carbon, Membrane and Cartridge Pack Timers

These timers record service time to ensure the reliability and to reduce the risk of bacterial contamination. The Prefilter, MPS, Carbon, Membrane and Cartridge Pack Timers must all be reset *prior* to initial operation and after cartridge replacement.

Reservoir Vent Timer

The Reservoir Vent Timer will alert the user when the reservoir vent filtering capacity has expired. The user must reset the Reservoir Vent Timer each time the Ventgard filter element (25001) is replaced.

System UV Timer

The user must reset the System UV Timer each time the UV lamp in the DIamond TII is replaced. This will reset the UV timer for approximately six months calendar time.

Reservoir UV Timer

The user must reset the UV Timer each time the UV lamp in the DIamond TII storage reservoir is replaced. This will reset the UV timer for approximately one year calendar time.

Sanitization Timer

The Sanitization Timer will automatically reset itself after a successful sanitization procedure. If the user decides to manually reset the sanitization timer, follow procedure in table above. This will reset the sanitization timer for approximately one year calendar time.

Shutdown

If the DIamond TII is to be shut down for an extended period of time, the unit should be completely drained and the cartridges and membrane(s) removed and refrigerated to prevent the growth of bacteria.

General Cleaning Instructions

Wipe exterior surfaces with lightly dampened cloth containing mild soap solution.

Troubleshooting

Problem	Possible Causes	Solutions
DIamond TII completely inactive (pump and display not operating.)	No electrical power to DIamond TII.	Ensure DIamond TII power cord is connected to a live power source and completely plugged into electrical outlet as well as power entry module on the unit. Make sure on/off switch is in the “I” (on) position.
	Main fuse(s) blown.	Replace the main fuse(s) as indicated in “Fuse Replacement.”
	Display not connected or remote display cable is loose.	Check display connection.
	Power supply fuse blown	Contact customer service concerning power supply fuse replacement.
RO system is operating but no water is exiting out the atmospheric drain connection.	Flush solenoid plugged.	Perform a system flush.
Increase in time required to replenish reservoir.	Membranes fouled.	Replace membranes.
	Low feedwater pressure.	Verify feedwater pressure is 30 psi minimum.
Short DI cartridge pack life.	Cartridge pack is beyond expiration date.	Check the expiration date. Cartridge packs begin to lose capacity after being stored for 2 years from the date of manufacture. Replace the cartridge pack with an unexpired one.
	Poor quality feed water.	Check that the RO membranes are functioning properly.

Problem	Possible Causes	Solutions
Water is leaking between the manifold and the cartridge pack.	Wing head screw is not tight enough.	Hand tighten wing head screw on unit manifold.
	New cartridge pack: o-ring missing from post (each of the 4 posts must contain an o-ring.)	Turn off power to system. Disconnect quick connect fitting in tube from reservoir. Disconnect the manifold and verify/replace missing o-ring. Reinstall cartridge pack as indicated in “Cartridge Pack Replacement.”
Leaks at membrane, drain connections, tank connections, or remote connections.	Burrs on tubing.	Remove tubing as shown in “Tubing Removal.” Check tubing for burrs.
	Tubing not installed in fitting completely.	Mark tubing and install per “Tubing Installation.”
Reduced or no product flow from the dispense arm or remote dispenser (if attached). (Low DI dispense flow.)	Plugged 0.2 micron final filter.	Replace final filter (Part no. D3750) as indicated in “0.2 Micron Filter Replacement” section.
	Reservoir not connected.	Reconnect reservoir. Ensure quick connect fitting in tube from reservoir is fully engaged.
	Reservoir improperly located too low.	Verify reservoir outlet is located at or above system inlet.
	DI pump not functioning.	Replace pump (Part no. PU1190X1)
	Pinched tubing.	Check tubing inside system and between reservoir and system.
	Air purge not complete.	Allow up to 24 hours of recirculation for purging all air from the fluid path.

System Alarms

If an error occurs in the DIamond TII system, the System Alarm LED will illuminate and an error message will appear on the display.

Message	Possible Causes	Action
Res Interface Error	Reservoir interface cable not attached at both ends.	Check cable connections.
	Interface board not connected.	Check cable connection to control board.
	Interface board, control board, or reservoir board out of tolerance.	Replace board (PC1403X2, PC1403X3, PC1406X1 or PC1406X2.)
	Alternate reservoir in use.	Using DIamond TII menu screens, set reservoir type to “Alternate” (in “System Options”).
TII Res Float Err	Float cable not securely connected.	Check float cable connection.
	Float not operating correctly.	Check float operation.
	Floats not wired correctly.	Check float wiring.
	Floats not installed correctly.	Check float installation.
	Alternate reservoir in use.	Using DIamond TII menu screens, set reservoir type to “Alternate” (in “System Options”).
Alt Res Float Err	Float cable not securely connected.	Check float cable connection.
	Float not operating correctly.	Check float operation.
	Floats not wired correctly.	Check float wiring.
	Floats not installed correctly.	Check float installation.
	DIamond TII reservoir in use.	Using DIamond TII menu screens, set reservoir type to “DIamond TII” (in “System Options”). Ensure interface connector is securely connected to the DIamond TII and the DIamond TII storage reservoir.
Purity Meter Error	Control board out of tolerance.	Replace control board (PC1403X3).
Meter Check Failed	Meter on control board out of calibration.	Calibrate meter using NIST module.
	Meter on control board out of tolerance.	Replace control board (PC1403X3).

Problem (cont.)	Possible Causes (cont.)	Action (cont.)
DI Temp Error	Resistivity cell not connected to board.	Check resistivity cell lead connection on board.
	Resistivity cell temperature sensor out of tolerance.	Replace resistivity cell (E1403X1A).
	Reservoir water temperature outside of allowable range.	Check the temperature of the storage reservoir water.
	Control board out of tolerance.	Replace control board (PC1403X3).
Low DI Purity	Cartridge pack near exhaustion.	Install a new cartridge pack (D502137) and reset timer.
	Cartridge pack not in place (sanitization block installed?).	Check that cartridge pack is installed.
	DI cell out of tolerance.	Replace resistivity cell (E1403X1A).
	DI meter on control board out of tolerance.	Replace control board (PC1403X3).
DI Over-range	Air in system.	Allow system to recirculate to purge air, or look for possible suction leak.
	Resistivity cell not connected to control board.	Check resistivity cell lead connections on control board.
	Incorrect NIST calibration offset.	Perform NIST calibration. This will require an E1403X4 calibration module. If you do not have a calibration module, perform calibration without module and answer "yes" to prompt to clear any incorrect offset value.
	Resistivity cell out of tolerance.	Replace resistivity cell (E1403X1A).
RO Temp Error	RTD not connected to board.	Check RTD connection.
	RTD out of tolerance.	Replace RTD (RSX432).
	Feedwater temperature outside of allowable range.	Check feedwater temperature.
	Control board out of tolerance.	Replace control board (PC1403X3).

Problem (cont.)	Possible Causes (cont.)	Action (cont.)
High RO Feed Purity	Improper feed water (unit being fed pretreated water).	Analyze feed water - check that system is being used for correct application.
	RO feed cell not connected to control board.	Check connection of feed cell.
	Feed cell fouled or out of tolerance.	Replace RO feed cell (E1403X3).
High RO Prod Purity	RO product cell not connected to control board.	Check connection of product cell.
	Product cell fouled or out of tolerance.	Replace RO product cell (E1403X3).
Low RO Purity	RO membranes are fouled.	Replace RO membrane(s) (FL1265X1).
	RO cell connections to control board are unplugged.	Check connections.
	RO cells are fouled or out of tolerance.	Replace RO cells (E1403X3).
Inlet Solenoid Err	No inlet water supply.	Check inlet water connection. Ensure feedwater is turned on.
	Inlet solenoid not connected to board or connected improperly.	Check connection.
	Inlet solenoid not functioning.	Replace inlet solenoid (RY1265X2).
	Regulator not functioning properly.	Replace regulator (PM1403X1).
Pressure Sensor Er1	Pressure sensor not connected to board or improperly connected.	Check connection.
	Pressure sensor not functioning.	Replace pressure sensor(s) (TDX8) and recalibrate.

Problem (cont.)	Possible Causes (cont.)	Action (cont.)
Pressure Sensor Er2	Pressure sensor not connected to board or improperly connected.	Check connection.
	Pressure sensor not functioning.	Replace pressure sensor(s) (TDX8) and recalibrate.
	Possible leak, prefilter installed incorrectly, or faulty prefilter.	Check for water spillage. If none, check installation of prefilter or replace prefilter (D502113) if necessary.
	Prefilter and membrane pressure sensors not connected to control board or improperly connected.	Check connections.
Pressure Sensor Er3	Pressure sensor not connected to board or improperly connected.	Check connection.
	Pressure sensor not functioning.	Replace pressure sensor(s) (TDX8) and recalibrate.
	Possible leak, or MPS or carbon filter installed incorrectly or faulty.	Check for water spillage. If none, check installation of MPS (D502114) and carbon filter (D502115), or replace if necessary.
Low Memb Pressure	Carbon cartridge (D502115) is plugged.	Replace carbon cartridge (D502115) and reset timer.
	Membrane failure or incorrect installation.	Check membrane connections, replace membrane(s) (FL1265X1) if necessary.
	Membrane pressure transducer out of calibration.	Recalibrate membrane pressure transducer.
	RO pump failure.	Replace RO pump (PU1190X1).
	Reject solenoid out of calibration or stuck open.	Perform manual flush. If error persists, replace solenoid (RY1265X1).
Check UV interlock	Reservoir UV cover not in place.	Recheck positioning of UV cover.
	UV interlock actuator or sensor out of position.	Check that the actuator is attached to the cover and the sensor is mounted to the reservoir.
	UV interlock cable not connected.	Check cable connections at the reservoir circuit board.
	UV interlock sensor not functioning.	Replace interlock sensor (SW1406X1 for 30L, or SW1407X1 for 60L).

Problem (cont.)	Possible Causes (cont.)	Action (cont.)
Check Res UV	Reservoir UV lamp cable not plugged in. Reservoir UV lamp burnt out or inadequate UV output. Reservoir UV lamp not properly connected to UV cable connector.	Plug reservoir UV lamp cable into control board. Replace reservoir UV lamp (LMX31) and reset timer. Check connection to UV cover. and inside UV cover.
Check Res Ballast	Reservoir UV ballast out of tolerance.	Replace ballast (TN1406X1). Call Technical Service.
Check System UV	System UV lamp cable not plugged into control board. System UV lamp burnt out or inadequate UV output. Chamber seal is compromised and system UV lamp is getting wet. System UV lamp not properly connected to UV cable connector.	Plug system UV lamp cable into control board. Replace system UV lamp (LMX13), and reset timer. Replace quartz sleeve and o-rings (TU733X1 and GSX62) Check connection at UV chamber.
Chk System Ballast	System UV ballast out of tolerance.	Replace system ballast (TN1403X1). Call Technical Service.
Flow Sensor Error	No water flow to DI loop. Pinched tube preventing water flow through DI loop (no water is being dispensed). Flow sensor not connected to control board or connection is bad. Flow sensor failure.	Check reservoir connections. Check tubing and repair as necessary. Check connection. Replace sensor (ME1190X1).
Auto Disp not Comp	Insufficient reservoir volume at start of dispense, or other drainage of reservoir (manual dispense from spigot, or dispense from distribution loop) during auto dispense.	Wait for reservoir to sufficiently refill, then reprogram auto dispense for remaining volume or time and complete the dispense.

Routine Care

Message	Possible Causes	Action
Replace Carbon	Chlorine capacity of the carbon prefilter has been reached, or 1 year service life has expired.	Replace Carbon Prefilter (D502115) and reset the carbon prefilter timer.
Check Prefilter	System has sensed that the prefilter is plugged.	Replace the RO Prefilter (D502113) and reset the prefilter timer.
Replace Prefilter	1 year service life of the prefilter has expired.	Replace the RO Prefilter (D502113) and reset the prefilter timer.
Replace Membrane	1 year service life of the membrane(s) has expired.	Replace the RO membrane(s) (FLX1265X1) and reset the membrane timer.
Replace Res Filter	6 month service life of vent filter has expired.	Replace vent filter element (25001) and reset the vent filter timer.
Replace MPS Cart	1 year service life of the MPS cartridge has expired.	Replace the MPS cartridge (D502114) and reset the MPS cartridge timer.
Replace DI Pack	1 year service life of the cartridge pack has expired.	Sanitize the system, replace the cartridge pack (D502137), and reset the sanitization and cartridge pack timers.
Replace System UV	6 month peak service life of the system UV lamp has expired.	Replace the system UV lamp (LMX13) and reset the system UV lamp timer.
Replace Res UV	1 year peak service life of the system UV lamp has expired.	Replace the reservoir UV lamp (LMX31) and reset the reservoir UV lamp timer.
Sanitize System	1 year system sanitization reminder has expired.	Sanitize the system and reset the sanitization timer.

Replacement Parts

Consumables

Consumable parts are those *required* to support the day-to-day operation of this equipment. Barnstead International establishes two types of consumables; those items that *must* periodically be replaced to maintain performance (filters, resin cartridges, etc.) and other items of limited life (fuses, etc.) that you can expect to replace on a more or less random basis. Where practical, Barnstead International recommends the frequency of replacement, or provides information on life expectancy from which you may calculate a replacement interval compatible with your usage pattern.

The replacement of consumable parts is discussed in the **Maintenance and Servicing** section to assist you in accomplishing your own service. Consumables may be ordered separately and in some cases, as an expendables kit. Check with your Barnstead International representative for additional information on the expendables kit.

Description	Catalog No.	Recommended Quantity	Max. Shelf Life
DIamond TII Cartridge Pack	D502137	1	2 years[1]
RO Carbon Prefilter	D502115	1	2 years[1]
MPS Cartridge	D502114	1	2 years[1]
1 Micron Prefilter	D502113	1	2 years[1]
0.2 Micron Final Filter and Bell Assembly	D3750	2	N/A
Fuse, Power Entry:			
100-120 volt (slow blow 1.6 amp)	FZX47	2	N/A
240 volt (IEC127 timelag 0.63 amp)	FZX54	2	N/A
Ultraviolet Lamp (DIamond TII)	LMX13	1	5 years

[1] This is reference information. Please check actual expiration dates on individual cartridges for shelf life end dates. Cartridges used past the shelf lifetimes will exhibit decreased capacity.

Note
Shelf life will be inaccurate if products are taken out of their original packaging.

General Maintenance

General maintenance parts are defined as laboratory level repair parts which do not require great expertise or special tools for installation. Barnstead International recommends that you stock the general maintenance parts as an aid to ensuring the continued operation of this equipment.

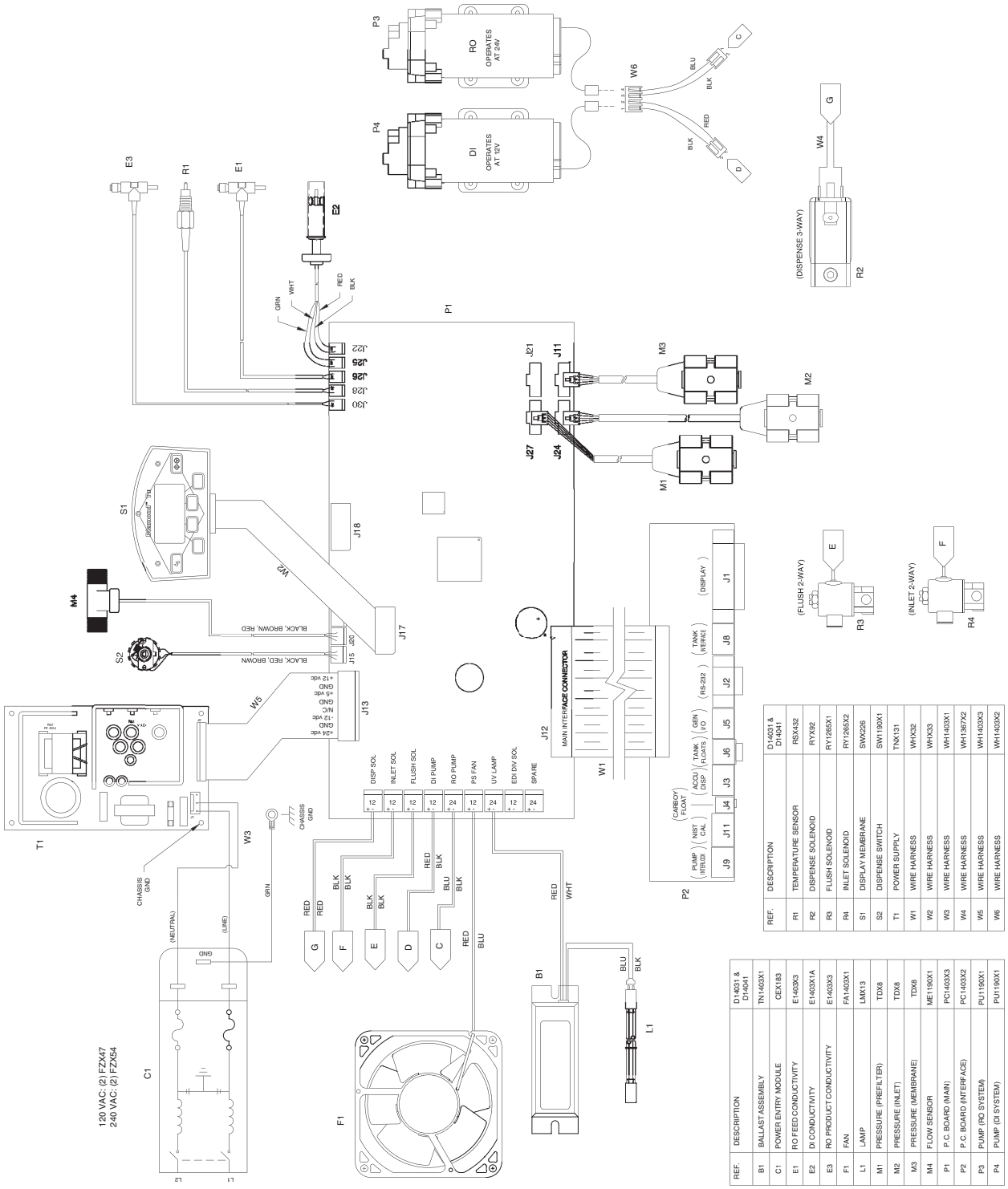
Description	Catalog No.	Recommended Quantity
Quick Disconnect Inlet	CUX8	1
Quick Disconnect Insert - 3/8” tube	CUX9	1
Quick Disconnect Inlet - 3/8” tube	CUX11	1
Cartridge Pack O-rings	GSX68	4
DIamond TII RO Membrane	FL1265X1	D14031 (1), D14041 (2)

Safety Stock

For critical applications where performance with *minimum* downtime is required, Barnstead International recommends that you maintain a local stock of those parts listed in the GENERAL MAINTENANCE PARTS and SAFETY STOCK sections.

Description	Catalog No.	Recommended Quantity
Replacement Control Board	PC1403X3	1
Replacement Interface Board	PC1403X2	1
Pump Ass’y	PU1190X1	2
DI Resistivity Cell	E1403X1A	1
RO Resistivity Cell	E1403X3	2
RO Temperature Sensor	RSX432	1
Resistivity Cell O-ring	GSX29	1
Ballast	TN1403X1	1
Quartz Sleeve	TU733X1	1
Quartz Sleeve O-rings	GSX62	2
Power Supply	TNX116	1
Inlet Solenoid Valve	RY1265X2	1
Flush Solenoid Valve	RY1265X1	1
Pressure Transducer	TDX8	3
Pressure Reducing Valve	PM1403X1	1
Display	SW1403X1	1
External Display Cable	WH1403X4	1
Dispense Manifold with Solenoid	BK1403X3	1
Dispense Switch	SW1190X1	1
Cartridge Pack Manifold	BK1403X1	1
Power Supply Fan	FA1403X1	1

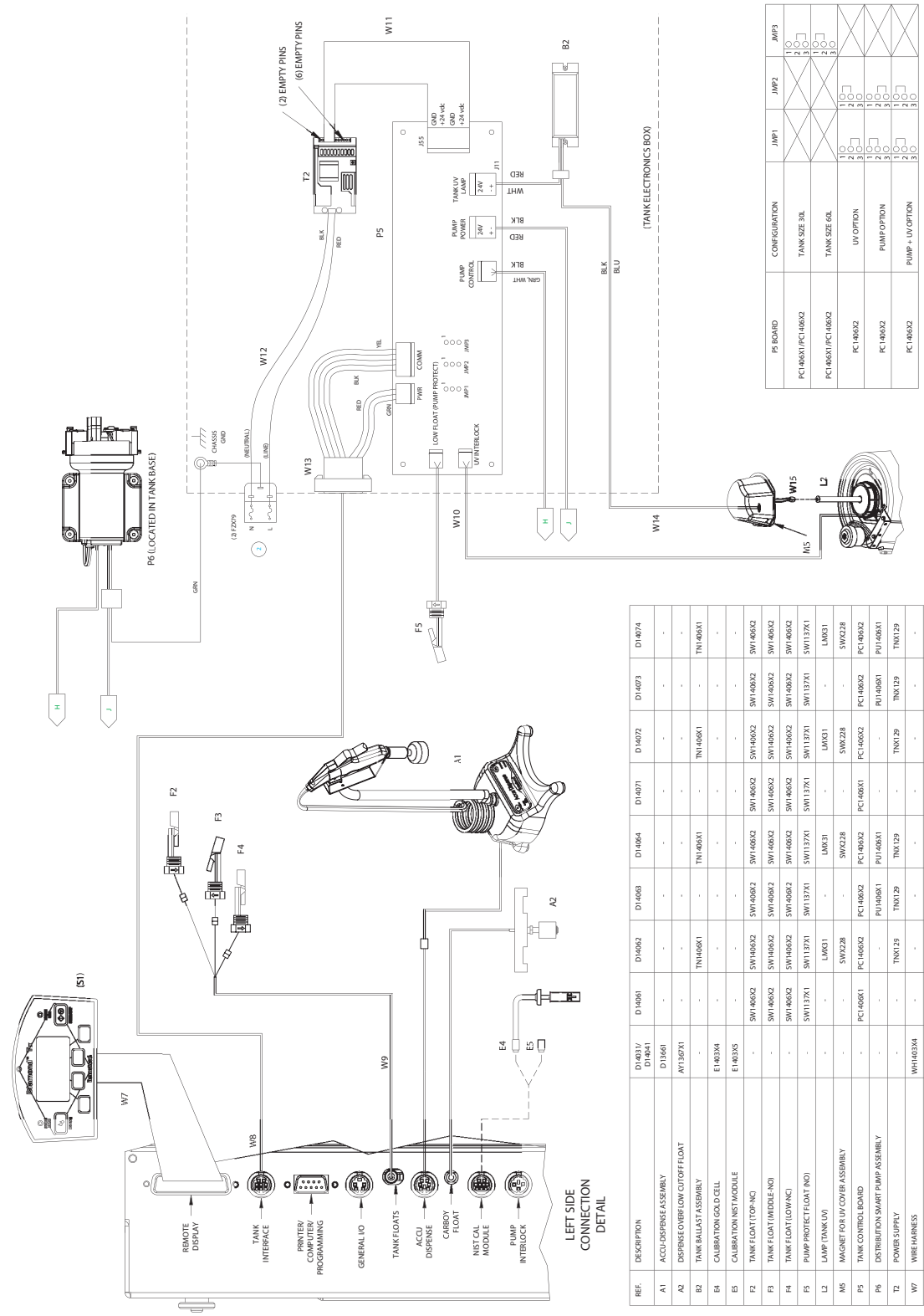
Wiring Diagrams



REF.	DESCRIPTION	D14031 & D14041
R1	TEMPERATURE SENSOR	RSX432
R2	DISPENSE SOLENOID	RYX92
R3	FLUSH SOLENOID	RY1285X1
R4	INLET SOLENOID	RY1285X2
S1	DISPLAY MEMBRANE	SWX226
S2	DISPENSE SWITCH	SW1190X1
T1	POWER SUPPLY	TNX131
W1	WIRE HARNESS	WHX32
W2	WIRE HARNESS	WHX33
W3	WIRE HARNESS	WH1403X1
W4	WIRE HARNESS	WH1367X2
W5	WIRE HARNESS	WH1403X3
W6	WIRE HARNESS	WH1403X2

REF.	DESCRIPTION	D14031 & D14041
B1	BALLAST ASSEMBLY	TN1403X1
C1	POWER ENTRY MODULE	CEX183
E1	RO FEED CONDUCTIVITY	E1403X3
E2	DI CONDUCTIVITY	E1403X1A
E3	RO PRODUCT CONDUCTIVITY	E1403X3
F1	FAN	FA1403X1
L1	LAMP	LMX13
M1	PRESSURE (PREFILTER)	TDX8
M2	PRESSURE (INLET)	TDX8
M3	PRESSURE (MEMBRANE)	TDX8
M4	FLOW SENSOR	ME1190X1
P1	P.C. BOARD (MAIN)	PC1403X3
P2	P.C. BOARD (INTERFACE)	PC1403X2
P3	PUMP (RO SYSTEM)	PU1190X1
P4	PUMP (DI SYSTEM)	PU1190X1

WIRING DIAGRAMS



P5 BOARD	CONFIGURATION	JMP1	JMP2	JMP3
PC1406X1/PC1406X2	TANK SIZE 30L			
PC1406X1/PC1406X2	TANK SIZE 60L			
PC1406X2	UV OPTION			
PC1406X2	PUMP OPTION			
PC1406X2	PUMP + UV OPTION			

REF.	DESCRIPTION	D140311/ D140411	D14061	D14062	D14063	D14064	D14071	D14072	D14073	D14074
A1	ACCU-DISPENSE ASSEMBLY	D13661	-	-	-	-	-	-	-	-
A2	DISPENSE OVERFLOW CUTOFF FLOAT	AY13607X1	-	-	-	-	-	-	-	-
B2	TANK BALLAST ASSEMBLY	-	-	TN1406X1	-	TN1406X1	-	TN1406X1	-	TN1406X1
E4	CALIBRATION GOLD CELL	E140334	-	-	-	-	-	-	-	-
E5	CALIBRATION NIST MODULE	E140335	-	-	-	-	-	-	-	-
F2	TANK FLOAT (TOP-NC)	-	SW1406X2	SW1406X2	SW1406X2	SW1406X2	SW1406X2	SW1406X2	SW1406X2	SW1406X2
F3	TANK FLOAT (MIDDLE-NO)	-	SW1406X2	SW1406X2	SW1406X2	SW1406X2	SW1406X2	SW1406X2	SW1406X2	SW1406X2
F4	TANK FLOAT (LOW-NC)	-	SW1406X2	SW1406X2	SW1406X2	SW1406X2	SW1406X2	SW1406X2	SW1406X2	SW1406X2
F5	PUMP PROTECT FLOAT (NO)	-	SW1137X1	SW1137X1	SW1137X1	SW1137X1	SW1137X1	SW1137X1	SW1137X1	SW1137X1
L2	LAMP (TANK UV)	-	-	LMX31	-	LMX31	-	LMX31	-	LMX31
M5	MAGNET FOR UV COVER ASSEMBLY	-	-	SWX228	-	SWX228	-	SWX228	-	SWX228
P5	TANK CONTROL BOARD	-	PC1406X1	PC1406X2	PC1406X2	PC1406X2	PC1406X1	PC1406X2	PC1406X2	PC1406X2
P6	DISTRIBUTION SMART PUMP ASSEMBLY	-	-	-	PU1406X1	PU1406X1	-	-	PU1406X1	PU1406X1
T2	POWER SUPPLY	-	-	TNX129	TNX129	TNX129	-	TNX129	TNX129	TNX129
W7	WIRE HARNESS	WH1403X4	-	-	-	-	-	-	-	-
W8	WIRE HARNESS	-	-	CBX111	CBX111	CBX111	-	CBX111	CBX111	CBX111
W9	WIRE HARNESS	-	WH1406X6	WH1406X6	WH1406X6	WH1406X6	WH1406X6	WH1406X6	WH1406X6	WH1406X6
W10	WIRE HARNESS	-	-	SW1406X1	-	SW1406X1	-	SW1406X1	-	SW1406X1
W11	WIRE HARNESS	-	-	WH1406X4	WH1406X4	WH1406X4	-	WH1406X4	WH1406X4	WH1406X4
W12	WIRE HARNESS	-	-	WH1406X5	WH1406X5	WH1406X5	-	WH1406X5	WH1406X5	WH1406X5
W13	WIRE HARNESS	-	-	WH1406X3	WH1406X3	WH1406X3	-	WH1406X3	WH1406X3	WH1406X3
W14	WIRE HARNESS	-	-	WH1406X1	-	WH1406X1	-	WH1406X1	-	WH1406X1
W15	WIRE HARNESS	-	-	WH1406X2	-	WH1406X2	-	WH1406X2	-	WH1406X2

Ordering Information

Please refer to the Specification Plate for the complete model number, serial number, and series number when requesting service, replacement parts or in any correspondence concerning this unit.

All parts listed herein may be ordered from the **Barnstead International** dealer from whom you purchased this unit or can be obtained promptly from the factory. When service or replacement parts are needed we ask that you check first with your dealer. If the dealer cannot handle your request, then contact our Customer Service Department at 563-556-2241 or 800-553-0039.

Prior to returning any materials to **Barnstead International**, please contact our Customer Service Department for a “Return Goods Authorization” number (RGA). Material returned without an RGA number will be returned.

Two Year Limited Warranty

BARNSTEAD INTERNATIONAL (“BARNSTEAD”) warrants that a product manufactured by Barnstead shall be free of defects in materials and workmanship for two (2) year from the first to occur of (i) the date the product is sold by BARNSTEAD or (ii) the date the product is purchased by the original retail customer (the “Commencement Date”). Except as expressly stated above, BARNSTEAD MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, WITH RESPECT TO THE PRODUCTS AND EXPRESSLY DISCLAIMS ANY AND ALL WARRANTIES, INCLUDING BUT NOT LIMITED TO, WARRANTIES OF DESIGN, MERCHANT ABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

An authorized representative of BARNSTEAD must perform all warranty inspections. In the event of a defect covered by BARNSTEAD’s warranty, BARNSTEAD shall, as its sole obligation and exclusive remedy, provide free replacement parts to remedy the defective product. In addition, for products sold by BARNSTEAD within the continental United States or Canada, BARNSTEAD shall provide free labor to repair the products with the replacement parts, but only for a period of ninety (90) days from the Commencement Date.

BARNSTEAD’s warranty provided hereunder shall be null and void and without further force or effect if there is any (i) repair made to the product by a party other than BARNSTEAD or its duly authorized service representative, (ii) misuse (including use inconsistent with written operating instructions for the product), mishandling, contamination, overheating, modification or alteration of the product by any customer or third party or (iii) use of replacement parts that are obtained from a party who is not an authorized dealer of BARNSTEAD.

Heating elements, because of their susceptibility to overheating and contamination, must be returned to the BARNSTEAD factory and if, upon inspection, it is concluded that failure is due to factors other than excessive high temperature or contamination, BARNSTEAD will provide warranty replacement. As a condition to the return of any product, or any constituent part thereof, to BARNSTEAD’s factory, it shall be sent prepaid and a prior written authorization from BARNSTEAD assigning a Return Materials Number to the product or part shall be obtained.

IN NO EVENT SHALL BARNSTEAD BE LIABLE TO ANY PARTY FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, OR FOR ANY DAMAGES RESULTING FROM LOSS OF USE OR PROFITS, ANTICIPATED OR OTHERWISE, ARISING OUT OF OR IN CONNECTION WITH THE SALE, USE OR PERFORMANCE OF ANY PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, TORT (INCLUDING NEGLIGENCE), ANY THEORY OF STRICT LIABILITY OR REGULATORY ACTION.

The name of the authorized Barnstead International dealer nearest you may be obtained by contacting Barnstead International:

BarnsteadInternational

Your Lab Starts Here

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