

ROpure[®] Infinity Premier Model Reverse Osmosis System

OPERATING MANUAL

AND PARTS LIST

Series 901

Model	Description	Liters/Hour	Voltage
D9011	Premier	15 l/hr	120
D9014	Premier	30 l/hr	120
D9012-33	Premier	15 l/hr	230
D9015-33	Premier	30 l/hr	230
D9013	Premier	15 l/hr	100

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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.

Your Barnstead|Thermolyne ROpure Infinity 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 indicators 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 ROpure Infinity 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. 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. This device is to be used with water feeds only. Sanitizing/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.
3. Avoid splashing disinfecting solutions on clothing or skin.
4. Ensure all piping connections are tight to avoid chemical leakage.
5. Ensure adequate ventilation.
6. Carefully follow manufacturer's safety instructions on labels of chemical containers and material safety data sheets.
7. Depressurize system prior to disengaging the cartridge hold-down bracket or membrane removal.
8. Refer servicing to qualified personnel.
9. Avoid contact of strong oxidizing agents, such as nitric acid, with ion exchange cartridges. An explosion may result.

Introduction

Congratulations on your purchase of a Barnstead|Thermolyne ROpure Infinity. This unit is a water purification system designed to provide reverse osmosis water for your lab or other ultrapure water system. It uses a thin film composite membrane combined with excellent pretreatment to supply reverse osmosis water.

Careful attention to the following instructions will assure that the ROpure Infinity operates properly and produces water to specifications. Also, be sure to fill out and return the enclosed warranty registration card. We would like to receive the information requested, and it will help us assure you of proper warranty coverage.

Each ROpure Infinity unit requires a separate storage reservoir for automatic operation (part number D9021). Please make sure you have an adequate storage reservoir before installing your ROpure Infinity.



Figure 1 ROpure Infinity Front

General Usage

Do not use this product for anything other than its intended usage.

Specifications

Dimensions and Clearance Requirements

Dimensions

Wall and Bench mounted models

Width	20"	(50.8 cm)
Depth	17-1/2"	(44.5 cm)
Height	22-5/8"	(57.5 cm)

Clearances

Sides - 6" (15 cm) minimum for servicing.

Above - 3" (7.6 cm) minimum for removal of the outer case.

Front - 20" (50.8 cm) minimum for opening the front door.

Cartridge and membrane replacement is easily accomplished upon opening the front door.

Feed Water Requirements^{1,5}

Types ¹	Tap (Potable).
Turbidity	1.0 N.T.U. maximum.
Pressure Range	30 psig (2 bar) to 100 psig (6.8 bar) maximum.
Temperature Range	4.4°C - 31°C (40-88°F)
Inlet Flow Requirements	154 lph
pH	4-11
TDS (Max. ppm as CaCO ₃)	500
Silt Density Index	<5%
Free Chlorine	<0.1 ppm ²
Langlier Saturation Index	Negative
Iron (Total as Fe)	<0.5 ppm

Product Water⁵

Product Water Flow Rate	15 lph ³ or 30 ³ lph maximum at minimum inlet feed water pressure of 30 psig at 60 Hz
% Recovery	25%

Membrane Rejection Rates⁴

Monovalent Ions	90-95%
Polyvalent Ions	95-99%
Particles	>99%
Microorganisms	>99%
Dissolved Organics (300 MW)	>99%
Reject Water Flow Rate	124-139 lph ⁵

1 Feed water suitability must be determined by a water analysis.

2 Free chlorine removed by pretreatment cartridge.

3 ±15%, feed water at 25°C and 60 psig operating pressure.

4 Membrane performance is dependent on condition, pressure, recovery, water temperature and water composition. Listed membrane performance for a new membrane is based on optimum operating conditions of 60 psig, 15% recovery, 25°C (77°F) feed water temperature and feed water composition of a maximum of 500 ppm NaCl at a pH of 6.0-6.5.

5 Membrane performance, flow rates and recovery information are nominal values. Variations in the feed water temperature, pumps and reject orifice may slightly alter these results.

SPECIFICATIONS

Electrical Requirements

The ROpure Infinity is equipped with a power cord to be plugged into an electrical outlet of the appropriate voltage.

Voltage and Frequency (Nominal)

Model D9013	100 VAC, 50-60 Hz	85-110 VAC, 47-63 Hz, 1 phase
Model D9011, D9014	120 VAC, 50-60 Hz	98-127 VAC, 47-63 Hz, 1 phase
Model D9012-33, D9015-33	230 VAC, 50-60 Hz	196-253 VAC, 47-63 Hz, 1 phase

Environmental Conditions

Operating: 4°C - 49°C; 20% to 80% relative humidity, non-condensing. Installation Category II (over-voltage) in accordance with IEC 664. Pollution Degree 2 in accordance with IEC 664. Altitude limit: 3,500 meters.

Storage: -25°C to 65°C; 10% to 85% relative humidity.

Declaration of Conformity (-33 models only)

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

EMC:	EN 50081-1	Generic Emission Standard;
	EN 50082-1	Generic Immunity Standard;
	EN 61326	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General Requirements
Safety:	EN61010-1	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:

European Manager
Barnstead|Thermolyne
Saarbrückener Str. 248
D-38116 Braunschweig
Germany

Copies of the Declaration of Conformity are available upon request.

Unpackaging and 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 275 lbs. 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.



Warning

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

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

Unpackaging

1. Remove the unit from its shipping container. Remove all contents carefully. **Ensure the following parts are removed from the packaging materials before discarding.**
 - 1) **Membrane(s)**
 - 2) **Prefilter cartridge**
 - 3) **MPS cartridge**
 - 4) **Wall bracket**
 - 5) **Accessory parts bag with feed water tube included**
 - 6) **Power cord**
2. Put the ROpure Infinity on a bench.

Choosing a Site

The ROpure Infinity system features a pivoting control panel display which allows the system to be mounted almost anywhere within the laboratory. Your ROpure Infinity must be located within six feet of an electrical outlet appropriate for your unit, within five feet of your feed water supply and close to an atmospherically vented drain. If you are using the accessory 60 Liter Infinity Storage Reservoir (part number D9021), the reservoir must not be mounted farther than four feet away from the ROpure Infinity.

Use the wall bracket for wall mounted systems as a template to drill mounting holes. (The ROpure Infinity does not include screws and fasteners for mounting.) Allow a minimum of 6 inches (15 cm) clearance on all sides of the unit for servicing, 3 inches (7.6 cm) on top for outer case removal and 20 inches (50.8 cm) in front for opening the door.

Tubing Adapter Installation

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

1. Completely disassemble the fitting. Refer to Figure 2 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 backup ring in the hex nut in the order and orientation shown in Figure 2. Thread the nut into 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 backup 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.

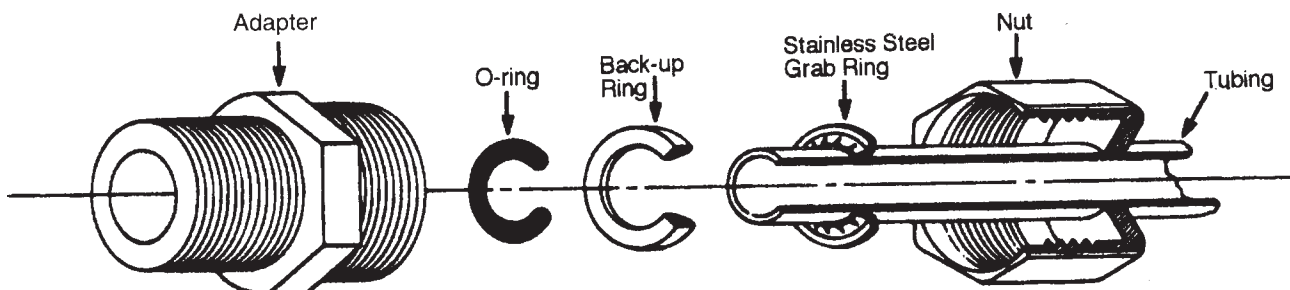


Figure 2 Typical Polypropylene Tubing Adapter Installation

**Warning**

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

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

**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 275 lbs. 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**

Prior to installing the ROpure Infinity on the wall, ensure that the membranes and/or other accessories such as the prefilters are installed. See the appropriate section of this manual for installation of accessories.

Bench Mounting

1. Place ROpure Infinity on a bench top that is accessible to water and electricity and that is convenient to your work area, noting clearance requirements.

Wall Mounting

Install the NANOpure Infinity on a wall in a convenient location that is accessible to water 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 the 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 Infinity 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.

Water Connections

Feed Water Connection

1. Locate the length of 3/8" O.D. tubing provided with a quick disconnect insert on one end and a 3/8" O.D. X 1/4" NPT tubing adapter on the other.
2. Install the tubing adapter onto your incoming water line. We recommend a customer supplied shut off valve be installed in your feed water line. The quick disconnect insert will be inserted into the feed water inlet on the lower left side of the ROpure Infinity during the Initial Operation (page 22).

Reject Water Connection

1. Locate the reject water tubing. This is the piece of 3/8" O.D. tubing that has an adapter on one end and no connector on the other end. Remove the nut, grab ring, backup ring and o-ring from the reject water fitting located at the lower right of the unit. (See Figure 2 for part identification).
2. Remove the tubing adapter from the reject water tubing connector. Thread the nut, grab ring, backup ring and o-ring onto the reject water tubing adapter located on the ROpure Infinity.
3. Route the other end of the reject water tubing to an atmospherically vented drain. Ensure there are no kinks in the tubing and that it proceeds in a downward plane.

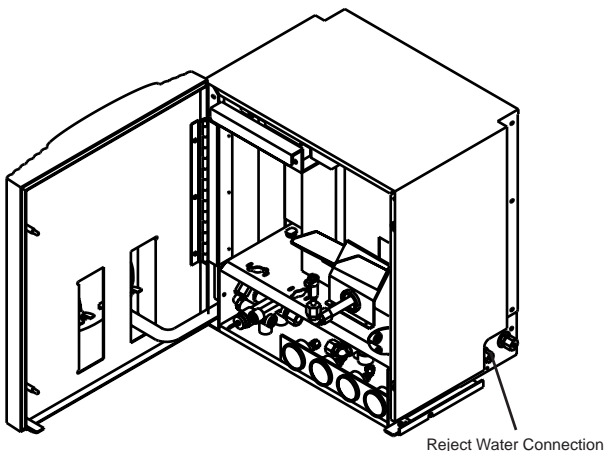


Figure 4 Reject Water Connection

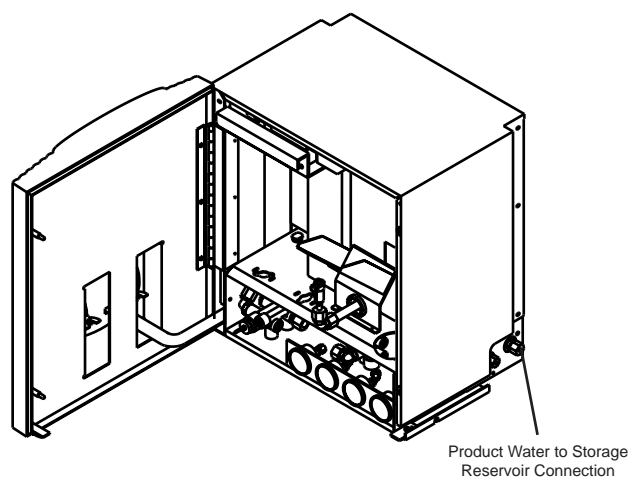


Figure 5 Product Water to Storage Reservoir Connection

**Note**

Install all tubing connections on the storage reservoir prior to installing the reservoir on the wall.

Product Water Connection to D9021

Storage Reservoir

1. Locate the 1/4" O.D. tubing labeled "Product tubing from ROpure Infinity to Storage." This tubing is in an accessory bag for the ROpure Infinity. Connect tubing on ROpure Infinity product water outlet, (on lower right of ROpure Infinity unit). Then, route the other end of the tubing through the opening in the bottom right corner in the rear of your 60 Liter Infinity Storage Reservoir.
2. Route the tubing up the rear of the storage reservoir, left of the black terminal block cover. Attach the tubing to the top fitting on the storage reservoir. Refer to the instructions for Tubing Adapter Installation on page 10 for proper orientation of the components.
3. Attach the tubing to the ROpure Infinity according to the instructions in the 60 Liter Infinity Storage Reservoir manual, before mounting the reservoir on a bench or wall.

Cartridge and Membrane Installation

Your Premier ROpure Infinity has been shipped with a prefilter cartridge, pretreatment carbon cartridge, MPS cartridge and one membrane (for 15 lph unit) or two membranes (for 30 lph unit), that you will install. To prepare your ROpure Infinity for operation, disconnect the unit from the power supply. Open the front door. Disengage the cartridge hold-down bracket by pulling it out and up. Rest the cartridge hold-down bracket on top of the ROpure Infinity.



Warning

Depressurize system prior to disengaging the cartridge hold-down bracket.



Note

The top cartridge nipple is the one with the right-angle turn and one flange. The bottom cartridge nipple extends straight out from the cartridge.

The flange on the top cartridge nipple should be able to slide down the keyway wall behind the sheet metal.

Prefilter Installation

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

1. Remove a new prefilter (Part Number D9004) from its plastic bag.
2. Wet the o-rings on both end caps of the prefilter.
3. Insert the upper end cap into the upper farthest left position of the two cartridge end cap sockets below the cartridge hold-down bracket until it bottoms out in the connector. The upper end cap is the one with the right angle turn and the flange. The flange on the end cap slides down inside the keyway wall.
4. Lower the prefilter and insert the lower end cap into the lower left socket until it is firmly seated.

Pretreatment Carbon Cartridge

Installation

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

**Note**

The top cartridge nipple is the one with the right-angle turn and one flange. The bottom cartridge nipple extends straight out from the cartridge.

The flange on the top cartridge nipple should be able to slide down the keyway wall behind the sheet metal.

Install the carbon cartridge as follows:

1. Remove a new carbon cartridge (Part Number D9005) from its plastic bag.
2. Wet the o-rings on both end caps of the carbon cartridge.
3. Insert the upper end cap into the upper position immediately right of the prefilter until it bottoms out in the connector. (The upper end cap is the one with the right angle turn and the flange.) The flange on the end cap slides down inside the keyway wall.
4. Lower the carbon cartridge and insert the lower end cap into the lower socket immediately right of the prefilter until it is firmly seated.
5. With both the prefilter and pretreatment carbon cartridges installed, place the cartridge hold-down bracket in the position that holds the cartridges in place.

MPS Installation

The MPS is a customer-installed clear plastic bag containing organophosphate powder. The powder is combined with water and pumped through the ROpure Infinity system to eliminate scale buildup on the membrane surface. After feed water flows through the prefilter and

pretreatment carbon cartridge, a pump injects 4-8 ppm of the powder-water mixture into the water flowing through the unit before it reaches the membrane (15 l/hr models) or membranes (30 l/hr models). The MPS is included on all premier units and is optional on all basic units.

1. Remove the small, clear plastic bag (Part Number CM900X1) containing organophosphate powder from the packing materials.
2. Remove the lid on the bag, twisting it counterclockwise. Add 1 liter of deionized, distilled or reverse osmosis water and agitate. Reattach the lid, twisting it clockwise.
3. Locate the quick disconnect fitting for the MPS. It will be protruding from a hole just to the right of where you installed the carbon cartridge and above the second pressure gauge at the bottom of the unit. Connect the tubing on the MPS bag for quick disconnect.
4. Carefully place the bag upside down in the MPS holder to the right of the carbon cartridge, with the tubing-quick disconnect connection fitting in the U-shaped opening, just above the hole for the quick disconnect.

Membrane Installation

15 LITER PER HOUR UNITS (1 MEMBRANE)

1. Remove the membrane from the packaging and remove the nut, grab



Note

The attached product and reject tubing located on the inside of the cabinet is used on systems that utilize 2 membranes.

- ring, back-up ring and o-ring from the top two connections on the membrane. See Figure 2 for part identification.
2. Place the membrane in the rear of the two large holes located on the shelf of the inside cabinet and secure in place with the Velcro® strap located on the bracket attached to the right side wall of the ROpure Infinity. Ensure that the center connector (product) points to the left and the offset (reject) connector points toward the rear of the unit.
3. Locate the free tubing (not attached to another piece of tubing) labeled “Product” and remove the tubing adapter ensuring that the o-ring, grab ring and back-up ring remain with the nut and attach to the center adapter on the membrane. The adapter can be discarded.
4. Locate the other length of free tubing (not attached to another piece of tubing) labeled “Reject” and remove the tubing adapter ensuring that the o-ring, grab ring and back-up ring remain with the nut and attach to the remaining adapter on the membrane. The adapter can be discarded.
5. Below the shelf locate the small piece of tubing with the quick disconnect attached (comes from the pump) and attach to the mating quick disconnect included on the bottom of the membrane.



Note

The larger piece of tubing with the quick disconnect attached is used only on models that utilize 2 membranes.

30 LITER PER HOUR UNITS (2 MEMBRANES)

1. Remove the membranes from the packaging and remove the nut, grab ring, back-up ring and o-ring from the top two connections on both membranes. See Figure 2 for part identification.
2. Place the first membrane in the rear of the two large holes located on the shelf of the inside cabinet and secure it in place with the Velcro strap located on the bracket attached to the right side wall of the ROpure Infinity. Ensure that the center connector (product) points to the left and the offset (reject) connector points toward the rear of the unit.
3. Locate the free tubing (not attached to another piece of tubing) labeled "Product" and remove the tubing adapter ensuring that the o-ring, grab ring and back-up ring remain with the nut and attach to the center adapter on the membrane. The adapter can be discarded.
4. Separate the product and reject tubing from the coupled tubing inside the cabinet and install the nut labeled "Reject" on the remaining adapter on the rear membrane. Ensure that the nut includes the o-ring, back-up ring and grab ring prior to installing.
5. Place the second membrane in the front hole of the two large holes located on the shelf of the inside cabinet and secure it in place with the Velcro strap located on the bracket attached to the right side wall of the ROpure Infinity.

Ensure that the center connector (product) points to the left and the offset (reject) connector points toward the rear of the unit.

6. Attach the remaining product tubing (that was separated in Step 4) to the center of the second membrane. After removing the tubing adapter from the remaining reject fitting, attach the nut labeled “reject” to the right tubing adapter of the front membrane. Again, ensure that the o-ring, back-up ring and grab ring remain with the nut prior to installing.
7. Below the shelf locate the small piece of tubing with the quick disconnect attached (comes from the pump) and attach to the mating quick disconnect included on the bottom of the rear membrane.
8. Locate the larger piece of tubing with the quick disconnect and attach it to the front membrane.

Controls

Main Power Switch

The main power switch on the ROpure Infinity is located on the lower left side of the unit (as you face the front of the unit), directly above the power cord receptacle. This switch should be turned off when any maintenance is to be done on the unit.

Control Panel

The Premier ROpure Infinity is controlled through a panel which incorporates five switches to control its functions: START/STOP, MODE, DOWN, UP and ENTER. This control panel utilizes a 16 character LCD display to show the product (outlet) water and inlet water purity and temperature characteristics. It also displays information regarding the unit's operation and any error conditions.

Two hidden LEDs illuminate to inform you it is time to replace the carbon filter (CBN) or time to replace the Membrane Protection System (MPS). The CBN light illuminates after the time the unit reaches the chlorine level set point. The MPS light illuminates after approximately 240 hours of use. After 312 hours, the unit will turn off the pumps and solenoid valves and display the "Check MPS" message. You should then press STOP to turn the unit off and replace the MPS cartridge. See resetting the MPS Timer section on page 28.

The control panel can be adjusted to the angle you need for viewing the digital display. To adjust the angle of the control panel:

1. Open the front door. Inside the door are two wing nuts in rectangular openings.

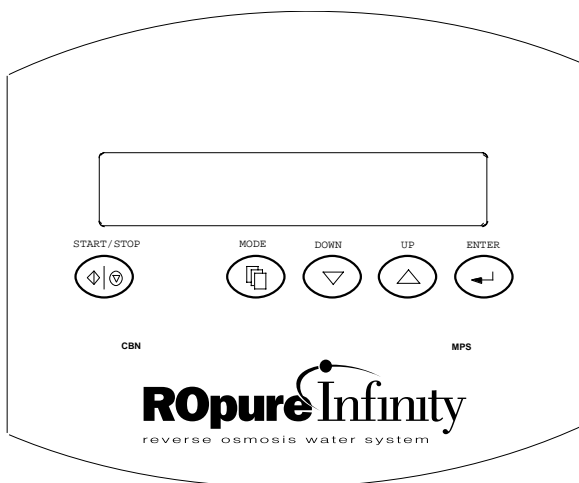


Figure 6

2. Turn the wing nuts counterclockwise to unlock and loosen them. The control panel will now pivot top to bottom in its opening. Reposition the control panel to your desired viewing position.
3. Lock the control panel in place by turning the wing nuts clockwise until they are hand-tightened.

Switches

When the main power switch (on the lower left side of the unit) is on, the five switches on the control panel function as follows:

START/STOP puts the unit into run (on) mode or off mode.

MODE allows you to access the Mode Menu, which includes these displays: "Membrane Flush," "Reset CBN Timer," "Reset MPS Timer," chlorine level in parts per million, "Change Chlorine Level," and "Display Menu."

ENTER allows you to make a selection from the Mode Menu or to accept a new set point or chlorine level.

UP and DOWN allow you to scroll through the Display Menu or the Mode Menu. They also can be used to modify the set point and chlorine level.

Initial Operation

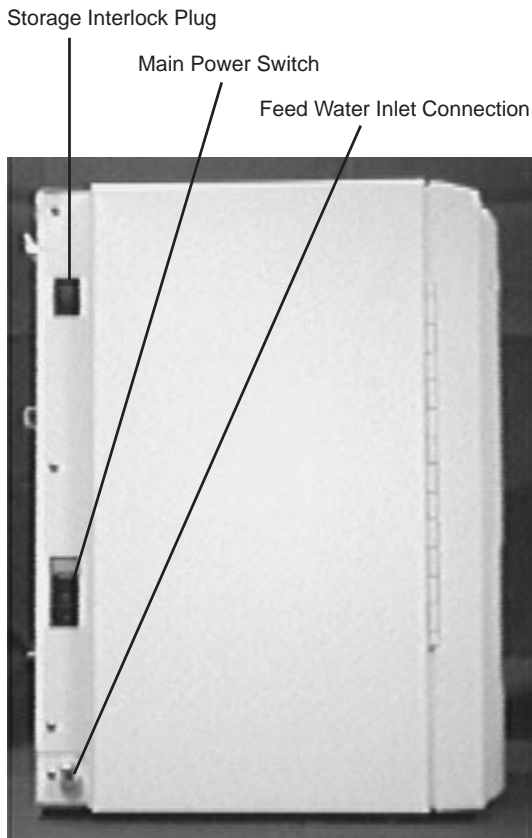


Figure 3 Feed Water Location

1. Connect water supply to unit by inserting the quick disconnect into the feed water inlet on the lower left side of the ROpure Infinity (see Figure 3). Turn the system power on by depressing the Main Power switch to the “I” position. Two LEDs (CBN and MPS) flash, testing the LEDs to make sure they are not burned out.
2. Press the START/STOP button on the control panel.
3. The 16 character LCD display reads “Initializing” for one minute. The first 30 seconds the inlet solenoid valve opens. The second 30 seconds the pump starts running. After the one minute “Initializing” display goes away, “% Rejection” comes up on the display.
4. Reset CBN (Carbon) timer and MPS (Membrane Protection System) timer prior to operating (see pages 27 and 28).



Warning

This device is to be used with water feeds only.

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



Caution

Make sure the cartridge hold-down bracket is in place.

Check and/or Change Chlorine Level

1. Turn the system power on by depressing the Main Power switch to the “I” position.
2. Press the START/STOP button on the control panel.

**Note**

The ROpure Infinity reminds you when it is time to change the carbon cartridge. To properly set the instrument, your incoming water chlorine level must be programmed into the ROpure Infinity.

**Note**

Pressing STOP will cancel any selection in the Mode Menu. If you hit ENTER by mistake, press MODE to start over in the Mode Menu.

3. Press the MODE button and Down Arrow. Change Chlorine Level. Enter.
4. Press DOWN button until you see one of three Chlorine level readings on the display:

0.05-0.80 ppm (960 hours)
0.81-1.40 ppm (480 hours)
1.41-Max (336 hours)
5. To change the Chlorine level from what your display reads, press the DOWN switch until it reads "Change Cl Level." You will be placed in a short menu as follows:

0.05-0.80 ppm (960 hours)
0.81-1.40 ppm (480 hours)
1.41-Max (336 hours)
6. You can scroll through this menu with the UP and DOWN buttons and save a new setting by pressing the ENTER button.
7. If you decide not to change the setting, pressing the Mode button will return you to the top item in the Mode Menu, which is "Membrane Flush."

Flushing the Membrane or Membranes



Note

The ROpure Infinity flushes automatically in standby for 10 minutes, after 3 hours, and 50 minutes of inactivity (reservoir full). This prevents stagnant water from damaging the membrane. A flush can also be initiated manually.

1. Turn the system power on by depressing the Main Power switch to the “I” position.
 2. Press the START/STOP button on the control panel.
 3. Press the MODE button. The display will read “Membrane Flush.”
 4. To do a membrane flush, press the ENTER button. After you press ENTER, the display will read “Membrane Flush10” and then count down a 10-minute membrane flush on the display.
 5. The flush can be terminated at any time by pressing the stop button.
1. Turn the system power on by depressing the Main Power switch to the “I” position. Two LEDs (CBN and MPS) flash, testing the LEDs to make sure they are not

Normal Operation

burned out.

2. Press the START/STOP button on the control panel.
3. The 16 character LCD display reads “Initializing” for one minute. The first 30 seconds the inlet solenoid valve opens. The second 30 seconds the pump starts running. After the one minute “Initializing” display goes away, “% Rejection” comes up on the display.

Reading the Purity of Product Water and Inlet Water

1. Turn the system power on by depressing the Main Power switch to the “I” position. Two LEDs (CBN and MPS) flash, testing the LEDs to make sure they are not burned out.
2. Press the START/STOP button on the control panel.
3. The 16 character LCD display reads “Initializing” for one minute. The first 30 seconds the inlet solenoid valve opens. The second 30 seconds the pump starts running. After the one minute “Initializing” display goes away, “% Rejection” comes up on the display.
4. Press the DOWN button to:
 - A) Display the resistivity of product water
 - B) Display the conductivity of product

- water
- C) Display the Total Dissolved Solids of product water
- D) Display temperature of product water
- E) Display resistivity of inlet water
- F) Display conductivity of inlet water
- G) Display Total Dissolved Solids of inlet water
- H) Display temperature of inlet water
- I) Display % rejection

Mode Menu

Pressing the Mode button shows the top item in the Mode Menu, "Membrane Flush." The membrane flush was described in the Initial Operation section of this manual. The UP and DOWN switches scroll in the Mode Menu to access the other five displays:

1. Reset CBN (Carbon) Timer
2. Reset MPS (Membrane Protection System) Timer
3. Chlorine level in parts per million
4. Change Cl (chlorine) Level
5. Display Menu

The change chlorine level was described in the Initial Operation section of this manual. The display menu was described in "Reading the Purity of Product Water and Inlet Water," immediately preceding this section.



Caution

Make sure the cartridge hold-down bracket is in place.



Caution

Do not allow the ROpure Infinity to operate unless water is available to the unit.

**Note**

Press STOP to cancel a selection in the Mode Menu. If you press ENTER by mistake, press MODE to start over.

Resetting the Carbon Timer

The red CBN light on your control panel illuminates when it is time to replace the carbon filter (CBN). The CBN light illuminates after the operation time reaches the chlorine level set point.

1. Turn the system power on by depressing the Main Power switch to the "I" position. Two LEDs (CBN and MPS) flash, testing the LEDs to make sure they are not burned out.
2. Press the START/STOP button on the control panel.
3. The 16 character LCD display reads "Initializing" for one minute. The first 30 seconds the inlet solenoid valve opens. The second 30 seconds the pump starts running. After the one minute "Initializing" display goes away, "% Rejection" comes up on the display.
4. Press the MODE button. Press the DOWN switch until the display reads "Reset CBN Timer."
5. Press ENTER twice to reset the carbon timer.



Note

When the “Check MPS” message appears, press STOP to turn the unit off and replace the MPS plastic bottle. When you power up the unit and press START the “Check MPS” message will still be on the display. Pressing the MODE button brings up the “Reset MPS Timer” display. Pressing ENTER twice will reset the time and LED and resume normal operation.

Resetting the MPS Timer

The red MPS light on your control panel illuminates when it is time to replace the Membrane Protection System (MPS). The MPS light illuminates after approximately 240 hours of use. After 312 hours, the unit will turn off the pumps and solenoid valves and display the “Check MPS” message.

1. Turn the system power on by depressing the Main Power switch to the “I” position. Two LEDs (CBN and MPS) flash, testing the LEDs to make sure they are not burned out.
2. Press the START/STOP button on the control panel.
3. The 16 character LCD display reads “Initializing” for one minute. The first 30 seconds the inlet solenoid valve opens. The second 30 seconds the pump starts running. After the one minute “Initializing” display goes away, “% Rejection” comes up on the display.
4. Press the MODE button. Press the DOWN button until the display reads “Reset MPS Timer.”
5. Press ENTER twice to reset the MPS timer.

Pressure Gauges

There are 4 pressure gauges on the ROpure Infinity. The functions of the gauges are to provide you the necessary information as to when certain maintenance procedures should be accomplished. The pressure gauges are located in the inside of the front door, on the bottom of the cabinet. The 4 gauge functions are as follows:

1. **Prefilter Inlet**—Provides you with incoming water pressure and is used in conjunction with the pre-filter outlet gauge to determine when it is time to change the prefilter.
2. **Prefilter Outlet**—Provides the pressure reading of the water exiting the prefilter. If there is a 10 psig pressure differential between this reading and the prefilter inlet reading, the prefilter should be replaced.
3. **Carbon Outlet**—Provides the pressure reading of the water exiting the carbon cartridge. If there is a 10 psig pressure differential between this reading and the prefilter outlet reading, the carbon cartridge should be replaced.
4. **Membrane Pressure**—Provides a reading of the membrane pressure. The gauge should read 60 psig, +/- 5 psig, during operation.



Note

Do not turn off the ROpure Infinity during non-work hours. Doing so will allow bacterial growth and other contamination of the water in the system. We recommend using the Standby Mode.

Standby Mode

The display will read “Standby Mode” when the storage tank is full. The unit is idle for 3 hours 50 minutes during the “Standby Mode,” then performs a 10-minute membrane flush. The display will read “Membrane Flush10” during the membrane flush and count down the minutes on the display. When the water level reaches the top float of the 60 Liter Infinity Storage Reservoir, the ROpure Infinity unit goes into standby. When the water level falls below the middle float in the reservoir, the ROpure Infinity resumes normal automatic operation.

Selecting the Percent Rejection Set Point

The ROpure Infinity electronics include a user-programmable set point which indicates when the water quality falls below the desired quality. The display reads “Below Setpoint” when the percent rejection of the product water is below your defined set point. The Set Point Mode allows you to change the setting for the minimum allowable percent rejection by scrolling through the numbers 0, 60, 70, 80, 90% with the UP or DOWN button.

The set point indication is set at the factory at 70%.

You must start this procedure from the off (stop) position.

1. Press and hold the ENTER button.
2. Press the START button.

3. The display will read "Setpt. 70%".
4. Release the ENTER and START buttons.
5. To adjust the value, press the UP or DOWN arrow until your desired value is displayed and press ENTER.

The ENTER button saves the new value and reverts the ROpure Infinity back to the regular run (on) mode. You may also follow the above procedure to merely view the current set point. The ENTER button returns you to the run (on) mode. The STOP button turns the unit off without saving any changes to the set point that may have just been made (as long as ENTER has not been pressed).

Low Pressure

The display reads "Check Inlet" when the inlet water has low pressure. The ROpure Infinity waits 1 minute and rechecks the pressure. After 1 minute, if the pressure is still low the pump will stay off. You then need to check your inlet water line. See problem solving section page 40.

Error Messages

There are three error displays you may see when there is a problem with your ROpure Infinity. They are:

"Error 1" — Trouble communicating between meter and main processor. Restart unit by pressing the STOP switch and turning Main Power Switch to the "O" position. Then turn Main Power

Switch to the “I” position and press the START button.

“Error 2” — The cell isn’t getting a good reading of the water or it is disconnected. The display will go away by itself if the cell starts reading properly. If not, you need to restart by pressing the STOP button and turning Main Power Switch to the “O” position. Then turn Main Power Switch to the “I” position and press the START button.

“Error 3” — The meter was reset improperly. Restart unit by pressing the STOP button and turning Main Power Switch to the “O” position. Then turn Main Power Switch to the “I” position and press the START button.

Other Status Messages

There are three other messages you may see on the display that either tell you the status of the unit or ask you to perform a function. They are:

“Enter to Reset” — This is a safety feature. You must press ENTER twice to reset the CBN or MPS timers.

“Membrane Flush” — This occurs after 3 hours 50 minutes in standby.

“Check MPS” — This tells you the MPS time is passed 312 hours and it needs to be replaced.

Maintenance



Warning

Disconnect from the power supply prior to maintenance and servicing.

Refer servicing to qualified personnel.

Ensure all piping connections are tight to avoid leakage of chemicals.

Ensure adequate ventilation when using chemicals for cleaning.

Follow carefully the manufacturers' safety instructions on labels of chemical containers and Material Safety Data Sheets (M.S.D.S.).



Warning

Depressurize system prior to disengaging the cartridge hold-down bracket.

Caring for Your ROpure Infinity

With proper care, your ROpure Infinity will give you consistently pure water. To ensure continued good service, regularly perform the following procedures

System Sanitization

The frequency of sanitizing depends on the rate and amount of contamination buildup.

The carbon cartridge must be removed before sanitization, the membranes can be left in place.

The ROpure Infinity can be easily sanitized by utilizing the sanitization cartridge (Part # 50258).

To accomplish this, follow these step-by-step instructions.

1. Turn off the ROpure Infinity. Turn off a NANOpure or other equipment fed by the ROpure Infinity and disconnect power from the unit.
2. Disconnect the product water tubing to the ROpure Infinity Reservoir and route to drain or other equipment.
3. Open the front door. Ensure all pressure gauges read "0". Disengage the cartridge hold down bracket by pulling it out and up. Remove the right most cartridge, the carbon cartridge, from the unit by pulling it up and out. Remove a D50258 sanitization cartridge from its bag. Wet the cartridge o-ring with water. Install the D50258 sanitization cartridge into the empty cartridge position. Press the top cartridge nipple into the upper socket until it bottoms out. Then, lower the cartridge,

inserting the bottom cartridge nipple into the lower socket until it is firmly sealed. Replace the cartridge hold down bracket.

All other cartridges and membranes should be left in place. Close the front door.

4. Reconnect power to the ROpure Infinity. Turn the main power switch to the "I" (on) position.
5. Push the start/stop button to start.
6. Run water to drain for 10 minutes.
7. After 10 minutes press the start/stop button to turn the unit off. Turn the main power switch to "O" off position and allow the chlorine to sit in the system for 20 minutes.
8. Open the front door. Disengage the cartridge hold-down bracket.
Depressurize the unit before removing cartridge, the prefilter and chlorine. Ensure all gauges read "0". Remove both cartridges by pulling first up and then out. Throw away the cartridges.
9. Refer to Prefilter and Carbon Cartridge Installation to install new cartridges.
10. Operate with all water being sent to drain for 30 minutes.
11. Reconnect the product water tubing to the ROpure Infinity reservoir.
12. Operate unit normally (see Normal Operation section).

General Cleaning Instructions

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

Service and Repair

Normal Unit Operation

Below is a brief description of the normal automatic operation of the ROpure Infinity. If the unit does not operate as described below, refer to the troubleshooting guide.

When you turn system power on by pressing the Main Power Switch, the following events will occur:

1. Two LEDs (CBN and MPS) flash, testing the LEDs to make sure that they work.
2. Press the START/STOP button on the control panel.
3. The 16 character LCD display reads "Initializing" for one minute.
4. The first 30 seconds the inlet solenoid valve opens.
5. The second 30 seconds the pump starts running.
6. After the one minute "Initializing" display goes away, "% Rejection" comes up on the display.
7. When used with a Barnstead 60 Liter Infinity reservoir, the ROpure Infinity will run automatically. It will turn off when the reservoir is full. The system is designed to automatically turn on and off when water is needed to fill the tank or when the tank is full.



Warning

To avoid electrical shock, always:

1. Use a properly grounded electrical outlet of correct voltage and current handling capacity.
2. Do not locate the ROpure Infinity 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. Disconnect from the power supply prior to maintenance and servicing.

Mains Fuse Replacement

1. Turn off the ROpure Infinity and disconnect it from the power supply by removing the power cord directly below the I/O switch. Locate the fuse drawer above the power cord receptacle.
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 Parts Listing.)
4. Replace fuse drawer.
5. Reattach the power cord and reconnect the unit to the power supply.
6. Operate normally.

Transformer Fuse Replacement

1. Turn off the ROpure Infinity and disconnect it from the power supply by removing the power cord directly below the I/O switch.
2. **Ensure pressure gauges read “0” prior to proceeding.**
3. Remove the 11 screws that hold the Infinity unit’s outer case in place. As you face the unit, there are three screws in the left side near the back, three in the right side near the back and five in the front, two on each side and one above the cartridge hold-down bracket. Remove the pressure switch connector from the upper left side of the unit, if present.
4. Lift and remove the outer case.
5. Remove the electric section cover directly behind the two farthest left cartridges as the Infinity unit faces you.
6. Locate the transformer fuse.

7. Remove the old fuse and replace with a fuse of the same type and rating. (See Replacement Parts list.)
8. Replace electric section cover.
9. Reinstall the ROpure Infinity outer case. Close the front door.
10. Operate normally.

**Warning**

Depressurize system prior to disengaging the cartridge hold-down bracket.

Membrane Replacement

A variety of factors will determine the service life of the ROpure Infinity membrane(s). With proper maintenance and monitoring the membrane should last a minimum of 2 years. To replace the membrane, ensure that the power and water are disconnected from the unit.

1. 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. **Ensure that you note which tubing is used for the front membrane and rear membrane if you are replacing two membranes.**
2. Install the new membrane(s) by following the “Membrane Installation” section of this manual.

Prefilter Replacement

The prefilter incorporated in your ROpure Infinity is designed to remove particles from your incoming water source. It is impossible to predict expected life. It is recommended that the prefilter be replaced when the pressure differential across the prefilter reaches 10 psig pressure. The pressure is displayed on the pressure gauges located on the inside of the ROpure Infinity cabinet. The differential repre-



Warning

Depressurize system prior to disengaging the cartridge hold-down bracket.

sents the difference between the prefilter inlet and the prefilter outlet. To replace the prefilter, ensure that all power and water are disconnected from the unit.

1. Remove the prefilter by first disconnecting the cartridge hold down bracket.
2. Remove the prefilter by pulling the prefilter up and then out.
3. Replace the prefilter by following the instructions located in the “Prefilter Installation” section of this manual.

Carbon Replacement

The carbon pretreatment cartridge incorporated provides a combination pre-filtration and chlorine removal. There is a timer built into the ROpure Infinity which will alert you when the carbon requires replacement. This is addressed in the “Check and/or Change Chlorine” section of this manual. When the “CBN” light illuminates the carbon cartridge must be replaced. To replace the carbon cartridge, ensure that all power and water are disconnected from the unit.

1. Remove the carbon cartridge by first disconnecting the cartridge hold down bracket.
2. Remove the carbon cartridge by pulling the prefilter up and then out.
3. Replace the carbon cartridge by following the instructions located in the “Pretreatment Carbon Cartridge Installation” section of this manual.
4. Reset the “CBN” timer by following the “Resetting the Carbon Timer” section included in this manual.

MPS Replacement

The MPS (Membrane Protection System) bag incorporated provides a method of protecting your membrane(s) from damage caused by scale build up on the membrane(s). There is a timer built into the ROpure Infinity which will alert you when the MPS requires replacement. This is addressed in the “MPS Installation” section of this manual. When the “MPS” light illuminates the MPS bag must be replaced. To replace the MPS bag, ensure that all power and water are disconnected from the unit.

1. Remove the MPS bag from the unit by first opening the front door.
2. Locate the MPS bag in the center of the ROpure Infinity. Remove the bag by depressing the stainless steel thumb pad on the quick disconnect, located on the inlet to the bag.
3. Remove and discard the bag.
4. Reconstitute and install a new bag by following the “MPS Installation” section of this manual.
5. Reset the “MPS” timer by following the “Resetting the MPS Timer” section included in this manual.

Shutdown

If the ROpure Infinity is to be shut down for an extended period of time, the unit should be completely drained and the cartridges and membranes removed to prevent the growth of bacteria.

If the system has remained inactive and full of water for more than 96 hours, the unit should be drained, sanitized and new cartridges installed prior to use.

Problem Solving

Problem	Possible Causes	Solutions
ROpure Infinity completely inactive (controls not operating)	No Electrical power to ROpure Infinity. Blown fuses.	Ensure ROpure Infinity power cord is installed and connected to live power. Check/replace fuses. Refer to Fuse Replacement for procedure.
No water flowing (check inlet displayed)	Feedwater supply valve closed. Prefilter cartridge plugged. Carbon cartridge plugged. Solenoid valve not open. Feed pressure below specification.	Open feedwater supply valve. Replace prefilter cartridge. Replace carbon cartridge. Replace solenoid valve. Increase pressure.
Below setpoint flasher on display. Decrease in % rejection.	Improperly installed membrane. Fouled membrane.	Ensure membrane is installed properly. Check setpoint setting (page 30). Replace membrane.
Decrease in system productivity.	Decrease in water temperature. Membrane fouled. Low incoming water pressure. Low membrane operating pressure.	If flowrate is unacceptable, install hot/cold water mixing valve to elevate temperature. Replace membrane. Ensure prefilter is not blocked - increase incoming water pressure. Increase operating pressure.
Error 1 Error 3	Meter PCB not communicating with Main Logic PCB.	Press STOP button and turn main power switch to "O" position. Turn main power switch back to "I" position and press START. If this fails after a couple of attempts, replace meter PCB.



Note

On initial start-up, the display may read “error 1” or Error 3”. This means that the meter that reads the water is not communicating with the Main Circuit Board. To correct this, turn the unit off by pressing the STOP button and turning the Main Power Switch to the “O” position. Then turn the Main Power Switch to the “I” position and press the START button.

Replacement Parts

Recommended Spares

Consumables

Consumable parts are those required to support the day-to-day operation of this equipment. **Barnstead|Thermolyne** 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 (indicator lights, fuses, etc.) that you can expect to replace on a more or less random basis. Where practical, **Barnstead|Thermolyne** 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|Thermolyne** representative for additional information on the expendables kit.

Description	Catalog No.	Recommended Quantity
Prefilter Cartridge	D9004	6
Pretreatment Carbon Cartridge	D9005	6
MPS Replacement Cartridge/Bag	CM900X1	6
Mains Fuse, 120V/100V - Type T Time-Lag, 3.0 Amp, 250 Volt	04455	2
Mains Fuse, 230V - Type T Time-Lag, 2.0 Amp, 250 Volt	5120-0025	2
Main Transformer Fuse, 120V/100V - Type T Time Lag, 1.0 Amp, 250 Volt	5120-0016	1
Main Transformer Fuse, 230V - Type T Time-Lag, 0.5 Amp, 250 Volt	FZX35	1
Resitivity Cell Assembly	E896X6	1

REPLACEMENT PARTS

General Maintenance Parts

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

Description	Catalog No.	Recommended Quantity
TFM, membrane, 15 l/hr	D9006	1
Sanitization Cartridge	D50258	1

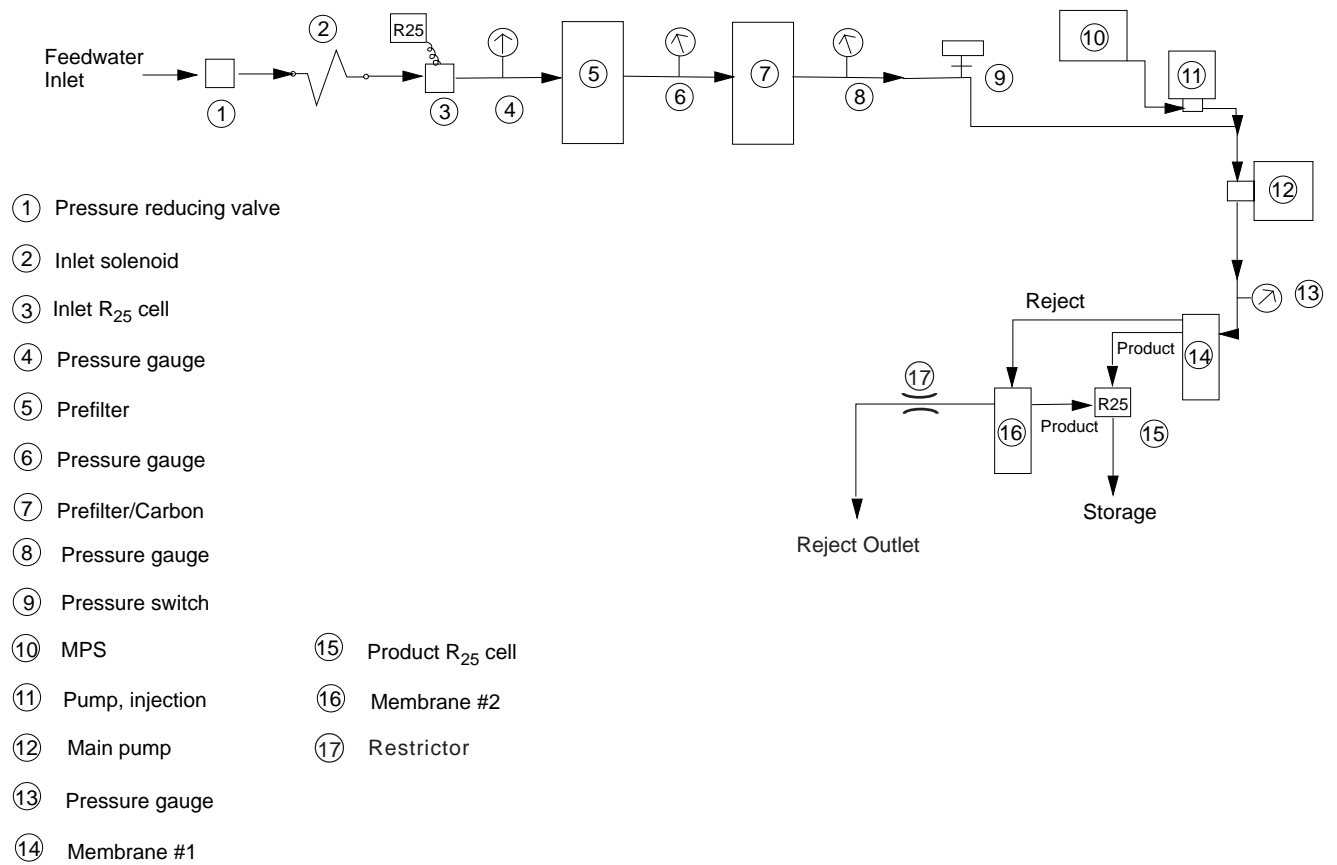
Safety Stock

For critical applications where performance with minimum downtime is required, **Barnstead|Thermolyne** 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
Pump 230 Volt	PU900X2	1
Pump 100, 120 Volt	PU900X1	1
MPS Pump 240 Volt	PU901X2	1
MPS Pump 120 Volt	PU901X1	1
Main PC Board	PC901X1	1
Inlet Solenoid Valve	RY898X1A	1
Pressure Regulating Valve	02280	1
Pressure Gauge	MEX172	3
Pressure Switch	01407	1
Meter PC Board	PC896X2	1

Flow Diagram

Flow Schematic ROpure Infinity Premier



Operating Log

	Initial Start-Up								
Date and Time									
Feed Water Resistivity									
Feed Water Temperature									
Feed Water PPM									
Product Water Resistivity									
Product Water Flowrate									
Product Water PPM									
Reject Water Flowrate									
Percent Rejection									
Pressure Prefilter Inlet									
Pressure Prefilter Outlet									
Pressure Carbon Outlet									
Membrane Pressure									

Ordering Procedures

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|Thermolyne** 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 319-556-2241 or 800-553-0039.

Prior to returning any materials to **Barnstead|Thermolyne Corp.**, please contact our Customer Service Department for a "Return Goods Authorization" number (RGA). Material returned without a RGA number will be refused.

One Year Limited Warranty

Barnstead|Thermolyne Corporation warrants that if a product manufactured by **Barnstead|Thermolyne** and sold within the continental United States or Canada proves to be defective in material or construction, **Barnstead|Thermolyne** will provide you, without charge, for a period of ninety (90) days, the labor, and a period of one (1) year, the parts, necessary to remedy any such defect. Outside the continental United States and Canada, the warranty provides, for one (1) year, the parts necessary to remedy any such defect. The warranty period shall commence either six (6) months following the date the product is sold by **Barnstead|Thermolyne** or on the date it is purchased by the original retail consumer, whichever date occurs first.

All warranty inspections and repairs must be performed by and parts obtained from an authorized **Barnstead|Thermolyne** dealer or **Barnstead|Thermolyne** (at its own discretion). Heating elements, however, because of their susceptibility to overheating and contamination, must be returned to our factory, and if, upon inspection, it is concluded that failure is not due to excessive high temperature or contamination, warranty replacement will be provided by **Barnstead|Thermolyne**. The name of the authorized **Barnstead|Thermolyne** dealer nearest you may be obtained by calling 1-800-446-6060 or writing to:

Barnstead|Thermolyne

P.O. Box 797

2555 Kerper Boulevard

Dubuque, IA 52004-0797

USA

FAX: (319) 589-0516

E-Mail: mkt@barnsteadthermolyne.com

Barnstead|Thermolyne's sole obligation with respect to its product shall be to repair or replace the product. Under no circumstances shall it be liable for incidental or consequential damage.

THE WARRANTY STATED HEREIN IS THE SOLE WARRANTY APPLICABLE TO **Barnstead|Thermolyne** PRODUCTS. **Barnstead|Thermolyne** EXPRESSLY DISCLAIMS ANY AND ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR USE.

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