Ultra Pure Water System
Model 3000 MAX

Installation Guide & Owner's Manual

The ***VistaPure*** **Ultra Pure Water System** is designed to produce two grades of high-purity water – 1) distilled-quality for use in your autoclaves and 2) non-corrosive water for use in bottle systems and for other uses. It is critical that water used in autoclaves be virtually free of dissolved solids and contaminants in order to protect the heating chamber and to prevent build-up of contaminants that can create hard deposits and more frequent cleanings. If poor quality water is used, the autoclave will generally need to be re-built or replaced at substantial cost. Water used in self-contained dental bottle systems should be of high quality but not the same grade as used in autoclaves since distilled-grade water is corrosive to metals used in the construction of dental units. The ***VistaPure*** system is designed to be built-in to sterilization centers, cabinetry or can be simply installed in an equipment room. In addition to use with your autoclaves, the high purity water produced by your new ***VistaPure*** can be used for making coffee, tea and other beverages, for laboratory use and more.

The system provides 2.7 gallons of treated water in the pressurized storage tank and automatically produces a new supply as water is drawn from storage. The system does not require electricity – it only needs a potable supply of cold water and a drain. It is highly recommended that water supplied to the system be free of sediment. Further, if the source water is hard, the system filtration elements will last longer if the water supply is softened.

Although actual installation of ***VistaPure*** is quite simple, it is recommended that a professional technician familiar with dental operatory systems perform the installation due to the wide variety of possible options, running of water and air lines, drain lines, etc. He/she should be familiar with the local plumbing codes and techniques for successful dental equipment installations.

Please read this entire manual before proceeding with installation and operation.

Please make certain that anyone responsible for future operation and maintenance of the system is familiar with all details contained in the installation and maintenance manuals.

Please keep the maintenance manual handy for future reference.

Please return the Warranty / Registration form immediately upon installation.

Always follow local plumbing codes.

Note the following specifications before proceeding:

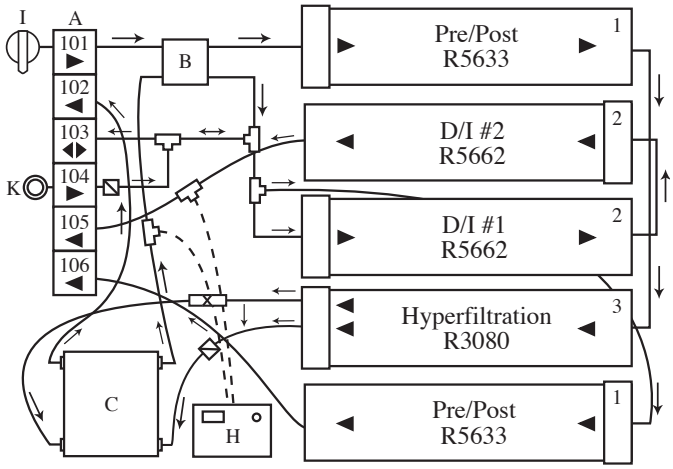


Figure 1. *Front view of the* ***VistaPure*** *system.*

VistaPure **Model 3000 MAX Specifications**

Maximum Operating Temperature	100° F
Minimum Operating Temperature	45° F
Maximum Operating Pressure	100 psi
Minimum Operating Pressure	40 psi
Optimal pH Range	6.5 – 8.5
Maximum Total Dissolved Solids (TDS)	500
Maximum pH Range	5.5 – 9.5
Maximum Influent Hardness	10 gr/171 ppm
Maximum Influent Manganese	0.05 ppm
Maximum Influent Iron	0.1 ppm
Maximum Influent Hydrogen Sulfide	none
Maximum Influent Chlorine/Chloramine	2 ppm
Maximum Daily Output (12 hours)	25 gal (94 L)
1 – Pre / Post Filter Element Service Life	1 year max
1 – Pre / Post Filter Replacement Order #	R5633
2 – Hyperfiltration Element Service Life	3-5 years
2 – Hyperfiltration Replacement Order #	R3080
3 – Deionization Element Service Life	4-18 mo – See pg 7
3 – Deionization Replacement Order #	R5662
System Dimensions (W x H x D)	22"x16"x 5"
Tank Dimensions (Dia x H)	9.5" x 16"
Approximate Shipping Weight (Dry-2 Cartons)	33 lbs

UNPACKING – Every VistaPure comes in two (2) cartons. Box 1 of 2 contains the system. Box 2 of 2 contains all other items including Installation Guide & Owner's Manual, Warranty Registration, tank, wand, faucet, drain fitting, TDS meters, colored tubing and all other accessories. Check to make certain there was no damage during shipment. If damage is evident, contact the shipping company or your distributor immediately.

DATA – Locate the serial tag on the system and record it on the blue Warranty Registration sheet. Provide all of the information requested on the Warranty Registration sheet and mail it immediately to *Vista Research Group, LLC* upon installation. Write the date of installation and the installer's name on the tag using a fine tip, permanent marker (e.g. a *Sharpie®*) or some other writing instrument that will not smear.

HOW THE SYSTEM WORKS – The system is a unique design that combines several technologies using multiple stages to produce the highest purity product – water with a total dissolved solids (TDS) reading as low as zero (000).

The first stage is a Prefilter that removes sediment, chlorine and other contaminants by physical filtration, absorption and adsorption. Next is the Hyperfiltration stage where pressure from the water source and the non-electric permeate pump forces the water through a semi-permeable membrane removing contaminants at the molecular level where about 95% of the contaminants are rinsed away from the membrane and down the drain. The water is then sent to the storage tank where about 2.7 gallons of treated water is stored. When water is needed to fill autoclaves through the filler wand, water automatically flows from the tank through two cartridges in series that contain special Deionization media for removing the remaining 5% of contaminants. When water is needed for filling dental bottles, etc., water automatically flows from the tank through the Postfilter to the special chrome faucet.

LOCATION: The ***VistaPure*** system can be installed nearly anywhere in the typical dental, medical, lab or hospital setting, typically near a faucet and sink. The system and tank are designed to fit under a countertop and connect directly to the cold water supply line and drain. It may also be installed in any area where there is a quality cold water supply and drain connection.

INSTALLATION: Although actual installation of ***VistaPure*** is quite simple, you may wish to enlist the services of a professional technician since your system is going to be directly connected to the plumbing system. He/she is familiar with the wide variety of possible installation options, running of water and drain lines, local plumbing codes and techniques for successful equipment installations.

Installation Procedure

(Please refer to drawings that follow)

1. If the system is not already mounted in another product (sterilization center, etc.) mount as desired near a cold water source and 1-1/2" drain.

2. Position storage tank as near ***VistaPure*** system board as possible.

3. Locate the white elbow tank valve in accessory pack and attach valve to the side of the tank. Hand-tighten only!! Never use tools on system valves and fittings!

4. Provide for a 1/4" connection to the cold water supply. This is usually done using a piercing saddle valve or compression fitting. Check codes.

5. Provide a drain connection using 1-1/2" material with trap as shown on page 6. A 1-1/2" utility Tee with both 3/8" and 1/4" push-in type fittings are included with each VistaPure. Various optional configurations are available. See page 6 for details.

6. Mount the faucet on the sink or countertop deck in the sterilization center, lab or kitchenette as desired. The faucet & 1/4" push-type faucet connector fitting are included in the accessory kit.

7. Attach colored tubing to the proper segments on the system manifold and the appliance/device as shown in Figure 2. When attaching tubing to the push-type fittings, make certain all tubing cuts are straight and free from burrs. Tubing must be firmly inserted into the fitting (11/16" plunge) to avoid leaks.

IMPORTANT NOTE: If the system is mounted inside a cabinet, under a sink or on a sliding device, be careful that tubes are not crushed or crimped. If the system is on a sliding device for easy access, make certain to create a coil with the tubes that will allow the system to move in and out without causing damage or restriction. See Figure 7 for the proper coil layout.

IMPORTANT NOTE: If the ***VistaPure*** system is to be installed remote to the autoclave(s) and/or in a cabinet, fish the solid blue tubing behind cabinetry to the autoclave center. The solid blue tubing and the coiled blue tubing are to be joined with the white 1/4" x 3/8" push-type union that is already attached to one end of the coiled tubing. Please see Figure 2.

Make certain to provide a restraint at the straight end of the coiled tubing near the union so that when pulling out on the autoclave wand and coiled tubing the union connection is not stressed.

Extra lengths of tubing are included with each system. Below is the tubing color code chart. Please refer to Figure 2 for detail.

Red	From Cold Water Supply
Black	To Drain
Natural	To and From Tank
Blue Smooth	To Autoclave Area
Blue Coiled	To Autoclave Filler Wand
White	To Faucet

8. Cleansing the system (after all tubing connections have been made). Find the 35 ml syringe that's included in the accessory kit. Place about 20-30 ml of clean water into a small paper cup and add about two (2) drops of standard household bleach. Stir gently with the syringe then pull the solution into the syringe. Remove the safety cap from the injection port at "K" on the manifold (see Figure 2). To remove the cap simply hold the collet back against the cap fitting and pull it away from the check valve. Inject the solution into the Injection Port. Draw 20-30 ml of fresh water into the syringe and also inject it into the Port in order to push all the bleach out of the check valve. Replace the safety cap by pushing it firmly onto the Injection Port tube. Immediately "Open" the Water Supply Inlet Valve "I" on the manifold and water will begin to flow into the system filling the tank with treated water and the bleach.

9. Allow the system to run for twenty (20) minutes. Waste water should be running to the drain Air Gap "D" and a pulsing / clicking sound should be heard coming from the Permeate Pump "C." After twenty minutes, "Close" the Water Supply Inlet Valve "I" on the system manifold then discharge water from both the Autoclave Wand "F" and Faucet "G" until Tank "E" is empty and water flow stops. The system is now cleansed.

10. "Open" Water Supply Inlet Valve "I" and allow it ro run until the tank is full. This will take over an hour for the tank to completely fill. However, water can be used anytime after about thirty minutes since the system produces and stores up to 2.7 gallons of water and can deliver water to both the Wand and the Faucet even while it's making new water. The system capacity is about 25 gallons of production per 12 hour work day.

Monitoring TDS

Total dissolved solids (TDS) is the quantitative measure of virtually ALL constituents found in a particular water supply counted as parts per million (ppm) or milligrams per liter (mg/l). Water is simply H2O – basically, everything else found in it would contribute to the TDS. A typical city water supply will have a TDS reading of from 150 – 350 TDS, although it varies greatly. The federal standard for municipal water systems is a maximum of 500 ppm TDS. Some rural well waters are quite often found to range from 300 to over 1,000 ppm. Water for use in autoclaves should be of distilled quality which is a TDS of 0 – 5 ppm (some more sensitive autoclaves require 0 – 3 ppm). Water with TDS readings higher than 5 ppm will eventually cause staining, scale build-up, etc. and require cleaning and/or repair. The worse the water, the more costly the maintenance and repairs – to the point that some autoclaves won't even operate if the TDS is high.

The ***VistaPure*** system comes equipped with a battery-operated dual TDS meter. This allows you to check the water quality throughout the system. For example, slide the switch on the TDS meter (see Figure 5) to "IN." This reads the level of TDS in the water emerging from the Hyperfiltration module. Slide the switch to "OUT" and this will display the level of TDS emerging from the Deionization modules on its way to the Tank and/or Autoclave Wand. Water should be running during test.

A separate handheld TDS meter is also included that can be used to determine the level of TDS in the Supply Water fed to the system. With these data one can monitor the complete process as necessary. For example, under normal operating conditions, **typical** TDS levels might be as follows in this example:

City Water Feed	200 TDS	X
After Hyperfiltration	010 TDS	5% of X
After Deionization	000 TDS	After D/I

Remember, this is only an example. However, the reading on the "IN" should generally be about 5% of the inbound water TDS and the D/I modules remove the balance remaining to achieve the 0-3 TDS level desired.

Figure 7 shows the handheld TDS monitor provided with your system. It can be used at any time to determine the quality of the raw and treated water. Simply remove it from the leather case, remove the protective cap exposing the probe, push the power button to activate, immerse the probe into the water. The LCD display will show the TDS level. **NEVER immerse the monitor beyond the first section (marked as "A" on Figure 5)**. While immersed, the "hold" button can be pushed to lock the display. After use, shake the water out of the probe area and wipe the outer portion dry – **never** push anything **into** the probe area. Check the water quality frequently and change filter elements as required (see the Specifications on cover for replacement frequency). Both TDS monitors are operated by a simple button cell battery available at most any store.

VistaPure Ultra Pure Water System
Model 3000 MAX
Block Flow Diagram Legend

A = System Manifold

101 = City Water "IN" To Prefilter

102 = To Drain From Permeate Pump

103 = To Water Storage Tank

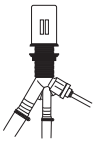
104 = Injection Port To Tank Line

105 = To Autoclave Filler Wand From D/I # 2

106 = To Bottle / Drinking Water Faucet From Postfilter

B = Automatic Shut-Off Valve

C = Permeate Pump

D = Air Gap Drain Fitting  or  or  (see page 6)

E = 2.7 Gallon Water Storage Tank

F = Autoclave Filler Wand

G = Lead-Free Bottle-Filling / Drinking Faucet

H = Dual Total Dissolved Solids (TDS) Monitor

I = System Water Shut-Off Valve

J = Water Storage Tank Shut-Off Valve

K = Injection Port Assembly

 = Flow Restrictor

 = Check Valve

 = DC Current Lines to TDS Meter

 = 3/8" O.D. x 1/4" I.D. Coiled Water Tubing

Vista Research Group, LLC
P.O. Box 321 • Ashland • OH • 44805-0321

Version: 100908

VistaPure Ultra Pure Water System
Model 3000 MAX*

NEW

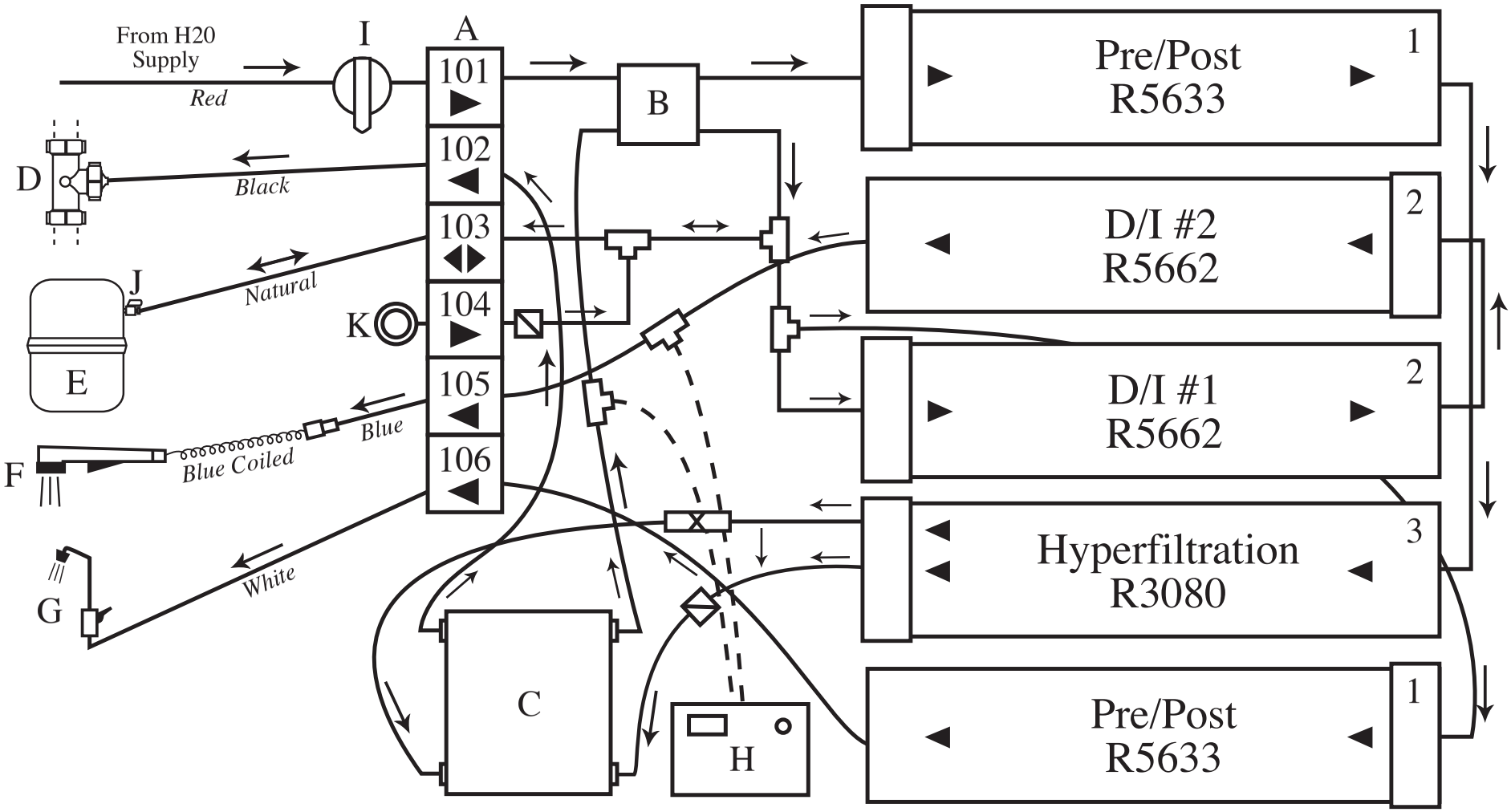


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Figure 2. *Complete block diagram of the VistaPure Model 3000 MAX system.*
** Current design for all VistaPure systems built after:*
Date: October 20, 2008 Serial #: 102860

Version: 100908

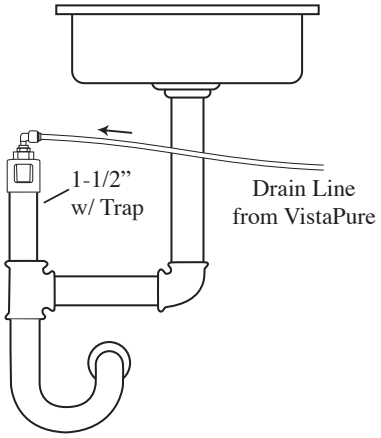


Figure 3. Typical installation of drain Air Gap (S9145) using existing sink drain system. Order separately.

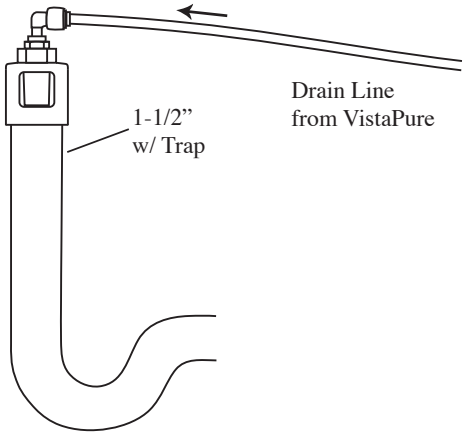


Figure 4. Typical installation of drain Air Gap (S9145) using separate riser and trap. Order separately.

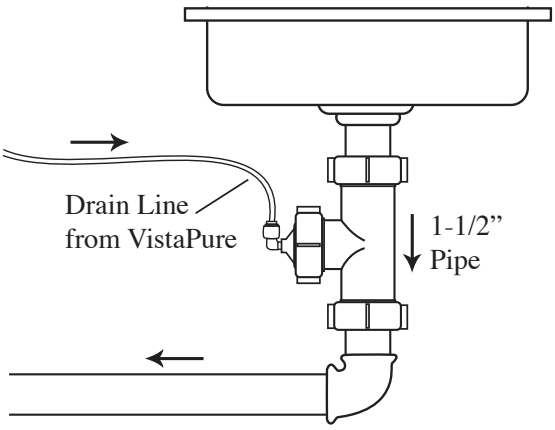


Figure 5. Typical installation of drain Tee (S9146) using existing sink drain system. Included with unit.

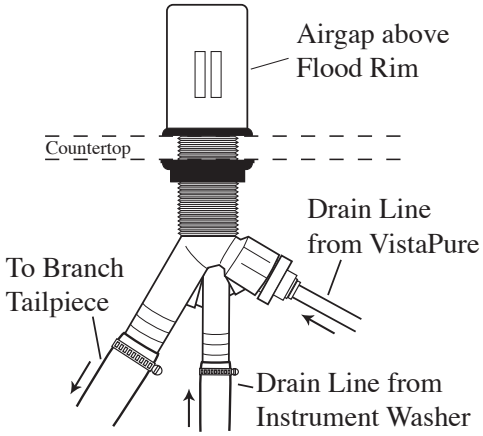
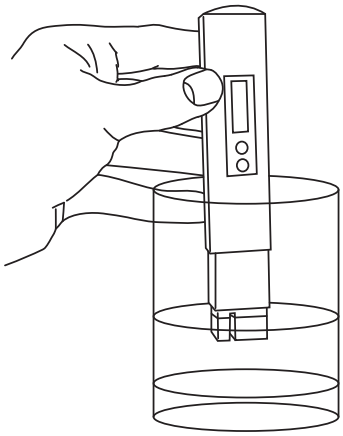


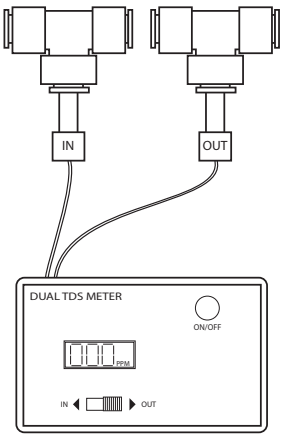
Figure 6. Typical installation of dual inlet drain Air Gap system (S9147) using branch tailpiece. Order separately.

Note: Figures 5 shows drain configuration using the air gap drain fitting included with the VistaPure system with 1-1/2" drain. Local codes vary greatly and other drain connection options are shown above. Every VistaPure has multiple check valves in the system to prevent backflow from drain connections.



Note: Keep the handheld TDS meter with your VistaPure system. It will be needed to perform regular monthly system checks and for troubleshooting if necessary.

Figure 7. Handheld TDS monitor.



Note: For proper readings on dual TDS monitor, see Note 4 on page 7.

Figure 8. Mounted dual TDS monitor.

Note: Replacement batteries for meters should be ordered locally. The Dual TDS Meter and the Handheld TDS Monitor for the VistaPure take two (2) of the following battery: 357A (LR44) Alkaline Button Cell - 1.5V 110mAh

Filter Performance Record

Date	"A" Water Supply to System (Use handheld TDS Meter)	"B" After Hyperfiltration (Use mounted Meter "IN")	"C" Percent TDS remaining (Divide column B by column A)	"D" TDS after D/I (Use mounted meter "OUT")	Water at Autoclave Wand (Use handheld TDS Meter)	Water at Faucet (Use handheld TDS Meter)

NOTE 1: Record the TDS level in each column above monthly to determine water quality. **First make a copy of the blank table before recording so you'll have a blank master for future years.** When the percent remaining in column "C" above goes above 10%, it is time to purchase and change the Hyperfiltration element R3080. This element should last 3-5 years between changes under normal conditions.

NOTE 2: Both Pre & Post Filters R5633 should be changed once each year.

NOTE 3: When the number in column "D" above goes above 3 TDS, it is time to purchase new and recylce ***both*** of the old D/I elements. Note the flow directions of the D/I #1 and D/I #2 elements, remove them and throw them away. Both D/I filter elements are identical but flow in different directions. Simply orient the elements in the proper flow direction.

NOTE 4: Water should be running through the system for accurate results when checking water quality using the system mounted TDS meter. Simply run the ***VistaPure*** faucet for a few moments and the system will start to produce water. Water will then be flowing through the probe "Tees" and yield accurate testing results.

****** WARNING ******

NEVER attempt to change any filter elements with pressure on the system! Follow these steps when changing elements:

1. Turn "OFF" Water Inlet Supply "I"
2. Close Tank Valve "J"
3. Discharge Autoclave Wand "F" and Faucet "G" to relieve all pressure
4. After elements are changed, perform a system cleansing by following Step # 8 of the Installation Instructions at least once per year and anytime a filter element is changed.

Filter Replacement Record

R5633 Prefilter	R3080 Hyperfiltration	R5662 Deionization	R5633 Postfilter

NOTE: Record the date of each element change in the table above. **First make a copy of the blank table before recording so you'll have a blank master for future years.**

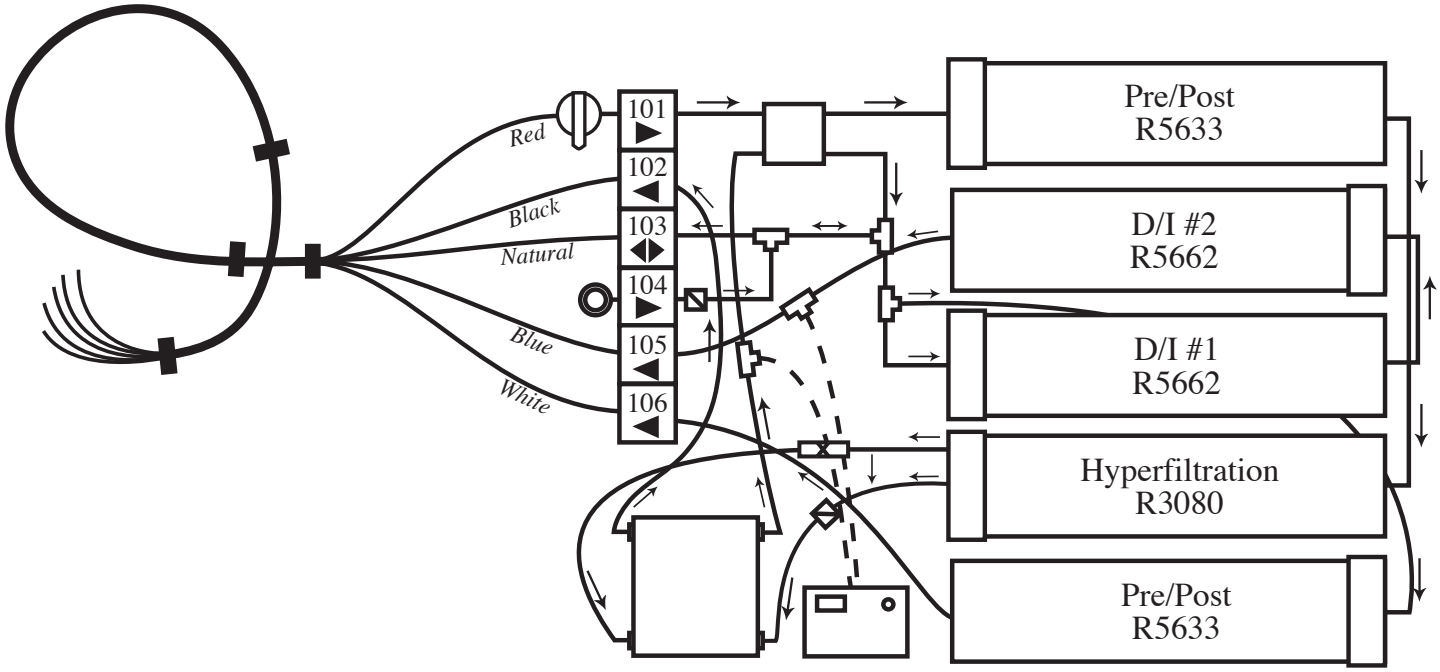


Figure 9. *Complete block diagram of the **VistaPure** Model 3000 MAX system showing tubing coil loop that allows the system to slide in and out of cabinetry. Note suggested wire ties on tubing loop.*

WARNING: Turn the valves on the water inlet (I) and tank (J) **"OFF"** at the end of each day to prevent water damage should a leak occur when staff is not present. Although the system components are all tested to high pressures, water hammer and higher nighttime water pressure could potentially create a leak that might cause property damage. Make it a standard practice to turn valves (I) and (J) "ON" each morning and "OFF" each evening. If the system is connected to a solenoid shut down system for the water line feeding the inlet, only the tank valve (J) needs to be turned "OFF."

NOTE: Please make certain the installers, users and persons maintaining the ***VistaPure*** system read this manual and the enclosed **"Special Notes, Warnings & Reminders"** page for requirements and to assure best system performance.

Vista Research Group, LLC
P.O. Box 321 • Ashland • Ohio • 44805-0321
419.281.3927 PH 419.281.7380 FX
vistaresearchgroup.com info@vistaresearchgroup.com