

 **DTS**⁺**AUTO**

 **DTS**⁺

 **DTS**⁺**RETRO**

Dockside Treatment System Plus Series User Manual and Installation Guide



The practice of running dock water through a standard seawater watermakers has been done for some time now.

It has allowed the boater to enjoy making purified water while at the slip and take advantage of the relatively spot free water produced under these circumstances. The downside has always been the premature failure of the seawater membranes due to exposure to chlorine, hot water, hard water, and various other contaminants that can foul a membrane. In addition, because the seawater membranes are not designed to be run under these conditions, they require far more energy and pressure than would membranes specifically designed for municipal water purification.

With the addition of a Dockside Treatment System Plus Series accessory to your watermaker, you can now purify dock water without the risk of fouling your seawater membranes.

The DTS⁺ Series models are designed to be used with FCI Watermaker saltwater systems. This watermaker accessory will allow a boater to run dock water through the watermaker without the risk of damaging the seawater membranes installed on the watermaker. The system can be incorporated into a standard watermaker so the addition of extra pumps, motors and control systems will not be needed. With the simple turn of a few valves you are making purified water from dock water and enjoying the peace of mind that your seawater system will be ready to go when you need it.

The DTS⁺ Series advances the dockside treatment system lineage with the introduction of a recycle valve technology. The recycle valve technology increases the water recovery rate up to 70%. The recycle valve technology is internal to the system and requires no user intervention.

FCI Watermakers offers three models in the DTS⁺ Series:

- **DTS^{+AUTO}:** This model is automated with actuated valves and does not require the user to manually turn any valves. The DTS^{+AUTO} works with Max•Q^{+APC} systems and is selected and operated through the HMI Touchscreen V4 Control display on the Max•Q^{+APC}.
- **DTS⁺:** This model is the same as above, except requires the user to manually turn a few valves when prompted by the Max•Q^{+APC} V4 Control.
- **DTS^{+RETRO}:** This model is designed for retro systems, specifically the Max•Q with V2 and V3 Control (using UROC2 and UROC3 technology) and the Aquamiser⁺ systems. The DTS^{+RETRO} is designed with a high pressure switch to safely shut down the system in case of an overpressure event. (For the DTS⁺ and DTS^{+AUTO}, the safety switch is in the saltwater system.)

PREFACE

We are committed to customer service that exceeds your expectations. If at any time you have questions about what's covered in this manual, our hands-on technical support will never leave you adrift. This manual contains technical information & instructions for the installation, operation, maintenance, and troubleshooting for FCI Watermakers Desalination Systems. Anyone responsible for the installation, operation, and maintenance of a FCI Watermakers Desalination System must read and understand the contents of this manual, and comply with these instructions, guidelines and safety requirements at all times.

The term *system* will be used throughout this manual, and it generally refers to the FCI Watermakers Dockside Treatment System Plus Series. Reading this manual in its entirety will familiarize you with the system and the operation of its components. By understanding the system in its entirety, one can readily operate and diagnose problems.

All references within this manual refers to other sections unless specifically defined. Graphics and illustrations are used for reference only and may not represent the actual part or arrangement of parts in a customized system.

ABOUT SAFETY NOTES

Safety issues requiring users attention are highlighted throughout this manual as follows:

WARNING:

Provides critical information in order to prevent the possibility of injuries and/or death.

CAUTION:

Provides important information to prevent the possibility of damaging the device or equipment.

NOTE:

Provides additional information to safely and properly operate the equipment.

NEW SYSTEM PERFORMANCE

Although each system has been fully tested prior to shipping, there will be a break-in period. During this period, approximately 48 hours, membrane performance will change or settle. Adjustments will need to be made to the high-pressure valve and the water quality and quantity will vary. For installations without APC, the high-pressure valve will need to be increased (turned clockwise) and the water quality produced will improve over this break-in period. For systems with APC, this adjustment will be automatic.

Purifying fresh water requires less pressure than purifying seawater, so prior to switching from the saltwater system to the DTS⁺ Series, turn the high-pressure valve fully counterclockwise (completely open) to lower pressure. For systems with APC, this adjustment will be automatic.

THEORY OF OPERATION

By utilizing existing watermaker pumps and control system, and adding the components specifically designed for municipal water, the DTS⁺ Series allows a user to make fresh drinking water.

The dockwater is delivered to the boat under city pressure. If the city pressure exceeds 15 PSI, the resulting pressure to the high pressure pump (after the watermaker feed pump) will be beyond the 45 PSI pressure limit. If this is the case, a pressure regulator can be installed to keep the pressure after the feed pump below the maximum limit. Contact the factory or your local FCI dealer for further details.

The dockwater is then passed through the supplied carbon inlet filter. Chlorine and bromide is harmful to the ceramic membranes of the watermaker, and the carbon inlet filter is provided to remove these contaminants from the dockwater.

The filtered dockwater is then controlled by a 3-way valve alongside the seawater source. When purifying dockwater through the DTS⁺ Series pressure vessels, the dockwater source is opened, and when purifying seawater through the saltwater system pressure vessels, the seawater source is opened. For the DTS⁺ and DTS^{+RETRO}, the water source is opened by manually turning the 3-way valve. For the DTS^{+AUTO}, the 3-way valve is actuated and the water source is opened by automation.

When purifying dockwater, the dockwater enters the low and high pressure pumps, and the DTS⁺ Series works together with the saltwater system by diverting the incoming water to the dockwater pressure vessels, and then returning the product water back to the saltwater system. A valve recycles part of the brine concentrate for further recovery and the remainder is returned to the saltwater system. The saltwater system controls and monitors the process, making its features and functions available under DTS⁺ Series operation.

LIMITED WARRANTY

This policy will define, in detail, what is and is not covered under warranty. It will also define how to obtain warranty service and approval.

I. Filtration Concepts Incorporated, dba FCI Watermakers (“FCI”), warrants to the original purchaser (“Purchaser”) that new Water Purification Products, Pumps, and Related Accessories (“Product(s)”), if used in accordance with FCI’s published specifications and operating manuals and all applicable laws and regulations, will not fail due to defects in material or workmanship during the period of the earlier of (i) one year from Startup (defined below), or (ii) 18 months from shipment (“Warranty Period”). At FCI’s option, it will repair, replace, or refund the original purchase price for the defective Product. Any parts repaired or replaced under this Product warranty shall not extend the original Warranty Period for the Product and will not be warranted any longer than the original Warranty Period. Labor costs to repair or replace are not included in this warranty.

Replacement parts (outside the original sale of the Product) shall carry a separate warranty as set forth in Article VI below.

Products built to Purchaser’s own specifications (“Custom products”). Custom Product Warranty: All Custom products manufactured by FCI pursuant to the design and specifications provide by Purchaser are warranted for one year from the date of manufacture. FCI warrants only that the Custom product will be manufactured in accordance with the Purchaser’s specifications.

II. To commence the warranty process, the Purchaser must call FCI’s Customer Service Department (see IV.2. below) for a recommendation as to the closest Authorized Servicing Dealer (see IV.2. below). If the Purchaser has a prior relationship with an Authorized Servicing Dealer, the Purchaser may contact same directly. If the Purchaser contacts FCI’s Customer Service Department for an Authorized Servicing Dealer and FCI has no one located in that particular area on the list, FCI will authorize the use of a local service company and work with that local company to assist in any way possible.

III. Exclusions to the above warranty:

1. Product failures resulting from improper installation or use contrary to operating manuals and other Product instructions;
2. Product failures resulting from abuse, misuse, accident, fire, or submergence;
3. Products manufactured by a third party that are not included in the original Product;
4. Products which fail as a result of improper application or improper installation, including but not limited to hose clamps, fittings, flare nuts, quick disconnects;
5. Products damaged during loading or shipment;
6. Cosmetic damages that do not affect the use and function of the Products;
7. Pumps that have been run dry, are water damaged or have been allowed to freeze;
8. Pumps with cracked heads;

LIMITED WARRANTY (continued)

9. Pump seals and UV light bulbs;
10. Sea strainer elements and cartridge filter elements;
11. Damage due to sand and/or gravel in a multi-media filter;
12. Pump packing assemblies;
13. Pump valve assemblies;
14. Pump crankcase oil;
15. Gauge instrument calibration;
16. Fuses;
17. Valve seals and packings;
18. Exterior corrosion;
19. Membrane elements;
20. Water damage to logic boards;
21. Logic boards with blown MOV's (Power Surge) or mis-programmed displays;
22. Water damage to displays or remotes;
23. Failures due to improper winterization;
24. All other consumable parts not covered herein;
25. Product damage resulting from improper return packaging by Purchaser; or
26. Force Majeure as more specifically defined in Section 9 of the General Terms and Conditions.

IV. Additional Exclusions/Restrictions:

1. For issues regarding installation, assembly or Start-up of the Product, the installer maintains all liability for its work, and FCI disclaims all liability therefor. Purchaser shall defend, indemnify and release FCI from and against any claims arising from the installer's work. "Start-up" is when the OEM or Authorized Servicing Dealer ("installer") has put the Product into service as shown on the Warranty Card (as defined in Article V. #3 below).
2. The installer must be an OEM or "Authorized Servicing Dealer". A list of Authorized Servicing Dealers can be found at <https://fciwatermakers.com/dealer-map/> or by calling FCI's Customer Service Department Monday-Friday from 8:00 a.m. until 5:00 p.m. (MT) at (801) 906-8840. If Purchaser wishes to use an installer that is not found on the list, please call the telephone number above for prior authorization. FCI is not liable for work performed by an installer and Purchaser shall defend, indemnify and release FCI from and against any claims arising from such third-party work.
3. Warranty repairs shall be subject to the same restriction as found in IV. #2 above. If an OEM or Authorized Servicing Dealer is not used for warranty repairs and/or installation, the warranty shall be voided.

LIMITED WARRANTY (continued)

4. Except as provided in IV. #5 below, labor costs and expenses for warranty repairs are excluded.
 5. If Purchaser, at its own cost and liability, packages and ships the defective Product to FCI for repair, FCI will repair the Product (or component) in its facility at its own expense (including labor) if found to be defective.
 6. If the Product is replaced under this warranty, all costs of uninstallation of the warranted Product and reinstallation of the new Product are excluded.
 7. In the case of a refund, the Purchaser must package and ship the Product back to FCI at its own cost and liability. If found to be defective, a refund will be issued.
 8. If the Product is uninstalled and reinstalled by Purchaser or its agent to another location, the warranty shall be voided.
 9. Purchaser (or its agents) shall be responsible for the cost to make the Product accessible for warranty repair.
 10. Products are not intended for use in connection with any nuclear facility or activity and FCI disclaims all liability for nuclear damage, injury, or contamination. Purchaser shall indemnify, defend, and hold FCI, its officers, directors, agents, employees, successors, assigns harmless from and against any and all damages or expenses of whatever nature (including attorney's fees and costs) which may be incurred arising from such use.
 11. If Purchaser or an installer purchases replacement parts to perform warranty repairs, unless FCI finds the returned part to be defective, FCI will not credit such purchase of a new part. Instead, FCI encourages Buyer to send the part in question to FCI's facility for evaluation of the alleged defect prior to purchasing a new part.
- V. Additional required conditions to warranty effectiveness:
1. FCI WARRANTIES ARE EFFECTIVE UPON PAYMENT IN FULL, AND FCI IS NOT OBLIGATED TO HONOR ANY WARRANTY OR PROVIDE ANY SERVICE UNTIL FCI RECEIVES PAYMENT IN FULL.
 2. Proof of purchase or proof of installation date may be required to verify warranty coverage.
 3. Purchaser must submit the "Warranty Card" at the time of Start-up through the portal found at <https://fciwatermakers.com/register-your-product/>. If Buyer fails to submit the Warranty Card upon Start-up, the Warranty Period for the purchased Product shall be limited to one year from shipment. All other terms and conditions herein shall apply.
 4. All products manufactured by FCI are based on a set criterion for performance based on feed water conditions. These parameters can be found on the product data sheet(s) ("PDS") for each product. Please refer to the applicable PDS for additional warranties, exclusions and terms and conditions. Variations from these parameters will affect system performance and in some cases damage system components. FCI is not responsible for feed water quality or changes in the feed water over time or the resulting system performance due to feed water being unbalanced or containing contaminants or biological elements. In these circumstances, the warranty will be void.

LIMITED WARRANTY (continued)

In cases when FCI's Application Questionnaire is completed by Purchaser, FCI assumes no liability for the accuracy of the data submitted by Purchaser or subsequent recommendations based on the submittal. If Purchaser's responses are inaccurate or incomplete, the warranty shall be void. If the feed water conditions change, the warranty will be void. If Purchaser does not return the Application Questionnaire and the product fails due to improper feed water conditions for the model purchased, the warranty will be void.

VI. Parts' Warranty: All parts ("Parts") sold outside the original Product sale (excluding replacement parts covered by the Product warranty above in Article I) that are sold by FCI shall be warranted for 90 days from the date of sale. FCI does not warrant parts manufactured by third parties and the Parts buyer should contact the original manufacturer for any applicable warranty rights.

VII. Additional limitations to the Product, Custom product and Parts warranties:

THE REMEDIES SET FORTH HEREIN ARE THE ONLY REMEDIES AVAILABLE TO ANY PERSON OR ENTITY FOR BREACH OF WARRANTY OR FOR BREACH OF ANY OTHER COVENANT OR OBLIGATION ON THE PART OF FCI AS SET FORTH HEREIN. FCI SHALL HAVE NO LIABILITY OR OBLIGATION TO ANY PERSON OR ENTITY FOR BREACH OF ANY OTHER COVENANT OR OBLIGATION UNDER THIS WARRANTY EXCEPT AS EXPRESSLY SET FORTH HEREIN.

IT IS EXPRESSLY AGREED THAT THIS WARRANTY DOES NOT FAIL OF ITS ESSENTIAL PURPOSE.

IN NO EVENT SHALL FCI BE LIABLE FOR INCIDENTAL, SPECIAL OR CONSEQUENTIAL OR PUNITIVE DAMAGES OF ANY NATURE WHATSOEVER, WHETHER ANY SUCH CLAIM OR DAMAGES BE BASED UPON WARRANTY, CONTRACT, NEGLIGENCE, STRICT LIABILITY, TORT, OR OTHERWISE.

IN NO EVENT SHALL FCI'S TOTAL LIABILITY HEREUNDER EXCEED THE ORIGINAL PURCHASE PRICE OF THE PRODUCT OR PART, AS APPLICABLE.

THIS LIMITED WARRANTY CONSTITUTES FCI'S EXCLUSIVE PRODUCT, CUSTOM PRODUCT AND PARTS WARRANTIES. ANY SERVICE, ADVICE, OR CONSULTATION FURNISHED TO PURCHASER OR BUYER BY FCI OR ITS REPRESENTATIVES AS WELL AS ALL OTHER WARRANTIES EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED.

VIII. FCI's General Terms and Conditions of Sale and applicable PDS are included in and applicable to this Limited Warranty. FCI's Customer Service Department can provide Purchaser with a copy of the General Terms and Conditions of Sale upon request.

Effective Date: 4/29/2022

WARRANTY REGISTRATION

INSTRUCTIONS: At the time of purchase of the FCI Watermakers system, please complete the warranty information listed below. After completing this form, please make a copy and submit the copy using one of the options at the bottom of the page. Keep this copy in your manual for future reference.

SYSTEM INFORMATION:

Model # _____
Serial # _____
Operating Voltage: _____

Date Purchased: _____

Date Commissioned: _____

DEALER INFORMATION:

Dealer Name: _____
Address: _____
City: _____ State: _____
Country: _____ Postal Code: _____
Dealer Invoice #: _____

CUSTOMER INFORMATION:

Customer Name: _____
Address: _____
City: _____
State: _____ Postal Code: _____
Country: _____
Phone: _____ Fax: _____
E-mail: _____

VESSEL INFORMATION:

Boat Manufacture: _____
Boat Model: _____
Boat Name: _____
Boat Length: _____

LAND BASED INFORMATION:

Installation site: _____
Site Name: (resort, company etc) _____

Application: _____

Operator Contact Information:

(person in charge of system maintenance and operation)
Name: _____
E-mail: _____
Phone: _____

COMMERCIAL APPLICATION:

Rig Name: _____
Rig Location: _____
Operator Name: _____
Operator E-mail: _____

Mail a copy to:

FCI WATERMAKERS, INC
ATTENTION: WARRANTY REGISTRATION
3782 W 2340 S, STE E
WEST VALLEY CITY, UT 84120-7291 USA

EMAIL: info@fciwatermakers.com
Subject: Warranty Registration

FAX: +1-801-883-9985

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FCI CONTACT INFORMATION

If you have questions regarding your FCI Watermakers system or the contents of this manual, or if you need replacement parts, please do not hesitate to contact us immediately. Our hands-on technical support is always at your service.

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GENERAL INFORMATION

FCI watermakers are the most advanced desalinating systems available, which produce potable water from seawater or brackish water. For over a decade, FCI Watermakers, Inc. has pioneered technology and innovated features that have become standards for today's desalinators: one-touch commands, multiple station operation, and remote system control and monitoring. As both engineers and craftsmen, we specialize in high-performance, value-driven watermakers and are proud of the thousands of continuously operating units that have been cruising the globe for decades.

At FCI Watermakers, our commitment and attention to detail transcends beyond materials and construction. Things that are seemingly trivial are never overlooked. For instance, your system's specifications formulate the Model Number. It is comprised of the Series, the Salt Water System to which the unit attaches, the Production Rating of the unit in gallons per day (GPD), and the Model Name:

A B C D
DTS+MQM-1850-A

A	B	C	D
Series	Salt Water System	DTS Production	Model Name
DTS: DTS+	A: Aquamiser+	-600: 600 GPD	BLANK: DTS+
Series	MQF: Max-Q(+) Framed	-700: 700 GPD	-A: DTS+AUTO
	MQM: Max-Q(+) Modular	-1200: 1,200 GPD	-R: DTS+RETRO
		-1275: 1,275 GPD	
		-1800: 1,800 GPD	
		-1850: 1,850 GPD	

Your FCI Reverse Osmosis Desalination System is designed to provide lasting performance using high-grade materials and uncompromising engineering. FCI systems utilize high-grade alloys in critical components, where competing brands often use inferior material that compromise system operation and jeopardize the vessel.

NEW SYSTEM PERFORMANCE

Although each system has been fully tested prior to shipping, there will be a break-in period. During this period, approximately 48 hours, membrane performance will change or settle. Adjustments will need to be made to the high-pressure valve and the water quality and quantity will vary. For installations without APC, the high-pressure valve will need to be increased (turned clockwise) and the water quality produced will improve over this break-in period. For systems with APC, this adjustment will be automatic.

Purifying fresh water requires less pressure than purifying sea water, so prior to switching from the saltwater system to the DTS+ Series, turn the high-pressure valve fully counterclockwise (completely open) to lower pressure. For systems with APC, this adjustment will be automatic.

2/ PRE-INSTALLATION

This section provides key information for a successful install, leading to long-term enjoyment of your FCI watermakers. It includes warnings, cautions and notes associated with the preparatory work necessary to properly install and maintain your watermaking system.

The FCI Watermakers System is supplied with an installation kit which includes an assortment of hoses needed to install the system. Because of the various options with regard to location, some installations may require additional hose or wire. Please contact your local dealer for these supplies. Be sure to follow all local codes when installing your new FCI watermaking system.

Always use genuine FCI approved parts to ensure proper operation of your watermaker.

PRE-INSTALLATION PRECAUTIONS

STORAGE PRIOR TO REMOVAL FROM CRATE

Adhere to crate markings:

- **DO NOT** store in direct sunlight;
- **DO NOT** store above 120° F (50° C);
- **DO NOT** freeze;
- **DO NOT** store longer than 4 months without flushing with storage chemical;
- **STORE ONLY** on base with **ARROWS UP**;
- **KEEP THE R.O. MEMBRANE ELEMENT WET AT ALL TIMES.**

REVERSE OSMOSIS MEMBRANE ELEMENT IS SUSCEPTIBILITY TO CHEMICAL ATTACK

CAUTION: Do Not expose the FCI Watermakers system to intake Feed Water from any chemical not approved in writing by FCI Watermakers, or any of the following chemicals:

- | | |
|---------------------|-------------------------|
| • Hydrogen peroxide | • Chloramines-T |
| • Chlorine dioxide | • Chlorine |
| • Bromine phenolic | • Disinfectants |
| • Chloramines | • N-chloroisocyanurates |
| • Hypochlorite | • Iodine |
| • Bromide | • Petroleum products |

USE OF NON-AUTHORIZED OR MISUSE OF AUTHORIZED CHEMICALS VOIDS SYSTEM WARRANTY

Do not connect any water line to the system that may contain any of the aforementioned chemicals. Example: Do not connect the inlet of the system to the ship's potable water system or the dockside water system without the carbon inlet filter, if the water systems contain chlorinated or brominated water. These chemicals destroy the copolymer components within the R.O. system. These oxidants and others also damage the R.O. membrane element.

DO NOT PERFORM INSTALLATION UNLESS:

- 1 The system feed water sea cock valve is closed.
- 2 The system main electrical disconnect switch is switched **OFF, LOCKED, and TAGGED.**

WARNING: ELECTRICAL SHOCK HAZARD. The installation procedures expose the installer to **HIGH VOLTAGE** and electrical shock hazard. Only attempt installation if you are a qualified electrician and only if surrounding conditions are safe.

QUALIFICATIONS

Technicians must have technical knowledge and ability in the following fields:

- a) Electrical, Electronic, Electric Motors and Circuits
- b) Electromechanical and Mechanical Systems
- c) Hydraulic and Liquid Pressure and Flow Systems
- d) Piping and Plumbing Systems
- e) Water Suction and Pressure Lines
- f) Thru-Hull Fitting below and above water level

WARNING: Do not attempt installation, commissioning, troubleshooting, or repair if you are not proficient in the above fields of expertise.

SPECIAL CONSIDERATIONS INSTALLATION CAUTIONS

Always allow hoses and tubes to enter and exit straight from the connection for a minimum of one inch prior to a bend. If stress is placed on the fitting due to a tight bend, the fitting will leak and may break.

Avoid skin and eye contact with the membrane packaging solution. In case of skin contact, rinse the skin thoroughly with water. In case of eye contact, flush repeatedly with water and notify a physician immediately. R.O. membrane elements are stored in “sodium bisulfite.”

NEVER mount liquid-holding component above any electrical or electronic device. Extensive damage to the electronic device will result if liquid enters device during maintenance and or component failure.

CONNECTION LINE CAUTIONS— All connection lines should be as short and straight as possible using minimum fittings. The connection lines must not be “kinked.”

ACCESSIBILITY CAUTIONS— This is a simple rule: Install the system and its supporting components in an accessible manner. The flow panel must be accessible for operation of the system.

R.O. MEMBRANE ELEMENT NOTES

CAUTION: Some systems are shipped **WITHOUT** the reverse osmosis membrane element. This is to accommodate boat builders that will install the system well in advance of commissioning the boat and the system.

DOES THIS SYSTEM HAVE R.O. MEMBRANE(S) INSTALLED OR NOT?

If not, is it your intention to install the R.O. membrane(s) at this time, or do you wish to install them at a later date when the boat is commissioned?

If the R.O. membrane element has been installed, there will be a R.O. membrane element serial number tag attached to the pressure vessel(s). Find this serial number tag to ensure that the R.O. membrane element(s) have been installed. If the R.O. membrane element serial number tag is missing or does not contain a serial number, then the R.O. membranes are not installed. If the R.O. membrane elements are not installed and you wish to install them at this time, contact FCI Watermakers, Inc. and supply us with your original purchase order number, FCI's invoice number, and this system's serial number.

WARNING: If the reverse osmosis membrane element is not to be installed at this time, ensure that you leave a visible note at the system controller and at the front of the control panel informing the end user that:

The reverse osmosis membrane elements are not installed;
to contact the factory for the R.O. membrane elements; and
DO NOT operate the system without the R.O. membrane
elements installed. Extensive damage will occur if the system is
operated without the R.O. membrane elements installed.

Damage to the system caused by the operation of the system without R.O. membrane elements installed:

- Is **NOT** covered by the FCI Watermakers, Inc. warranty
- Is the liability of the installer if the installer did not notify the end user.
- Is the liability of the end user if the installer notified the end user that the R.O. membranes were not installed and to not operate the system without the R.O. membrane elements installed.

COMPONENT IDENTIFICATION

Figure 1 introduces the components required for the install. Each component plays an important part in the install and is referenced throughout this manual.

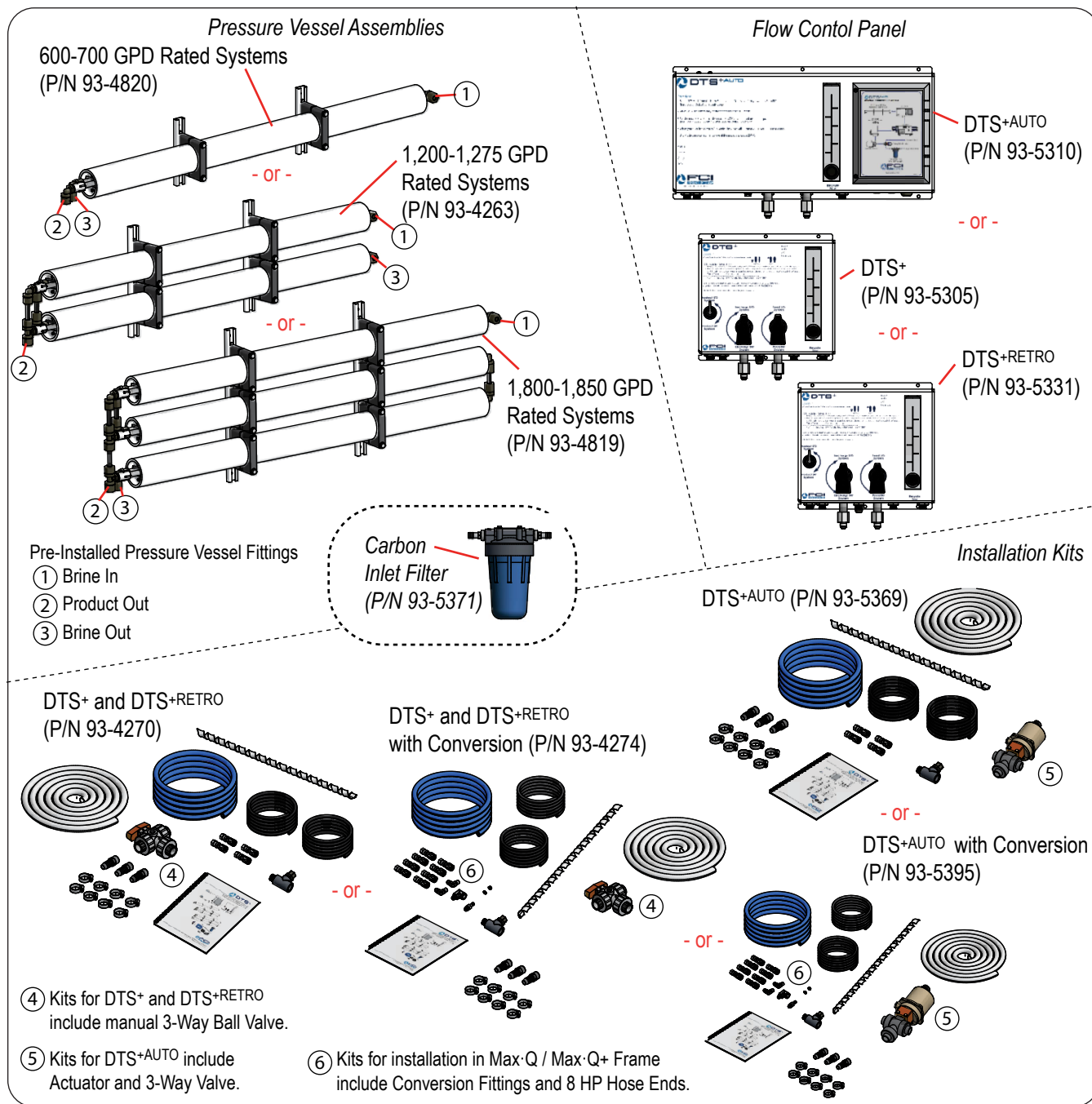


Figure 1: Component Identification

INSTALLATION KITS

The installation kit provided with DTS⁺ Series system will match a kit shown in *Figure 2* to *Figure 5*. The kits are specific to the model (DTS⁺/DTS⁺RETRO or DTS⁺AUTO). Also, kits with conversion fittings are supplied if the installation will be in a Max•Q^{+/+/APC} framed system.

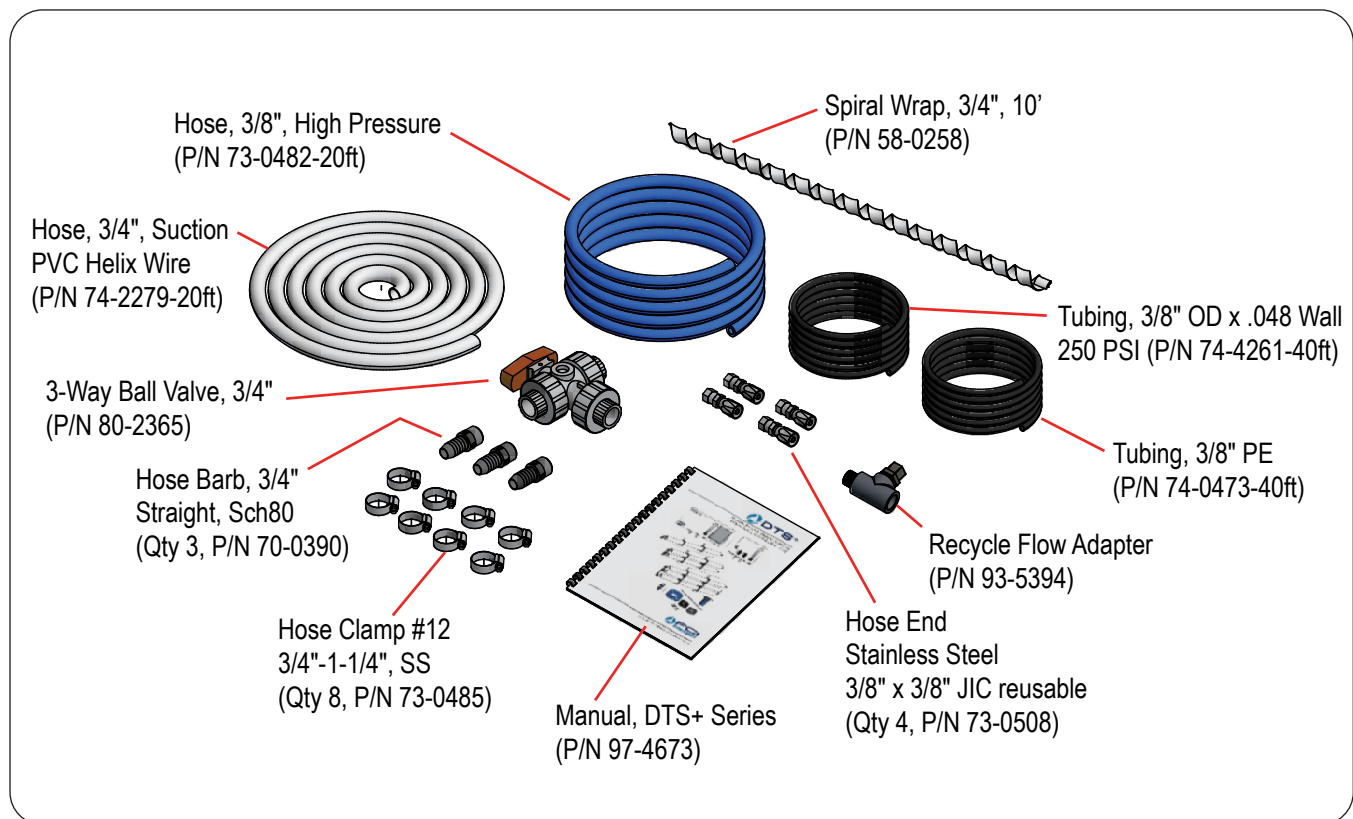


Figure 2: Installation Kit (P/N 93-4270) (DTS⁺ and DTS⁺RETRO)

INSTALLATION KITS (continued)

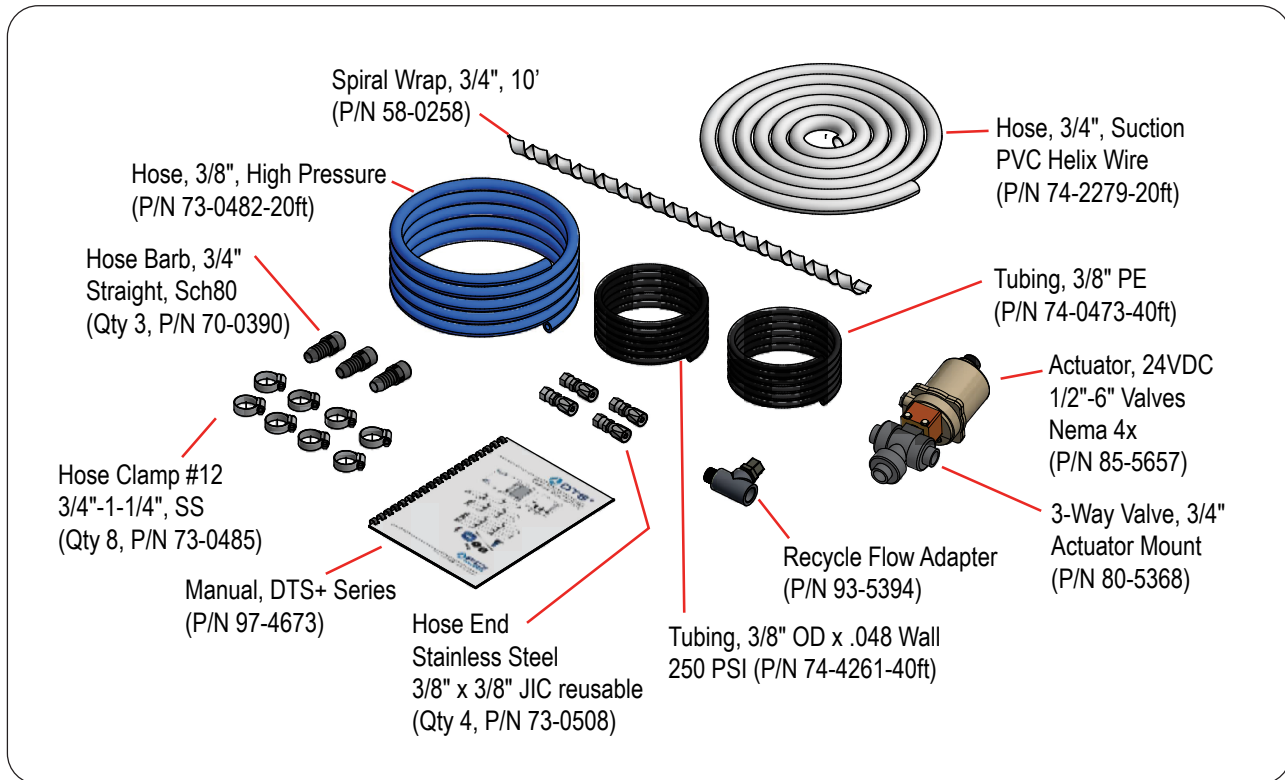


Figure 3: Installation Kit P/N (93-5369) (DTS⁺AUTO)

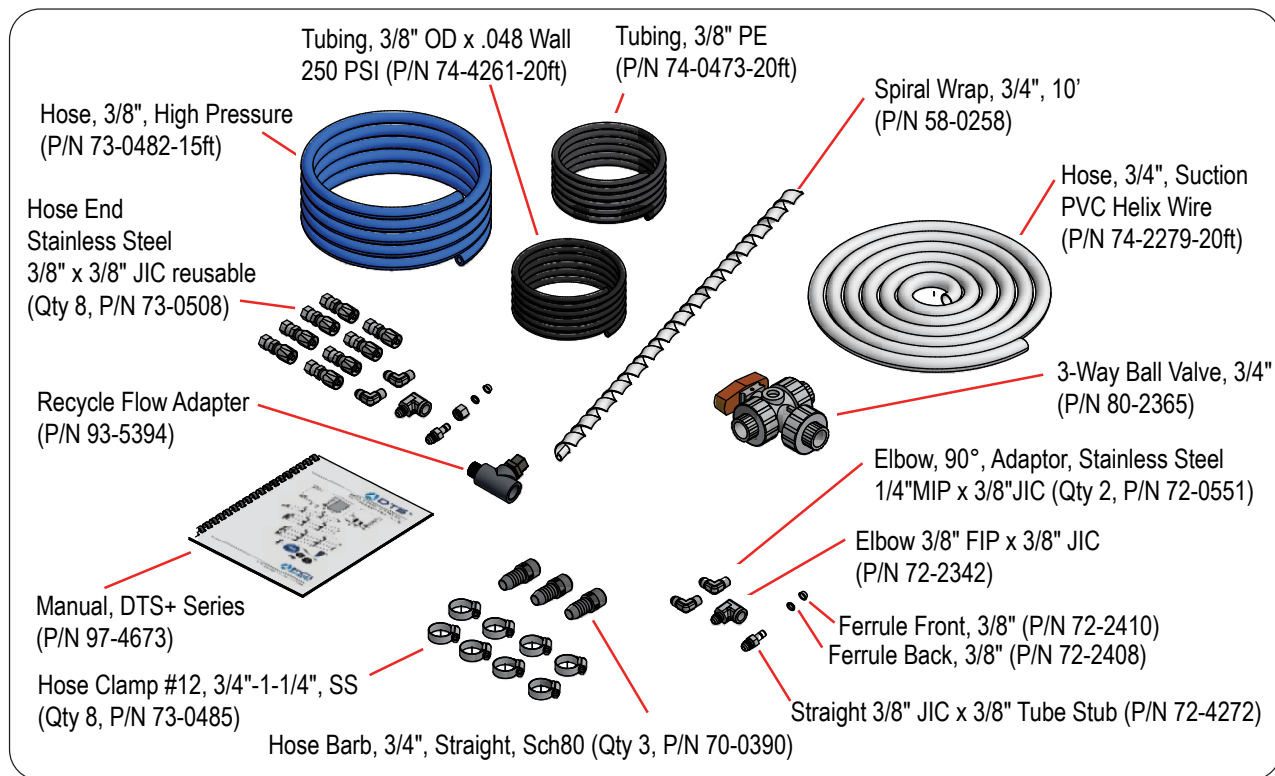


Figure 4: Installation Kit with Conversion P/N (93-4274) (DTS⁺ and DTS⁺RETRO)

INSTALLATION KITS (continued)

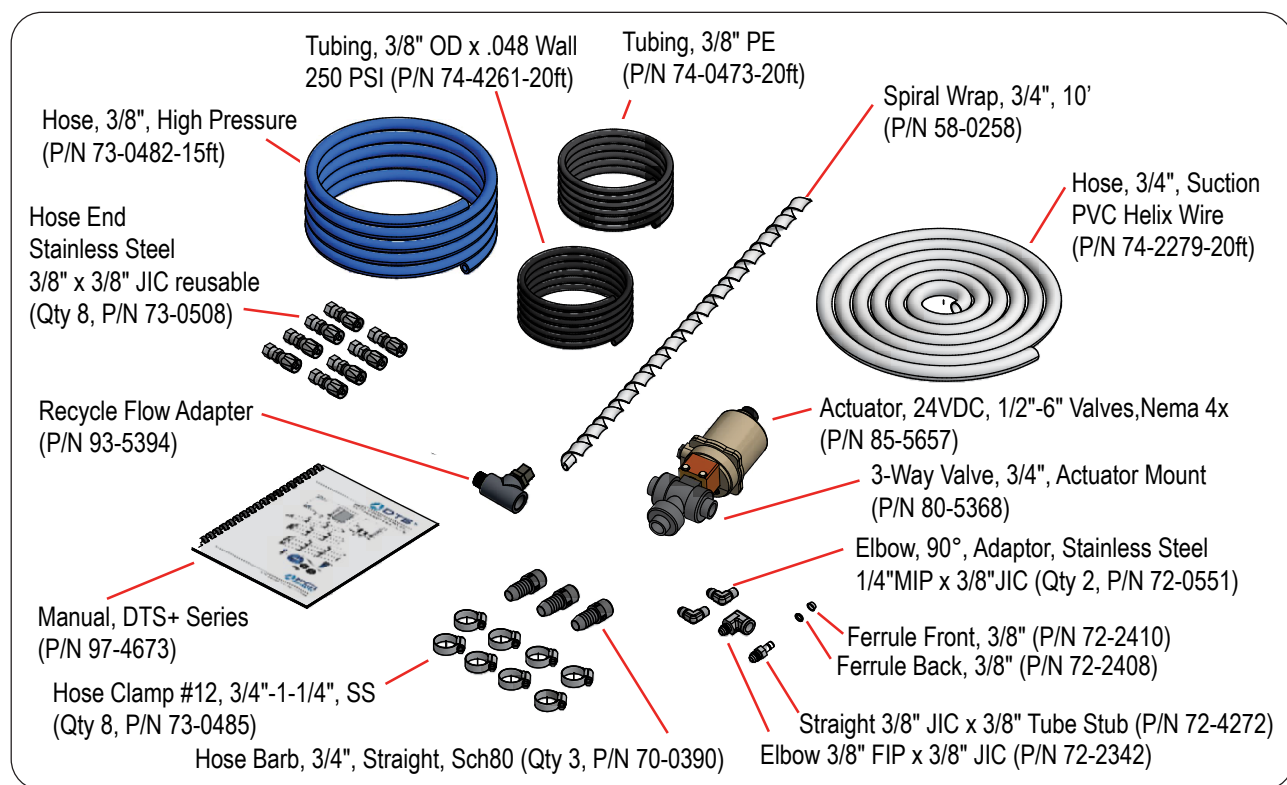


Figure 5: Installation Kit with Conversion (P/N 93-5395) (DTS+AUTO)

PIPING & INSTRUMENTATION DIAGRAM

Figure 6 shows the piping and interconnect of the components, including standard and optional accessory configurations. Determine the pre-filtration and post-filtration components that were supplied with your system, and identify how each component interconnects.

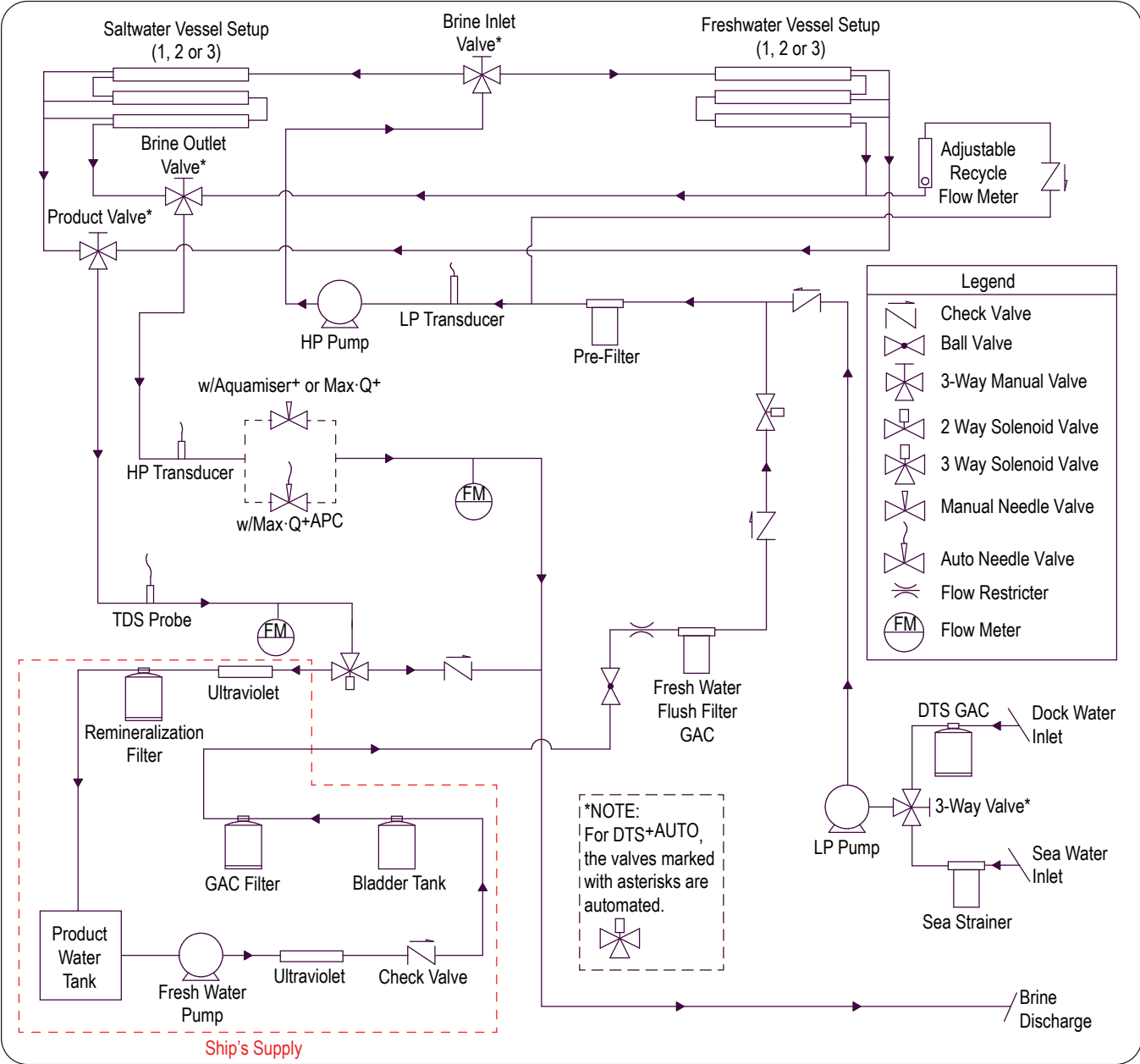


Figure 6: Piping & Instrumentation Diagram

COMPONENT DESCRIPTIONS

Standard and optional components are described in this section, and items required by the installer are listed. The location, operation, and purpose of each major component of the system is briefly explained.

Use of third party, Non-FCI (or unauthorized) components may lead to premature failure, added operating and maintenance costs, and increased labor. Using 3rd party, Non-FCI components may void any and all FCI Watermakers Warranty. We only wish to help you enjoy the luxury of owning a FCI Desalinating System. Treat it properly by using only FCI supplied parts, recommended consumables, and authorized accessories.

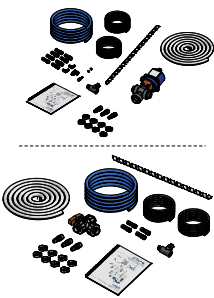
INSTALLATION KIT

If you are installing the DTS⁺ Series system onto an framed Max•Q^{/++APC} system, you will receive a installation kit with conversion fittings (shown on left margin above the line). This kit has extra fittings to help attach the tubes to the Max•Q^{/++APC} frame.

If you are installing the DTS⁺ Series system onto a modular Max•Q^{/++APC}, modular Aquamiser+, or Framed Aquamiser+, you will receive an installation kit without the conversion fittings (shown on left margin below the line).

For DTS⁺ and DTS⁺RETRO installations, the manual 3-way ball valve is included with the installation kit. For DTS⁺AUTO installations, the actuator and 3-way valve with mount are assembled into the 3-way actuated inlet valve, and it is included with the installation kit.

The kits also come with a recycle flow adapter, hose ends, hose, and tubing.

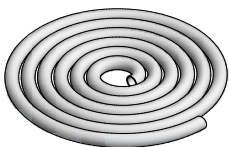
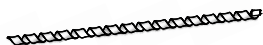


FITTINGS

Hose ends and fittings are supplied with the kits to connect the plumbing from the DTS⁺ Series System to the salt water system. Some fittings are shipped attached to the pressure vessel assembly and flow control panel.

SPIRAL WRAP

If needed for extra protection where hose and tubes may rub, 10 feet of spiral wrap is included in the kits. Simply cut the spiral wrap to the length of the area where needed, and place over the tube or hose.



PVC HELIX WIRE SUCTION HOSE (supplied with kit)

The suction hose is used with the hose barb and clamps to plumb from the seawater and dockwater sources, through the sea strainer and carbon filter, and to the low pressure pump.



HIGH PRESSURE HOSE (supplied with kit)

The high pressure hose must be cut to length, and the stainless steel hose end must be fitted onto the hose. There are four hose connections between the DTS⁺ Series and the saltwater system, used to transport the brine associated with the saltwater system pressure vessels.

COMPONENT DESCRIPTIONS (continued)



PE TUBING (Rated ≥ 250 PSI, supplied with kit)

The tubing rated for high pressure (≥ 250 PSI) is used to connect the brine inlet and outlet of the freshwater pressure vessel to the flow control panel. The tubing must be cut to length and the push-in fittings installed on the tube ends. A quantity of two high-pressure PE tubes are required. Note that the high pressure tubing is shiny black and the low pressure tubing (described below) has a dull black appearance.



PE TUBING (Rated 125 PSI, supplied with kit)

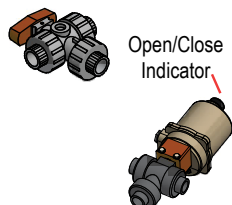
The low pressure tubing (125 PSI) has a duller black appearance than the high pressure tubing described above. The tubing must be cut to length and the push-in fittings installed. There are three low pressure tubes used in the installation of the DTS⁺ Series to the saltwater system to transport the product water, and one low pressure tube used for the recycle flow.



Carbon Inlet Filter
GAC Part # 20-0026

CARBON INLET FILTER

Chlorine and bromide are harmful to the fresh water membranes. The carbon inlet filter is supplied to remove these chemicals. The filter is installed at the dockwater inlet. The Granular Activated Carbon filter element should be replaced as needed (Part # 20-0026).



3-WAY VALVE

For the DTS⁺ and DTS^{+RETRO} models, a manual 3-way ball valve, PVC helix wire suction hose, barbs, and clamps are supplied in the installation kit. You may use the hose, barbs, and clamps to install the 3-way valve upstream from the low pressure pump of the watermaker. The 3-way valve may also be hard piped into place. The inlets of the 3-way valve connect to seawater source (after the sea strainer) and the dockwater source (after the carbon inlet filter). The outlet of the 3-way valve connects to the low pressure pump of the seawater system. Do not install 3-way valve below the ship's waterline.

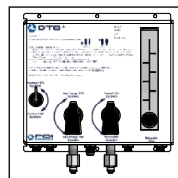
For the DTS^{+AUTO}, a 3-way actuated valve is supplied and connects as described above. In addition, wires from the flow control panel connect to the actuated valve.

COMPONENT DESCRIPTIONS (continued)

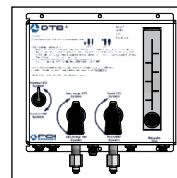
FLOW CONTROL PANEL

The flow control panel uses valves to divert water between the seawater system and the DTS⁺ Series. Also, the panel has an adjustable recycle flowmeter and knob that is used to set the recycle flow to 70% of rated production.

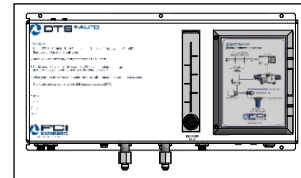
There are several plumbing connections to set up between the seawater system and the flow control panel. Also, the flow control panel of the DTS⁺RETRO has a wire from the dockside HP switch (located inside the flow control panel) that connects to the seawater system. For the DTS⁺AUTO, power must be wired to the power supply located in the electrical enclosure of the DTS⁺AUTO system. Also, the two cables that feed through the bottom of the flow control panel must be connected to the 3-way actuated valve, and one cable connected to the PC board, located in the electrical enclosure of the saltwater system.



DTS⁺RETRO



DTS⁺



DTS⁺AUTO

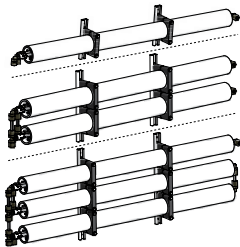
The DTS⁺RETRO and the DTS⁺ have flow control panels with manual valves. Turn the valves upward to run the water source through the freshwater membranes, and turn the valves downward to run the water source through the seawater membranes. Be careful to turn the valves only when systems are idle (no water flowing).

The DTS⁺AUTO has a flow control panel with actuated valves and is automated. That is, the system turns the valves for you.



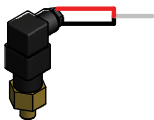
RECYCLE FLOW ADAPTER (supplied with kit)

The recycle flow adapter is to be installed on the high pressure pump where the inlet tube from the pre-filter outlet attaches. The DTS⁺ Series flow control panel's recycle flow output is plumbed to the adapter's recycle flow input,



PRESSURE VESSEL ASSEMBLY

The freshwater pressure vessels operate at a lower pressure than seawater pressure vessels, so be sure to turn high pressure valve counterclockwise when switching from seawater pressure vessels to freshwater pressure vessel. The pressure vessels contain the R. O. membranes used to filter the water.



DOCKSIDE HP SWITCH (located inside the DTS⁺RETRO flow control panel)

The dockside high pressure switch is used to monitor and shutdown the DTS should parameters be outside of operating range. The dockside high pressure switch is located inside the DTS⁺RETRO flow control panel. Its wires are to be routed through the bottom of the flow control panel and connect to the saltwater system near or at the PC board. The PC board is located on the door of the electrical enclosure. Access the PC board by loosening the two screws on the side of the enclosure and swinging the door open.

3/ INSTALLATION

Read below to understand the overall approach of the install.

DIMENSIONS, WEIGHT, & FOOTPRINTS

Immediately following this overview are diagrams of the DTS⁺ Series components with their dimensions and footprints. These diagrams are used to plan where to mount the components.

GENERAL CONNECTION DIAGRAMS

The General Connection Diagrams are supplied to provide a one page layout of how the system components connect. These diagrams are used to plan where to mount the components and as a reference when connecting the plumbing.

SYSTEM INSTALLATION / KIT FOR FRAMED MAX•Q^{/+/+APC}

This section is a two part illustrated, step-by-step guide to installing the Installation Kit onto a Framed Max•Q^{/+/+APC}. If you are installing the DTS⁺ Series onto a Modular Max•Q^{/+/+APC} or an Aquamiser⁺, you can skip this section and proceed to mounting.

SYSTEM INSTALLATION / MOUNTING

This section has instructions on mounting the components. The footprint and layout diagrams of the previous sections are available for reference when mounting the system components.

SYSTEM INSTALLATION / PLUMBING

After the mounting instructions, the manual describes the plumbing. General instructions are provided on how to install the hose ends and fittings. Illustrations and a table call out the plumbing connections by letter. You are instructed to work through the hoses and tubes letter-by-letter until the plumbing is connected.

SYSTEM INSTALLATION / ELECTRICAL CONNECTIONS

For the DTS⁺, there is no wiring and you can skip this section.

For DTS^{+RETRO}, the wires from the high pressure switch that feed through the bottom of the flow control panel connect near or at the PC board, located in the electrical enclosure of the saltwater system. For the Max•Q only, you also must activate the high pressure switch from the display panel's menu hierarchy system.

For the DTS^{+AUTO}, power must be wired to the power supply, located in the electrical enclosure of the DTS^{+AUTO} system. Also, one cable that feeds through the bottom of the electrical enclosure must be connected to the 3-way actuated valve and one cable to the PC board located in the saltwater system.

INSTALLATION CHECKLIST

After the installation is complete, use the list to double check the installation.

DIMENSIONS, WEIGHT & FOOTPRINTS

Dimensions, weight and footprints of the systems components are shown in *Figure 7* to *Figure 12*. Refer to the figures when planning where to mount the components. Planning considerations are discussed in "SYSTEM INSTALLATION / MOUNTING".



Figure 7: Dimensions Carbon Inlet Filter (P/N 93-5371)

DIMENSIONS, WEIGHT & FOOTPRINTS (continued)

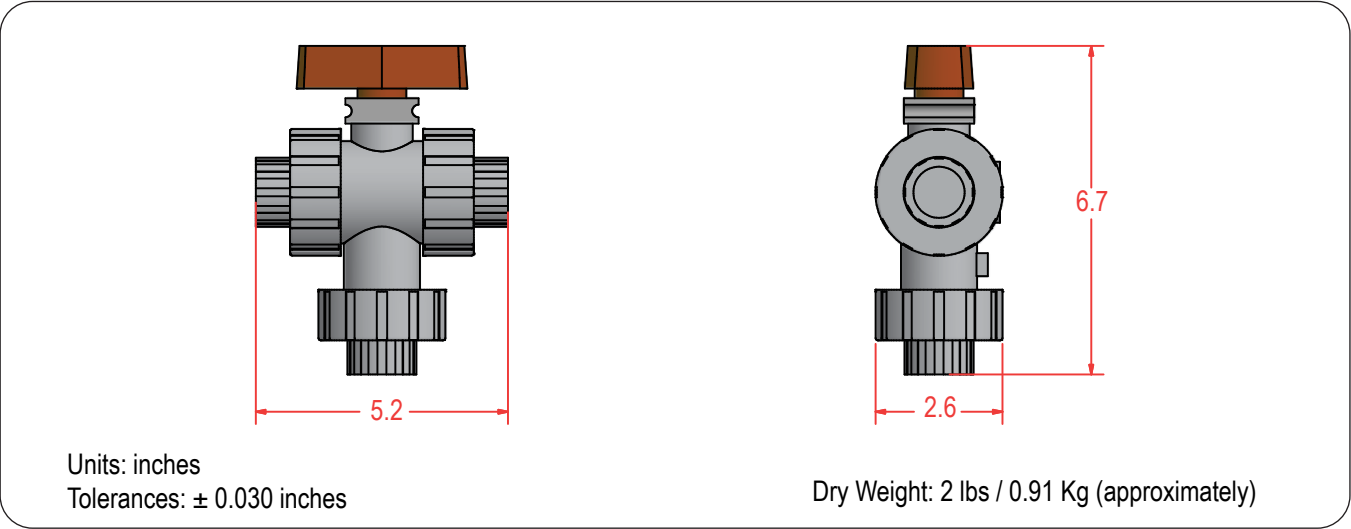


Figure 8: Dimensions 3-Way Manual Valve (P/N 80-2365) (DTS⁺ and DTS⁺RETRO)

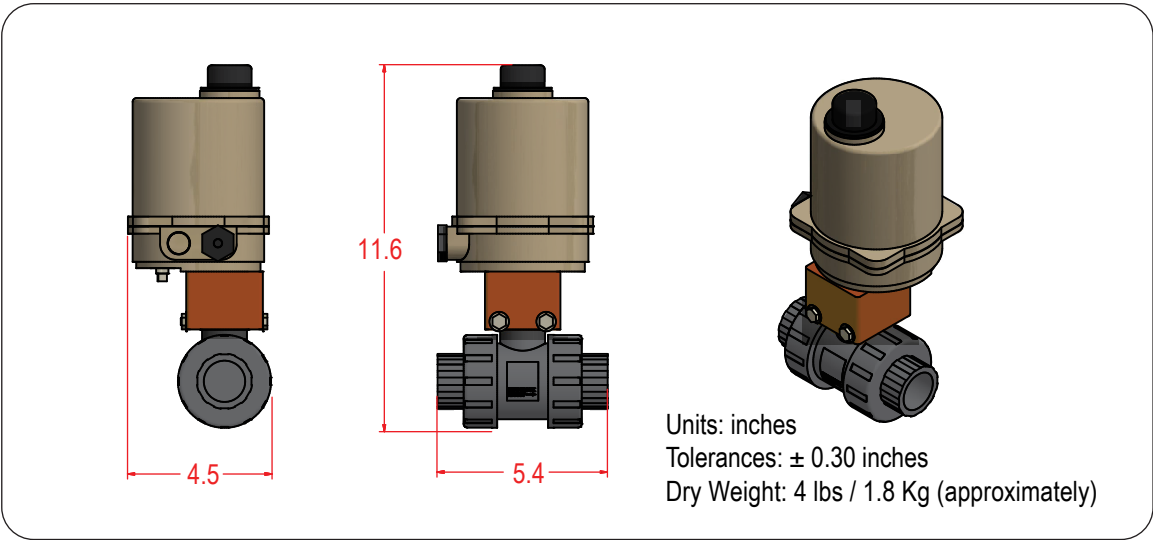


Figure 9: Dimensions 3-Way Actuated Valve (P/Ns 80-5368 & 85-5657) (DTS⁺AUTO)

DIMENSIONS, WEIGHT & FOOTPRINTS (continued)

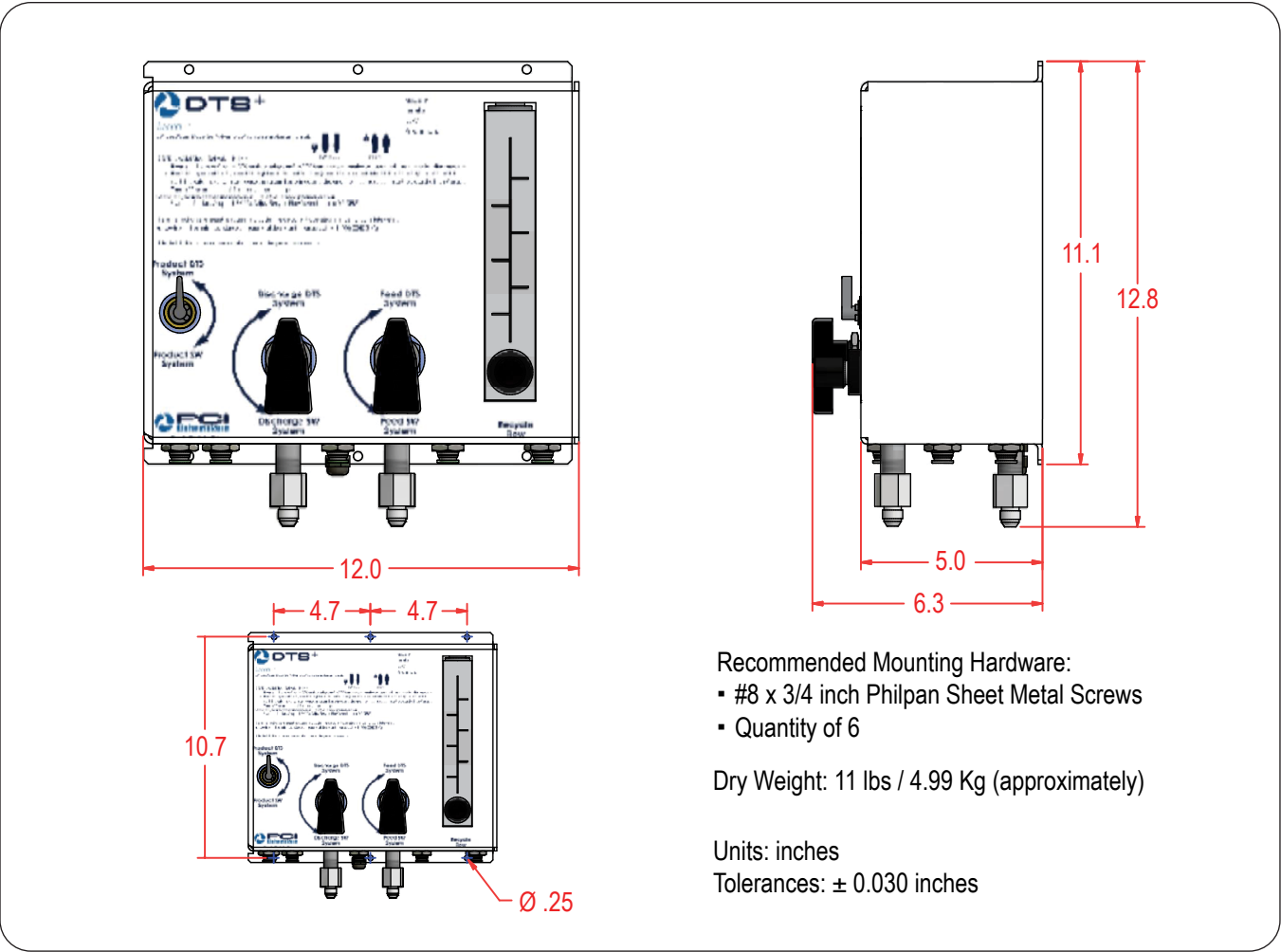


Figure 10: Dimensions FC Panel (DTS+^{RETRO} P/N 93-5331, DTS+ P/N 93-5305)

DIMENSIONS, WEIGHT & FOOTPRINTS (continued)

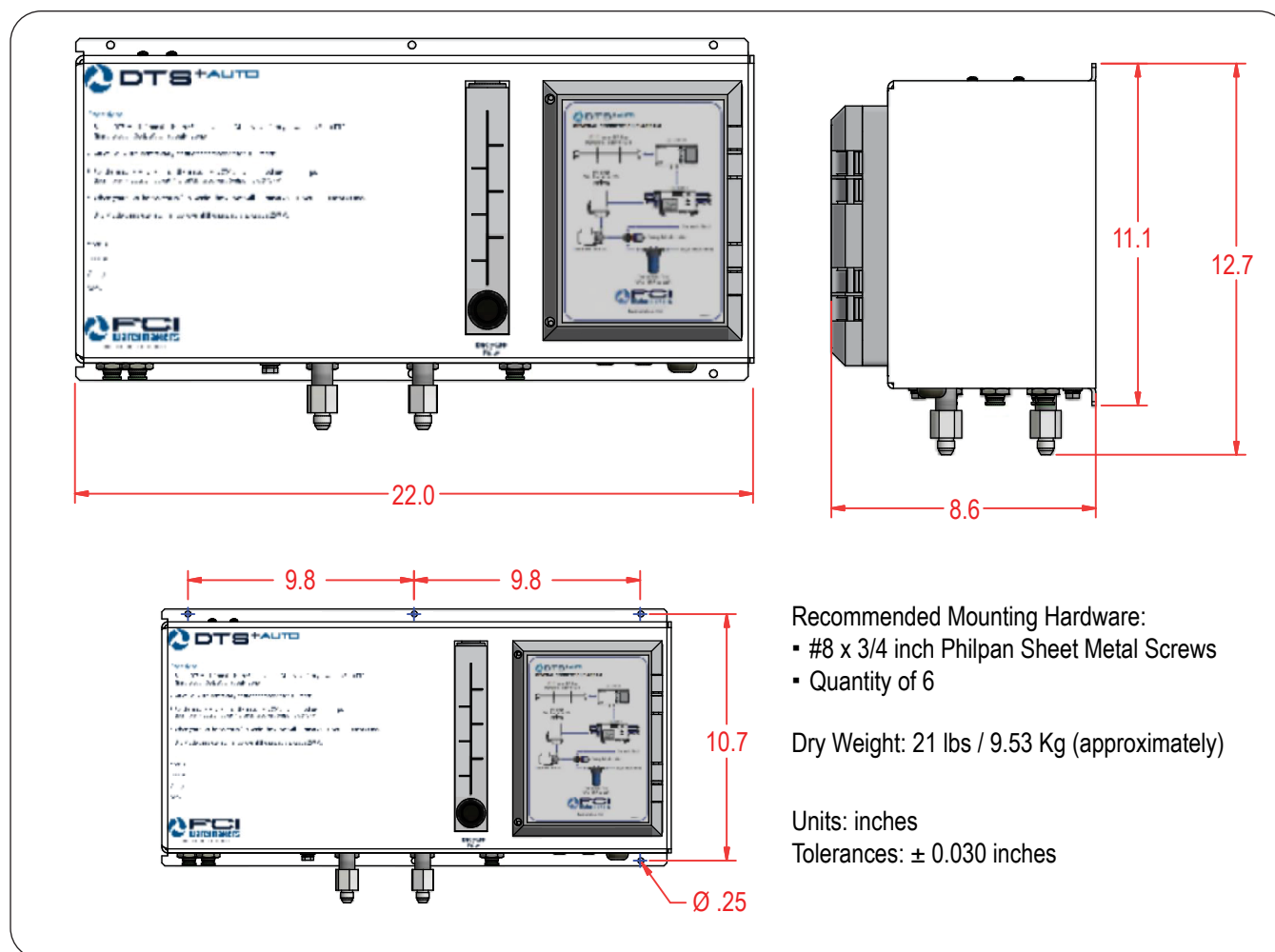


Figure 11: Dimensions Flow Control Panel (P/N 93-5310) (DTS+AUTO)

DIMENSIONS, WEIGHT & FOOTPRINTS (continued)

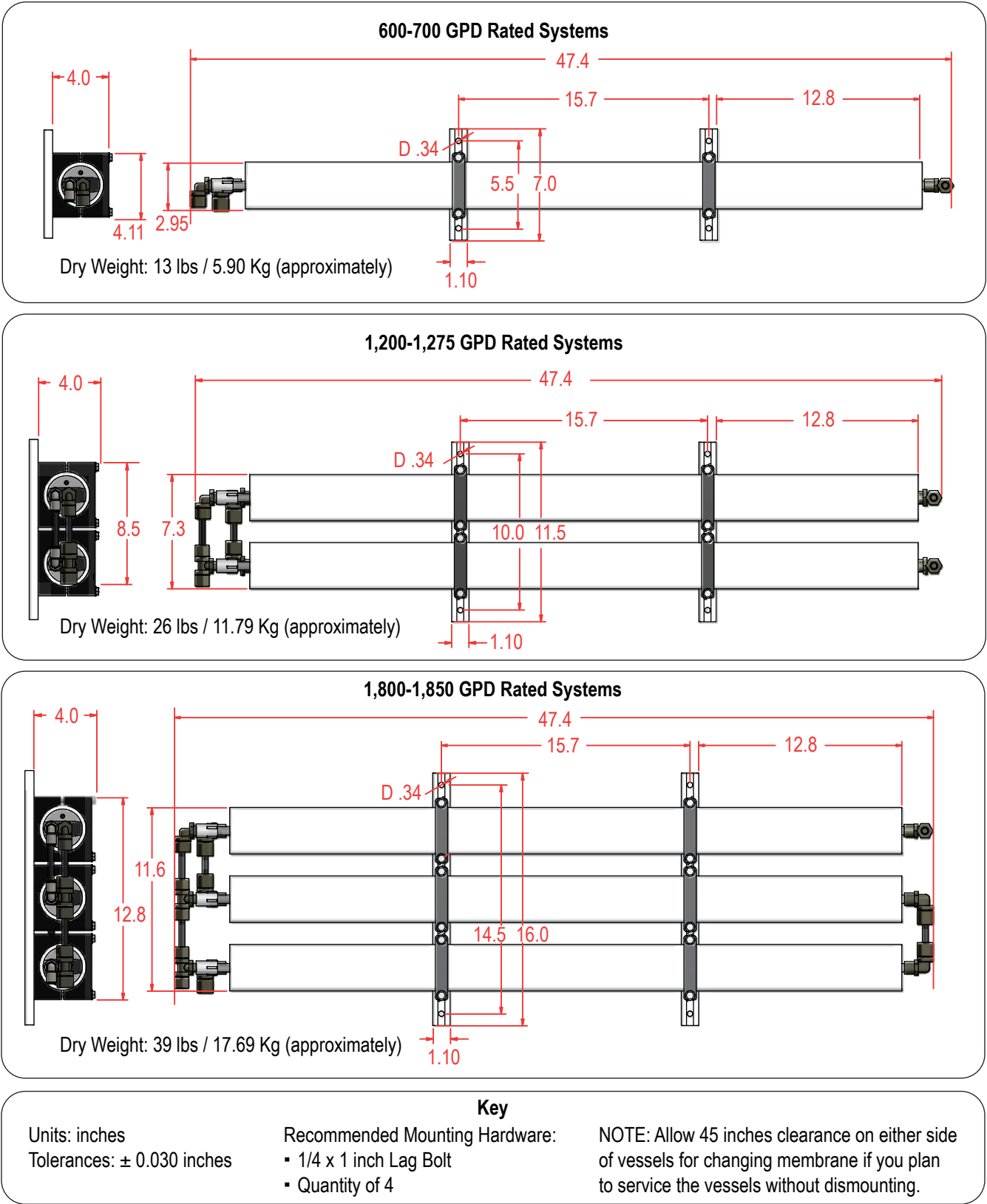


Figure 12: Dimensions 1PV (P/N 93-4828), 2PV (P/N 93-4263), 3PV (P/N 93-4819)

GENERAL CONNECTION DIAGRAMS

Several *General Connection Diagrams* are provided on the following pages to show how the system components connect. Refer to the diagram that is the best fit to your configuration when planning to mount the components, and as a reference when connecting the plumbing.

ORGANIZATION OF THE PLUMBING ILLUSTRATIONS

The *General Connection Diagrams* are organized as follows:

First, Aquamiser+ Frame:

- "Figure 13: Aquamiser+ Frame 250-600 GPD with DTS+RETRO" on page 35
- "Figure 14: Aquamiser+ Frame 800-1,200 GPD with DTS+RETRO" on page 36
- "Figure 15: Aquamiser+ Frame 1,800 GPD with DTS+RETRO" on page 37

Second, Aquamiser+ Modular:

- "Figure 16: Aquamiser+ Modular 250-600 GPD with DTS+RETRO" on page 38
- "Figure 17: Aquamiser+ Modular 800-1,200 GPD with DTS+RETRO" on page 39
- "Figure 18: Aquamiser+ Modular 1,800 GPD with DTS+RETRO" on page 40

Third, Max•Q+ Frame:

- "Figure 19: Max•Q+APC Frame 700 GPD with DTS+" on page 41
- "Figure 20: Max•Q+APC Frame 1,275 GPD with DTS+" on page 42
- "Figure 21: Max•Q+APC Frame 1,850 GPD with DTS+" on page 43
- "Figure 22: Max•Q+APC Frame 700 GPD with DTS+AUTO" on page 44
- "Figure 23: Max•Q+APC Frame 1,275 GPD with DTS+AUTO" on page 45
- "Figure 24: Max•Q+APC Frame 1,850 GPD with DTS+AUTO" on page 46

Fourth, Max•Q+ Modular:

- "Figure 25: Max•Q+ Modular 700 GPD with DTS+" on page 47
- "Figure 26: Max•Q+ Modular 1,275 GPD with DTS+" on page 48
- "Figure 27: Max•Q+ Modular 1,850 GPD with DTS+" on page 49
- "Figure 28: Max•Q+ Modular 700 GPD with DTS+AUTO" on page 50
- "Figure 29: Max•Q+ Modular 1,275 GPD with DTS+AUTO" on page 51
- "Figure 30: Max•Q+ Modular 1,850 GPD with DTS+AUTO" on page 52

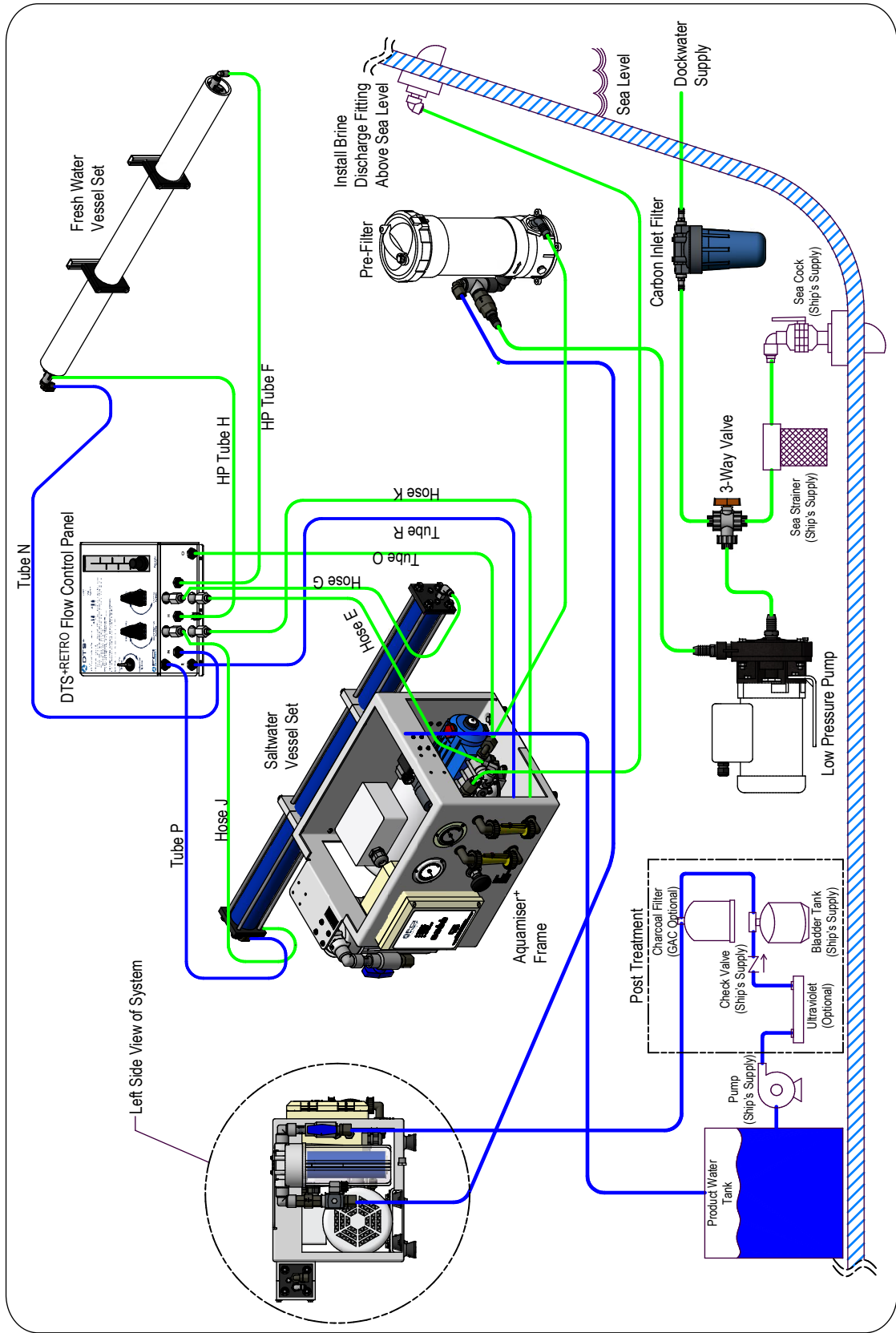


Figure 13: Aquamiser+ Frame 250-600 GPD with DTS+RETRO

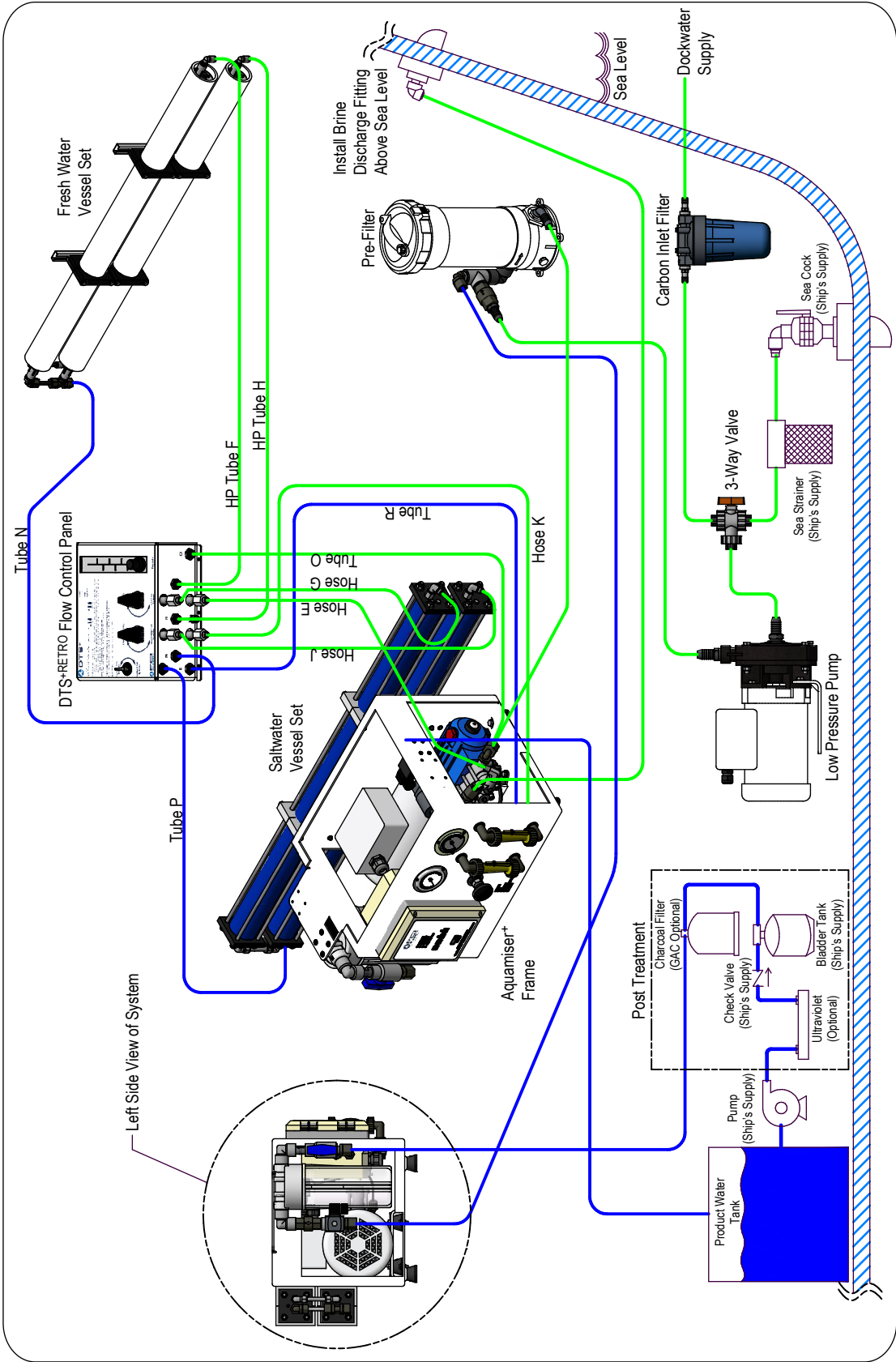


Figure 14: Aquamiser+ Frame 800-1,200 GPD with DTS+RETRO

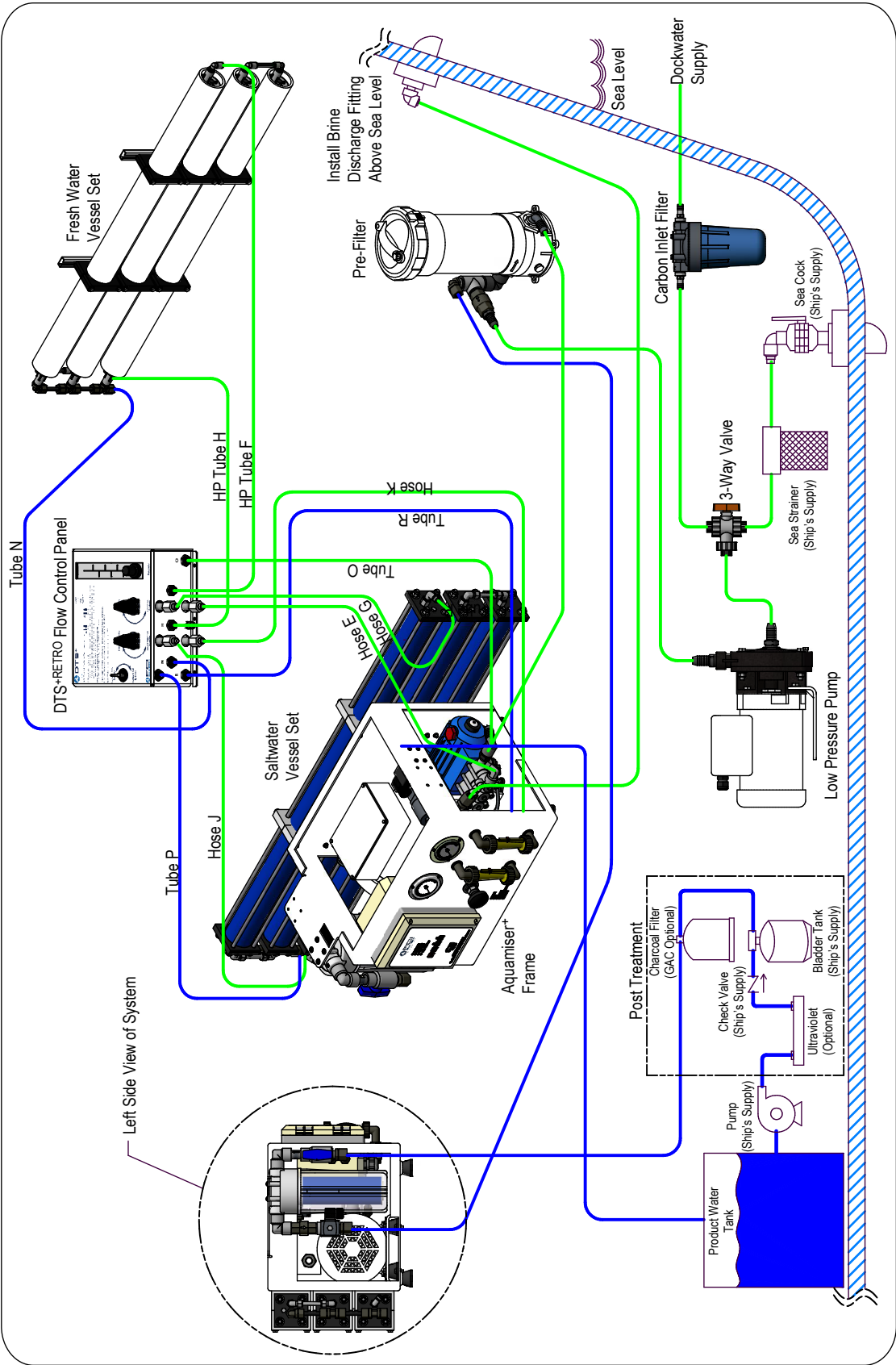


Figure 15: Aquamiser+ Frame 1,800 GPD with DTS+RETRO

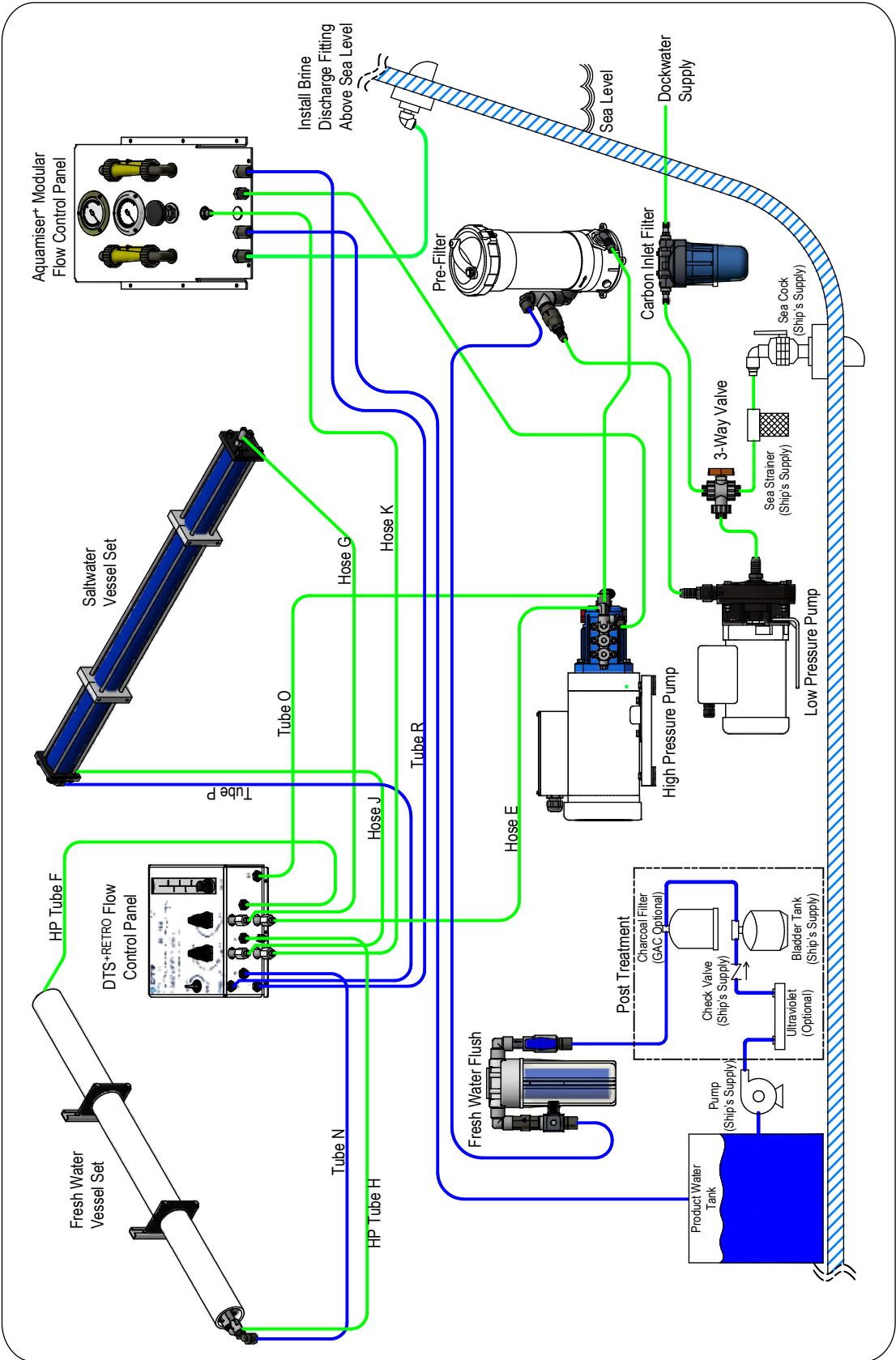


Figure 16: Aquamiser+ Modular 250-600 GPD with DTS+RETRO

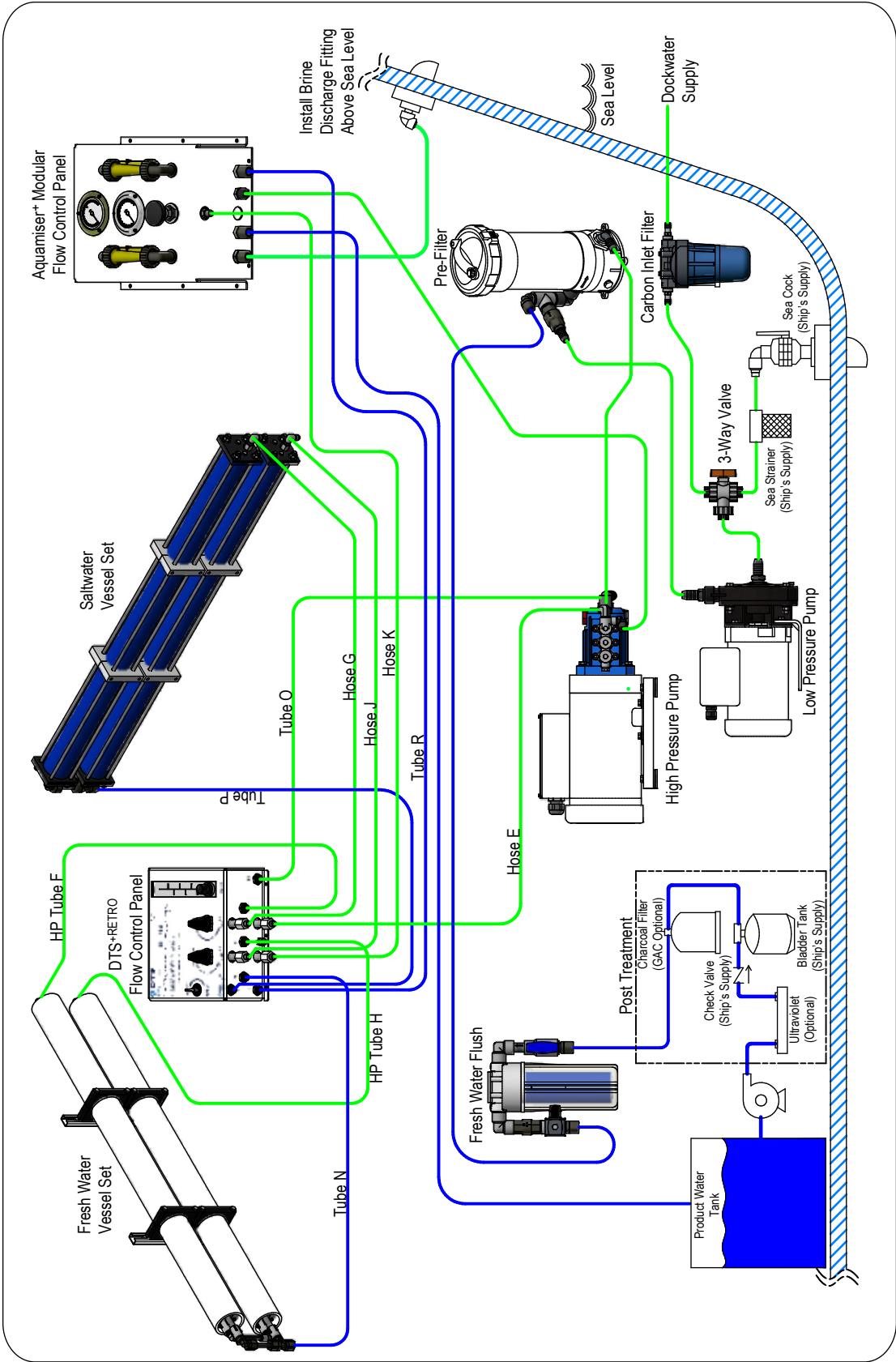


Figure 17: Aquamiser® Modular 800-1,200 GPD with DTS+RETRO

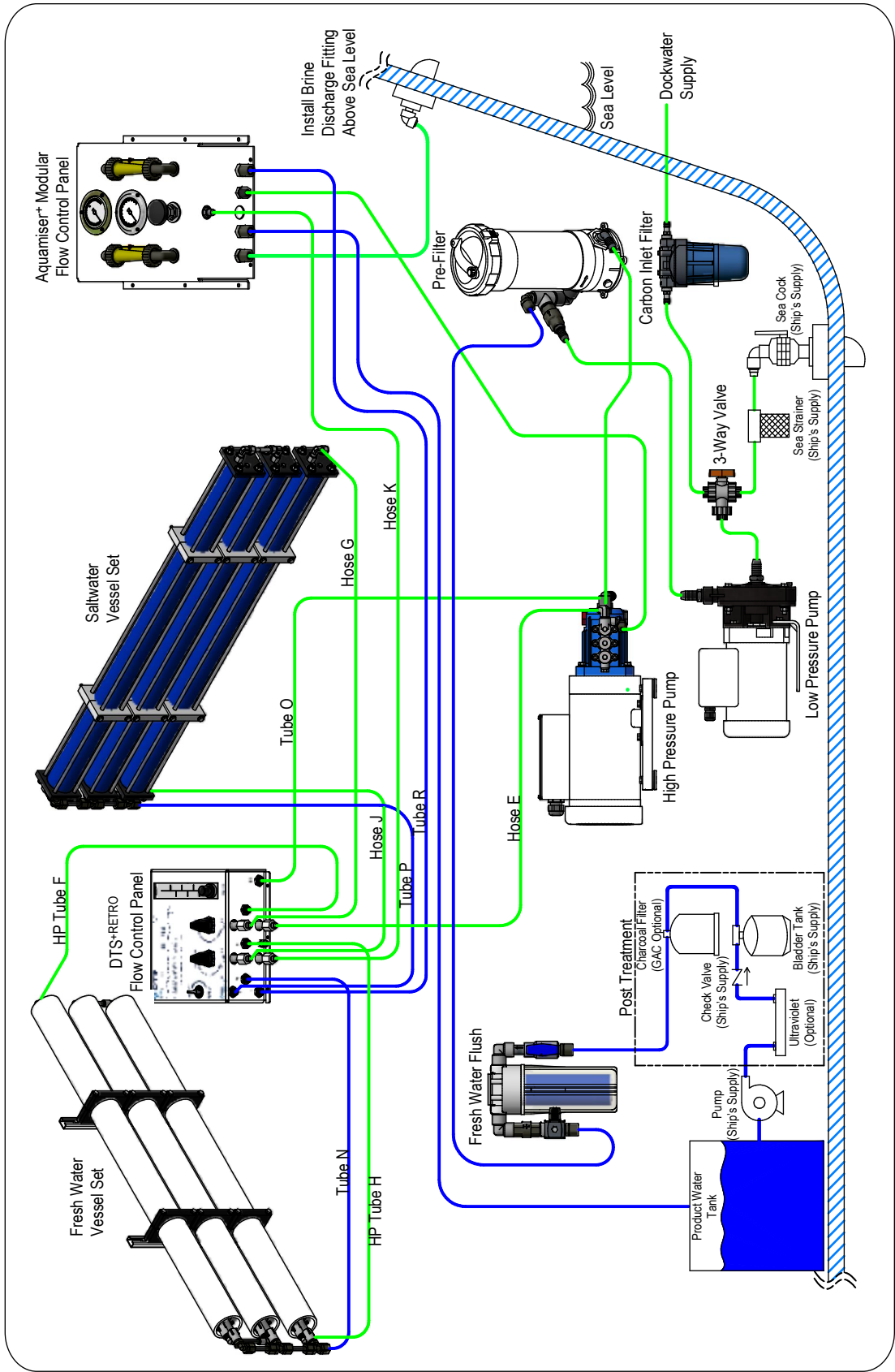


Figure 18: Aquamiser+ Modular 1,800 GPD with DTS+RETRO

GENERAL CONNECTION DIAGRAMS (continued)

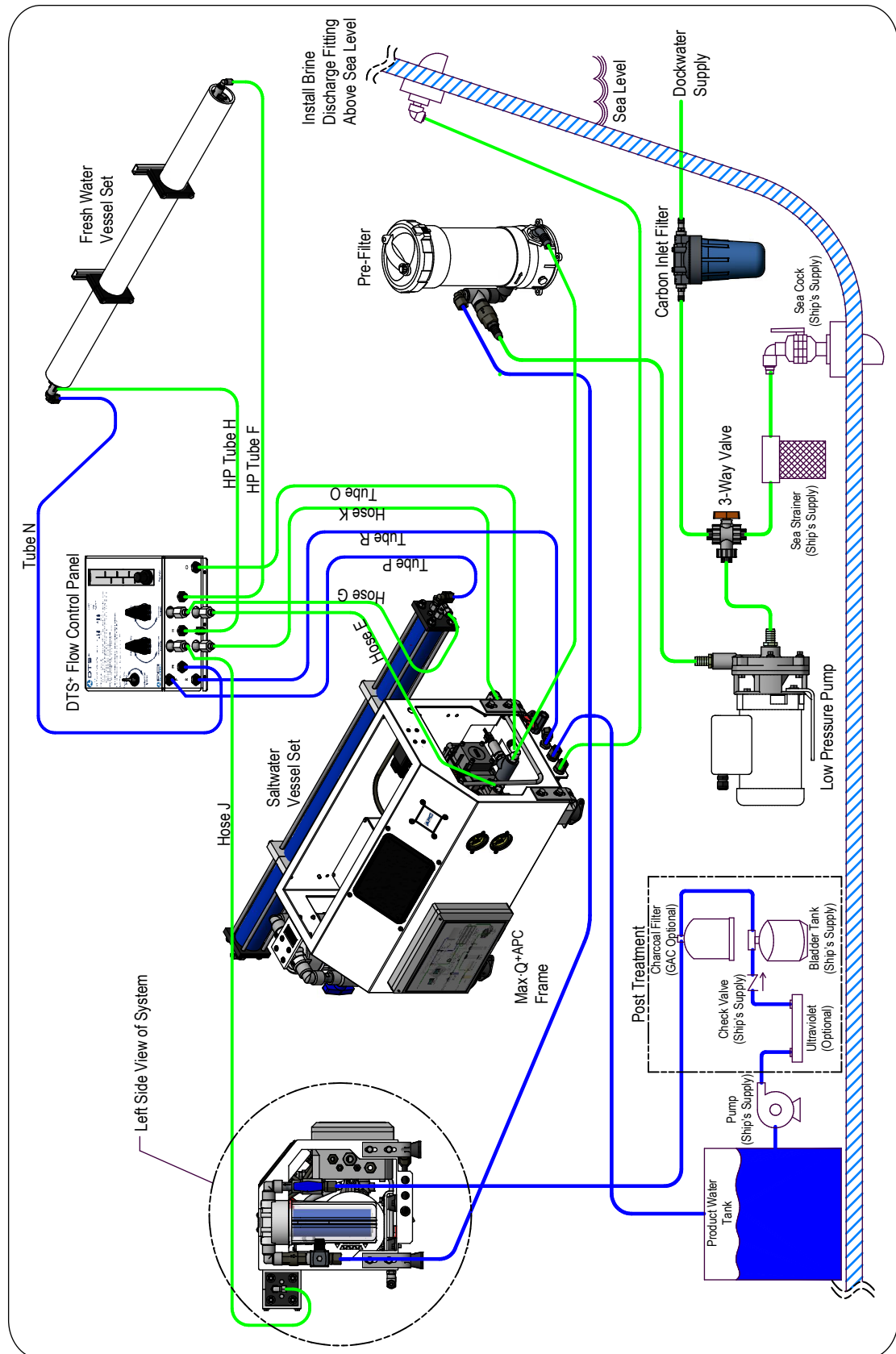


Figure 19: Max-Q+APC Frame 700 GPD with DTS+

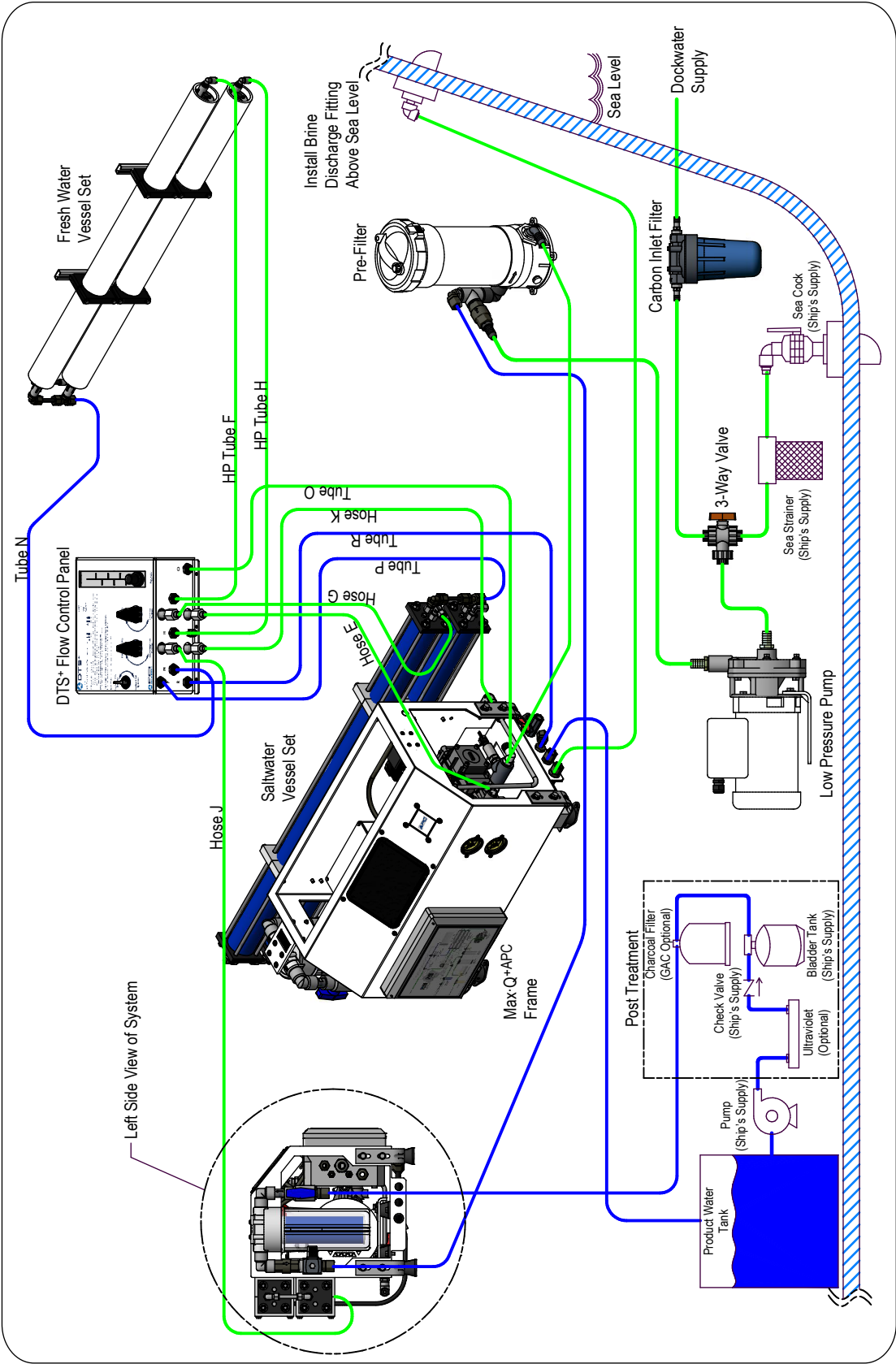


Figure 20: Max-Q+APC Frame 1,275 GPD with DTS+

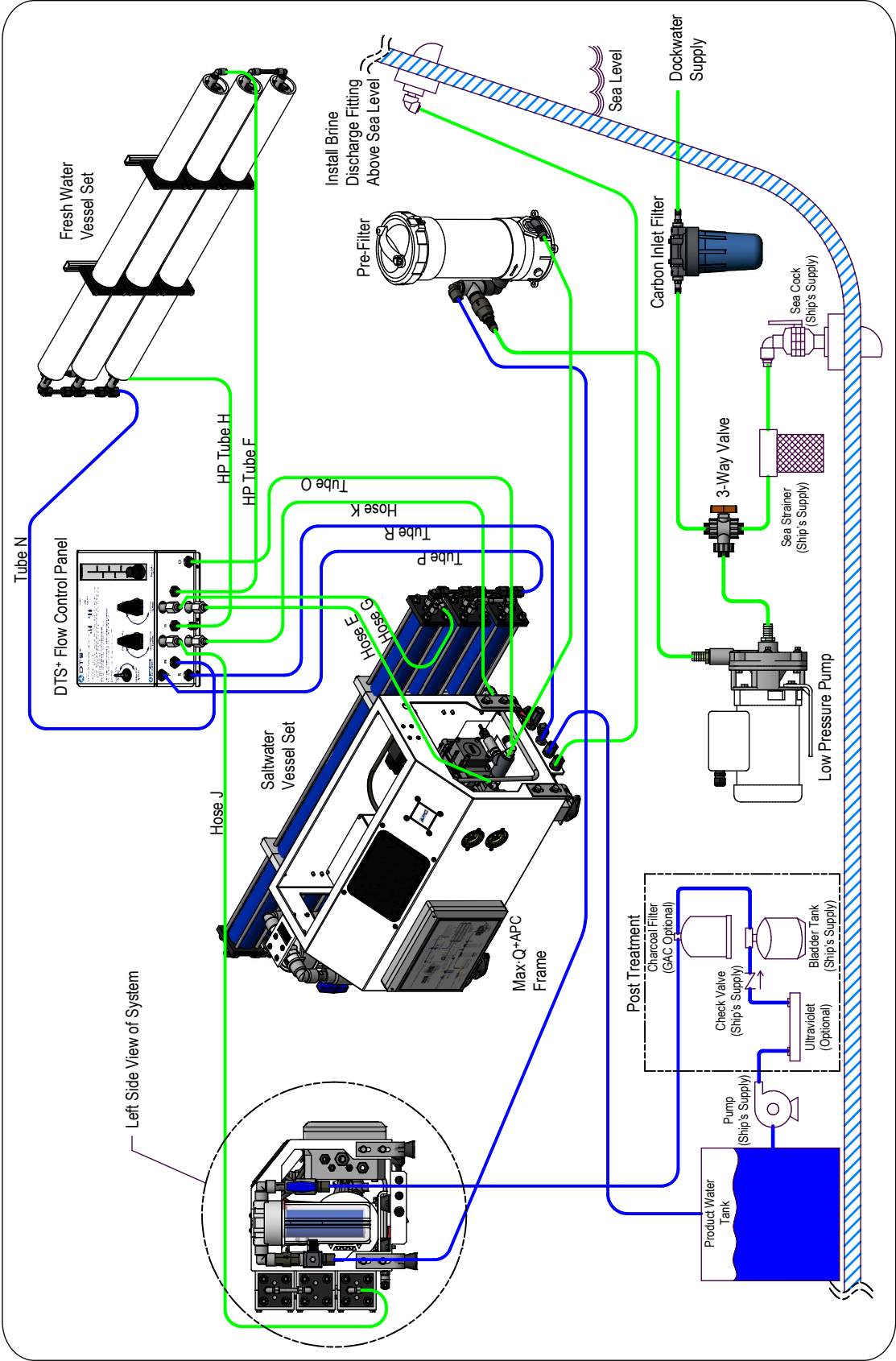


Figure 21: Max-Q+APC Frame 1,850 GPD with DTS+

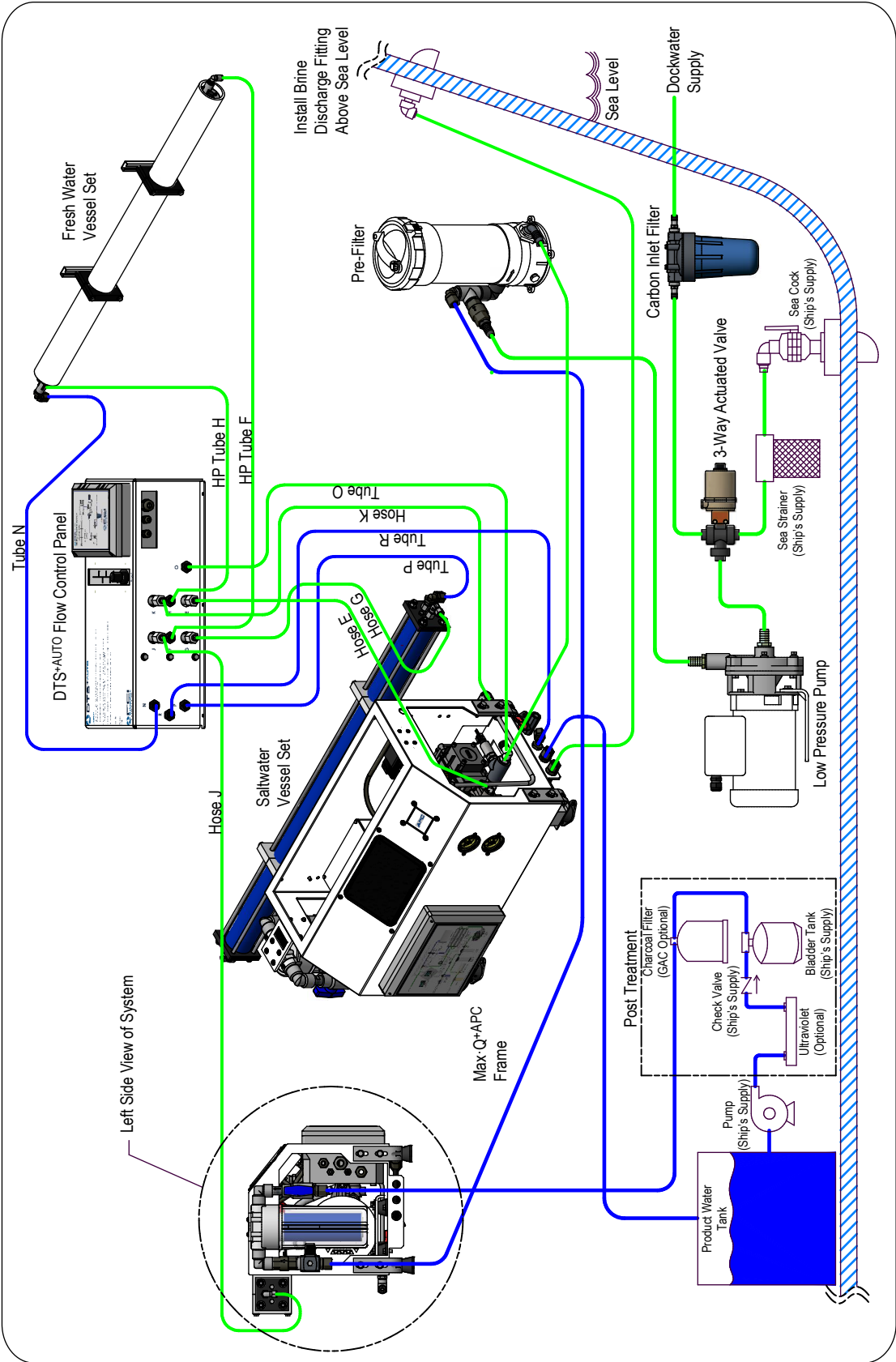
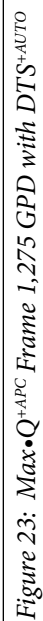


Figure 22: Max•Q•APC Frame 700 GPD with DTS•AUTO

FCI WATERMAKERS, INC.



GENERAL CONNECTION DIAGRAMS (continued)

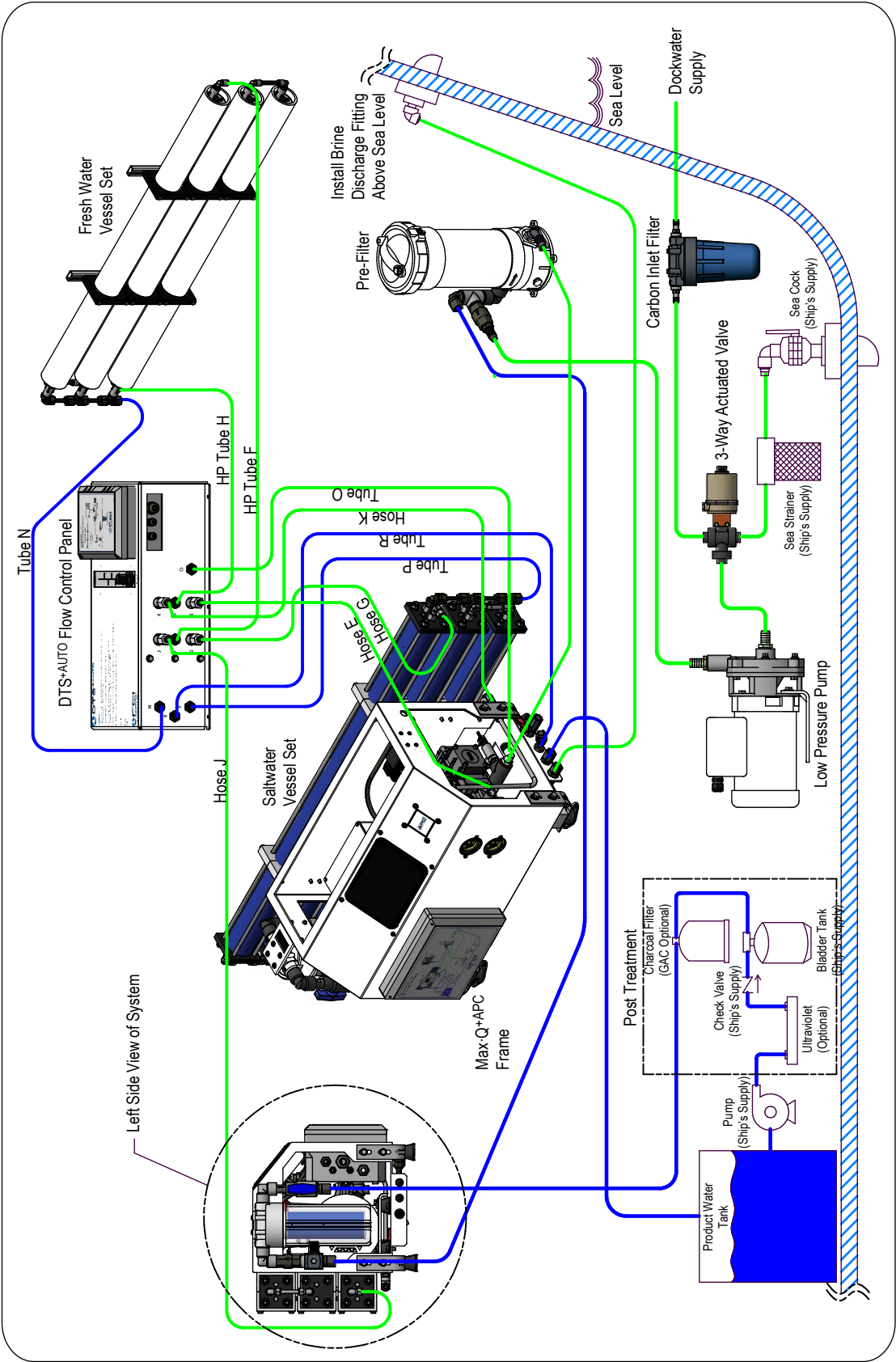


Figure 24: Max-Q+APC Frame 1,850 GPD with DTS+AUTO

FCI WATERMAKERS, INC.



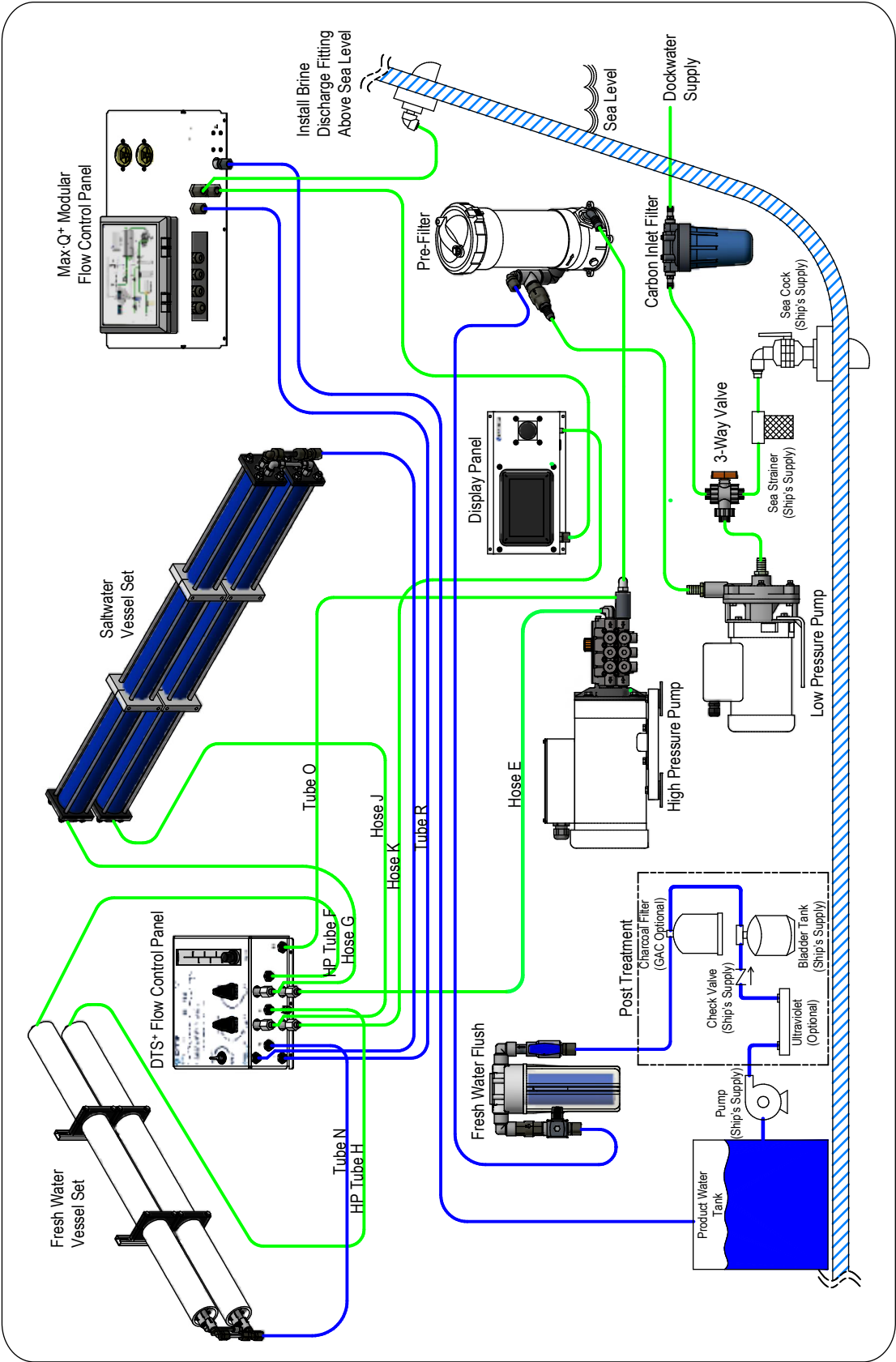


Figure 26: Max•Q+ Modular 1,275 GPD with DTS+

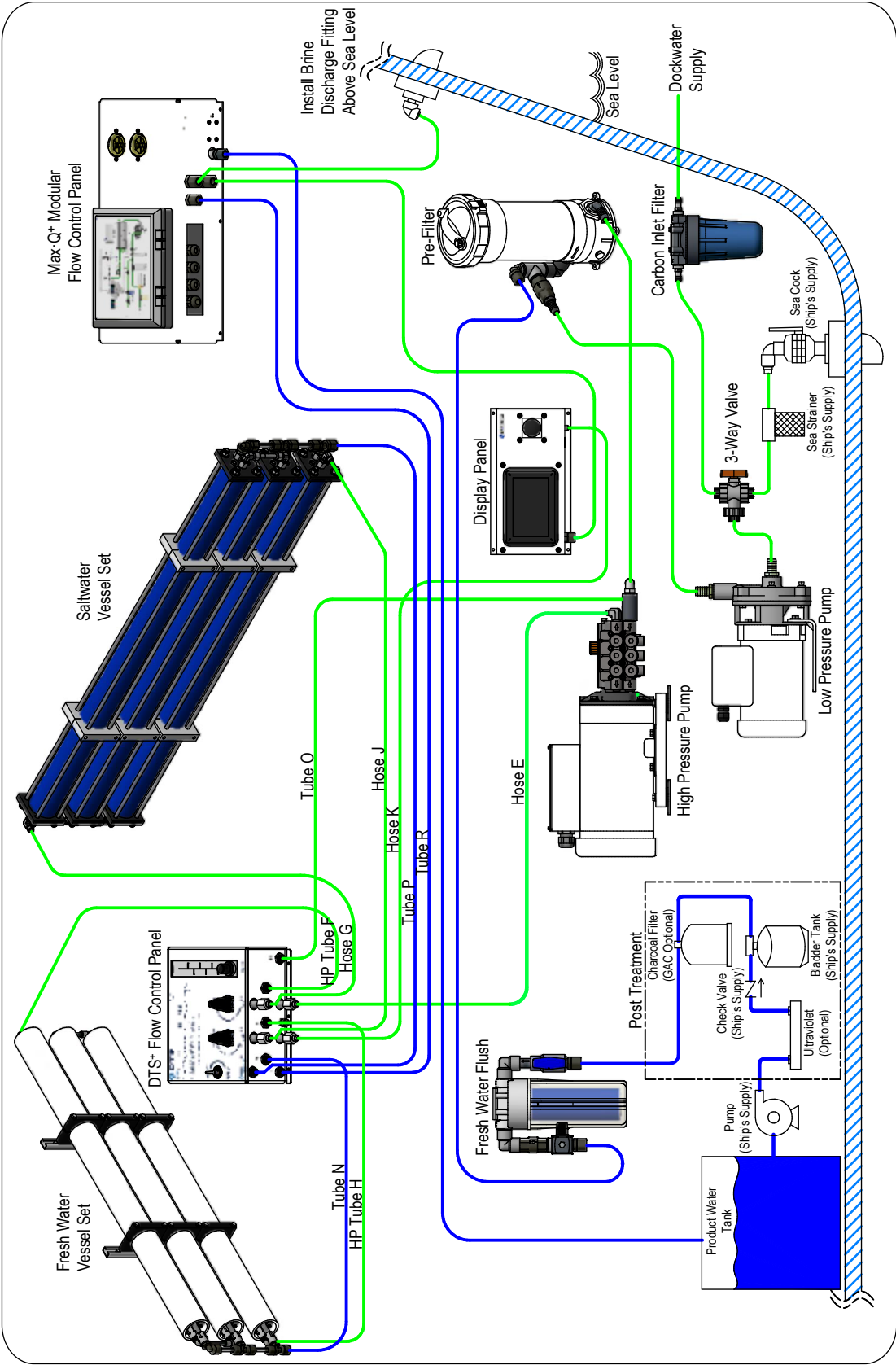


Figure 27: Max•Q+ Modular 1,850 GPD with DTS+

GENERAL CONNECTION DIAGRAMS (continued)

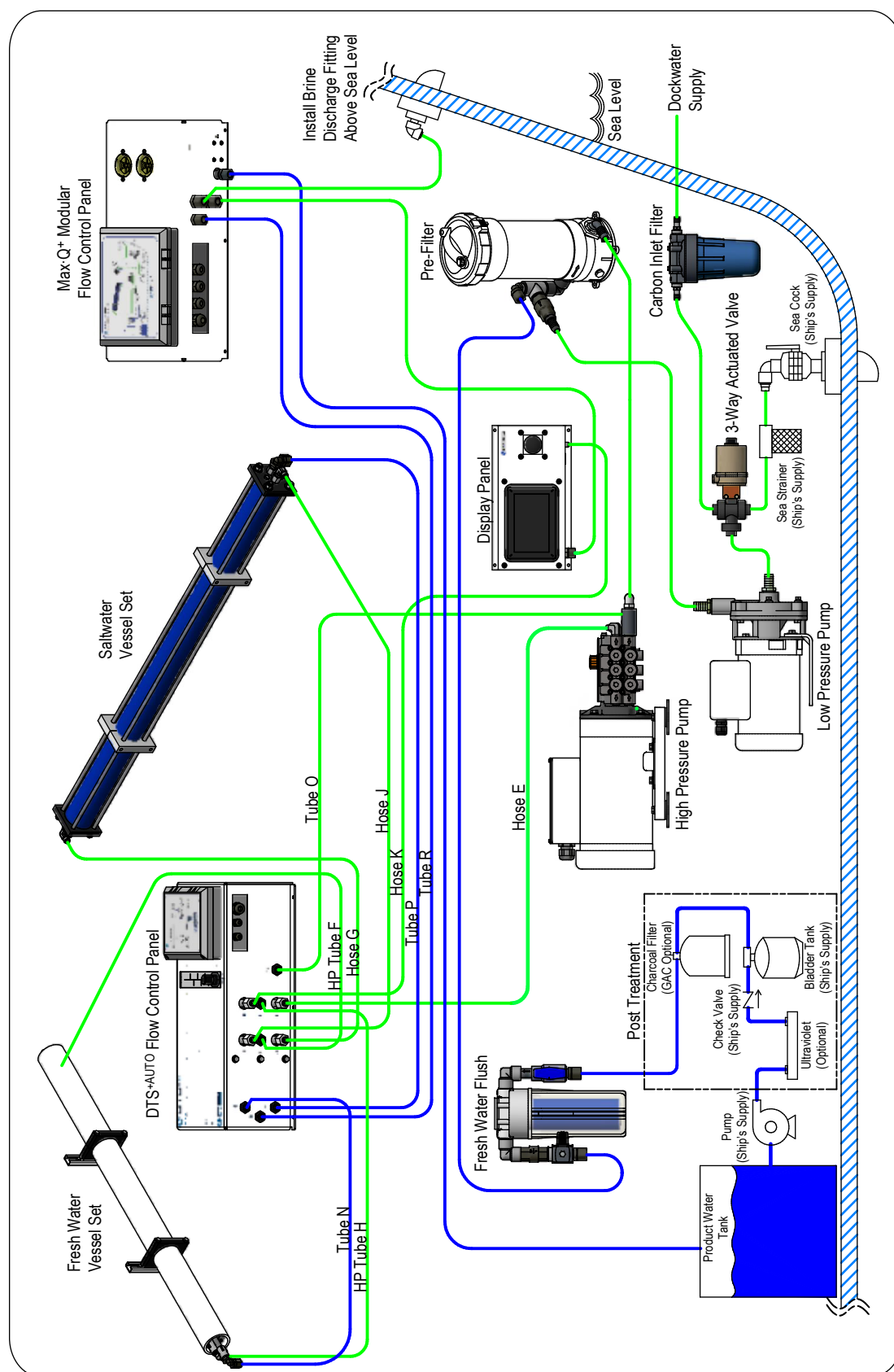


Figure 28: Max•Q+ Modular 700 GPD with DTS+AUTO

GENERAL CONNECTION DIAGRAMS (continued)

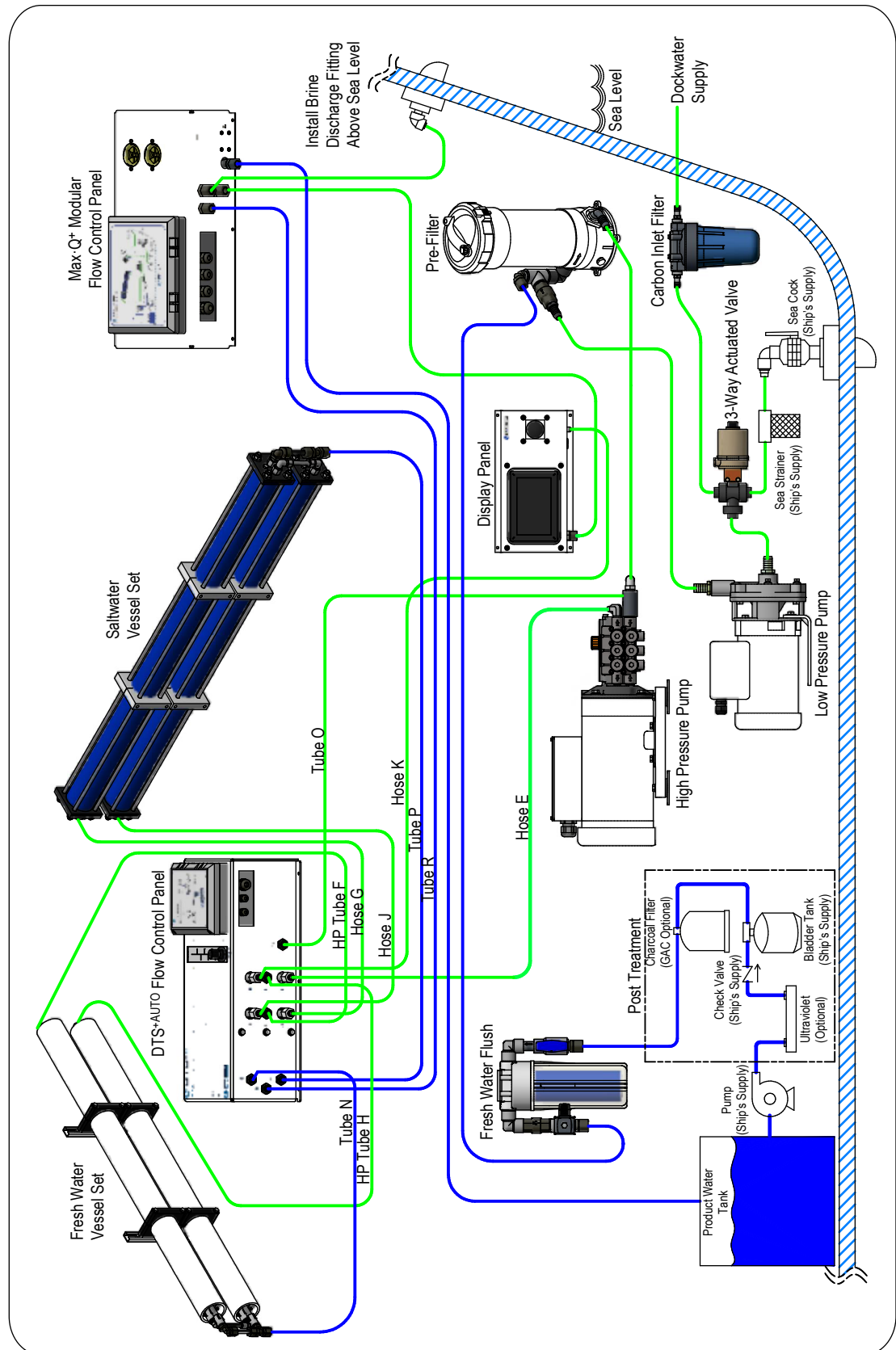


Figure 29: Max-Q+ Modular 1,275 GPD with DTS+AUTO

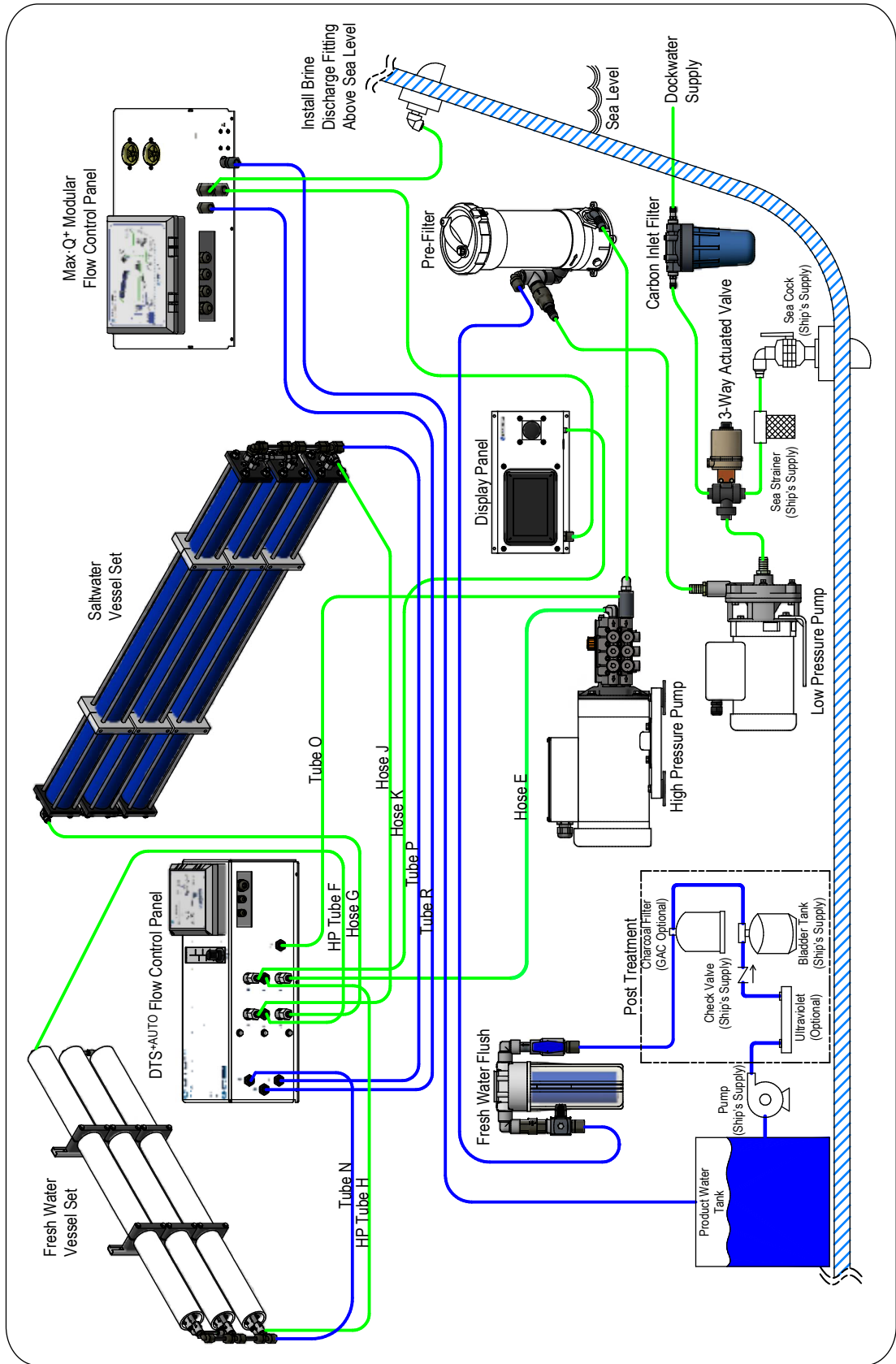


Figure 30: Max•Q+ Modular 1,850 GPD with DTS+AUTO

If you are installing the DTS⁺ Series onto a Framed Max•Q^{/+/+APC} follow the instructions shown in *Figure 31* and *Figure 32* to prepare the frame to accept the new plumbing.

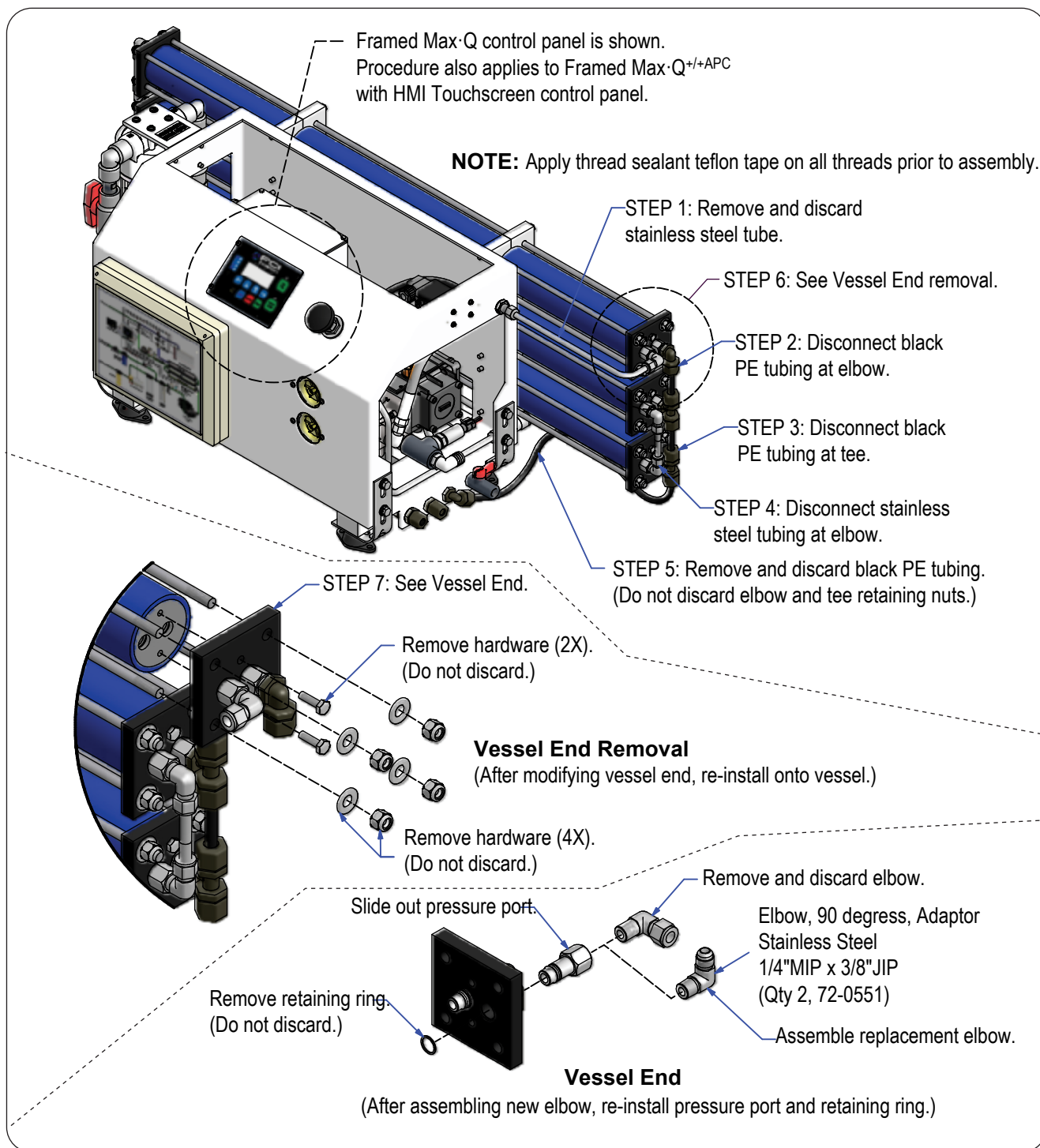


Figure 31: Installing Kit for Framed Max•Q^{/+/+APC} (Part 1)

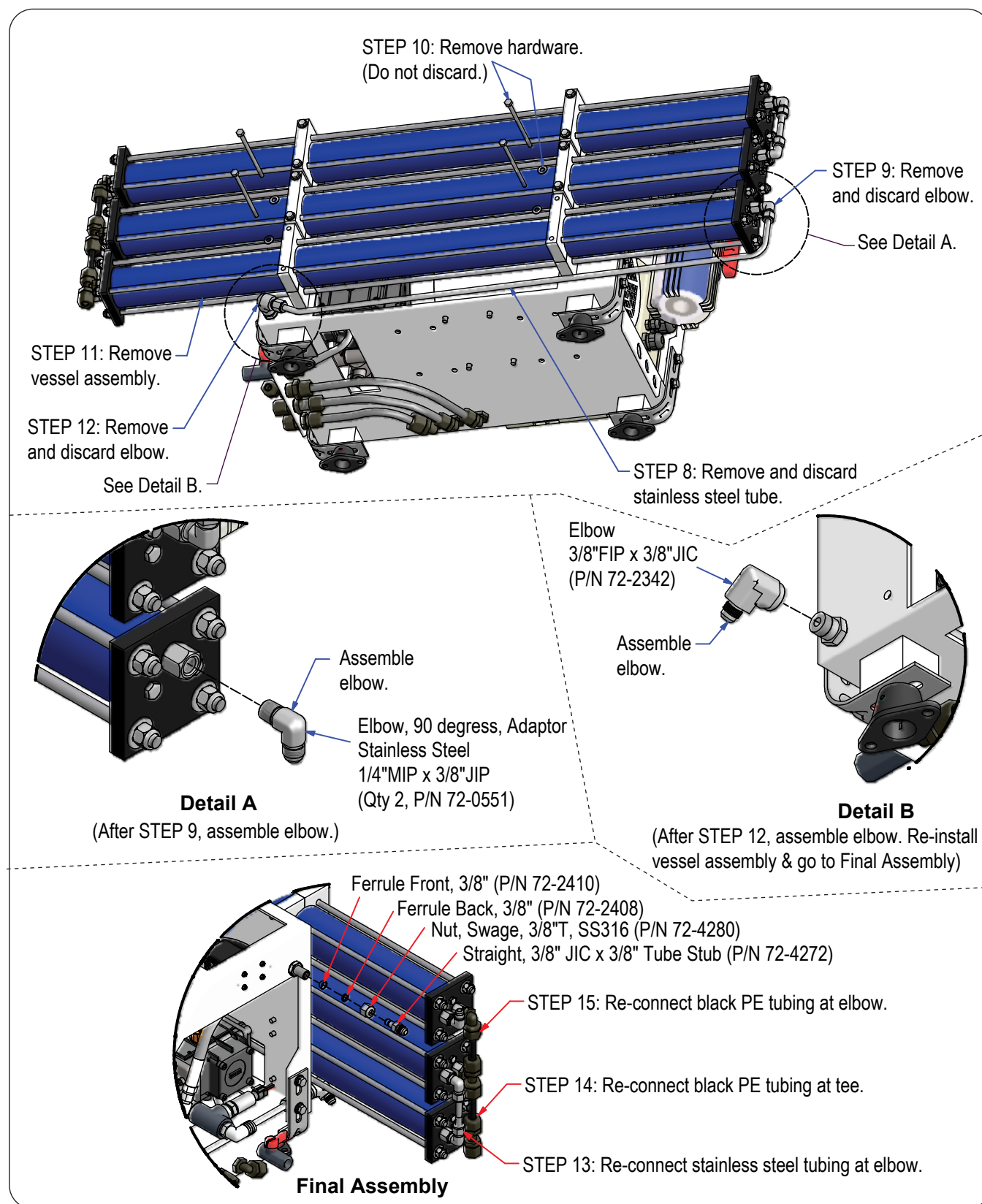


Figure 32: Installing Kit for Framed Max•Q^{+/+APC} (Part 2)

SYSTEM INSTALLATION / MOUNTING

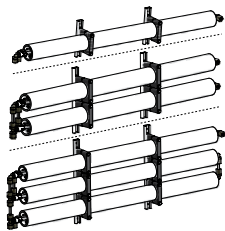
Please refer to the appropriate footprint and layout diagrams from "DIMENSIONS, WEIGHT & FOOTPRINTS", and mount the components as described below.



Carbon Inlet Filter
GAC Part # 20-0026

CARBON INLET FILTER MOUNTING

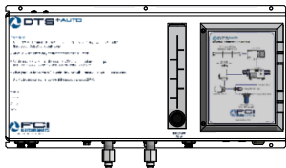
Find a suitable location to mount the carbon inlet filter. Do not install above any electrical equipment. Also, the filter needs to drop down 1-1/2" to change the cartridge. The inlet source of water for the assembly is the dockside fresh water. Using four 5/16" screws, secure to solid bulkhead.



FRESH WATER PRESSURE VESSEL

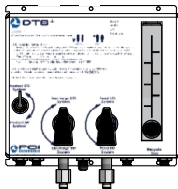
Locate an area for the vessel assembly to be mounted. The assembly can be mounted vertically or horizontally. It should not be mounted above any electrical equipment in case a leak develops over time. If the ambient temperature of the mounting location will exceed 120°F, it will be necessary to relocate the pressure vessel to a cooler environment. Additional high-pressure hose may be needed. Allow 45 inches on either side of vessel if you plan to service vessels in the future without dismounting.

Mount the pressure vessel set with 1/4" x 1" lag bolts, quantity of four.



FLOW CONTROL PANEL

Locate an area for the flow control panel to be mounted. It should not be mounted above any electrical equipment in case a leak develops over time. Be sure to allow enough room to access the valves. Using #8 x 3/4" philpan sheet metal screws (quantity of six), mount the panel to a bulkhead or other secure wall or panel.



SYSTEM INSTALLATION / PLUMBING

Before proceeding, review the notes below to ensure proper installation of the hose ends and fittings.

PROPER TUBE FITTING AND HOSE CONNECTIONS

1. Cut the tube or hose end square and clean. You may use a vise and fine-tooth saw to facilitate a square and clean cut.
2. Remove any burrs.
3. For high and low pressure tubes, and high pressure hose, push-in fittings are supplied. Insert tube into fitting until it bottoms.
4. For PVC helix wire suction hose, feed hose through a clamp, push hose on over the barb until it bottoms against the barb, and tighten clamp. Do not use lubricant on the tube end; it may leave a residue that compromises the connection. You may, however, soak the hose end in hot water for a few minutes before pushing the hose on the barb.

CAUTION: Always allow slack in all tube and hose lines. Never cause the tube or hose to immediately bend from the fitting. Allow the line to enter or leave from the fitting in a straight manner for several inches to ensure proper connection, to relieve stress to the fitting and tube or hose, and to allow ease of detachment and reattachment during maintenance or repair.

Read the overview on this page and study the illustrations on the following pages. Proceed with the plumbing installation when ready.

ORGANIZATION OF THE PLUMBING ILLUSTRATIONS

The plumbing is illustrated in four parts.

First, the plumbing to the carbon inlet filter and 3-way valve is illustrated:

- "Figure 33: Plumbing Carbon Inlet Filter and 3-Way Valve" on page 59

Second, the plumbing to the freshwater vessels is illustrated.

- "Figure 34: Plumbing the Freshwater Vessel Set" on page 60

Third, the plumbing to the saltwater systems is illustrated. Refer to the illustration that matches your saltwater system model:

- "Figure 35: Plumbing Framed Aquamiser+" on page 61
- "Figure 36: Plumbing Modular Aquamiser+" on page 62
- "Figure 37: Plumbing Framed Max•Q/+/+APC" on page 63
- "Figure 38: Plumbing Modular Max•Q/+/+APC" on page 64

Fourth, the plumbing of the recycle flow adapter is illustrated.

- "Figure 39: Plumbing the Recycle Flow Adapter" on page 65

SYSTEM INSTALLATION / PLUMBING (continued)

INSTALLING THE PLUMBING

Table 1 lists all the plumbing connections by letter, and the rows of the table that are related to each plumbing illustration are repeated above the plumbing illustration for convenience. Work through each tube or hose in the table, one at a time until complete.

1. Identify the tubing or hose by its specifications in the table's description column. Refer to "COMPONENT IDENTIFICATION" on page 20 if you need review.
2. Identify where the two ends connect. Use the illustrations listed on the previous page.
3. Cut the tubing or hose to length, install fittings the ends, and connect to the system component. The fittings are on the system or supplied with the installation kit. For PVC helix wire suction hose, use the barbs and clamps.

Table 1: Hose, Tubing, Route & Description

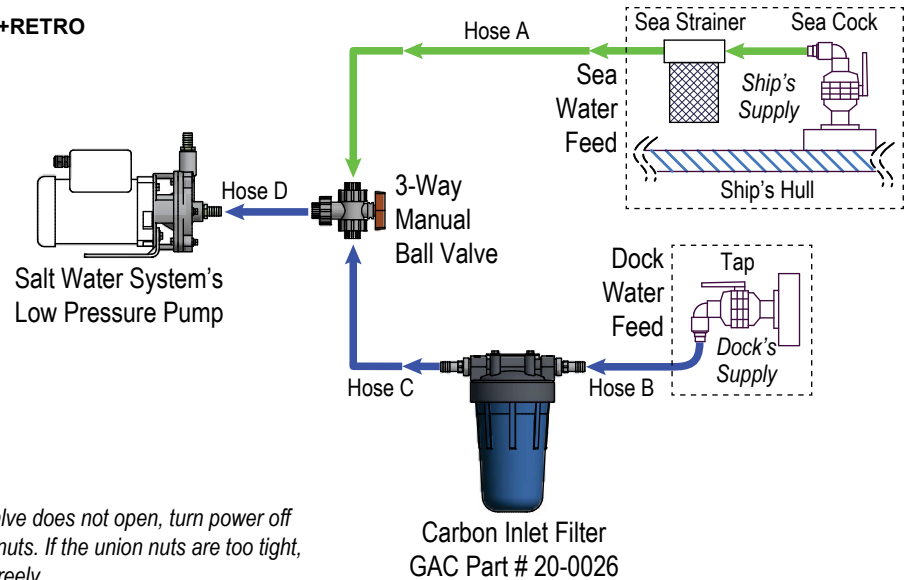
Item	From	To	Description
Hose A	Sea Strainer Outlet	3-Way Valve Inlet (seawater)	PVC Helix Wire Suction Hose, 3/4"
Hose B	Dock Water Tap	Carbon Filter Inlet	PVC Helix Wire Suction Hose, 3/4"
Hose C	Carbon Filter Outlet	3-Way Valve Inlet (freshwater)	PVC Helix Wire Suction Hose, 3/4"
Hose D	3-Way Valve Outlet	Salt Water System Low Pressure Pump Inlet	PVC Helix Wire Suction Hose, 3/4"
Hose E	High Pressure Pump Outlet	Flow Panel Connection "E" (Brine Inlet)	High Pressure Hose, 3/8"
Hose G	Flow Panel Connection "G" (Salt Water Brine Outlet)	Salt Water Pressure Vessel Assembly Brine Inlet	High Pressure Hose, 3/8"
Hose J	Salt Water PV Assy Brine Outlet	Flow Panel Connection "J" (Salt Water Brine Inlet)	High Pressure Hose, 3/8"
Hose K	Flow Panel Connection "K" (Brine Discharge)	Saltwater System High Pressure Inlet	High Pressure Hose, 3/8"
Tube F	Flow Panel Connection "F" (Fresh Water Brine Outlet)	Fresh Water Pressure Vessel Assembly Brine Inlet	Tubing, High Pressure, 3/8" X .048 Wall
Tube H	Fresh Water Pressure Vessel Assembly Brine Outlet	Flow Panel Connection "H" (Fresh Water Brine Inlet)	Tubing, High Pressure, 3/8" X .048 Wall
Tube P	Salt Water Pressure Vessel Assembly Product Outlet	Flow Panel Connection "P" (Salt Water Product Inlet)	Tubing, Low Pressure, PE, 3/8"
Tube N	Fresh Water Pressure Vessel Assembly Product Outlet	Flow Panel Connection "N" (Fresh Water Product Inlet)	Tubing, Low Pressure, PE, 3/8"
Tube R	Flow Panel Connection "R" (Product Outlet)	Saltwater System Product Inlet	Tubing, Low Pressure, PE, 3/8"
Tube O	Flow Panel Connection "O" (Recycle Flow Outlet)	Recycle Flow Adapter, Recycle Flow Inlet	Tubing, Low Pressure, PE, 3/8"

SYSTEM INSTALLATION / PLUMBING (continued)

Table 2: Plumbing Carbon Inlet Filter and 3-Way Valve

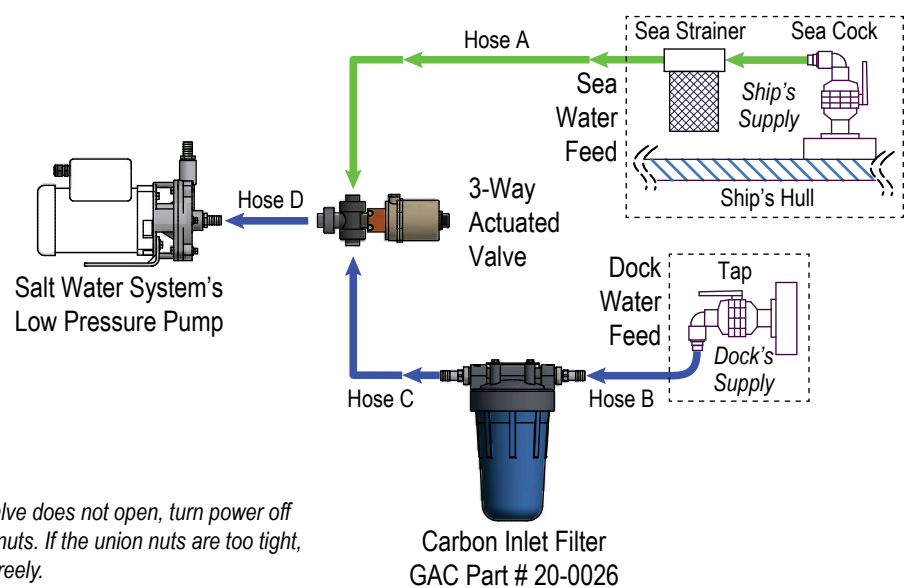
Item	From	To	Description
Hose A	Sea Strainer Outlet	3-Way Valve Inlet (seawater)	PVC Helix Wire Suction Hose, 3/4"
Hose B	Dock Water Tap	Carbon Filter Inlet	PVC Helix Wire Suction Hose, 3/4"
Hose C	Carbon Filter Outlet	3-Way Valve Inlet (freshwater)	PVC Helix Wire Suction Hose, 3/4"
Hose D	3-Way Valve Outlet	Salt Water System Low Pressure Pump Inlet	PVC Helix Wire Suction Hose, 3/4"

DTS+ and DTS+RETRO



NOTE: If the 3-way valve does not open, turn power off and loosen the union nuts. If the union nuts are too tight, the ball may not turn freely.

DTS+AUTO



NOTE: If the 3-way valve does not open, turn power off and loosen the union nuts. If the union nuts are too tight, the ball may not turn freely.

Figure 33: Plumbing Carbon Inlet Filter and 3-Way Valve

SYSTEM INSTALLATION / PLUMBING (continued)

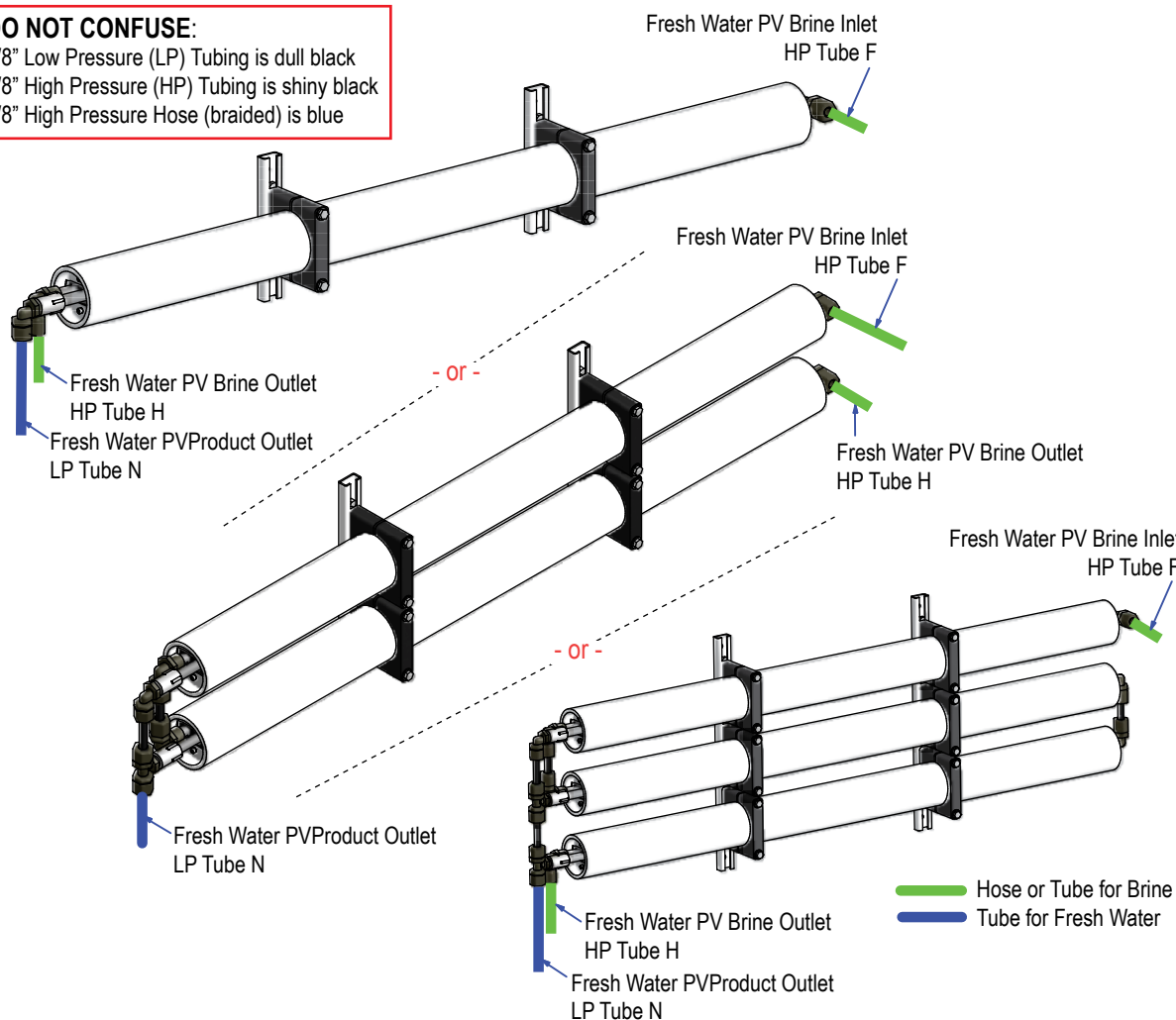
Table 3: Plumbing the Freshwater Vessel Set

Item	From	To	Description
Tube F	Flow Panel Connection "F" (Fresh Water Brine Outlet)	Fresh Water Pressure Vessel Assembly Brine Inlet	Tubing, High Pressure, 3/8" X .048 Wall
Tube H	Fresh Water Pressure Vessel Assembly Brine Outlet	Flow Panel Connection "H" (Fresh Water Brine Inlet)	Tubing, High Pressure, 3/8" X .048 Wall
Tube N	Fresh Water Pressure Vessel Assembly Product Outlet	Flow Panel Connection "N" (Fresh Water Product Inlet)	Tubing, Low Pressure, PE, 3/8"

- ① Using fittings, attach one end of Tubes F, H, and N to the Fresh Water Pressure Assembly as shown.

DO NOT CONFUSE:

3/8" Low Pressure (LP) Tubing is dull black
3/8" High Pressure (HP) Tubing is shiny black
3/8" High Pressure Hose (braided) is blue



- ② Attach the other end of Tubes F, H, and N to the Flow Control Panel as shown.

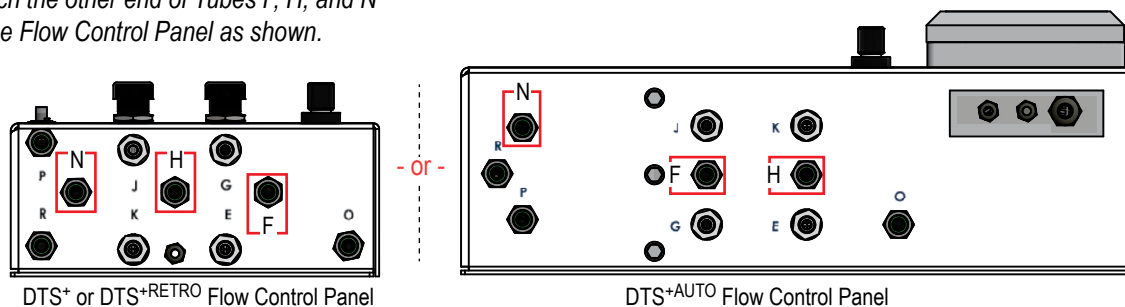


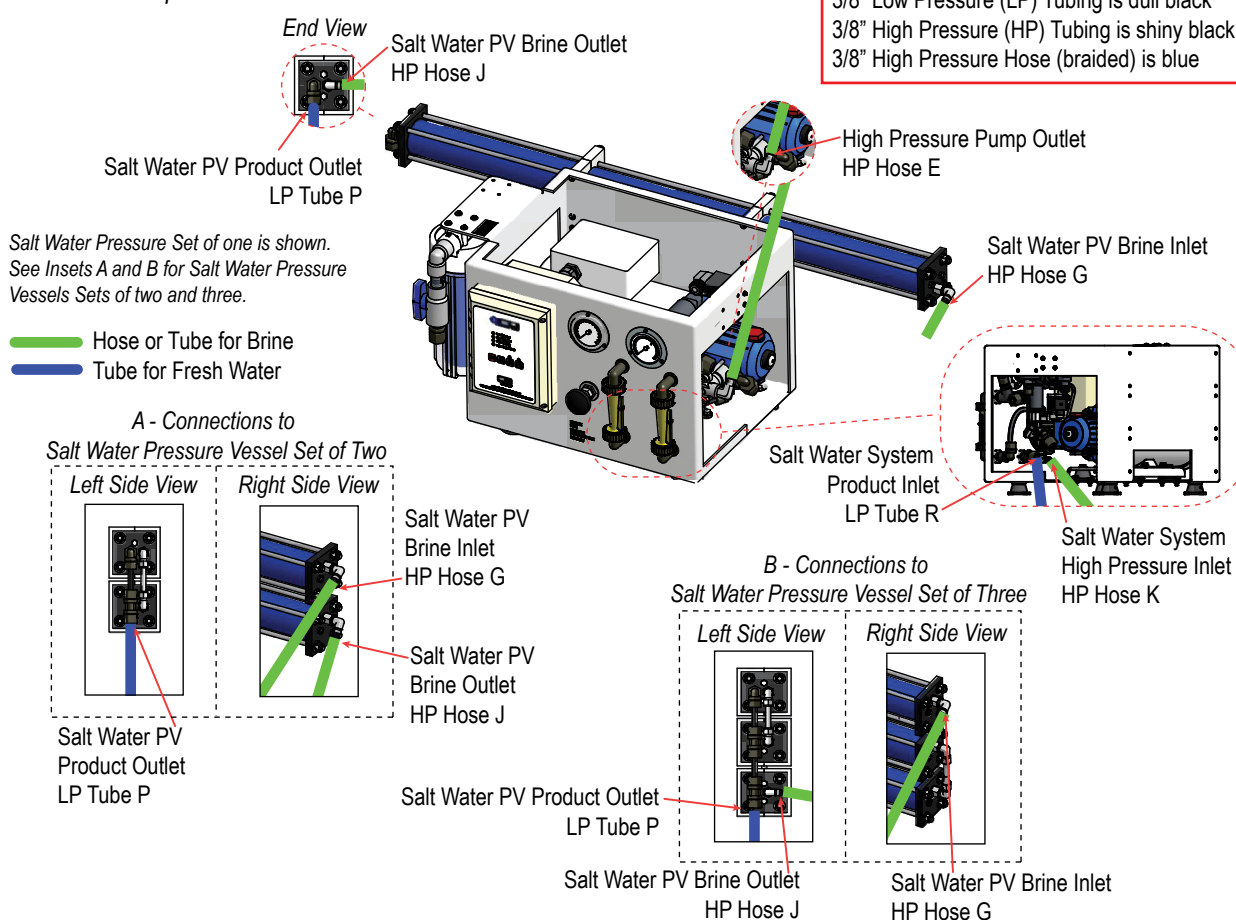
Figure 34: Plumbing the Freshwater Vessel Set

SYSTEM INSTALLATION / PLUMBING (continued)

Table 4: Plumbing Framed Aquamiser⁺

Item	From	To	Description
Hose E	High Pressure Pump Outlet	Flow Panel Connection "E" (Brine Inlet)	High Pressure Hose, 3/8"
Hose G	Flow Panel Connection "G" (Salt Water Brine Outlet)	Salt Water Pressure Vessel Assembly Brine Inlet	High Pressure Hose, 3/8"
Hose J	Salt Water PV Assy Brine Outlet	Flow Panel Connection "J" (Salt Water Brine Inlet)	High Pressure Hose, 3/8"
Hose K	Flow Panel Connection "K" (Brine Discharge)	Saltwater System High Pressure Inlet	High Pressure Hose, 3/8"
Tube P	Salt Water Pressure Vessel Assembly Product Outlet	Flow Panel Connection "P" (Salt Water Product Inlet)	Tubing, Low Pressure, PE, 3/8"
Tube R	Flow Panel Connection "R" (Product Outlet)	Saltwater System Product Inlet	Tubing, Low Pressure, PE, 3/8"

- ① Using fittings, attach one end of Tubes and Hoses E, G, J, K, P, and R to the Framed Aquamiser⁺ as shown.



- ② Attach the other end of Tubes and Hoses E, G, J, K, P, and R to the Flow Control Panel as shown.

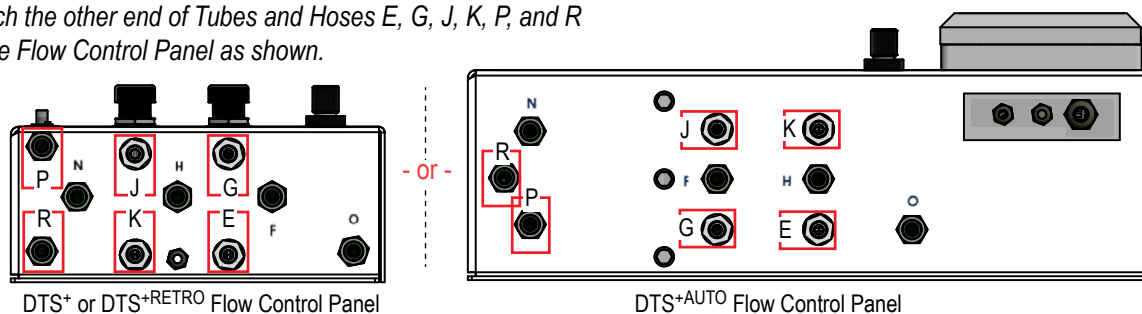


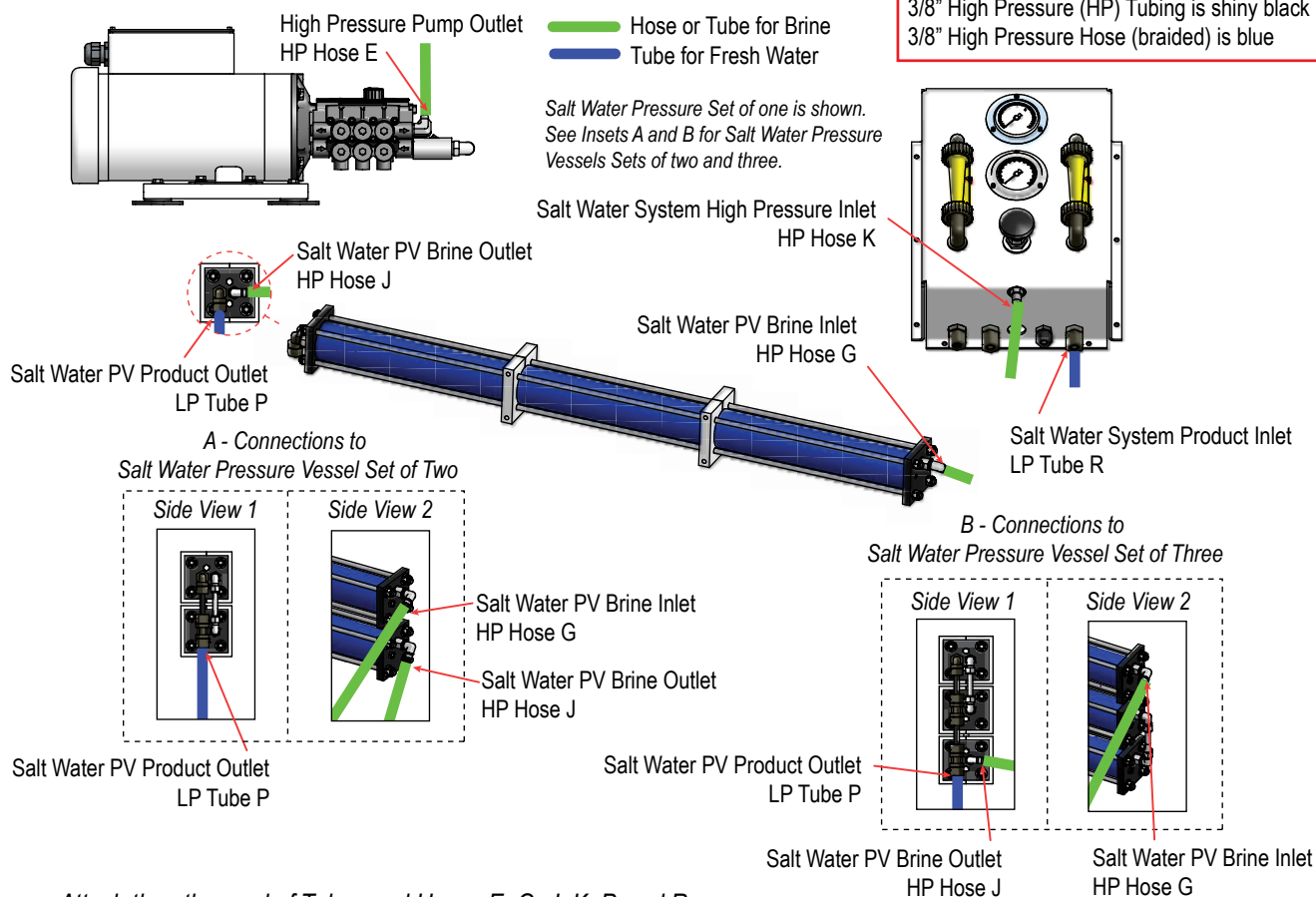
Figure 35: Plumbing Framed Aquamiser⁺

SYSTEM INSTALLATION / PLUMBING (continued)

Table 5: Plumbing Modular Aquamiser⁺

Item	From	To	Description
Hose E	High Pressure Pump Outlet	Flow Panel Connection "E" (Brine Inlet)	High Pressure Hose, 3/8"
Hose G	Flow Panel Connection "G" (Salt Water Brine Outlet)	Salt Water Pressure Vessel Assembly Brine Inlet	High Pressure Hose, 3/8"
Hose J	Salt Water PV Assy Brine Outlet	Flow Panel Connection "J" (Salt Water Brine Inlet)	High Pressure Hose, 3/8"
Hose K	Flow Panel Connection "K" (Brine Discharge)	Saltwater System High Pressure Inlet	High Pressure Hose, 3/8"
Tube P	Salt Water Pressure Vessel Assembly Product Outlet	Flow Panel Connection "P" (Salt Water Product Inlet)	Tubing, Low Pressure, PE, 3/8"
Tube R	Flow Panel Connection "R" (Product Outlet)	Saltwater System Product Inlet	Tubing, Low Pressure, PE, 3/8"

- ① Using fittings, attach one end of Tubes and Hoses E, G, J, K, P, and R to the Modular Aquamiser⁺ as shown.



- ② Attach the other end of Tubes and Hoses E, G, J, K, P, and R to the Flow Control Panel as shown.

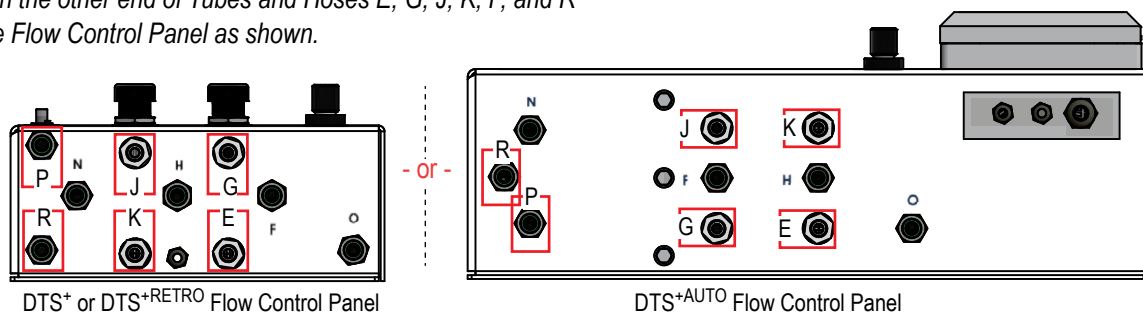


Figure 36: Plumbing Modular Aquamiser⁺

SYSTEM INSTALLATION / PLUMBING (continued)

Table 6: Plumbing Framed Max•Q^{+/+APC}

Item	From	To	Description
Hose E	High Pressure Pump Outlet	Flow Panel Connection "E" (Brine Inlet)	High Pressure Hose, 3/8"
Hose G	Flow Panel Connection "G" (Salt Water Brine Outlet)	Salt Water Pressure Vessel Assembly Brine Inlet	High Pressure Hose, 3/8"
Hose J	Salt Water PV Assy Brine Outlet	Flow Panel Connection "J" (Salt Water Brine Inlet)	High Pressure Hose, 3/8"
Hose K	Flow Panel Connection "K" (Brine Discharge)	Saltwater System High Pressure Inlet	High Pressure Hose, 3/8"
Tube P	Salt Water Pressure Vessel Assembly Product Outlet	Flow Panel Connection "P" (Salt Water Product Inlet)	Tubing, Low Pressure, PE, 3/8"
Tube R	Flow Panel Connection "R" (Product Outlet)	Saltwater System Product Inlet	Tubing, Low Pressure, PE, 3/8"

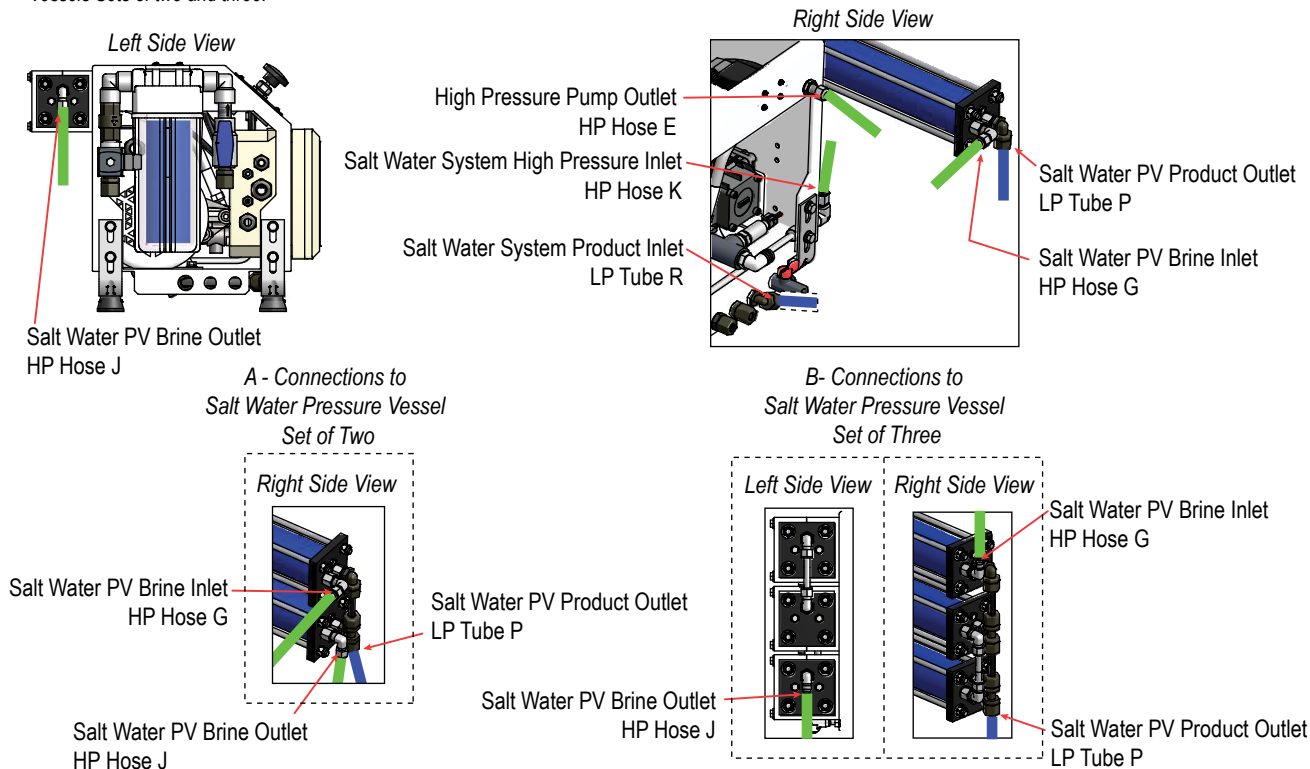
- ① Using fittings, attach one end of Tubes and Hoses E, G, J, K, P, and R to the Framed Max•Q/ Max•Q⁺ as shown.

One Salt Water Pressure Set of one is shown.
See Insets A and B for Salt Water Pressure Vessels Sets of two and three.

— Hose or Tube for Brine
— Tube for Fresh Water

DO NOT CONFUSE:

3/8" Low Pressure (LP) Tubing is dull black
3/8" High Pressure (HP) Tubing is shiny black
3/8" High Pressure Hose (braided) is blue



- ② Attach the other end of Tubes and Hoses E, G, J, K, P, and R to the Flow Control Panel as shown.

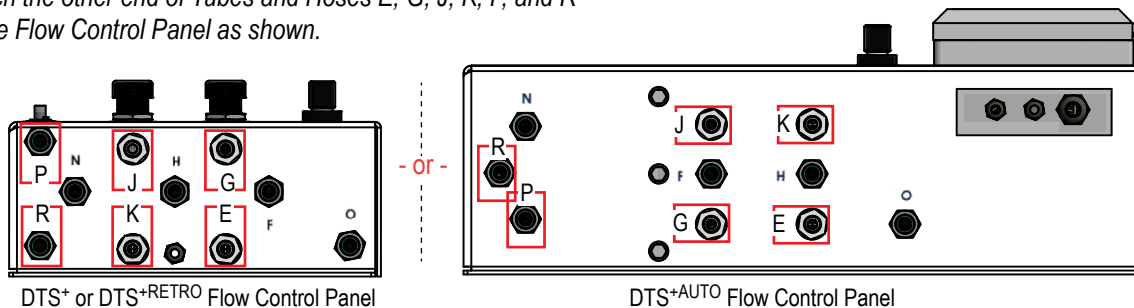


Figure 37: Plumbing Framed Max•Q^{+/+APC}

SYSTEM INSTALLATION / PLUMBING (continued)

Table 7: Plumbing Modular Max•Q^{+/+APC}

Item	From	To	Description
Hose E	High Pressure Pump Outlet	Flow Panel Connection "E" (Brine Inlet)	High Pressure Hose, 3/8"
Hose G	Flow Panel Connection "G" (Salt Water Brine Outlet)	Salt Water Pressure Vessel Assembly Brine Inlet	High Pressure Hose, 3/8"
Hose J	Salt Water PV Assy Brine Outlet	Flow Panel Connection "J" (Salt Water Brine Inlet)	High Pressure Hose, 3/8"
Hose K	Flow Panel Connection "K" (Brine Discharge)	Saltwater System High Pressure Inlet	High Pressure Hose, 3/8"
Tube P	Salt Water Pressure Vessel Assembly Product Outlet	Flow Panel Connection "P" (Salt Water Product Inlet)	Tubing, Low Pressure, PE, 3/8"
Tube R	Flow Panel Connection "R" (Product Outlet)	Saltwater System Product Inlet	Tubing, Low Pressure, PE, 3/8"

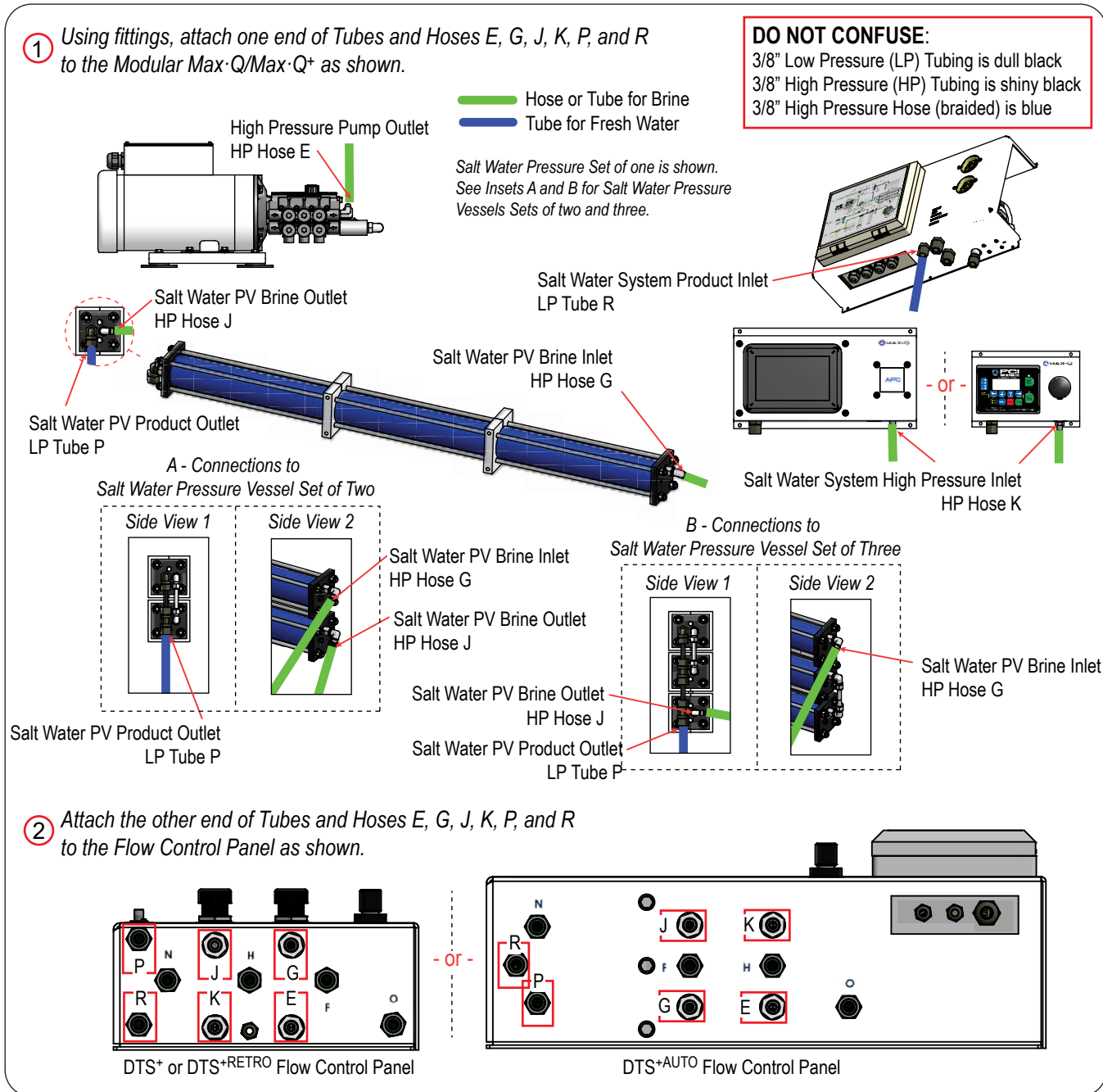


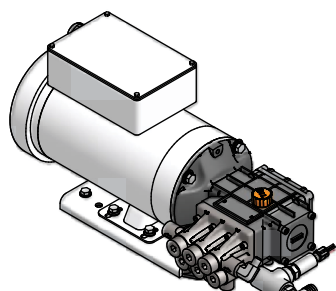
Figure 38: Plumbing Modular Max•Q^{+/+APC}

SYSTEM INSTALLATION / PLUMBING (continued)

Table 8: Plumbing the Recycle Flow Adapter

Item	From	To	Description
Tube O	Flow Panel Connection "O" (Recycle Flow Outlet)	Recycle Flow Adapter, Recycle Flow Inlet	Tubing, Low Pressure, PE, 3/8

- ① Find the inlet fitting at the high pressure pump where the pre-filter plumbing attaches. Disconnect the fitting.

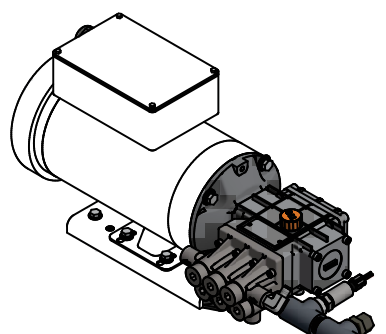


Disconnect Fitting at HPP

DO NOT CONFUSE:

3/8" Low Pressure (LP) Tubing is dull black
3/8" High Pressure (HP) Tubing is shiny black
3/8" High Pressure Hose (braided) is blue

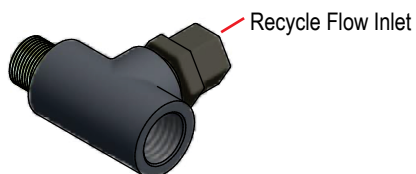
- ② Attach the recycle flow adapter to where the fitting was removed. Re-install fitting onto recycle flow adapter.



Attach Recycle Flow Adapter to HPP

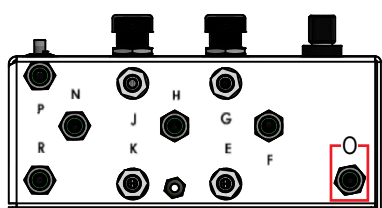
Reinstall Fitting

- ③ Using fittings, attach one end of Tube O to the adapter's recycle flow inlet.



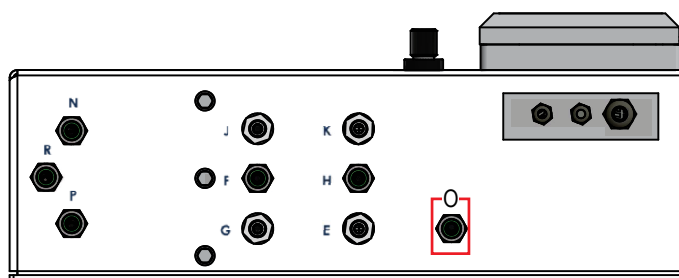
Recycle Flow Inlet

- ④ Attach the other end of Tube O to the Flow Control Panel as shown.



DTS+ or DTS+RETRO Flow Control Panel

- or -



DTS+AUTO Flow Control Panel

Figure 39: Plumbing the Recycle Flow Adapter

SYSTEM INSTALLATION / ELECTRICAL CONNECTIONS

Read the CAUTIONS before working with the system electrical connections.

CAUTION: DO NOT PERFORM INSTALLATION UNLESS:

1. The system feed water sea cock valve is closed.
2. The system main electrical disconnect switch is switched OFF, LOCKED, and TAGGED.

WARNING: ELECTRICAL SHOCK HAZARD. A volt/ohm meter will be necessary. The following installation procedures expose the installer to **HIGH VOLTAGE** and electrical shock hazard. Only attempt this if you are a qualified electrician and only if surrounding conditions are safe.

CAUTION: Always allow slack in electrical cables. Allow the cable to enter or leave from the strain relief in a straight manner for several inches to ensure proper connection, to relieve stress to the cable and fitting, and to allow ease of detachment and reattachment for maintenance or replacement. If electrical cables are pulled tight causing them to bend at the strain relief, they will pull out of the strain relief causing a dangerous electrical shock condition.

NOTE:

- Always follow all local and Coast Guard codes when installing this system.
- Grounding and circuit protection should be done in accordance with National Electrical Code.
- Never attempt to hook-up or service this system without disconnecting all power.
- Always check to make sure system voltage matches incoming voltage.
- If system is 3-phase, be sure to check for correct rotation on all pumps before running system.

To wire and activate the DTS+ Series, please refer to the pages specific to your model.

ORGANIZATION OF THE WIRING & ACTIVATING INSTRUCTIONS

The instructions for wiring and activating the DTS+ Series is organized by DTS+ Series model.

For DTS^{+RETRO}, refer to:

- "WIRING THE DTS+RETRO" on page 67
- "ACTIVATING THE HIGH PRESSURE SWITCH" on page 69 (DTS^{+RETRO} with Max•Q only)

For DTS⁺, refer to:

- "ACTIVATING THE DTS+ ON MAX•Q+/+APC" on page 71

For DTS^{+AUTO}, refer to:

- "WIRING THE DTS+AUTO" on page 71
- "ACTIVATING THE DTS+AUTO ON MAX•Q+/+APC" on page 71

WIRING THE DTS^{+RETRO}

1. Make sure the source water is closed (for both fresh and saltwater), and the system's main electrical disconnect switch is switched "OFF," LOCKED, and TAGGED.
2. The electrical enclosure is behind the control panel on the Aquamiser+ and behind the layout diagram on the Max•Q. Loosen the screws on the side of the electrical enclosure and swing door open.
3. Following local regulatory codes, route the wires from high pressure switch, located inside the flow control panel, through the grommets and into the electrical enclosure.
4. Connect the wires to the PC board, located inside the electrical enclosure, as shown in *Figure 40 on page 68*.
5. Secure the enclosure door with the screws loosened in *Step 2*.
6. Proceed to "ACTIVATING THE HIGH PRESSURE SWITCH" on page 69 to complete the installation.

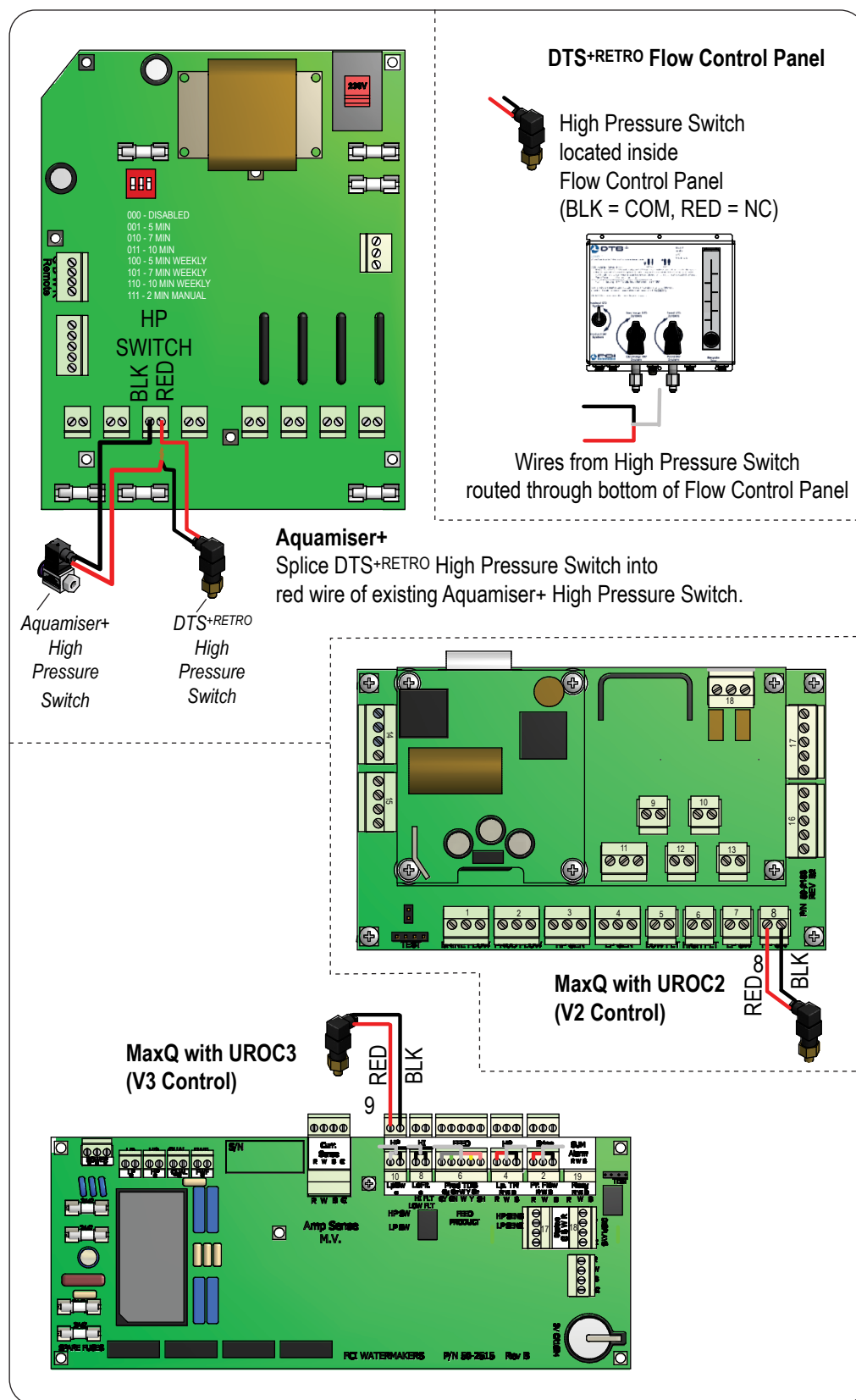


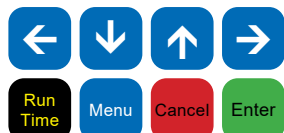
Figure 40: Connecting High Pressure Switch to PC Board (DTS+RETRO)

ACTIVATING THE HIGH PRESSURE SWITCH (DTS^{+RETRO} with Max•Q only)

If you are installing the DTS^{+RETRO} alongside the Aquamiser⁺, the high pressure switch is already activated. Proceed to "INSTALLATION CHECKLIST" on page 75.

For installation alongside the Max•Q, the high pressure switch is activated via the hierarchy of menus. Proceed as follows:

Keypad on Max•Q
Display Panel



1. Make sure all valves are in operating position.
2. Power up the Max•Q to standby. Display will show "FCI Watermakers."



3. Press the MENU button on the display panel.
4. Use the ARROW KEYS and the ENTER button to navigate the menu hierarchy to the pressure sensor setting.



You need to choose:

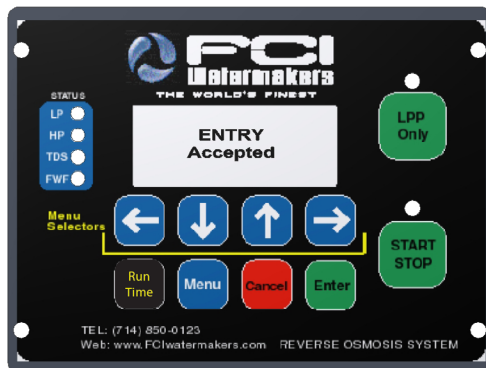
- System Options
- Inputs
- Sensors
- High Pressure

Then select the following setting:

- "Use Both"

5. If the system was set differently, the system will notify that the new setting was accepted:

Entry Accepted



6. Press MENU to exit the menu hierarchy system.

This completes the installation of the DTS^{+RETRO}, please proceed to "INSTALLATION CHECKLIST" on page 75.

ACTIVATING THE DTS⁺ ON MAX•Q^{+/+APC}

The DTS⁺ does not require wiring; however, please contact the factory for instructions on activating the DTS⁺ on the Max•Q^{+/+APC} V4 Control System.

After activating the DTS⁺, proceed to "INSTALLATION CHECKLIST" on page 75.

WIRING THE DTS⁺AUTO

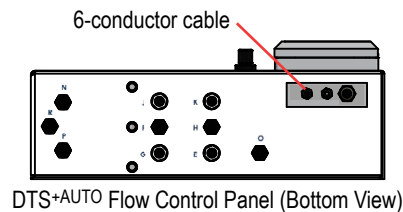
1. Make sure the source water is closed (for both fresh and saltwater), and the system's main electrical disconnect switch is switched "OFF," LOCKED, and TAGGED.
2. Following local regulatory codes, make the connections described in *Figure 41*, *Figure 42*, and *Figure 43*. For additional reference, the DTS⁺AUTO schematic is provided on page 74.
3. Proceed to "ACTIVATING THE DTS⁺AUTO ON MAX•Q^{+/+APC}", below.

ACTIVATING THE DTS⁺AUTO ON MAX•Q^{+/+APC}

Please contact the factory for instructions on activating the DTS⁺AUTO on the Max•Q^{+/+APC} V4 Control System.

After activating the DTS⁺AUTO, proceed to "INSTALLATION CHECKLIST" on page 75.

- ① *Locate the 6-conductor cable that feeds through a cable grip on the DTS⁺AUTO flow control panel.*



- ③ *Following local regulatory codes, route the cable to the 3-way actuated valve, and connect the color-coded wires as shown in diagram.*

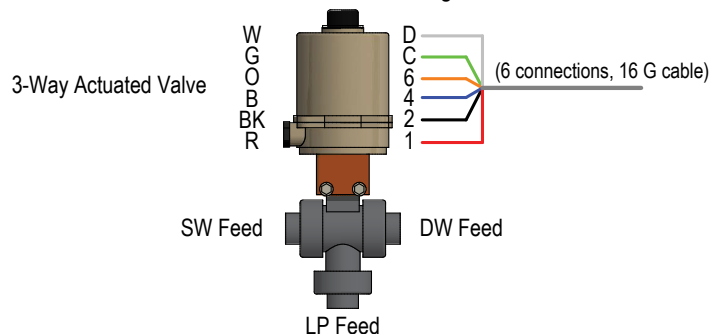
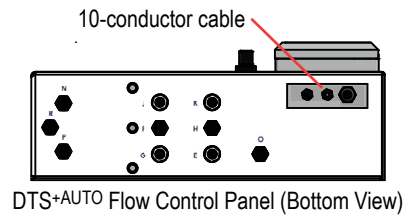
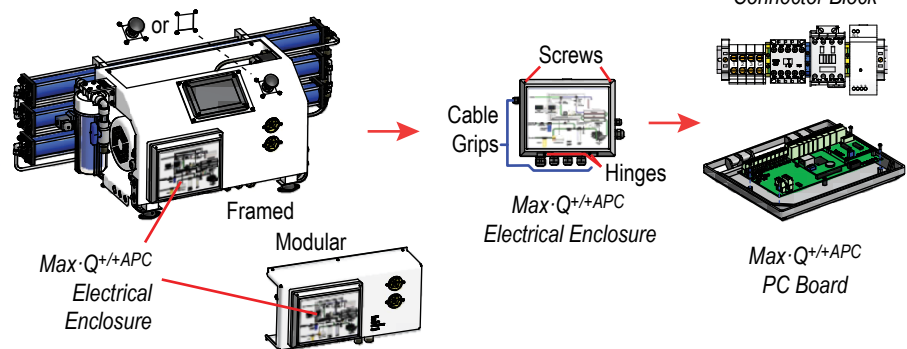


Figure 41: Wiring the DTS⁺AUTO to 3-Way Actuated Valve

- ① Locate the 10-conductor cable that feeds through a cable grip on the DTS⁺AUTO flow control panel.



- ② Following local regulatory codes, route the 10-conductor cable into a cable grip of Max·Q^{+/+}APC electrical enclosure.



- ③ Connect the color-coded wires to the Max·Q^{+/+}APC PC board terminals and the black wire to the Max·Q^{+/+}APC PC board connector block as shown in diagram.

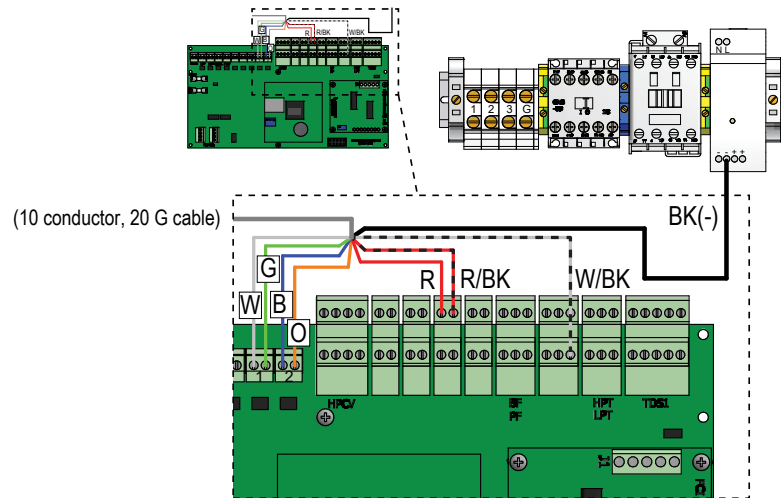
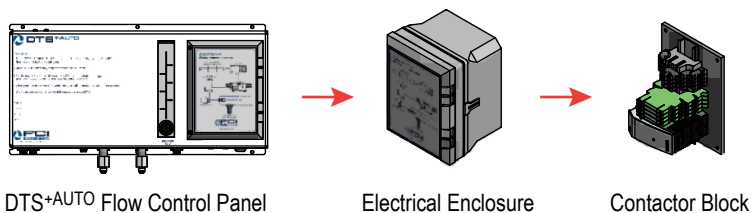
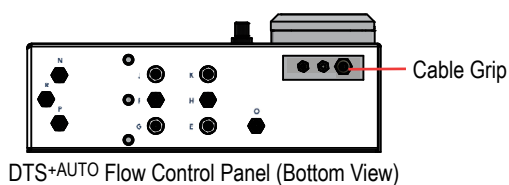


Figure 42: Wiring the DTS⁺AUTO to Max·Q^{+/+}APC PC Board

- ① The contactor block for DTS+*AUTO* power supply is located inside the electrical enclosure of the DTS+*AUTO* flow control panel.



- ② Following local regulatory codes, route primary power through the cable grip of the electrical enclosure.



- ③ Connect primary power to the contractor block as shown in diagram.

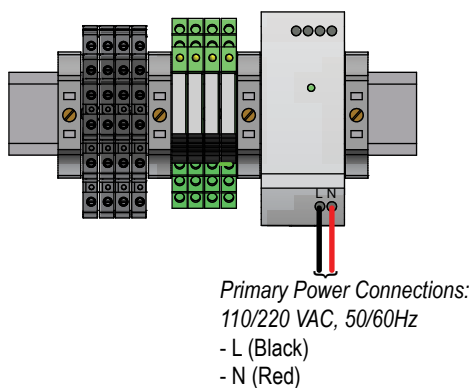
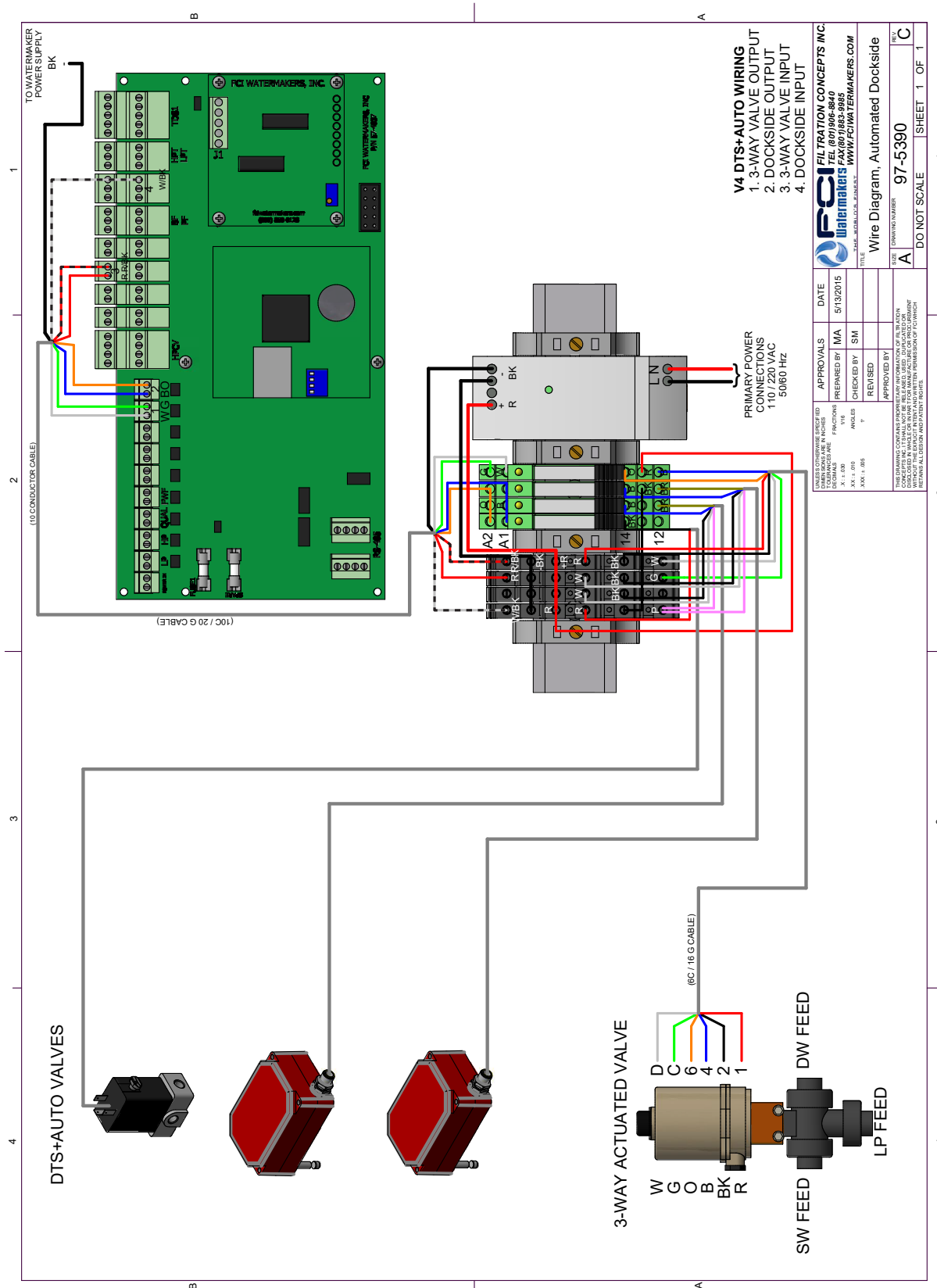


Figure 43: Wiring Power to the DTS+*AUTO* Power Supply



INSTALLATION CHECKLIST

The following list will help ensure a successful installation:

- Ample access around system/components
- All connections are tight
- Electrical connections are secure
- All Coast Guard/local codes have been met
- No iron or ferrous fittings have been used
- Electrical connections are correct
- Plumbing connections do not leak
- Hose clamps are tight
- Pressure Sensor is set to "Use Both" in Menu Hierarchy System (DTS^{+RETRO} with Max•Q configurations only)
- DTS^{+/+AUTO} has been activated on Max•Q^{+/+APC} V4 Control System

4/ OPERATIONAL INSTRUCTIONS

Prior to Start-Up, it is important to take note of the following:

FEED WATER — Be aware of the condition of the water the system is processing. Is it muddy, silty, or oily? Does it show signs of other man-made contaminants? If this is the case, DO NOT run the system. If these feed water conditions are unavoidable, additional filtration will be necessary. Consult the factory or your local dealer for further details and assistance with specific water conditions.

SALINITY EFFECT — Like water temperature, the salinity of the water has a direct effect on the output of the system and the quality of water produced. Your watermaker is equipped with protection for overproduction and low quality water produced. When operating with a low saline water source, the “high-pressure” required will be less. Reduce the pressure to the point where you are making the rated output of your system. If this pressure adjustment is not monitored the system may detect a fault condition, protect itself, and shutdown.

PRESSURE EFFECT — The pressure within a system is regulated by the size of the orifice through which the brine stream flows; thus, creating back pressure in the pressure vessel. This pressure squeezes product water out of the brine stream. The amount of pressure applied through the system directly affects the quantity and quality of water produced. More pressure is needed in cold water than in warm waters. The reason being, membranes contract in cold water, not allowing the fresh water through as easily. When operating systems without APC, always try to maintain the pressure necessary for the system to operate at its rated output. As a safety feature, the system will shutdown when the pressure is too high or too low.

TEMPERATURE & PRESSURE EFFECTS CHART

TEMPERATURE EFFECT — Water temperature has a great effect on the output of the system. Increased water temperature increases output at a given pressure. Therefore, it is very critical to adjust the pressure of the machine to maintain proper fresh-water production rate. It is more important to produce the rated output than it is to achieve a certain pressure. It is perfectly normal and acceptable for your system to produce good quality water while operating at its rated output at a lower pressure. This reduced pressure is most likely caused by an increase in the water temperature, or a reduction in salinity. Refer to *Figure 44*.

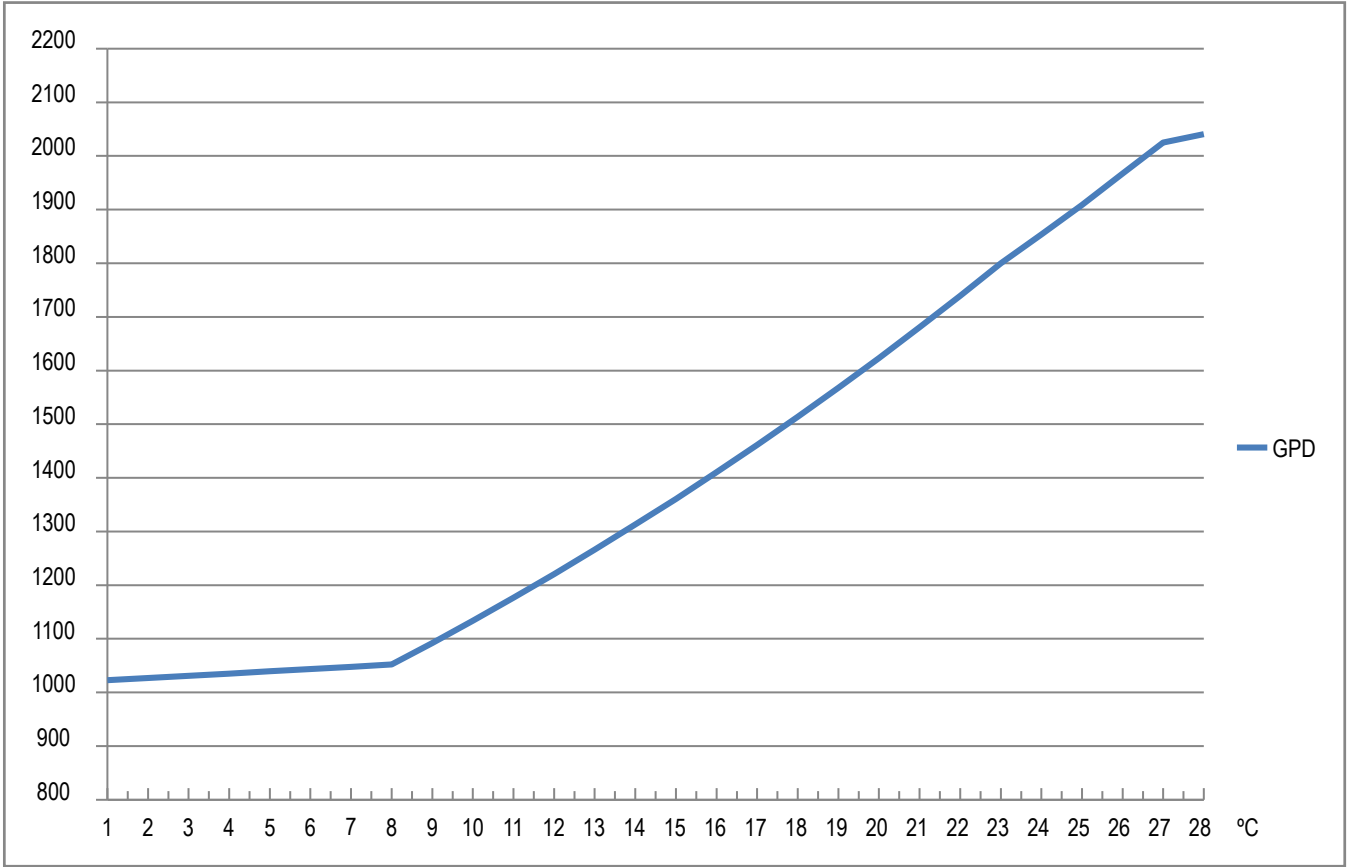


Figure 44: Water Temperature vs. Output (constant pressure)

OPERATING THE DTS+ SERIES

Refer to the operating instructions for your model:

- "DTS+ Operating Instructions" on page 78;
- "DTS+RETRO Operating Instructions" on page 80;
- "DTS+AUTO Operating Instructions" on page 81.

DTS+ OPERATING INSTRUCTIONS

Refer to Figure 45 and the instructions that follow.

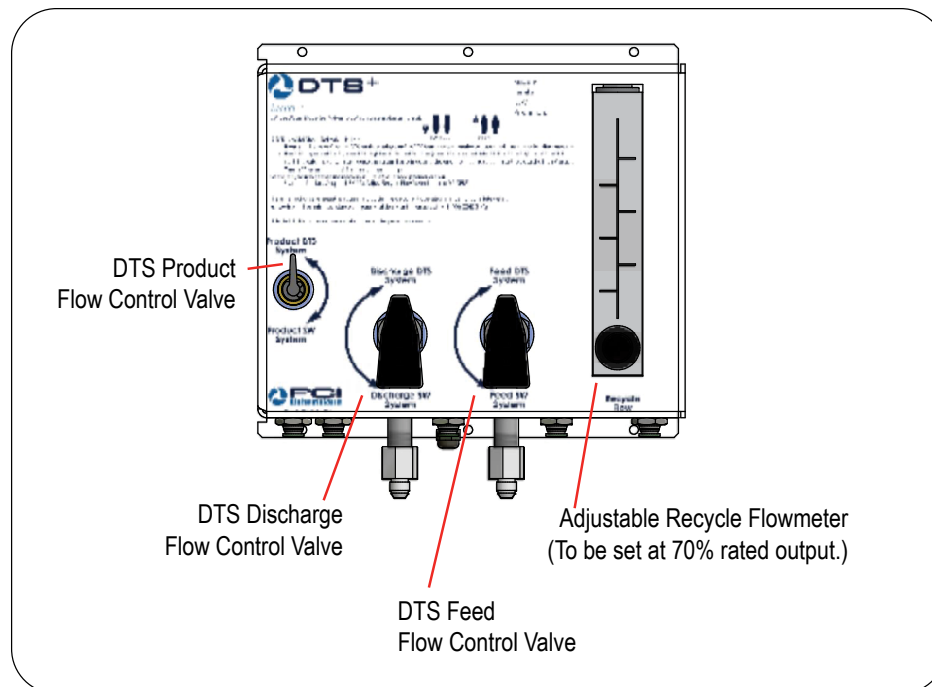
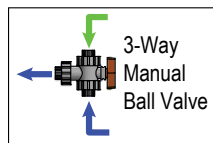


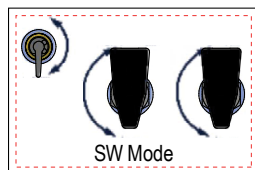
Figure 45: DTS+ and DTS+RETRO Manual Valves

To use systems with saltwater:

1. Make sure systems are off (that is, no flow through systems).
2. Turn 3-way inlet valve to saltwater source.



3. Select SeaWater Mode on the flow control panel by setting valves to SW.

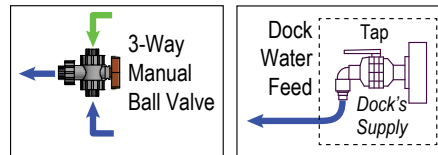


4. Run the system as normal to make product.

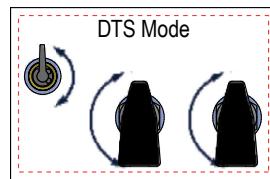
OPERATING THE DTS⁺ SERIES (continued)

To use systems with dockside water:

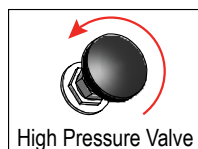
1. Make sure the systems are off (that is, no flow through systems).
2. Turn 3-way inlet valve to dockside water source. Be sure dockside water tap is on.



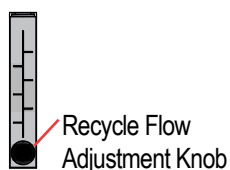
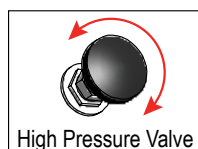
3. Select Dockside Treatment System Mode by setting flow control valves to DTS.



4. Start systems as described below.
 - If equipped with APC:
 - a. Select DTS on the display.
 - b. Confirm DTS Start.
 - c. The systems will start and automatically adjust pressure.
 - If not equipped with APC:
 - a. Open the High Pressure Control Valve (counterclockwise).



- b. Select DTS on the display.
- c. Confirm DTS Start, the systems will start.
- d. Once the systems have primed and show the initialize screen, start to close the High Pressure Control Valve until the unit is making its rated output.



NOTE: Set the recycle valve on the flow control panel so that the recovery is 70% of your rated product output. Example: Product Output: 1.3 GPM, Recovery Setpoint: 0.9 GPM.)

NOTE: In DTS Mode, the system will shutdown if the pressure exceeds 250 PSI.

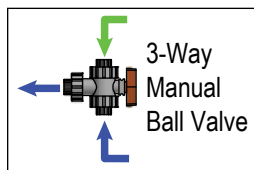
OPERATING THE DTS⁺ SERIES (continued)

DTS⁺RETRO OPERATING INSTRUCTIONS

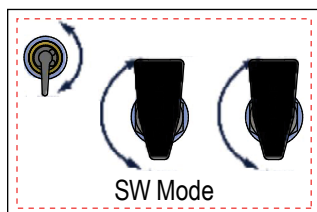
Refer to Figure 45 on page 78 and the instructions below.

To use systems with saltwater:

1. Make sure systems are off (that is, no flow through systems).
2. Turn 3-way inlet valve to saltwater source.



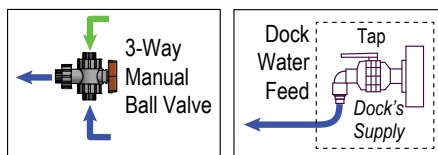
3. Select SeaWater Mode on the flow control panel by setting valves to SW.



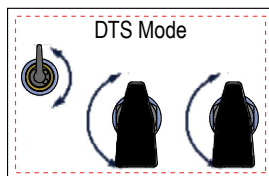
4. Run the system as normal to make product.

To use systems with dockside water:

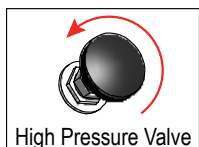
1. Make sure the systems are off (that is, no flow through systems).
2. Turn 3-way inlet valve to dockside water source. Be sure dockside water tap is on.



3. Select Dockside Treatment System Mode by setting flow control valves to DTS.



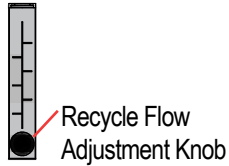
4. Open the High Pressure Control Valve (counterclockwise).



5. Start the systems from the saltwater system's control panel.

OPERATING THE DTS⁺ SERIES (continued)

6. Once the systems have primed and show the initialize mode, start to close the High Pressure Control Valve until the unit is making its rated output.

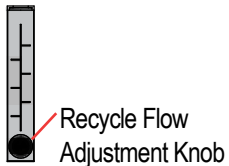


NOTE: Set the recycle valve on the flow control panel so that the recovery is 70% of your rated product output. (Example: Product Output: 1.3 GPM, Recovery Setpoint: 0.9 GPM.)

NOTE: In DTS Mode, the system will shutdown if the pressure exceeds 250 PSI.

DTS^{+AUTO} OPERATING INSTRUCTIONS

1. Select DTS Mode from the Home Screen on the display, confirm you want to Start DTS. (Ensure your dock water supply is on.)
2. All valves will automatically position themselves for DTS Mode.
3. When you stop the system in DTS Mode, the valves will automatically revert back to SW Mode.



NOTE: Set the recycle valve on the flow control panel so that the recovery is 70% of your rated product output. (Example: Product Output: 1.3 GPM, Recovery Setpoint: 0.9 GPM.)

NOTE: In DTS Mode, the system will shutdown if the pressure exceeds 250 PSI.

Troubleshooting, maintenance and repair of the DTS⁺ Series is similar to that of the saltwater system; refer to the saltwater system user manual for details. This chapter provides supplemental information on replacing, cleaning, and storing the fresh water membranes.

MEMBRANE REPLACEMENT

As your watermaker ages, your membrane will start to deteriorate and produce lower grade water. When this happens, you may try to chemically clean the membrane(s) to recover the performance. If this fails, you will need to replace the membrane.

Refer to *Figure 46*, *Figure 47*, *Figure 48*, or *Figure 49* and proceed as follows:

- 1 Shut the the fresh and salt water sources, and disconnect the high-pressure (and low-pressure, if needed) hose connections from the end of the vessel in question.
- 2 Remove the hoses and fittings from one end of the pressure vessel.
- 3 Remove the two retaining clip screws on the end of the vessel, and remove the retaining clip.
- 4 Remove the end plug. The membrane will now be visible inside the pressure vessel.
- 5 Using a pair of needle-nose pliers, grab the exposed white tube. With a firm grip, pull the membrane out of the vessel. If you are taking the membrane(s) out to be returned to FCI for evaluation, do not damage or mar the white tube—doing so will make it impossible for us to evaluate the membrane.
- 6 Take the new membrane out of the bag. Take care NOT to get the membrane dirty.
- 7 If the old membrane is being returned to FCI, rinse well with fresh water and place into the bag. Seal the end with tape and return immediately.
- 8 With the new membrane in hand, slide into the vessel in the same position as the original came out.
- 9 Inspect the o-rings, replace if needed, lubricate the o-rings and slide into the vessel.
- 10 Replace the fittings and hoses.

MEMBRANE REPLACEMENT (continued)

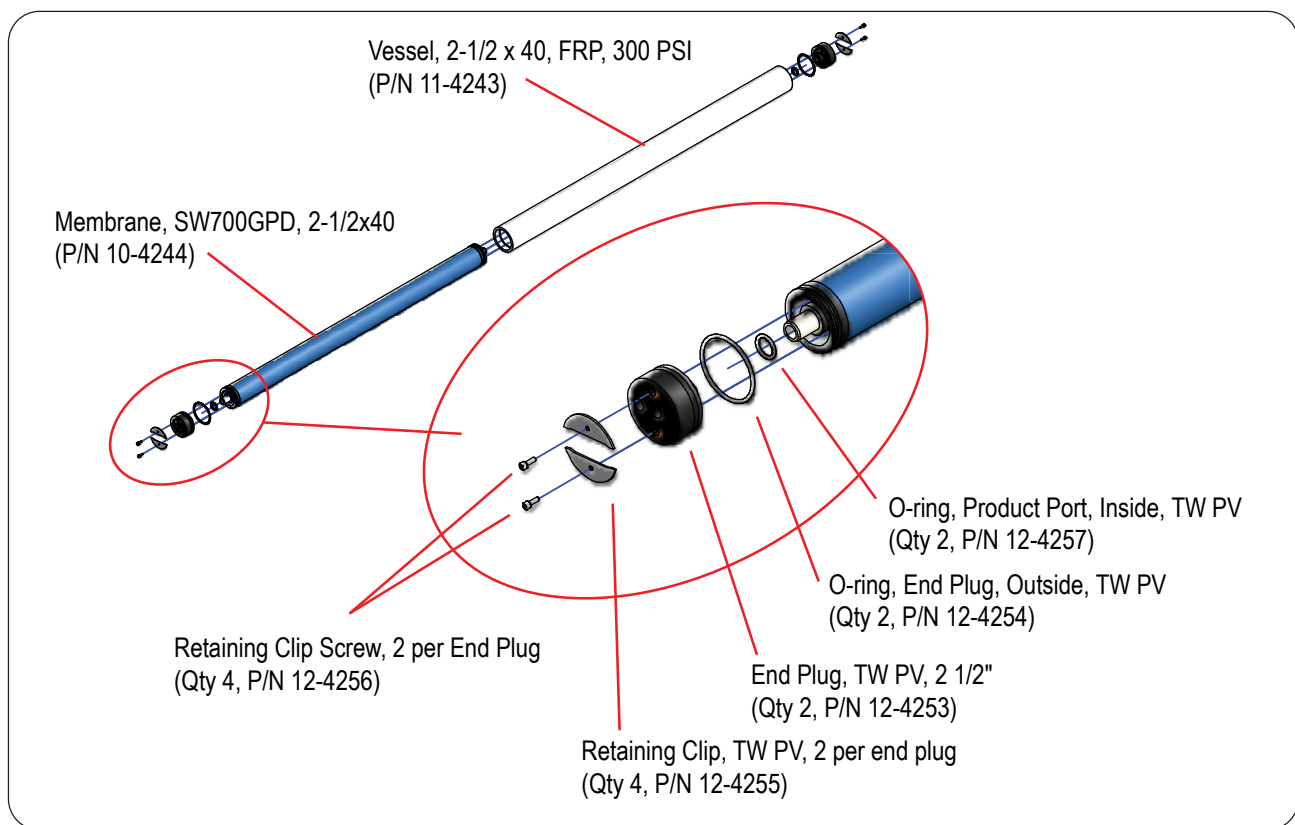


Figure 46: Replacing the Membrane

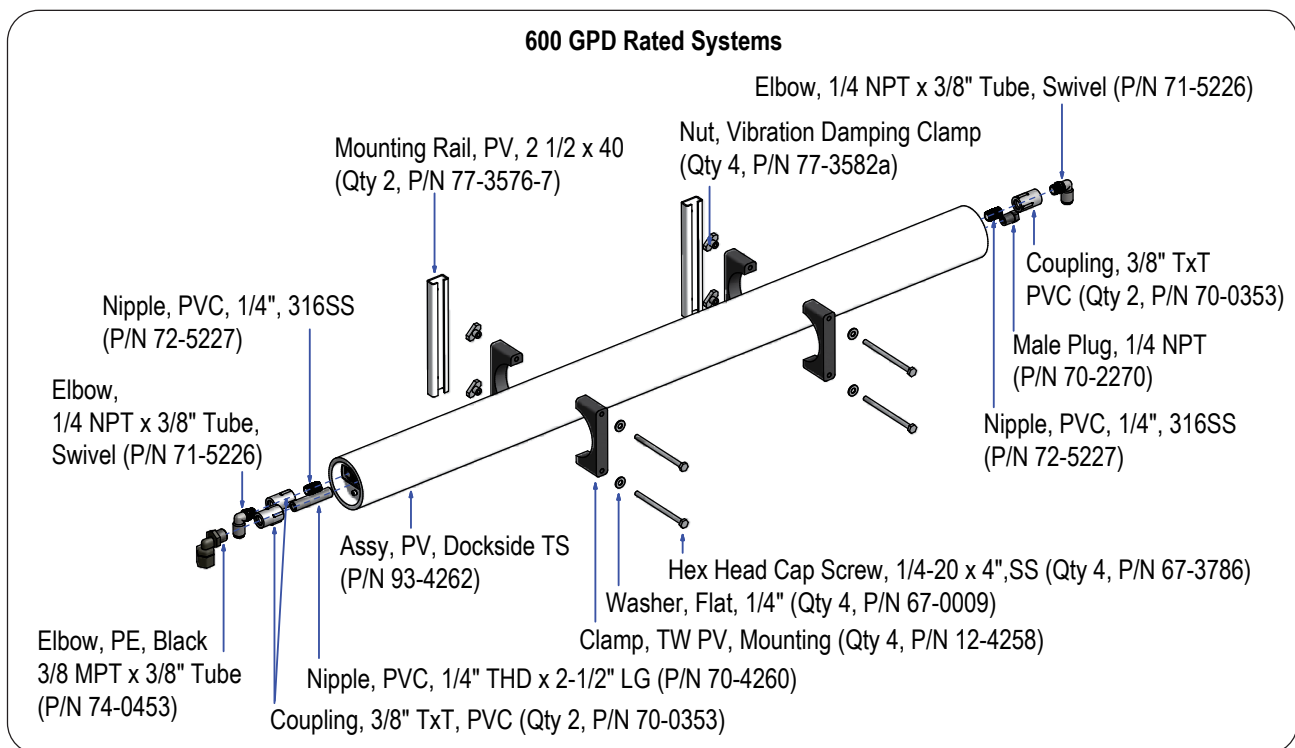


Figure 47: 1 PV for 600-700 GPD Rated Systems (P/N 93-4828)

MEMBRANE REPLACEMENT (continued)

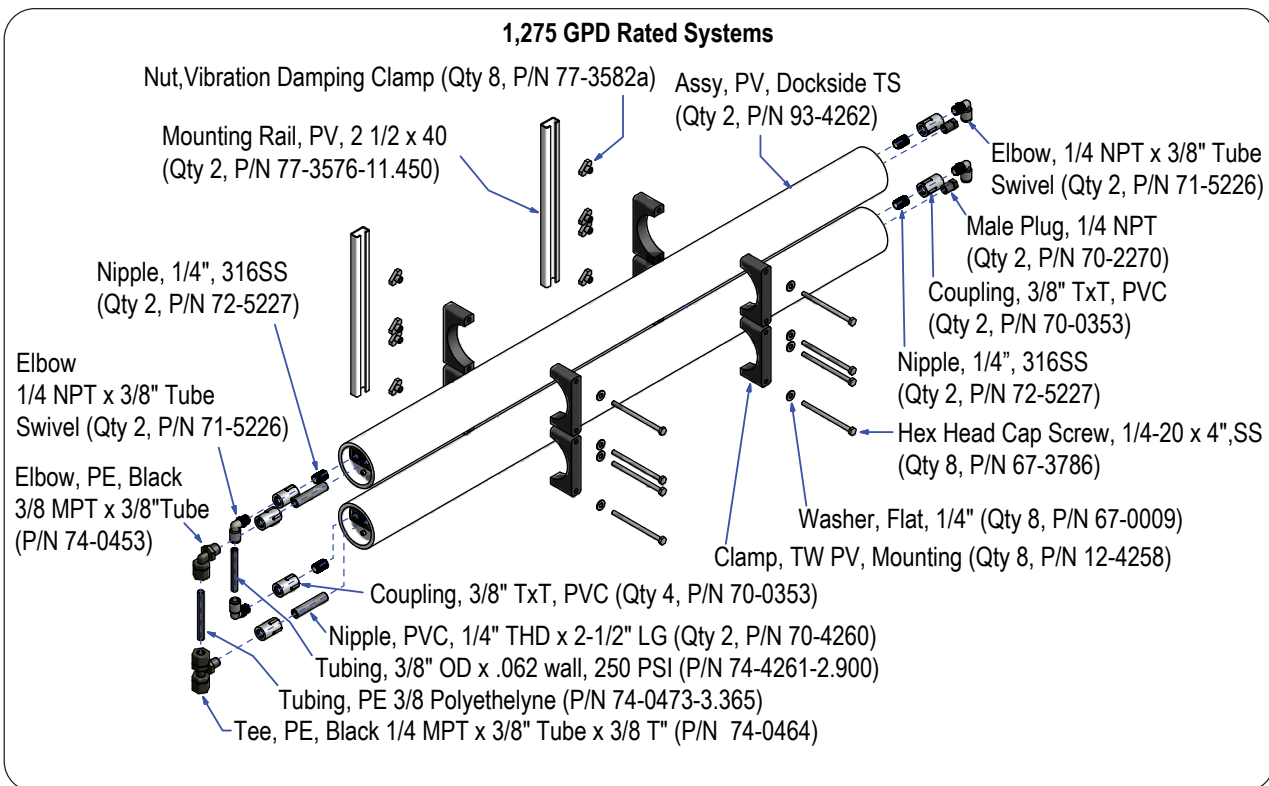


Figure 48: 2 PVs for 1,200-1,275 GPD Rated Systems P/N (93-4263)

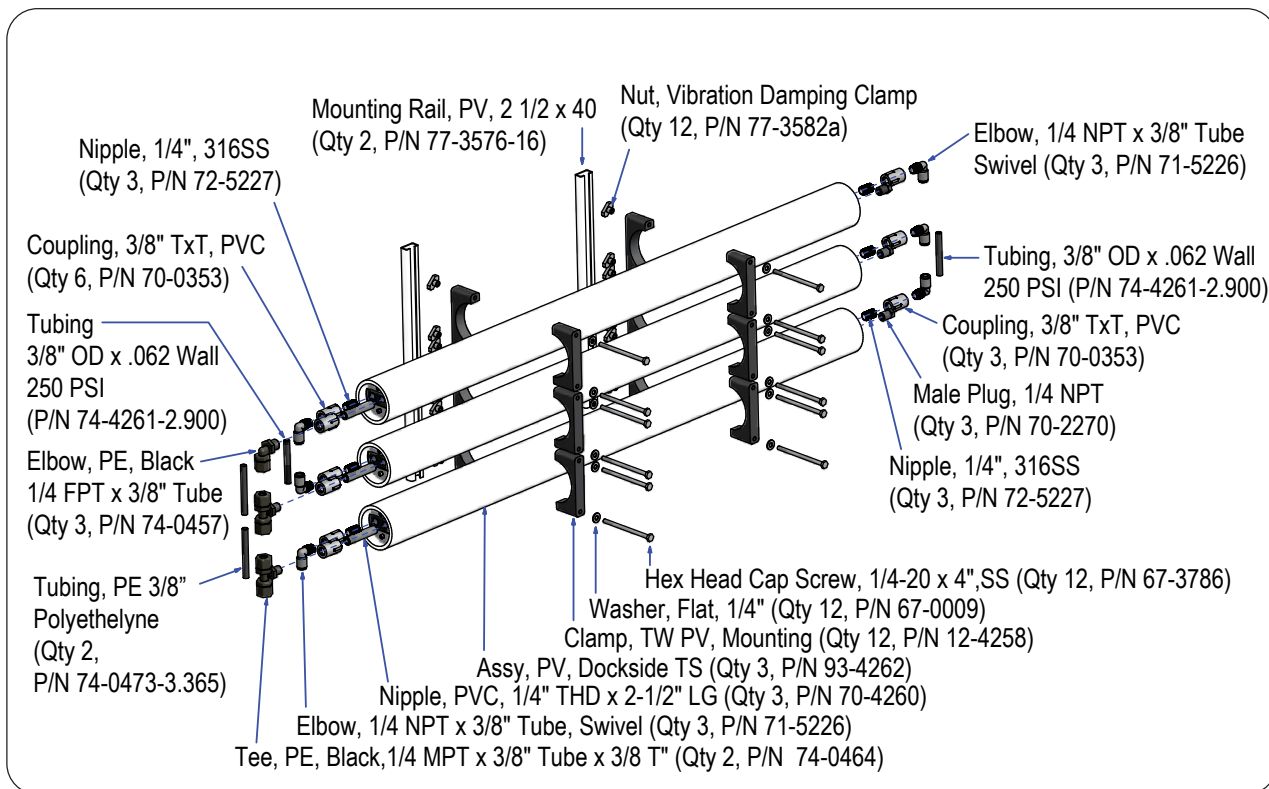


Figure 49: 3 PVs for 1,800-1,850 GPD Rated Systems (93-4819)

CLEANING AND STORAGE PROCEDURES

Invariably there will be times when the watermaker will not be used. During this time, it is recommended that the system be shut down and certain precautions are taken. By following these simple instructions, your FCI System will continue to provide you with fresh water for years to come.

NOTE: Before performing the cleaning or storage procedures on the DTS⁺ Series, be sure to switch from seawater to dockwater mode.

SHORT TERM SHUTDOWN

Flush the membranes with fresh water weekly to keep them wet.

LONG TERM SHUTDOWN

For long term shutdown you can “pickle” or preserve the system, which will last up to six months. Please refer to "STORAGE PROCEDURE".

WARNING: FRESH WATER FLUSH

There must be sufficient fresh water in the potable water storage tank: In order to provide the required flow of water to the system during the fresh water flush cycle, the boat or home's fresh water pressure system must deliver minimum 1 U.S. Gallons (3.8 Liters) Per Minute at minimum 25 PSI (172 kPa) and maximum 60 PSI (414 kPa).

WARNING: FREEZING TEMPERATURE

The system must be protected from freezing if it will be exposed to temperatures below 32° Fahrenheit (0° Celsius). Freezing temperatures (below 32° F / 0° C) will cause extensive damage to the system as the water expands within the system during the freezing process. Resulting damage to the system caused by freezing temperatures is the liability of the operator. DO NOT subject the system to temperatures below 32° Fahrenheit (0° Celsius) unless the system has been rinsed with a solution of product water with twenty percent (20%) food-grade glycerin (propylene glycol).

NOTE: USE OF CHEMICALS

Although chemicals are necessary in some instances, FCI recommends using them only as needed. The chemicals can attack the membrane polymers and weaken the integrity of the membrane.

WINTERIZING PROCEDURE

If the system will be exposed to freezing temperatures, the system must be drained of all product water and rinsed with a solution of product water with 20% food-grade glycerin (propylene glycol).

CLEANING AND STORAGE PROCEDURES (continued)

CLEANING PROCEDURE

HIGH PH CLEANER (Green Cap — Part# 14-0013)

1. When systems are idle, switch from seawater to dockwater mode.
2. Disconnect system feed line, turn system on and let drain for 30 seconds.
3. Place feed line and discharge line in a container filled with clean de-chlorinated fresh water.
4. Mix one pound of chemical for every 15 gallons of water.
5. With regulator valves completely open and a maximum of 50 PSI on the system, circulate the solution through the system for 30 minutes. If solution discolors, dump solution after 15 minutes and start at *Step 2* again.
6. Remove suction line from container and let system drain for 30 seconds.
7. Rinse the system with fresh water with discharge to drain for 15 minutes.
8. When R.O. unit is first restarted, product water should be diverted to drain for the first 15 minutes.

LOW PH CLEANER (Red Cap — Part# 14-0014)

1. When systems are idle, switch from seawater to dockwater mode.
2. Disconnect system feed line, turn system on and let drain for 30 seconds.
3. Place feed line and discharge line in a clean container filled with de-chlorinated fresh water.
4. Mix one pound of chemical for every 15 gallons of water.
5. With regulator valves complete open and a maximum of 50 PSI on the system, circulate the solution through the system for 30 minutes. If solution discolors, dump solution after 15 minutes and start *Step 2* again.
6. Remove suction line from container and let system drain for 30 seconds.
7. Rinse system with fresh water with discharge to drain for 15 minutes.
8. When R.O. unit is first restarted, product water should be diverted to drain for the first 15 minutes.

CLEANING AND STORAGE PROCEDURES (continued)

STORAGE PROCEDURE

MEMBRANE STORAGE AGENT (Blue Cap — Part# 14-0015)

1. Membranes should be cleaned prior to storage.
2. When systems are idle, switch from seawater to dockwater mode.
3. Disconnect system feed line, turn system on and let drain for 30 seconds.
4. Place feed line and discharge line in a container filled with clean de-chlorinated fresh water.
5. Mix one pound of chemical for every 10 gallons of water.
For 2 1/2" membranes use 15 gallons of water.
6. With regulator valves completely open and a maximum of 50 PSI on the system, circulate the solution through the system for 10 minutes.
7. After circulation, shut system down and close valves.
Make sure solution does not drain out.
8. After storage and upon start up, open valves for operation. Start the system up and run for 15 minutes with no applied pressure.
9. When R.O. unit is first restarted, product water should be diverted for 15 minutes.

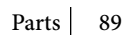
When ordering replacement parts, refer to the illustrated part drawings in this chapter to identify the part numbers.

ORGANIZATION OF THE ILLUSTRATED PARTS

The illustrations are organized in the following categories:

- "ILLUSTRATED PARTS / DTS+SERIES" on page 89
- "ILLUSTRATED PARTS / CARBON INLET FILTER" on page 110
- "ILLUSTRATED PARTS / PRESSURE VESSEL" on page 111
- "ILLUSTRATED PARTS / FLOW CONTROL" on page 116
- "ILLUSTRATED PARTS / RECYCLE FLOW ADAPTER" on page 119
- "ILLUSTRATED PARTS / ELECTRICAL (DTS+AUTO)" on page 120

FCI WATERMAKERS, INC.



ILLUSTRATED PARTS / DTS+SERIES (continued)

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Part's List

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	93-4263	Assy, Dockside, 800-1275 GPD PV
2	1	93-5331	Assy, DTS+, Manual, Retro
3	1	93-4270	Kit, Installation, DTS+
4	1	93-5371	Carbon Inlet Filter, DTS+

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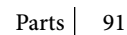
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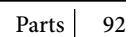
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ILLUSTRATED PARTS / DTS+SERIES (continued)

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PART NUMBER

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93-4820

Assy, Dockside, 250 - 700 GPD PV

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93-5305

Assy, DTS+, Manual

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93-4274

Kit, Conversion, MaxQ+ Frame, DTS+

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93-5371

Carbon Inlet Filter, DTS+

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DTS+ Manual, 700 GPD

DTS+MQF-700

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ILLUSTRATED PARTS / DTS+SERIES (continued)

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REV	DESCRIPTION	DATE	ENG	MFG
A	Production Release	8/2015	IMA	

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	93-4620	Assy, Dockside, 250 - 700 GPD PV
2	1	93-5395	Kit, Conversion, MaxQ+ Frame, DTS+Auto
3	1	93-5310	Assy, DTS+, Auto
4	1	93-5371	Carbon Inlet Filter, DTS+

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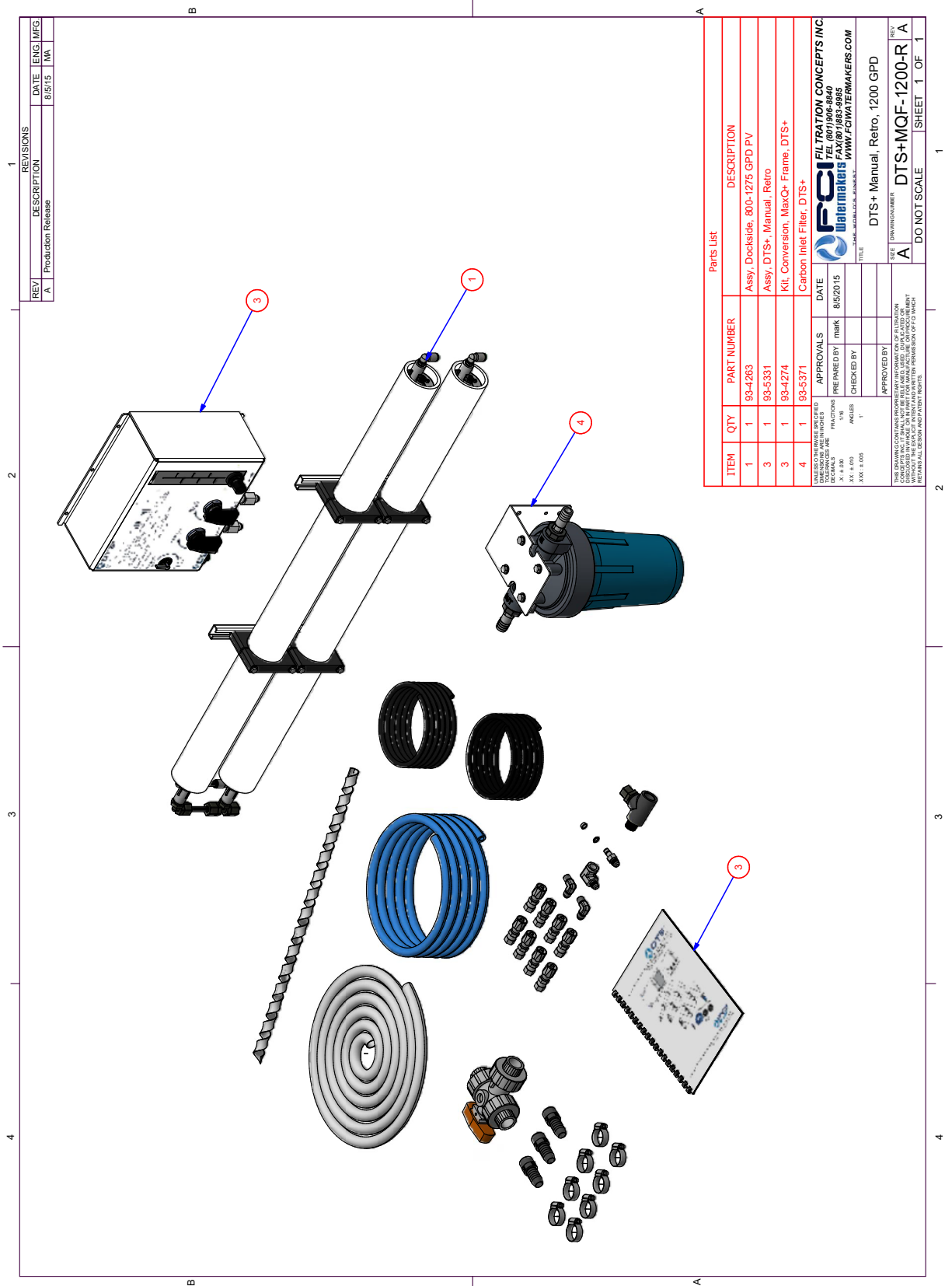
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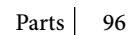
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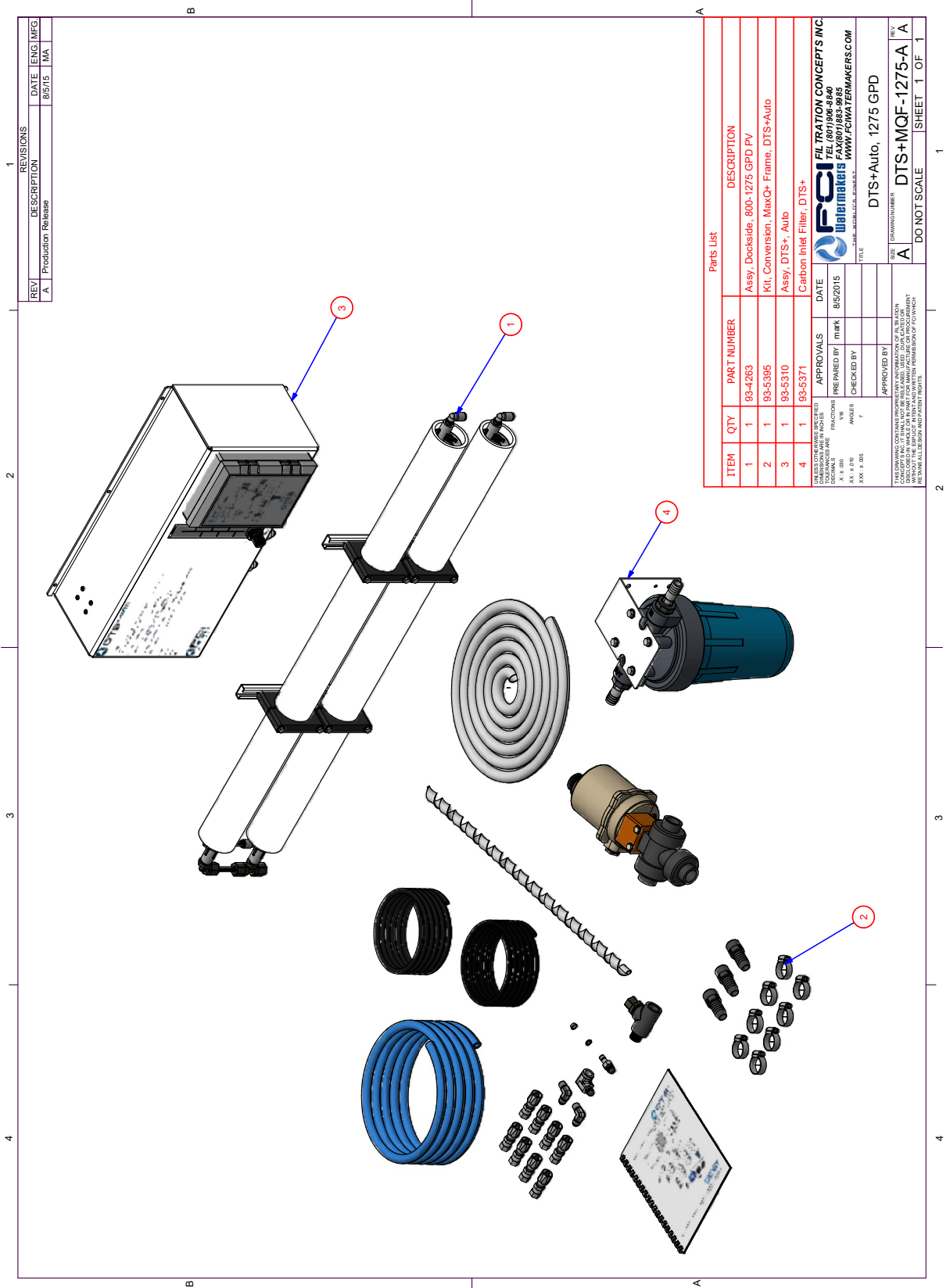
ILLUSTRATED PARTS / DTS+SERIES (continued)



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ILLUSTRATED PARTS / DTS+SERIES (continued)



ILLUSTRATED PARTS / DTS+SERIES (continued)

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A	Production Release	8/5/15	MA	

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	83-4819	Assy, Dockside, 1850 GPD PV
2	1	83-5331	Assy, DTS+, Manual, Retro
3	1	83-4274	Kit, Conversion, MaxQ+ Frame, DTS+
4	1	83-5371	Carbon Inlet Filter, DTS+

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DTS+ Manual, Retro, 1800 GPD

DTS+MQF-1800-R

ILLUSTRATED PARTS / DTS+SERIES (continued)

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ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	93-4819	Assy, Dockside, 1850 GPD PV
2	1	93-5305	Assy, DTS+, Manual
3	1	93-4274	Kit, Conversion, MaxQ+ Frame, DTS+
4	1	93-5371	Carbon Inlet Filter, DTS+

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FCI WATERMAKERS, INC.

TEL: 801.906.8840

FAX: 801.983.3988

WWW.FCIWATERMAKERS.COM

DATE

8/5/2015

PREPARED BY

mmk

CHECKED BY

APPROVED BY

SIZE

A

DO NOT SCALE

SHEET 1 OF 1

ILLUSTRATED PARTS / DTS+SERIES (continued)

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B

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REV		DESCRIPTION		DATE		ENG		MFG	
A		Production Release		8/5/15		MA			

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	93-4819	Assy, Dockside, 1850 GPD PV
2	1	93-5385	Kit, Conversion, MaxQ+ Frame, DTS+Auto
3	1	93-5310	Assy, DTS+, Auto
4	1	93-5371	Carbon Inlet Filter, DTS+

DATE OF DRAWING RELEASED: 8/5/2015

PREPARED BY: mmk

REVIEWED BY: 1/18

SCALE: XX:1 1:000

UNIT: INCHES

APP: 1:000

APPROVED BY:

DATE:

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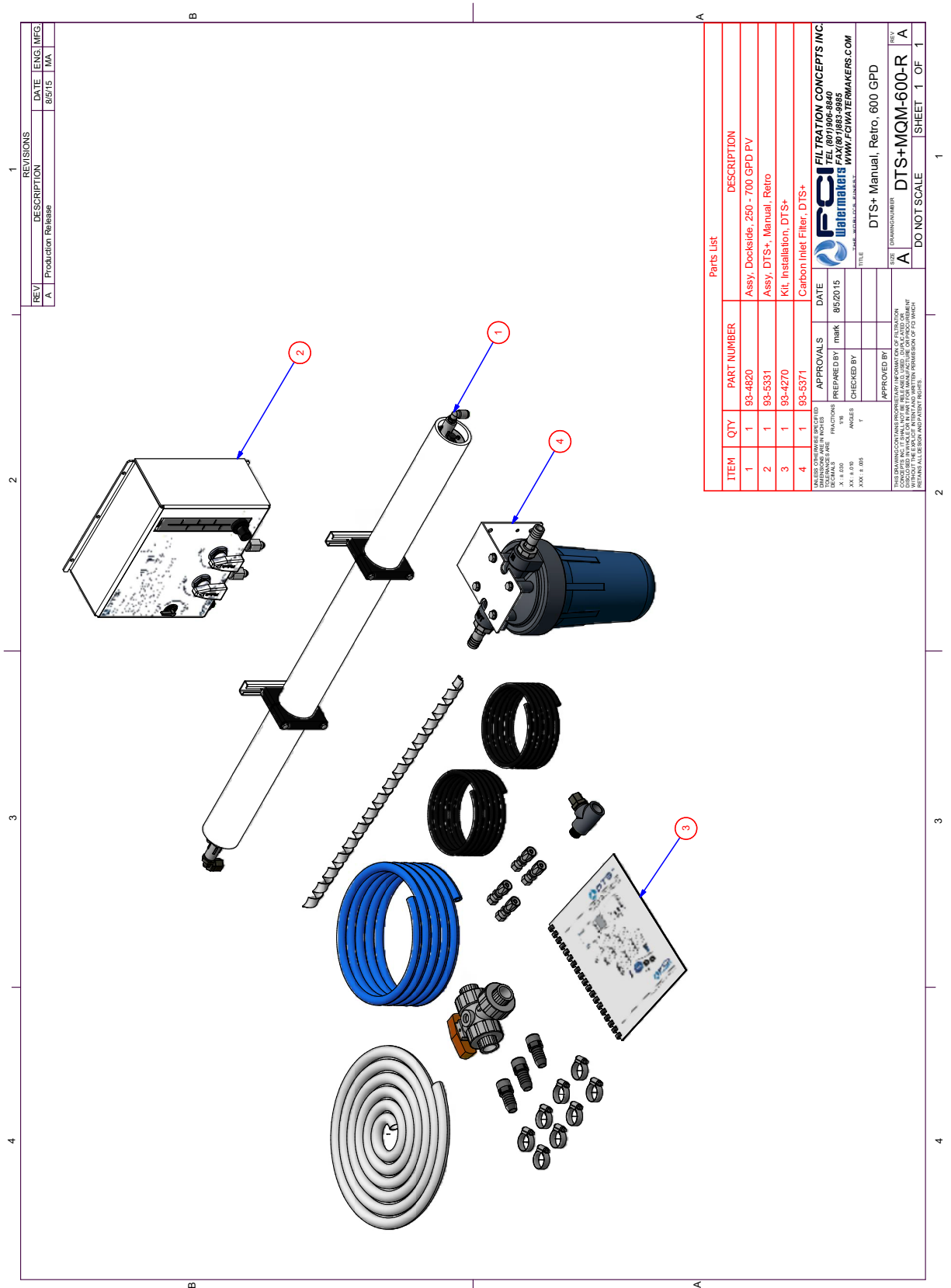
DTS+Auto, 1850 GPD

DTS+MQF-1850-A

DO NOT SCALE

SHEET 1 OF 1

ILLUSTRATED PARTS / DTS+SERIES (continued)



ILLUSTRATED PARTS / DTS+SERIES (continued)

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REV	DESCRIPTION	DATE	ENG	MFG
A	Production Release	8/5/15	MA	

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	93-4820	Assy, Dockside, 250 - 700 GPD PV
2	1	93-5305	Assy, DTS+, Manual
3	1	93-4270	Kil. Installation, DTS+
4	1	93-5371	Carbon Inlet Filter, DTS+

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8/5/2015

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SIZE

A

DRAWING NUMBER

DTS+MQM-700

DO NOT SCALE

SHEET 1 OF 1

ILLUSTRATED PARTS / DTS+SERIES (continued)

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REV	DESCRIPTION	DATE	ENG	MFG
A	Production Release	8/5/15	MA	

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	93-4820	Assy, Dockside, 250 - 700 GPD PV
2	1	93-5369	Kit, Installation, Modular, DTS+Auto
3	1	93-5310	Assy, DTS+, Auto
4	1	93-5371	Carbon Inlet Filter, DTS+

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8/5/2015

PREPARED BY

mmk

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SIZE

DRAWING NUMBER

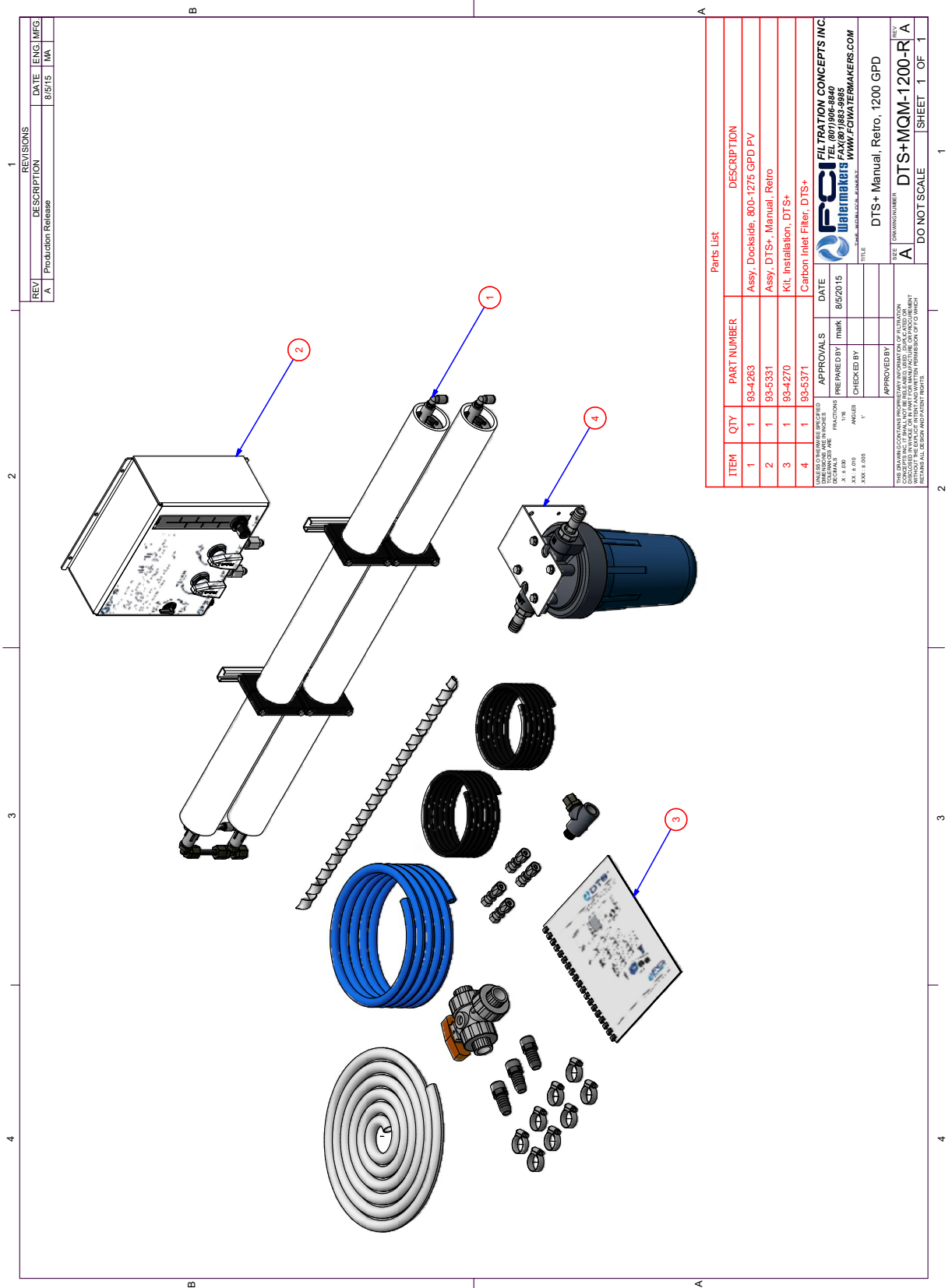
DO NOT SCALE

SHEET 1 OF 1

FCI WATERMAKERS, INC.

Parts | 103

ILLUSTRATED PARTS / DTS+SERIES (continued)



ILLUSTRATED PARTS / DTS+SERIES (continued)

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REV		DESCRIPTION		DATE		ENG		MFG	
A		Production Release		8/5/15		MA			

ITEM		QTY		PART NUMBER		DESCRIPTION	
1		1		93-4263		Assy, Dockside, 800-1275 GPD PV	
2		1		93-5305		Assy, DTS+, Manual	
3		1		93-4270		KIT, Installation, DTS+	
4		1		93-5371		Carbon Inlet Filter, DTS+	

APPROVALS		DATE	
PREPARED BY	mmk	8/5/2015	
CHECKED BY			
APPROVED BY			

FCI

FILTRATION CONCEPTS INC.

Watermakers

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FAX 801.983.3988

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SIZE

DRAWING NUMBER

DO NOT SCALE

SHEET 1 OF 1

REC

A

ILLUSTRATED PARTS / DTS+SERIES (continued)

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REV		DESCRIPTION		DATE		ENG		MFG	
A	1	Production Release		8/5/15		MA			

ITEM		QTY		PART NUMBER		DESCRIPTION	
1	1	1		93-4263		Assy, Dockside, 800-1275 GPD PV	
2	1	1		93-5369		Kit, Installation, Modular, DTS+Auto	
3	1	1		93-5310		Assy, DTS+, Auto	
4	1	1		93-5371		Carbon Inlet Filter, DTS+	

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DATE

8/5/2015

PREPARED BY

Mark

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SIZE

DRAWING NUMBER

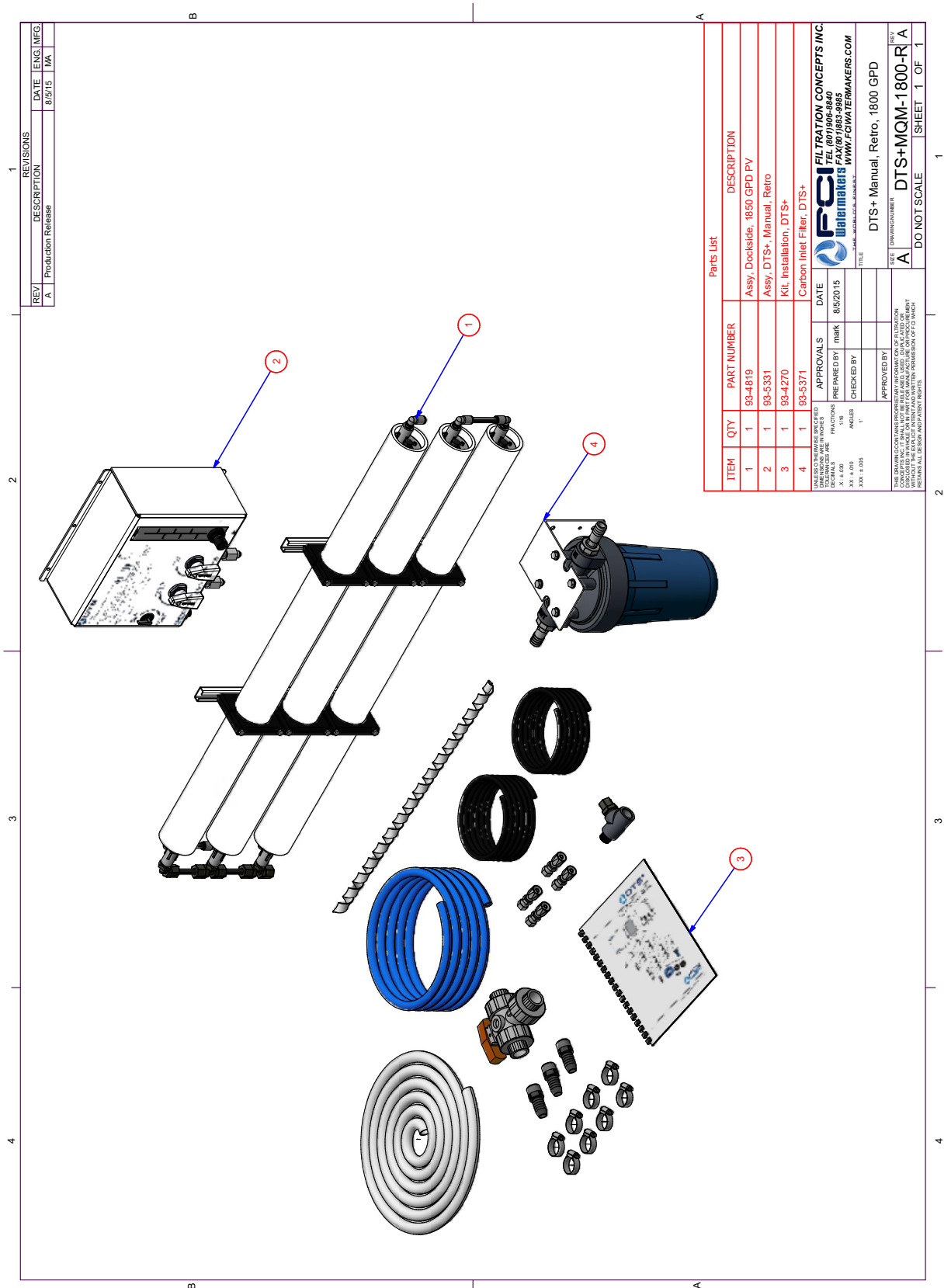
DO NOT SCALE

SHEET 1 OF 1

DTS+Auto, 1275 GPD

DTS+MQM-1275-A

ILLUSTRATED PARTS / DTS+SERIES (continued)



ILLUSTRATED PARTS / DTS+SERIES (continued)

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A

REV	DESCRIPTION	DATE	ENG	MFG
A	Production Release	8/5/15	MA	

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	93-4819	Assy, Dockside, 1850 GPD PV
2	1	93-5305	Assy, DTS+, Manual
3	1	93-4270	Kit, Installation, DTS+
4	1	93-5371	Carbon Inlet Filter, DTS+

DATE

8/5/2015

APPROVED BY

THINK

PREPARED BY

THINK

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DO NOT SCALE

SHEET 1 OF 1

ILLUSTRATED PARTS / DTS+SERIES (continued)

1

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B

A

REV		DESCRIPTION		DATE		ENG. MFG.	
A	1	Production Release		8/5/15	IMA		

ITEM		QTY		PART NUMBER		DESCRIPTION	
1	1	93-4819					Assy, Dockside, 1850 GPD PV
2	1	93-5369					Kit, Installation, Modular, DTS+Auto
3	1	93-5310					Assy, DTS+, Auto
4	1	93-5371					Carbon Inlet Filter, DTS+

FCI

FILTRATION CONCEPTS INC.

Watermakers

WWW.FCIWATERMAKERS.COM

DATE

8/5/2015

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REV

A

DRAWING NUMBER

DTS+MQM-1850-A

DO NOT SCALE

SHEET 1 OF 1

ILLUSTRATED PARTS / CARBON INLET FILTER

1

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B

A

REV

DESCRIPTION

DATE

ENG

MFG

A

Production Release

7/31/15

TMA

6 (4x)

7 (4x)

6

1

2

5

4

3

9

1

9

6

1

2

5

4

3

9

1

9

ITEM

QTY

PART NUMBER

DESCRIPTION

1

2

70-1982

Bushing PVC 1"x1/2" x 1"

2

1

21-0027-1op

Housing JB 4"x10" x 1"

3

1

21-0027-housing

Housing JB 4"x10" x 1"

4

1

23-0039

O-ring, housing BB 4x10

5

1

20-0026

Filler GAC Fresh water flush 4.5 x 10"

6

1

22-0035

Bracket JB SS

7

4

67-0007

Washer Flat 5/16

8

4

67-3246

Lag Bolt 5/16" x 1-1/2"

9

2

70-2206

Adaptor PVC 1/2" MIP x 3/4" HB sch80

APPROVALS

DATE

PREPARED BY

7/31/2015

CHECKED BY

APPROVED BY

FCI WATERMAKERS, INC.

10000 W. 10TH AVE. SUITE 100

MINNEAPOLIS, MN 55428

TEL (800) 906-8840

FAX (800) 906-8840

WWW.FCIWATERMAKERS.COM

Carbon Inlet Filter, DTS+

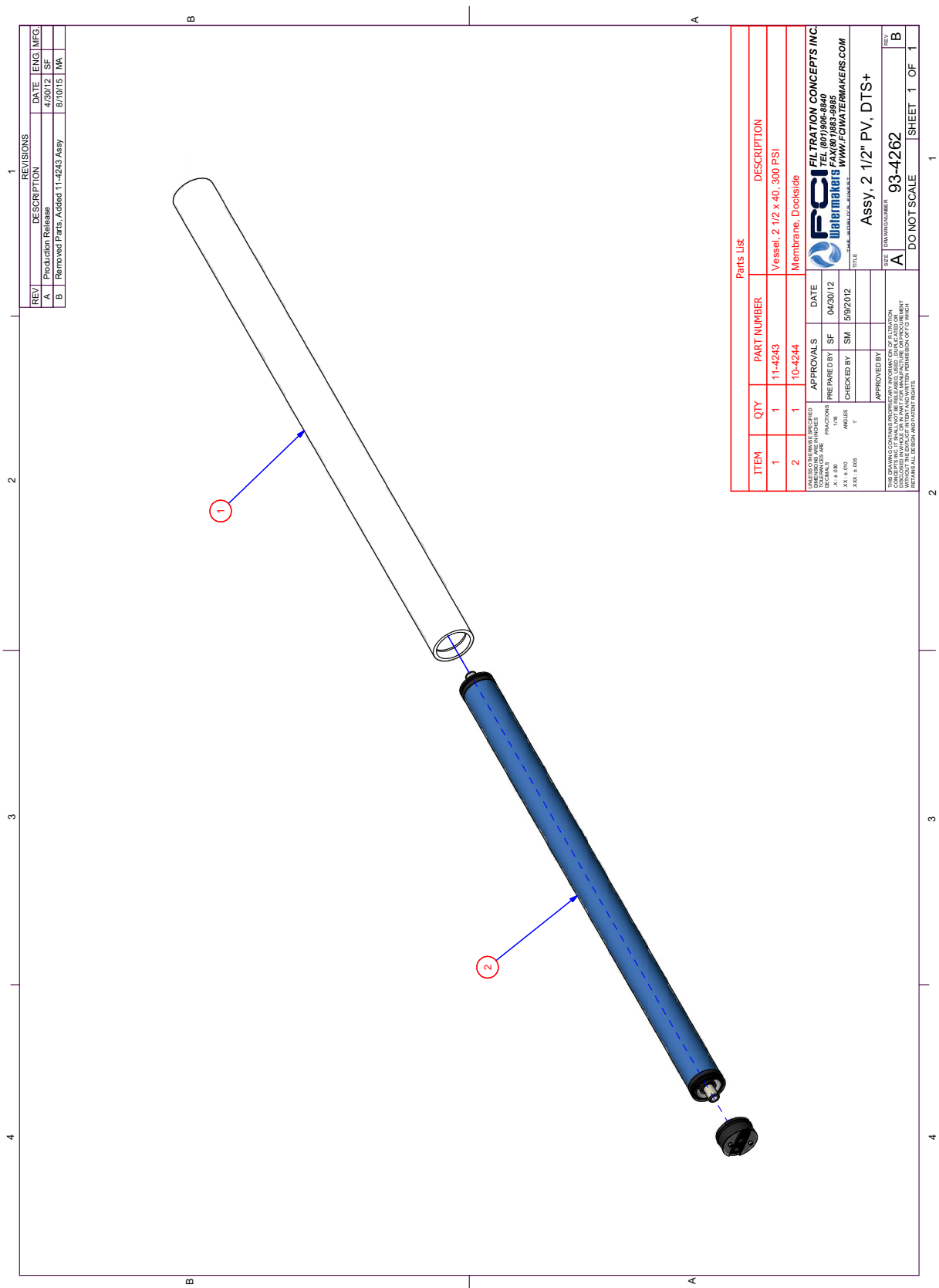
93-5371

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ILLUSTRATED PARTS / PRESSURE VESSEL



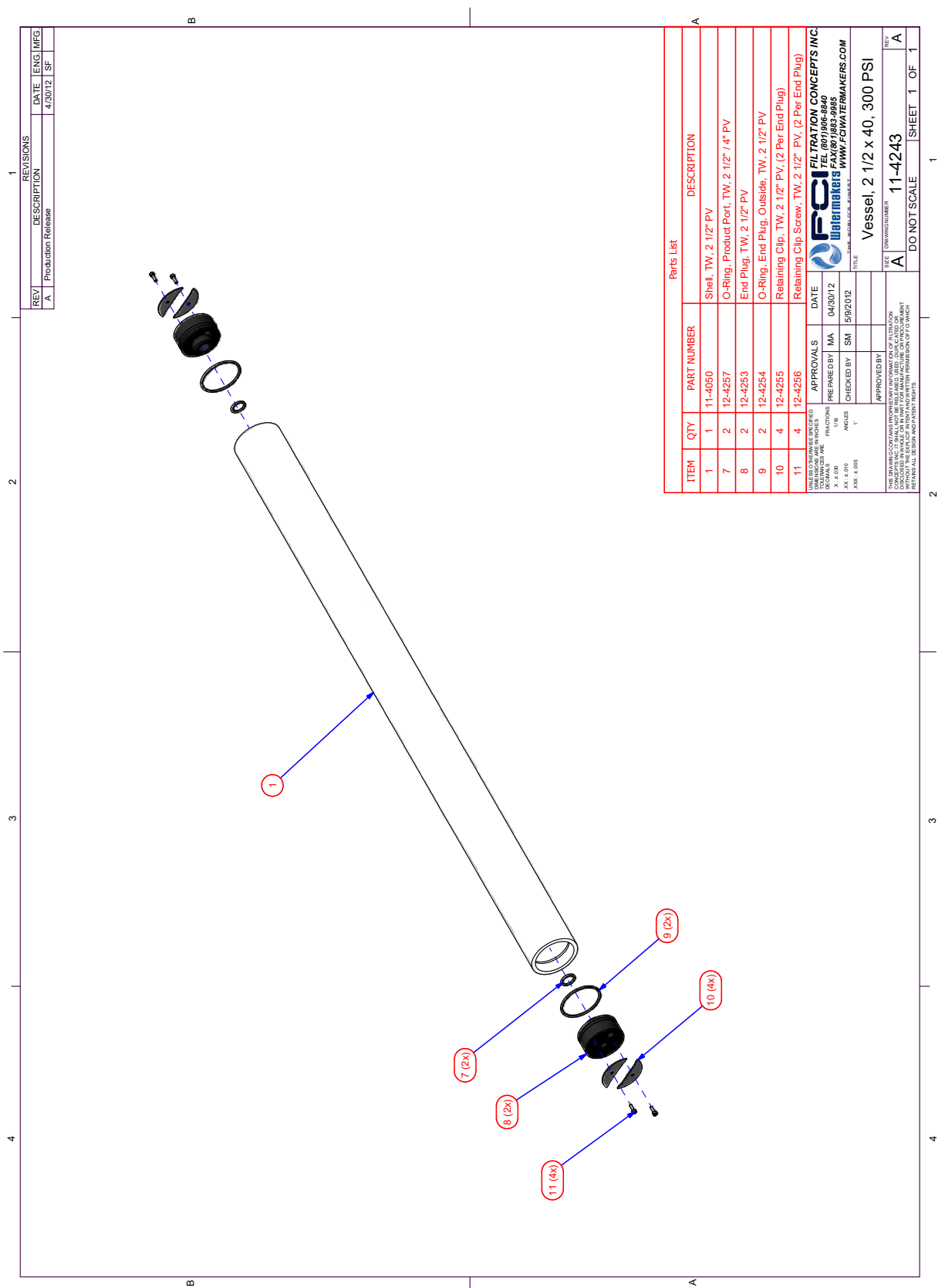
REVISIONS			
REV	DESCRIPTION	DATE	ENG. MFG.
A	Production Release	4/30/12	SF
B	Removed Parts / Added 11-4243 Assy	8/10/15	MA

Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	11-4243	Vessel, 2 1/2 x 40, 300 PSI
2	1	10-4244	Membrane, Dockside

APPROVALS		DATE
PREPARED BY	SF	04/30/12
CHECKED BY	SM	5/9/2012
APPROVED BY		

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Filtration Concepts, Inc. 10000 W. 10th Ave. Suite 100 Denver, CO 80202 TEL: (801) 906-3840 FAX: (801) 983-3983 WWW.FCIWATERMAKERS.COM	
TITLE: 2 1/2" PV, DTS+	
DRAWING NUMBER: 93-4262	
DO NOT SCALE	
SHEET 1 OF 1	

ILLUSTRATED PARTS / PRESSURE VESSEL (continued)



REVISIONS		DATE	ENG.	MFG.
REV	DESCRIPTION			
A	Production Release	4/30/12	SF	

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	11-4050	Shell, TW, 2 1/2" PV
7	2	12-4257	O-Ring, Product Port, TW, 2 1/2" / 4" PV
8	2	12-4253	End Plug, TW, 2 1/2" PV
9	2	12-4254	O-Ring, End Plug, Outside, TW, 2 1/2" PV
10	4	12-4255	Retaining Clip, TW, 2 1/2" PV, (2 Per End Plug)
11	4	12-4256	Retaining Clip Screw, TW, 2 1/2" PV, (2 Per End Plug)

APPROVALS		DATE
PREPARED BY	MA	04/30/12
CHECKED BY	SM	5/9/2012
APPROVED BY		

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	A	11-4243

DO NOT SCALE		SHEET 1 OF 1
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Parts | 114



ILLUSTRATED PARTS / PRESSURE VESSEL (continued)

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REV	DESCRIPTION	DATE	ENG	MFG
A	Production Release	4/14/14	MA	
B	Replaced, High Pressure Fittings	3/16/15	MA	
C	Replaced Part # 70-4280 w/Part # 70-2433	9/22/16	MA	

ITEM	QTY	PART NUMBER	DESCRIPTION
1	3	93-4262	Assy, 2 1/2" PV, DTS*
2	12	12-4258	Clamp, TW PV, Mounting
3	3	70-2270	1/4 NPT, male plug
4	1	74-0453	Elbow, PE, Black 3/8" MPT x 3/8" Tube
5	2	74-0464	Tee, PE, Black 1/4 MPT x 3/8" Tube x 3/8 T"
6	9	70-0353	Coupling, 1/4" T x T, PVC
7	2	74-0473-385	Tubing, PE 3/8 Polyethylene
8	12	67-0009	Washer, Flat, 1/4"
9	12	67-3786	Hex Head Cap Screw, 1/4-20 x 4" SS
10	2	74-4261-2,900	Tubing, 3/8" OD x .062 wall, 250 PSI
11	12	77-3582a	Nut/Vibration Damping Clamps
12	2	77-3576-16	Mounting Rail, PV, 2 1/2 x 40
13	6	72-5227	Nipple, 1/4", 316SS
14	6	71-5226	Elbow, 1/4" NPT x 3/8" Tube, Swivel
15	3	70-2433	Nipple/PVC 1/4" x 2" sch 80

APPROVALS

DATE

PREPARED BY

MA

CHECKED BY

SM

APPROVED BY

DATE

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93-4819

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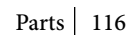
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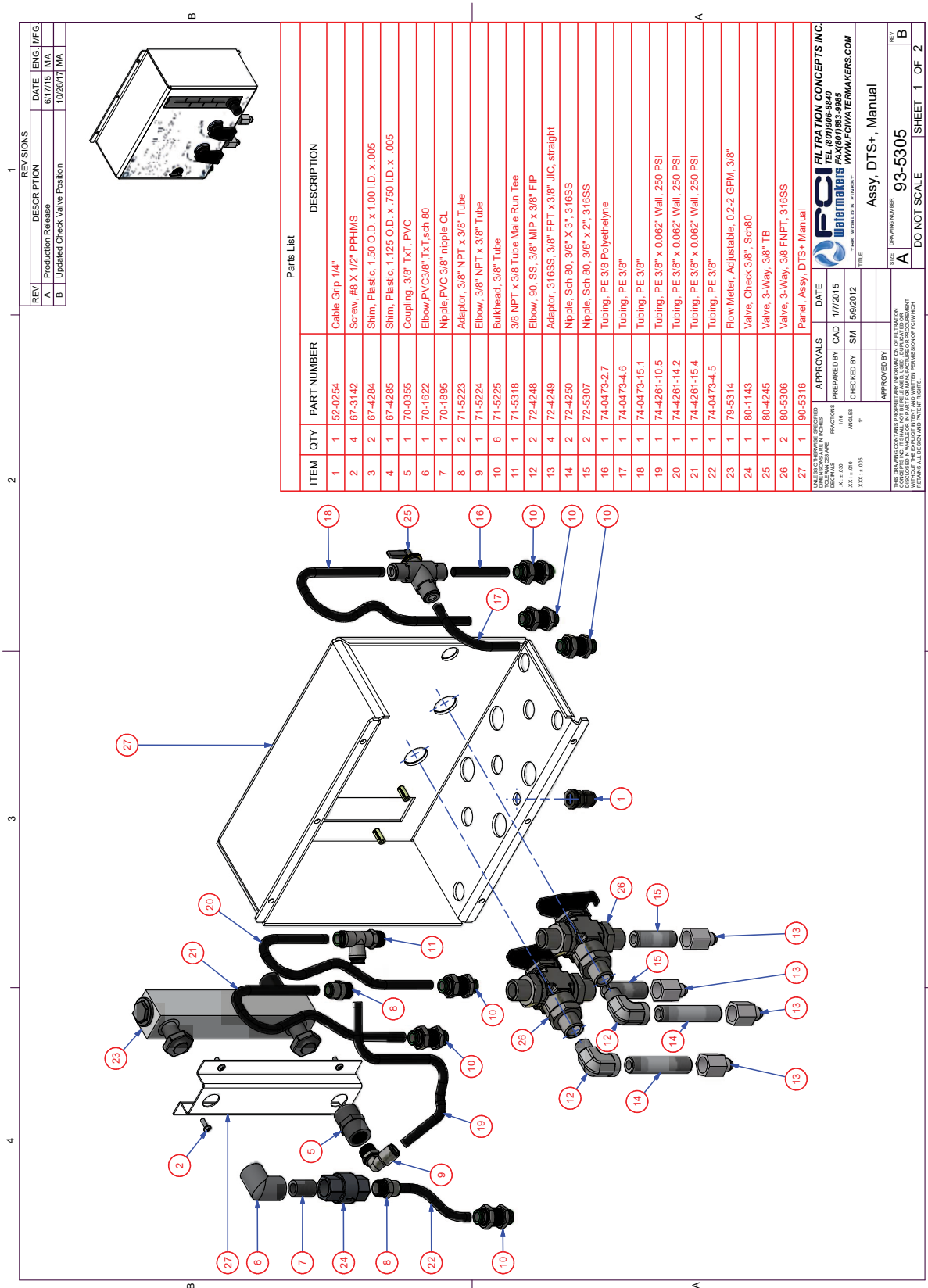
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FCI WATERMAKERS, INC.



FCI WATERMAKERS, INC.



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REV	DESCRIPTION	DATE	ENG	MFG
A	Production Release	5/26/15	MA	
B	Replaced Part # 74-0453 w/Part # 74-0452	10/26/17	MA	

PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	3	67-0008	Screw, 1/4-20 x 3/4", HHC
2	3	67-0009	Washer, Flat, 1/4"
3	3	67-0011	Washer, Spring Lock, 1/4"
4	4	67-0018	Screw, #8 x 1/2, PPH, SMS
5	4	67-2701	Washer, Nylon, #6
6	4	67-3142	Screw, #8 x 1/2", PPHMS
7	1	70-0355	Coupling, 3/8" T x T, PVC
8	1	71-5223	Adaptor, 3/8" NPT x 3/8" Tube
9	2	71-5224	Elbow, 3/8" NPT x 3/8" Tube
10	6	71-5225	Bulkhead, 3/8" Tube
11	1	71-5318	3/8" NPT x 3/8" Tube Male Run Tee
12	2	72-4248	Elbow, 90, SS, 3/8" MIP x 3/8" FIP
13	4	72-4249	Adaptor, 316SS, 3/8" FPT x 3/8" JIC, straight
14	2	72-4250	Nipple, Sch 80, 3/8" x 3", 316SS
15	2	72-5307	Nipple, Sch 80, 3/8" x 2", 316SS
16	3	74-0452	Elbow, PE, Black 1/4" MPT x 3/8" Tube
17	1	74-0473-8.2	Tubing, PE 3/8"
18	2	74-0473-8.7	Tubing, PE 3/8"
19	1	74-4261-14.0	Tubing, PE 3/8" x 0.062" Wall, 250 PSI
20	1	74-4261-14.5	Tubing, PE 3/8" x 0.062" Wall, 250 PSI
21	1	74-4261-6.6	Tubing, PE 3/8" x 0.062" Wall, 250 PSI
22	1	74-4261-7.4	Tubing, PE 3/8" x 0.062" Wall, 250 PSI
23	1	79-5314	Flow Meter, Adjustable, 0.2-2 GPM, 3/8"
24	1	80-1143	Valve, Check 3/8", Sch80
25	2	80-5306	Valve, 3-Way, 3/8" FNPT, 316SS
26	1	84-0580	Plug, Solenoid
27	1	84-4835	Solenoid, 3-Way, 24VDC, 1/4" FPT
28	2	85-5339	Valve, 3-Way Auto
29	1	90-5317	Panel, Assy, DTS+ Auto
30	1	93-5319	Assy, Enclosure, DTS+
31	1	93-5320	Assy, Control, 1PH50-60Hz, 6x8, DTS+Auto

APPROVALS		DATE
DESIGNED BY	MA	17/2015
PREPARED BY	MA	
CHECKED BY		
APPROVED BY		

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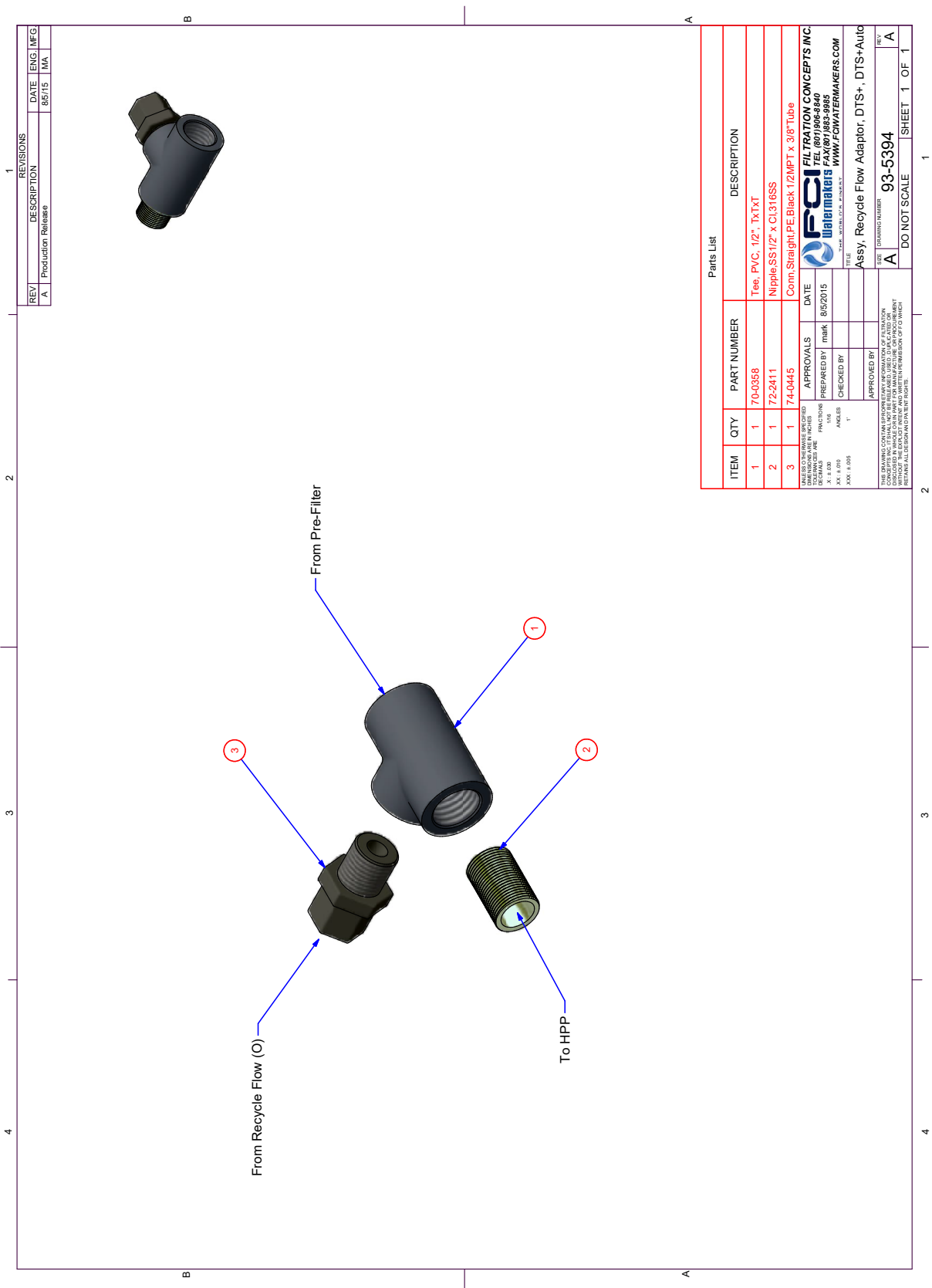
Assy, DTS+, Auto

93-5310

DO NOT SCALE

SHEET 1 OF 2

ILLUSTRATED PARTS / RECYCLE FLOW ADAPTER



REVISIONS		DATE	ENG	MFG
REV	DESCRIPTION			
A	Production Release	8/5/15	MA	

Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	70-0358	Tee, PVC, 1/2", T x T x T
2	1	72-2411	Nipple, SS 1/2" x CI 316SS
3	1	74-0445	Cap, Straight PE, Black 1/2 MPT x 3/8" Tube

DATE		8/5/2015
PREPARED BY	mmk	
CHECKED BY		
APPROVED BY		

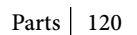
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X.Y: 8.000		1/8"
X.Z: 8.000		1/8"

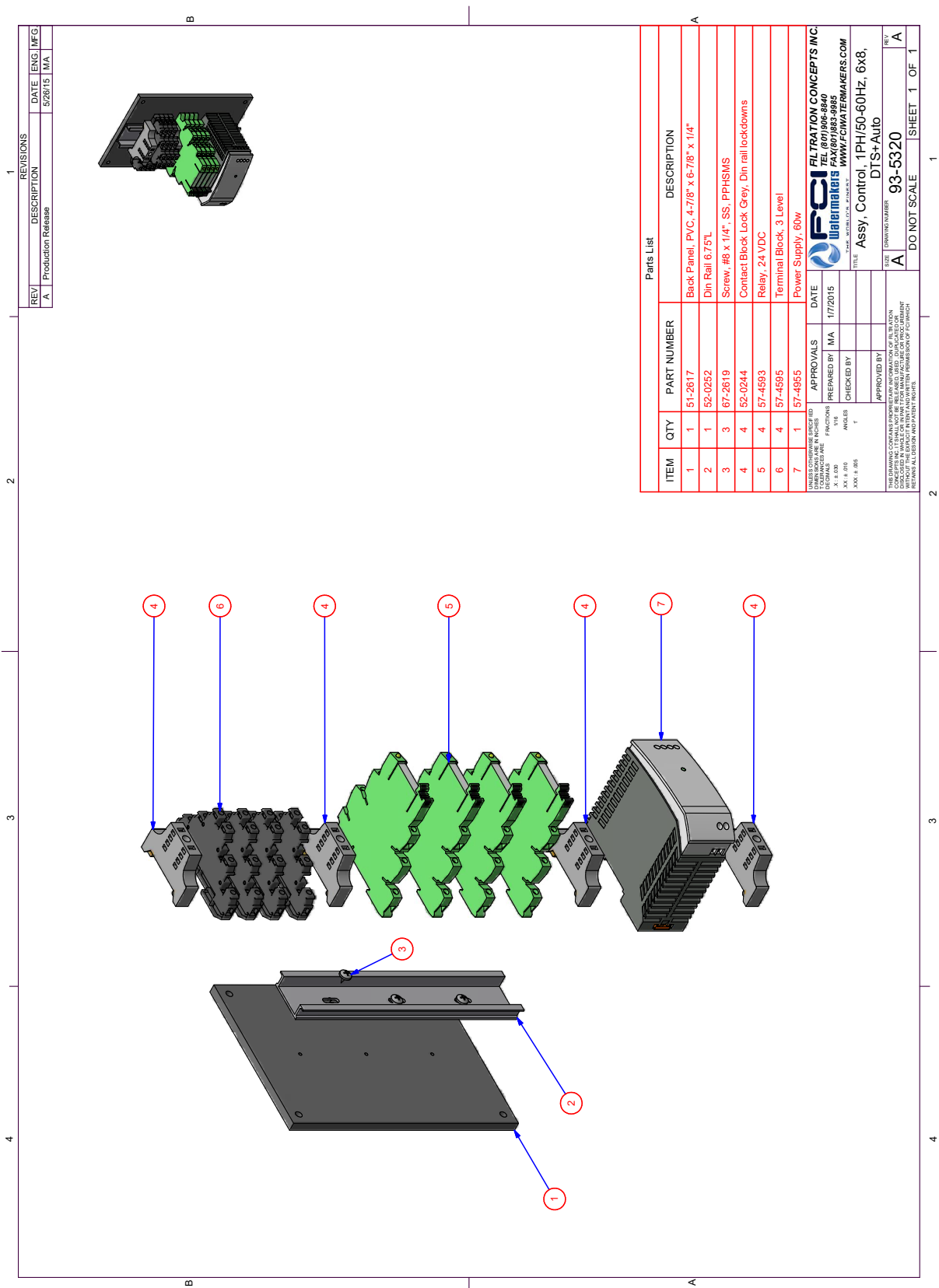
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SHEET 1 OF 1	

FCI WATERMAKERS, INC.





7/ REVISION HISTORY

REVISION HISTORY

Revision	Date	Description
A	09/11/2015	Initial release.
B	01/05/2016	Figure of DTS ^{+RETRO} electrical connections to Aquamiser+ updated to show switch spliced into red wire of existing switch.
C	12/12/2016	Illustrations, wiring and PN for 3-way actuated valve updated. Illustrated Parts for PV assemblies updated. Plumbing illustrations callouts for HP Tube J corrected to HP Hose J.
D	04/15/2018	Nut (72-4280) removed from Install Kits with Conversion. Illustrated Parts 93-5305, 93-5310, and 93-5331 updated. Illustrated Parts for Models DTS+MQF updated.
E	06/13/2021	Logos updated.
F	06/04/2023	Warranty updated.



Document Part Number: 97-4673 Revision F

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