ENGINEERING YOUR SUCCESS.

Parker Sea Recovery

AQUA MATIC DUAL PASS

Owner's Manual

REVISION HISTORY

REVISION	DESCRIPTION	DATE	AUTHOR
-	Initial Release	February 2, 2018	S. Lentz
A	Updated Diagrams, Added Schematics, Page numbering, Table of contents and Various minor updates.	JAN, 2023	O.Madie
B	Updated chapter 6	January 2024	James D.

Contents

Purpose
This manual is intended for Parker's system technicians, technical support and training personnel. It contains technical information and instructions for the installation, operation, maintenance and troubleshooting of the Aqua Matic Dual Pass RO Desalination System. Parker's RO desalination systems are designed and engineered to function as complete working units. If installation, operation and maintenance instructions are not followed correctly, the system might cascade in failure. Thus, the intent of this manual is to familiarize you, or other installer(s) and/or operator(s) with each system component. With a core understanding of the function, importance and normal operation of each subsystem component, you will be equipped to diagnose minor problems, which, if detected early on, are typically correctable. Note that if a minor component problem is left uncorrected, it can affect the rest of the system and lead to more extensive issues and/or damage.

Important: Parker encourages you to read the Aqua Matic Dual Pass RO Desalination System manual thoroughly before attempting installation or operation, as well as to keep the manual for future reference. By gaining a better understanding of your system, you will be equipped with the knowledge to achieve optimum performance and a longer service life.

References
All references in this manual refer to sections within this manual, unless otherwise specified.

Graphics
Graphics used in this manual are for reference and illustration purposes only, and may not represent the actual part or arrangement of parts in a customized system.

Notice of Liability
The information contained in the manual is distributed on an "as is" basis, without warranty. While every effort has been taken in the preparation of this manual, Parker shall not be held liable with respect to any liability, loss or damage caused by the instructions contained in this manual. The information contained in this manual is subject to change without notice.

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operating, maintaining and repairing the Aqua Matic Dual Pass RO Desalination System. Any other use, including the reproduction, modification, distribution, transmission, republication, display or performance, of the content within this manual is strictly prohibited.

Chapter 1

INTRODUCTION

Parts Warning
The major documented cause of failures and problems are from the use of third-party, non-Parker parts; improper installation; and improper operation. **Do not use parts, components from any source other than Parker!** The use of third-party, non-Parker parts is *strongly discouraged* and will result in the following consequences:

• The use of third-party, non-Parker components, spares and assemblies will damage the RO System and/or specific components within the System.

• The use of third-party, non-Parker components, spares and assemblies will void any warranty of the System and/or void the affected component within the System.

Important: Parker maintains inventory for immediate shipment and our Service Dealers throughout the world maintain stock of Parker parts. Always insist on Parker supplied parts to avoid failures, eliminate problems, and maintain your warranty.

Product Changes
Parker reserves the right to make changes or improvements in its product, during subsequent production, without incurring the obligation to incorporate such changes or improvements on previously manufactured equipment.

Registration
Parker recommends that all customers register their System immediately after delivery to ensure and guarantee product technical support and warranty.

TEMPERATURE AND PRESSURE EFFECTS

Parker ®
TEMPERATURE EFFECT COMPARISON CHART
(At 820 psi and 35,000 ppm feed water TDS conditions)

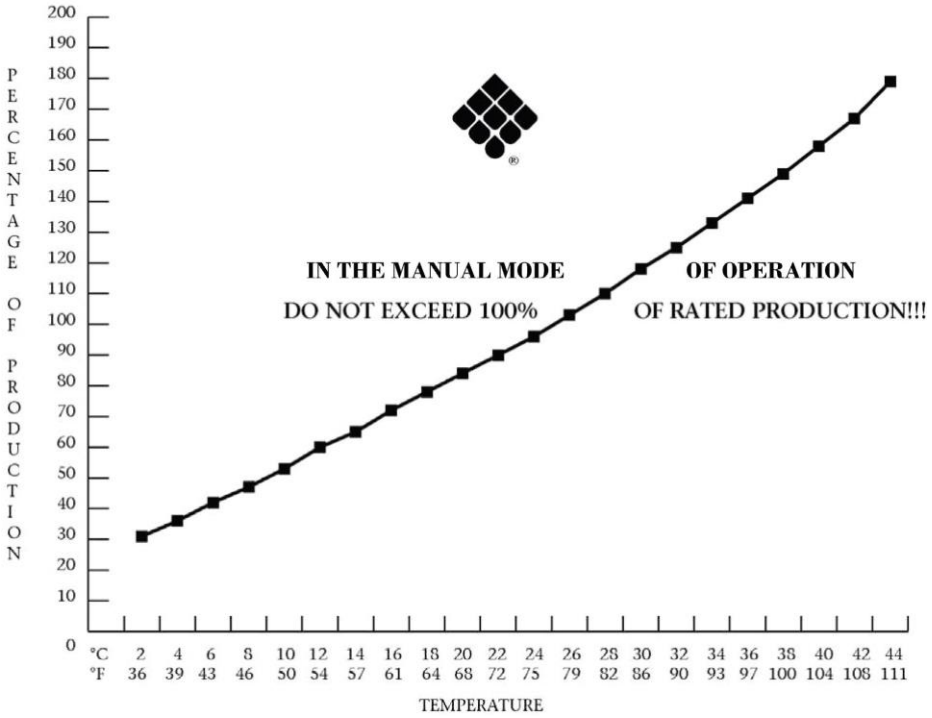
The Temperature Effect Charts (Figures 1.0 and 1.1) illustrate the loss or gain of productivity across the R.O. Membrane.

To determine what normal (in spec.) flow of the system is at 77º F (25º C), follow these directions:

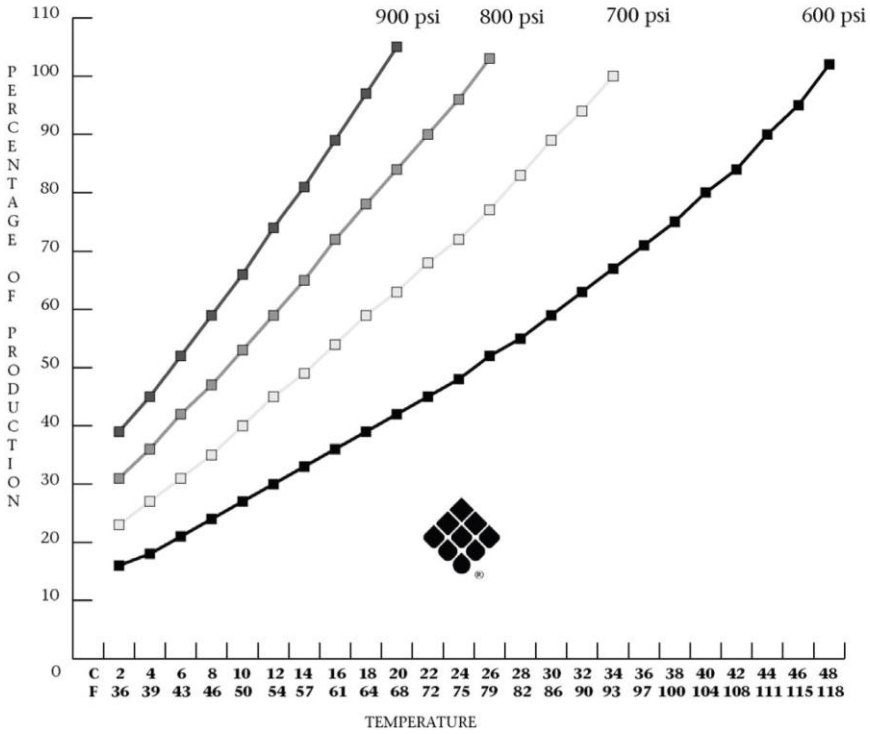
1. Determine feed temperature.
2. Locate the corresponding temperature on the chart.
3. Follow the corresponding temperature in a vertical line up to the plotted production line.
4. From this temperature point at the production line, move left horizontally to the plotted productivity percent.
5. Calculate the system's present productivity in U.S. gallons per day by multiplying the gallon per hour product water flow meter reading by 24.
6. Divide the figure reached in Step 5 above, present gallon per day productivity, by the plotted productivity percentage from Step 4 above. The answer will be equivalent to the membranes present productivity at specification test parameters, 820 psi & 77º F (25º C).

Example: With the system operating at 820 psi (57 bar).

1. Present Feed Temperature is 61º F (16º C).
2. Plotted Productivity is therefore 72% of normal.
3. The System is a 14,530 gallon per day model and it is presently producing 9,000 gallons per day.
4. 9,000 per day divided by .72 equals 12,500 gallons per day calculated productivity.
5. The system is rated at 14,530 gallons per day ± 15% (12,350 to 16,709 gallons per day). Therefore, the system is within specifications at 12,500 gallons per day actual productivity at 61º F (16º C), 820 psi (57 bar), and 35,000 ppm feed.



Temperature Effect Comparison Chart
(Do not use this chart for brackish water systems & applications)



Temperature Effect Comparison Chart (Variable PSI)

As the seawater temperature increases, the Parker system pressure must be adjusted so that the system achieves no greater than 100% of rated product water flow. Product water flow greater than 100% of rated capacity causes premature fouling of the R.O. Membrane Element and leads to more frequent required cleaning.

DO NOT EXCEED 100% OF RATED PRODUCTION!!!

SAFETY

Parties responsible for the installation, operation, and maintenance of the Aqua Matic Dual Pass RO Desalination System must read this manual thoroughly and always comply with the instructions and safety requirements.

Disposal
If System disposal is necessary, you must comply with all federal and state environmental regulations.

CHEMICAL WARNINGS

Parker Storage Chemical

WARNING! CONTAINS SODIUM METABISULFITE. HARMFUL IF SWALLOWED, AVOID BREATHING DUST & FUMES. CAUSES IRRITATION TO EYES & MUCOUS MEMBRANES. DO NOT TAKE INTERNALLY. KEEP AWAY FROM FOOD.

FIRST AID: IF SWALLOWED, CALL A PHYSICIAN, GIVE TAP WATER & INDUCE VOMITING. IN CASE OF CONTACT IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES & GET IMMEDIATE MEDICAL ATTENTION. THOROUGHLY WASH AFFECTED SKIN AFTER HANDLING PRODUCT.

MEDICAL PERSONNEL FAMILIAR WITH PARKER'S SYSTEM & MEMBRANE STORAGE CHEMICAL, ARE AVAILABLE 24 HOURS A DAY, 7 DAYS A WEEK
U.S.A. TOLL FREE MEDICAL EMERGENCY NUMBER: 1-800-228-5635.

FOR INDUSTRIAL USE ONLY.

Use with adequate ventilation. Prevent breathing dust and prevent contact with eyes. Thoroughly wash contacted parts after handling. Do not allow powder to become wetted with small amounts of water. Adding small amounts of water to power may liberate irritating sulfur dioxide gas. Do not mix with other chemicals or cleaners. If spilled, sweep up as much as possible then flush with water to drain.

KEEP OUT OF REACH OF CHILDREN

NET CONTENTS 1.5 POUNDS (.68 Kg)

Parker MCC-1 Membrane Cleaning Chemical

WARNING! CONTAINS SODIUM METASILICATE. HARMFUL IF SWALLOWED. MAY CAUSE BURNS. AVOID CONTACT WITH EYES. AVOID PROLONGED CONTACT WITH SKIN. DO NOT TAKE INTERNALLY. KEEP AWAY FROM FOOD.

FIRST AID: IF SWALLOWED, CALL A PHYSICIAN, DO NOT INDUCE VOMITING, GIVE ONE GLASS OF TAP WATER OR MILK. IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES & GET IMMEDIATE MEDICAL ATTENTION. THOROUGHLY WASH AFFECTED SKIN AFTER HANDLING PRODUCT. CONTACT A PHYSICIAN IF IRRITATION PERSISTS.

MEDICAL PERSONNEL FAMILIAR WITH Parker "MCC1", R.O. MEMBRANE ELEMENT - ALKALINE DETERGENT CLEANING CHEMICAL ARE AVAILABLE 24 HOURS A DAY, 7 DAYS A WEEK
U.S.A. TOLL FREE MEDICAL EMERGENCY NUMBER: 1-800-228-5635

FOR INDUSTRIAL USE ONLY.

Use with adequate ventilation. Prevent breathing dust & prevent contact with eyes. Thoroughly wash contacted parts after handling. Do not allow powder to become wetted with small amounts of water. Do not mix with other chemicals or cleaners. If spilled, sweep up as much as possible then flush with water to drain.

KEEP OUT OF REACH OF CHILDREN

NET CONTENTS 1.5 POUNDS (.68 Kg)

Parker MCC-2 Membrane Cleaning Chemical

WARNING! CONTAINS SULFAMIC ACID. CAUSES BURNS, EYE & SKIN IRRITATION. HARMFUL IF SWALLOWED. AVOID BREATHING DUST. DO NOT TAKE INTERNALLY. KEEP AWAY FROM FOOD.

FIRST AID: IF SWALLOWED, CALL A PHYSICIAN, DO NOT INDUCE VOMITING, GIVE ONE GLASS OF TAP WATER OR MILK. IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES & GET IMMEDIATE MEDICAL ATTENTION. THOROUGHLY WASH AFFECTED SKIN AFTER HANDLING PRODUCT. CONTACT A PHYSICIAN IF IRRITATION PERSISTS.

MEDICAL PERSONNEL FAMILIAR WITH Parker “MCC2”, R.O. MEMBRANE ELEMENT - ACID CLEANING CHEMICAL, ARE AVAILABLE 24 HOURS A DAY, 7 DAYS A WEEK
U.S.A. TOLL FREE MEDICAL EMERGENCY NUMBER: 1-800-228-5635

FOR INDUSTRIAL USE ONLY.

DO NOT MIX WITH CHLORINATED SOLUTIONS OR COMPOUNDS. Use with adequate ventilation. Prevent breathing dust & prevent contact with eyes. Thoroughly wash contacted parts after handling. Do not allow powder to become wetted with small amounts of water. Do not mix with other chemicals or cleaners. If spilled, sweep up as much as possible then flush with water to drain.

KEEP OUT OF REACH OF CHILDREN

NET CONTENTS 1.5 POUNDS (.68 Kg)

Parker MCC-3 Membrane Cleaning Chemical

WARNING! CONTAINS SODIUM METABISULFITE. HARMFUL IF SWALLOWED. AVOID BREATHING DUST AND FUMES. CAUSES IRRITATION TO EYES AND MUCOUS MEMBRANES. DO NOT TAKE INTERNALLY. KEEP AWAY FROM FOOD.

FIRST AID: IF SWALLOWED, CALL A PHYSICIAN, DO NOT INDUCE VOMITING, GIVE ONE GLASS OF TAP WATER OR MILK. IN CASE OF CONTACT IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES & GET IMMEDIATE MEDICAL ATTENTION. THOROUGHLY WASH AFFECTED SKIN AFTER HANDLING PRODUCT. CONTACT A PHYSICIAN IF IRRITATION PERSISTS.

MEDICAL PERSONNEL FAMILIAR WITH Parker “MCC2”, R.O. MEMBRANE ELEMENT - ACID CLEANING CHEMICAL, ARE AVAILABLE 24 HOURS A DAY, 7 DAYS A WEEK
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KEEP OUT OF REACH OF CHILDREN

NET CONTENTS 1.5 POUNDS (.68 Kg)

Patent Information
Certain aspects of the Aqua Matic Dual Pass RO Desalination System are protected by U.S. and International Patent Laws.

Chapter 2

SYSTEM SPECIFICATIONS

PERFORMANCE

PRODUCT WATER PRODUCED PER HOUR AND PER DAY OF OPERATION:

(1st Pass is based on ±20% @ 850 psig / 58 BAR, 77°F / 25°C and 35,000 PPM TDS Feed Water Salinity)
(2nd Pass is based on ±20% @ 80 psig / 5.5 BAR, 77°F / 25° and 500 PPM TDS Dock Feed Water Salinity)

Model Number	per 1 hour of operation:	per 24 hours of operation:
SRC Aqua Matic Dual Pass 1800/1400/900	75 U.S. Gallons - 284 liters 58.3 U.S. Gallons – 221 liters 37.5 Gallons – 142 liters	1800 U.S. Gallons - 6814 liters 1400 U.S. Gallons - 5300 liters 900 U.S. Gallons - 3407 liters
SRC Aqua Matic Dual Pass 2600/2200/1700	108.3 U.S. Gallons - 410 liters 91.6 U.S. Gallons – 347 liters 70.8 Gallons – 268 liters	2600 U.S. Gallons - 9843.6 liters 2200 U.S. Gallons - 8328 liters 1700 U.S. Gallons - 6435 liters
SRC Aqua Matic Dual Pass 3400/2900/2400	141.7 U.S. Gallons - 536 liters 95.8 U.S. Gallons - 362.8 liters 100 Gallons – 378.5 liters	3400 U.S. Gallons - 12872 liters 2900 U.S. Gallons - 10978 liters 2400 U.S. Gallons - 9085 liters

SALT REJECTION (CHLORIDE ION): Minimum 99.2 %, Average 99.4%

PRODUCT WATER TEMPERATURE: Ambient to feed water temperature.

SALINITY MONITORING: Automatic computer controlled electronic monitoring. Temperature compensated with the Water Quality Indicator. The salinity monitoring components of the system give a continuous readout in micromhos per cubic centimeter, are temperature compensated and of a fail-safe design.

SALINITY RANGE OF FEED WATER:

Seawater up to 50,000 PPM TDS (NaCl) (typical seawater salinity is 35,000 PPM)

TEMPERATURE RANGE: Max. 122°F / 50°C, Min. 33°F / .5°C

1st PASS SYSTEM FEED WATER:

Model Number	Power Source Cycles (Hz)	Feed Water Flow / Minute:
SRC A400C 1800-2/1400-1	AC (50HZ)	4.8 U.S. Gallons / 18.2 liters
SRC A400C 2600-3/2200-2	AC (50HZ)	7.0 U.S. Gallons / 26.5 liters
SRC A400C 3400-4/2600-3	AC (50HZ)	7.0 U.S. Gallons / 26.5 liters
SRC A400C 1800-2/1400-1	AC (60HZ)	5.5 U.S. Gallons / 20.8 liters
SRC A400C 2600-3/2200-2	AC (60HZ)	8.0 U.S. Gallons / 30.3 liters
SRC A400C 3400-4/2600-3	AC (60HZ)	8.0 U.S. Gallons / 30.3 liters

REVERSE OSMOSIS MEMBRANE:

TYPE: Specifically selected High Rejection / High Yield aromatic tri-polyamide, thin film composite, spiral wound, single pass reverse osmosis membrane element.

CHLORINE TOLERANCE: 0.1 PPM.

pH RANGE: 3-11 (typical seawater pH is 8)

SYSTEM PRESSURE:

FEED WATER: Minimum 6 psi / .42 Kg/cm2. / 41.4 kPa	Maximum 40 psi // 2.8 Kg/cm2 / 275.8 kPa
OPERATION: Seawater @ 35,000 PPM & 77º F / 25º C	Nominal 800 psi // 56.25 Kg/cm2 / 5516 kPa

FRAME DIMENSIONS AND WEIGHT

MODEL	Weight	Length	Width	Height
SRC AQUA MATIC DUAL PASS	606 lbs. / 67 kg	37"	16"	21.5”

EXTERNAL INSTALLATION WATER CONNECTIONS:

Pipe sizes to be supplied by the installer, are for connections to the SRC Aqua Matic Dual Pass Systems.

Feed Inlet	3/4 MNPT – 3/4 BARB
Brine Discharge	1/2 MNPT – 1/2 TUBE
Product	1/2 MNPT – 1/2 TUBE

Electric Motor Specifications
Abbreviations:
• HP = Horse Power
• RPM = Revolutions Per Minute
• FLA = Full Load Amperes
• LRA = Locked Rotor Amperes at startup

CAUTION The Parker Desalination Systems are designed to be as electrically efficient as possible. RPM supplied to and Pressure created by the High-Pressure Pump governs the amount of energy required by the High-Pressure Pump's Electric Motor. To maintain a sufficient flow of feed water into the Reverse Osmosis Membrane Element, Parker utilizes several different High-Pressure Pumps with different displacement characteristics. These different High-Pressure Pumps, in turn, have different power requirements.
As such, several different Electric Motors are used in the Parker Systems. To maintain maximum operational versatility Parker SRC Aqua Matic Dual Pass Systems utilize dual Cycle (Hz) Electric Motors capable of operating from both 50 Hz and 60 Hz. In a Boat application, use caution when switching from your auxiliary AC on board generator to shore power. In many cases, due to insufficient wiring or long distances from the power source to the end of the dock, shore power from a Marina may be insufficient to operate your Parker Sea Recovery System. Low voltage to the Parker Sea Recovery System causes damage to the electric motor. Damage caused to the system due to low voltage is not covered by Warranty.

High Pressure Pump Motor and Booster Pump:

		High Pressure Pump Motor				Booster Pump Motor			
VAC	**Hz**	**H.P.**	**RPM**	**FLA**	**LRA**	**H.P.**	**RPM**	**FLA**	**LRA**
220	50	5	1450	24	72	1	2850	14.2	54
230	60	5	1450	21.8	66	1.5	2850	18.2	54

SINGLE PHASE ALTERNATING CURRENT

		High Pressure Pump Motor				Booster Pump Motor			
VAC	**Hz**	**H.P.**	**RPM**	**FLA**	**LRA**	**H.P.**	**RPM**	**FLA**	**LRA**
190	50	5	1450	16.2	49	1.5	2850	4.8	14
380	50	5	1450	8.1	27	1.5	2850	2.4	7.2
230	60	7.5	1750	19	57	2	3450	5	15
460	60	7.5	1750	9.5	29	2	3450	2.5	7.5

THREE PHASE ALTERNATING CURRENT

Recommended Circuit Breaker:

Operating Voltage	**Phase**	**Recommended Circuit Breaker (Ampere)**
220-230 VAC	1	83/73
220 VAC	3	60
380 VAC	3	30
460 VAC	3	30

CIRCUIT BREAKER - ALTERNATING CURRENT

Recommended Power Wire Size to System:

Operating Voltage	Phase	Max Load (Amperes)	Recommended Minimum Wire Size for Run Length		
			10 ft. / 3 m	**25 ft. / 8 m**	**50 ft. / 15 m**
220-230 VAC	Single	17.4	12 AWG / 4 mm^2	12 AWG / 4 mm^2	12 AWG / 4 mm^2
220-230 VAC	Three	10.4	14 AWG / 2.5 mm^2	14 AWG / 2.5 mm^2	14 AWG / 2.5 mm^2
380 VAC	Three	6.1	14 AWG / 2.5 mm^2	14 AWG / 2.5 mm^2	14 AWG / 2.5 mm^2
460 VAC	Three	5	14 AWG / 2.5 mm^2	14 AWG / 2.5 mm^2	14 AWG / 2.5 mm^2

RECOMMENDED WIRE SIZE

Chapter 3

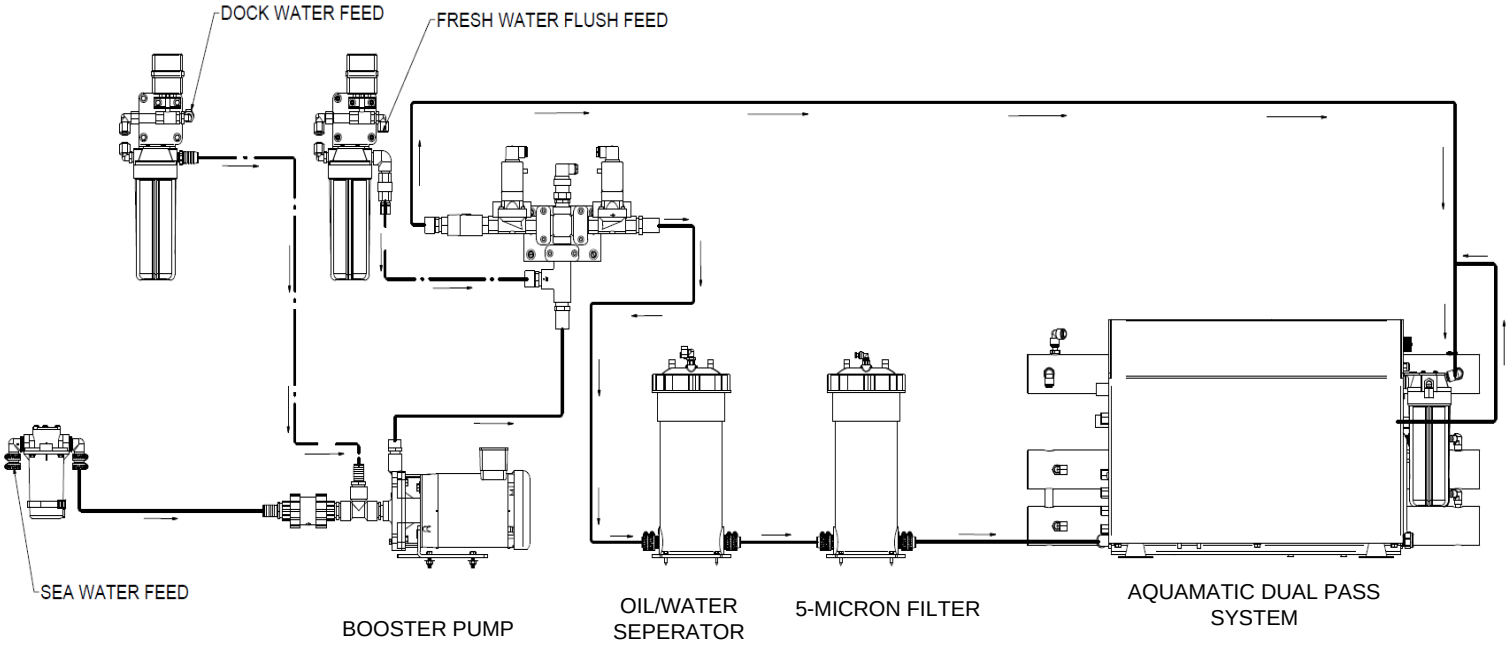
SYSTEM AND COMPONENTS DESCRIPTION

Component Descriptions

All components supplied by Parker, both standard and optional, are described in this section along with items required or desired by the installer. The location, operation, and purpose of each major component are briefly explained in this section. The descriptions in this chapter are listed per the ID numbers each component is given in the System Piping and Interconnect Diagram (P&ID).

Throughout this manual, components are followed by a number in brackets (i.e., “Sea Strainer”), which refers to the component’s location in the illustration on the P&ID (Piping and Interconnect Diagram).

System Diagram



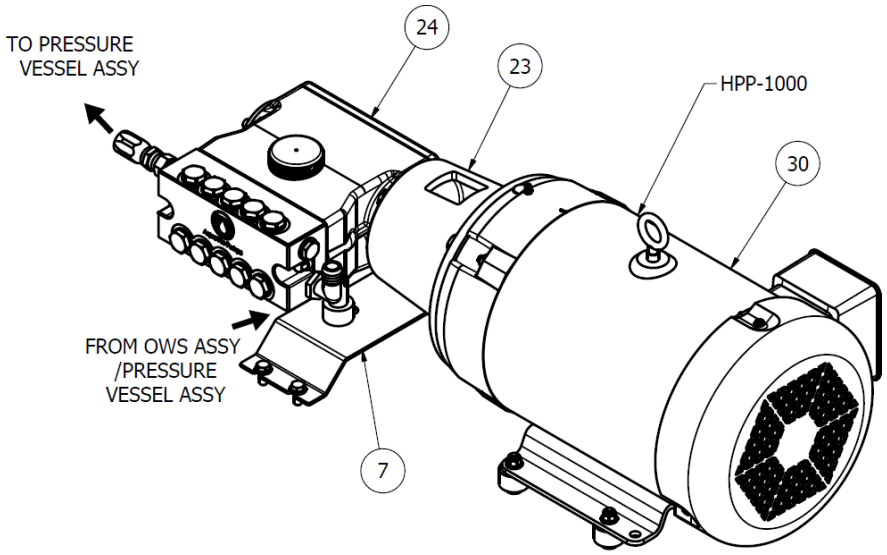
Note: Detailed Diagram is included at the end of the Manual

**** Denotes items supplied by installer**
***** Denotes optional equipment.**

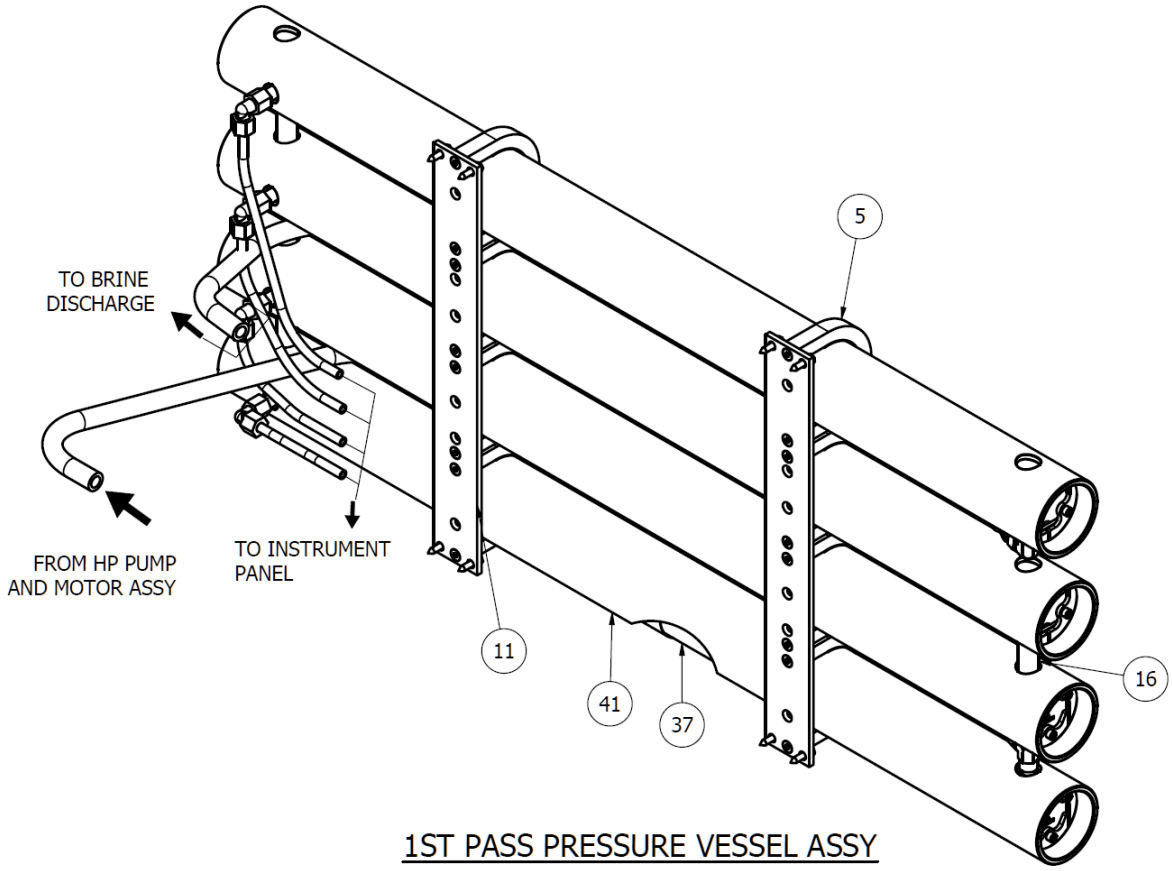
Throughout this Owner's Manual, cautions are given to the technician, operator, and owner to ensure that you use only Parker supplied components, consumables, spares, and replacement parts.

Pre-filtration Subsystem from Seawater Inlet (FIRST PASS FEED)

This section of the system filters and delivers the Seawater feed into the system. The Seawater feed is filtered to remove suspended solids larger than 5 Micron size (5/1,000,000 of a meter), then is pumped by the High-Pressure Pump (inside in the system) to the 1st Pass Pressure Vessels. The pre-filtration (outside the system) protects the Reverse Osmosis Membrane Element (Item 37) from premature fouling.



HP PUMP AND MOTOR ASSY



1ST PASS PRESSURE VESSEL ASSY

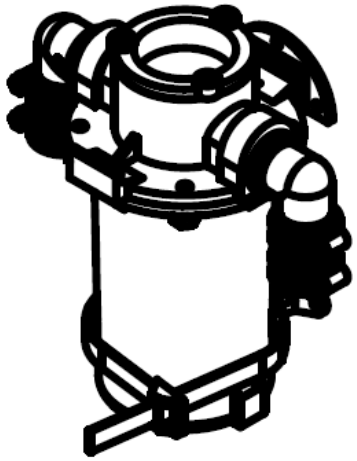
1. Inlet Thru Hull Fitting with Forward Facing Scoop ** is the point at which the 1st Pass feed water enters the system. It is important that the installer utilizes a forward-facing scoop so that the system receives a positive flow of water as the boat is under way.

CAUTION A flat inlet thru-hull fitting will cause a vacuum as the boat is under way, and this will cause loss of 1st Pass feed water flow and cavitation of the 1st Pass feed water pump and high-pressure pump, resulting in continual system shut down due to low 1st Pass feed water flow and pressure. The resulting failure of the system to remain in operation is attributed to improper installation, is the liability of the installer, and is not covered by the Parker warranty.

CAUTION If the thru-hull fitting is placed in a position on the underside of the hull that allows air to continually enter the thru-hull fitting, this will cause the system to continually shut down due to loss of 1st Pass feed water. The resulting failure of the system to remain in operation is attributed to improper installation, is the liability of the installer, and is not covered by the Parker warranty.

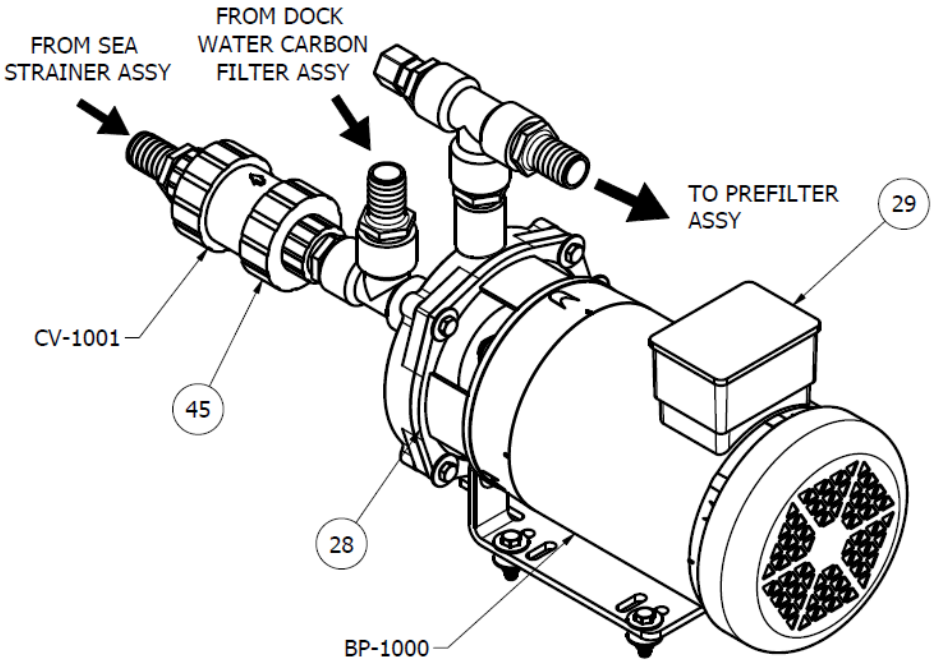
2. Sea Cock Valve ** is used in a ship installation for safety reasons to close the 1st Pass feed water line during repair, maintenance, and misuse of the system.

3. Sea Strainer has a clear bowl with nylon body filter housing or optional bronze body containing a cleanable Monel fine mesh filter screen. The Sea Strainer filters out large particulate matter and suspended particles that would otherwise prematurely foul the cartridge Pre-filter Element.

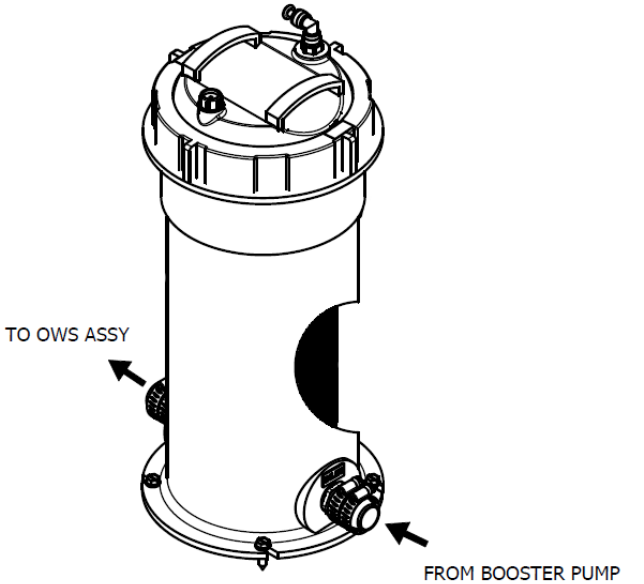


SEA STRAINER

4. Booster Pump supplies a positive pressure to the Pre-filters and through to the High-Pressure Pump. The resulting pressure at the High-Pressure Pump depends on the final installation configuration.



BOOSTER PUMP ASSY



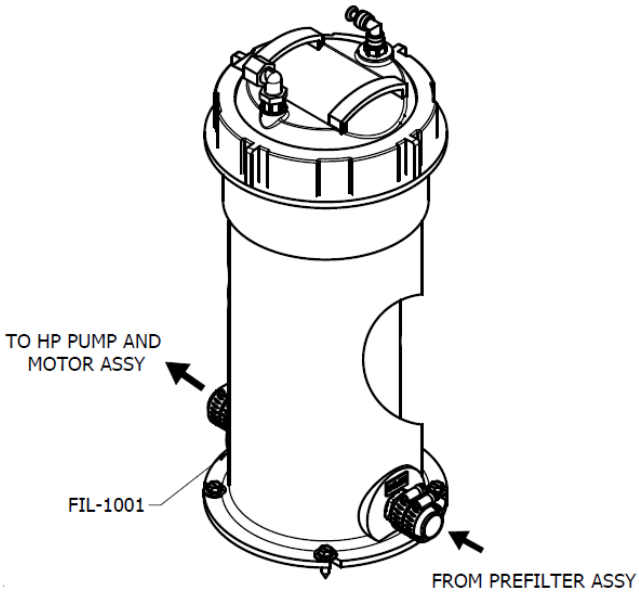
PREFILTER ASSY

5. Pre-Filter. This filter removes suspended solids 5 Microns and larger to protect the Reverse Osmosis Membrane from fouling.

CAUTION Do not use third party pre-filter elements, use only Parker pre-filter elements. Third party pre-filter elements do not properly fit and the seams fall apart. They also allow by-pass resulting in premature fouling of the RO Membrane Element.

CAUTION Do not use “string wound” or “fiber” pre-filter elements. These types of elements are designed for the Photographic Film Developing Industry. When used in sea water, they will plug up rapidly in 1/10th or less the time. This will cause frequent shutdowns of the system and very frequent changing, which will result in very high cost of maintenance.

6. Oil Water Separator removes oil present in the 1st Pass Feed Water.

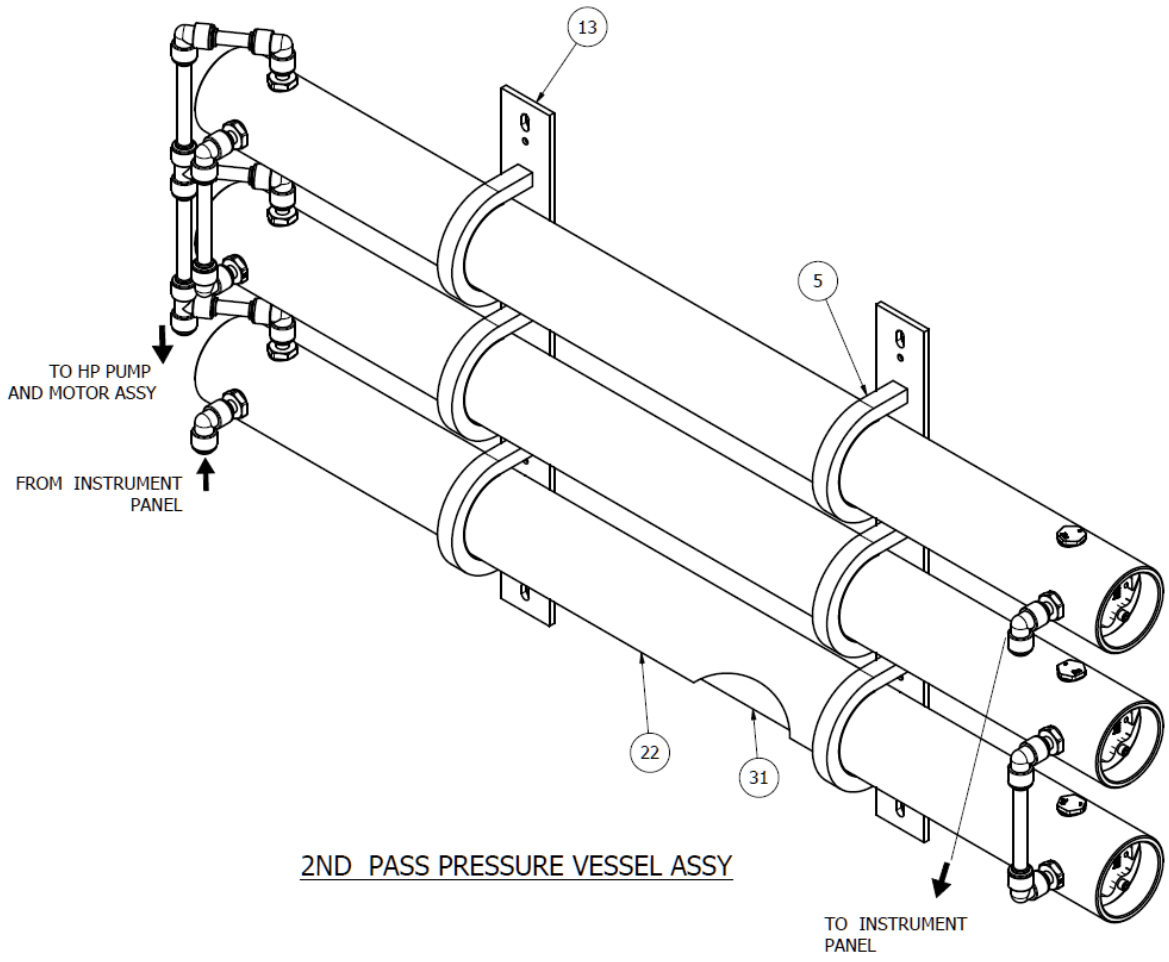


OWS ASSY

CAUTION Oil permanently destroys the R.O. Membrane element It is recommended that the user avoid operating the Parker R.O. System in oil polluted water if the Oil/Water Separator Filter is not installed.

7. Low Pressure Gauge displays the Inlet Pressure to the High-Pressure Pump. The gauge assists the operator in diagnosing the Sea Strainer, Booster Pump, and Pre-Filter Element condition.
8. Low Pressure Transducer shuts the system off automatically when a plugged filter element or other condition causes a low flow situation. This protects the High-Pressure Pump, the RO Membrane Element, and the Booster Pump from damage.

Dock/Tap Water Subsystem (SECOND PASS FEED)
This section of the system filters and delivers the Dock Water feed into the system. The Dock Water feed is filtered to remove chlorine and suspended solids larger than 5 Micron size (5/1,000,000 of a meter). The pre-filtration protects the Reverse Osmosis Membrane Element from premature fouling.



1. Sea Strainer has a clear bowl with nylon body filter housing or optional bronze body containing a cleanable Monel fine mesh filter screen. The Sea Strainer filters out large particulate matter and suspended particles that would otherwise clog the selector valve and prematurely foul the cartridge charcoal element.
2. Selector Valve is used for the system selection of Dock Water Feed. When selected by the controller, the valve will be allowing dock water to enter the system to create technical water.
3. Charcoal filter removes chlorine form the dock water to protect the 2nd Pass membranes from premature fouling.

CAUTION Do not use third party charcoal filter elements, use only Parker charcoal filter elements. Third party charcoal elements do not properly fit and the seams fall apart. They also allow by-pass resulting in premature fouling of the RO Membrane Element.

4. Booster Pump supplies a positive pressure to the Pre-filters and through to the 2nd Pass membranes. The resulting pressure from the Booster pump depends on the final installation configuration.
5. Pre-Filters removes suspended solids 5 Microns and larger to protect the Reverse Osmosis Membrane from fouling.

CAUTION Do not use third party pre-filter elements, use only Parker pre-filter elements. Third party pre-filter elements do not properly fit and the seams fall apart. They also allow by-pass resulting in premature fouling of the RO Membrane Element.

CAUTION Do not use "string wound" or "fiber" pre-filter elements. These types of elements are designed for the Photographic Film Developing Industry. When used in sea water, they will plug up rapidly in $1/10^{th}$ or less the time. This will cause frequent shut downs of the system and very frequent changing which will result in very high cost of maintenance.

6. Low Pressure Gauge displays the Inlet Pressure to the High-Pressure Pump. The gauge assists the operator in diagnosing the Sea Strainer, Booster Pump, and Pre-Filter Element condition.
7. Low Pressure Transducer shuts the system off automatically when a plugged filter element or other condition causes a low flow situation.

Pressurization Subsystem

Proper pressure and proper flow across the Membrane Element are two basic requirements of Reverse Osmosis.

1. High Pressure Pump Motor is directly coupled to the High-Pressure Pump.
2. High Pressure Pump is a marine quality, positive displacement, ceramic plunger pump with a 316-stainless steel manifold.
3. High Pressure Hose, HP Pump Outlet to MVA Inlet, transfers pressurized sea water from the High-Pressure Pump to the inlet of the RO Membrane Element.
4. RO Membrane Element and Vessel - The Membrane Element allows potable water molecules to pass through while rejecting the salt ions. Only a small percentage of the Seawater Feed becomes fresh Product Water. The remainder carries the rejected salt ions out of the RO Membrane Element in a concentrated brine stream.

Brine Discharge Subsystem

This section of the System carries the Brine Discharge exiting from the RO Membrane Element.

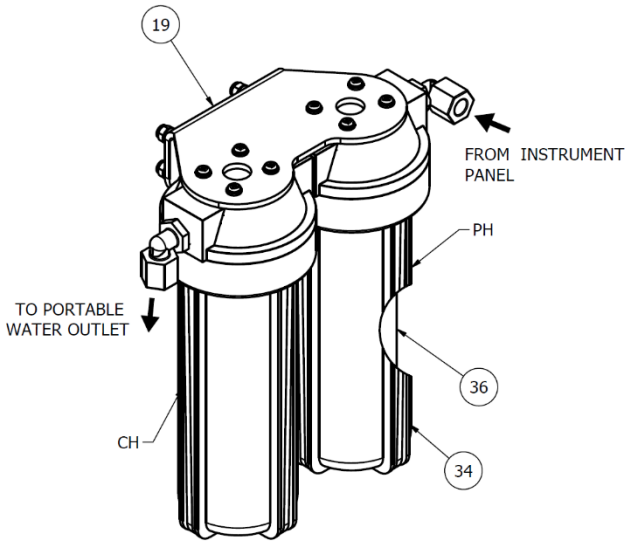
1. High Pressure Hose, MVA Outlet to inlet of manifold, transfers pressurized Brine Discharge Water from the Membrane Vessel Assembly to the Control Manifold Assembly.
2. High Pressure Gauge displays the RO Membrane Vessel outlet pressure.
3. High Pressure Transducer automatically turns the system off in case of over-pressurization during operation.
4. Back Pressure Regulator, by automatically turning the valve clockwise and counterclockwise, pressure is increased and decreased accordingly. This increases and decreases the production of the RO Membrane Element.
5. Thru Hull Discharge Fitting ** should be installed above water level for discharge of the Brine Discharge Water from the system.

Product Water Subsystem

This section of the system gives a visual indication of the clarity, quantity, and quality of the product water. Post Filtration is the final step in Product Water quality control. The Post Filtration

Subsystem is designed to limit unpleasant odor and taste, as well as sterilize biological matter, which may have passed through the RO Membrane Element.

1. Temperature Compensated Salinity Probe electronically determines whether the salinity content of the Product Water is acceptable. This Salinity Probe is temperature compensated and provides an accurate measurement of Product Water quality.
2. Flow Meter - Product Water measures the rate of Product Water flow, in gallons and liters per hour. It measures from the RO Membrane Element toward the Product Water Post Filtration Components.
3. 3-Way Product Water Diversion Valve, Electric Solenoid Actuated, the Controller energizes this valve to the “Potable” position when the system produces water which meets the low salinity requirement. If the Product Water being produced is “Un-potable”, high in salinity, then no signal is sent to the valve, and it thus remains in the normal open position. The “fail safe” normal open position diverts the un-potable Product Water to discharge.
4. Charcoal Filter is designed to remove foul odors from the Product Water. Sulfurous odor (rotten eggs) is caused when decaying biological matter in the feed water section. Fresh water flushing of the system helps to minimize this.
5. pH Neutralizer Filter. The product water from the system will be slightly acidic. The pH Neutralizer Filter neutralizes the pH of the product water.
6. Potable Water Storage Tank** may be any container suitable for storing Potable Water, i.e. existing water storage tank.



FILTER ASSY

Tech Water Subsystem

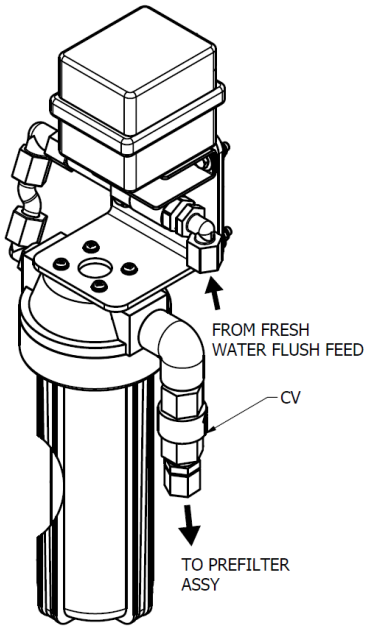
This section of the system gives a visual indication of the clarity, quantity, and quality of the product water. The Tech Water Subsystem is designed for boat wash down. The tech water produced has very low ppm levels (< 50ppm) to provide rinse water to wash down your boat and allow it to air dry spot free.

1. Temperature Compensated Salinity Probe electronically determines whether the salinity content of the Product Technical Water is acceptable. This Salinity Probe provides an accurate measurement of Product Water quality.
2. Flow Meter measures the rate of Technical Product Water flow, in gallons and liters per hour. It measures from the RO Membrane Element toward the Product Selector Valve.
3. 3-Way Product Water Diversion Valve, Electric Solenoid Actuated, the Controller energizes this valve to the “Technical” position when the system produces water, which meets the low salinity requirement. If the Tech Water being produced is “Non-Technical”, high in salinity, then no signal is sent to the valve, and it thus remains in the normal open position. The “fail safe” normal open position diverts the Non-Technical Product Water to discharge.

WARNING! Technical Water is slightly acidic. Use of technical water over time in the main boats water supply - to sinks, showers, and galley equipment may strip metallic coatings from such equipment. It is best to use charcoal and pH Neutralizer prior to entering the main boat’s water supply to such equipment.

4. Charcoal Filter *** is designed to remove foul odors from the Product Water. Sulfurous odor (rotten eggs) is caused when decaying biological matter in the feed water section. Fresh water flushing of the system helps to minimize this.
5. pH Neutralizer Filter*** The product water from the system will be slightly acidic. The pH Neutralizer Filter neutralizes the pH of the product water.
6. Technical Water Storage Tank** may be any container suitable for storing Potable Water, i.e. existing water storage tank.

Fresh Water Flush Subsystem



FRESH WATER FILTER ASSY

Consists of supplied valves and required tank or container for the cleaning, rinsing, or storage of the RO System.

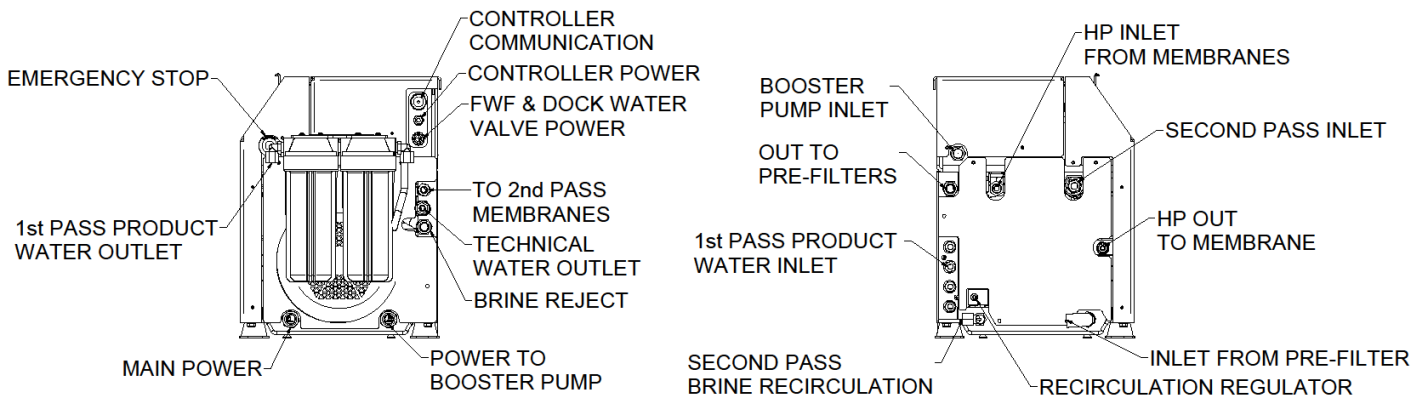
1. Fresh Water Flush System (including charcoal filter and solenoid valve) automatically flushes the system with fresh water. This process is automatic at each shut down of the 1st Pass system and repeats automatically every 7 days. Fresh Water Flushing replaces the seawater in the system with less corrosive fresh water, and this also reduces the biological decay as well as biological growth that naturally occur if the feed water (sea water) is not flushed from the system with fresh water.
2. Fresh Water Flush Check Valve Assembly included with the Fresh Water Flush Assembly, isolates the Fresh Water Flush system which prevents seawater from flowing in the reverse direction through the Charcoal Filter.

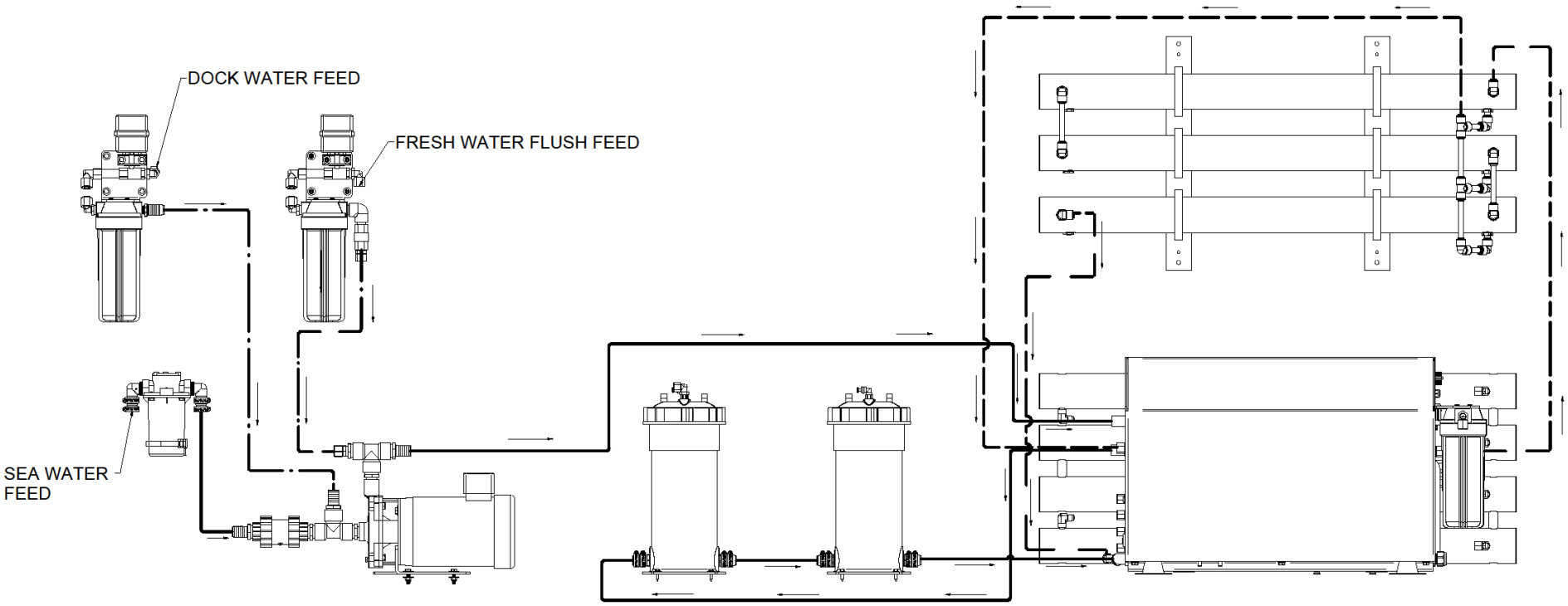
Electronic Subsystem

This subsystem measures water quality, controls the direction of Product Water flow, Starts and Stops the pumps, and contains the central electrical connection point of the system. It also ensures only potable Product Water passes into the Product Water Storage Tank.

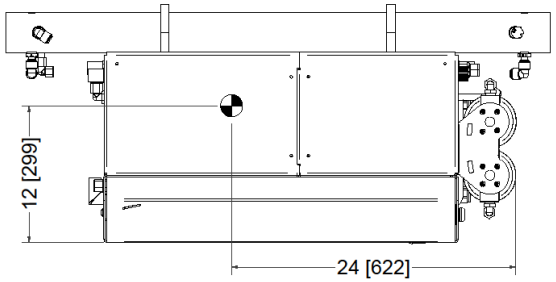
1. The controller monitors the salt content of the product water and signals the 3-Way Product Diversion Valve when Potable Water is being produced. The 3-Way Product Diversion Valve, Motors, and Remote Control are each governed by this controller. This enclosure houses the high-voltage components of the system. It serves as the connection point for all the electrical systems such as the motors, switches, valves, and the controller.
2. Remote Controller *** (optional) allows for remote monitoring and/or controlling of the system.

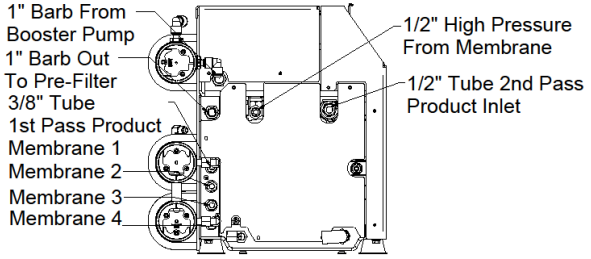
System Piping and Interconnect Diagram (P&ID)

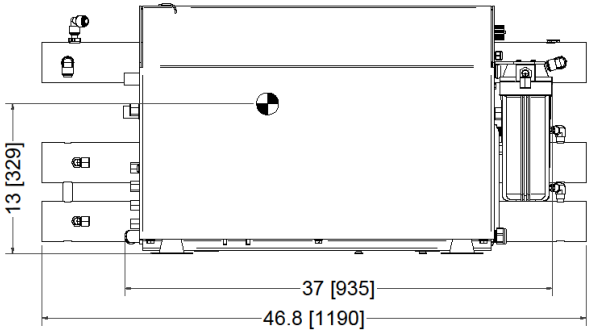


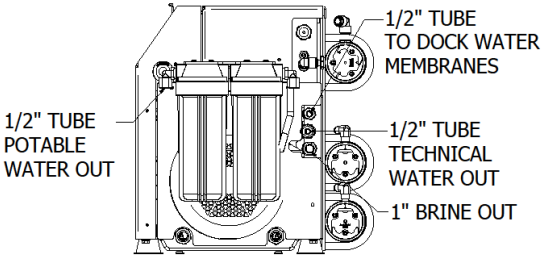


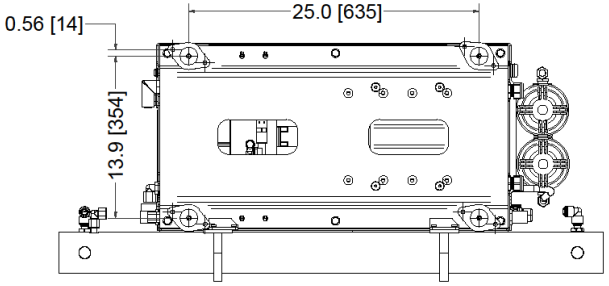
GENERAL ARRANGEMENT











ELECTRICAL OPTIONS
220 VOLT/1 PHASE/50-60Hz
220-380-440 VOLT/3 PHASE/ 50-60 Hz
MOTOR&PUMP SIZE
5HP/7.6 GPM (1800-3400GPD)
SEA WATER MEMBRANE OPTIONS
1800-2
2600-3
3400-4
FRESH WATER MEMBRANE OPTIONS
1400GPD
2200GPD
2900GPD

1. ENG MUST APPROVE ANY DEVIATIONS
NOTES: UNLESS OTHERWISE SPECIFIED

DIMENSIONAL TOLERANCES - UNLESS OTHERWISE SPECIFIED			
MACHINED			WELDMENT
FRACTION	±1/32"		± 1/16"
.X	-	± 4mm	± 1/8"
.X	± .1"	± 2mm	± 1/16"
.XX	± .01"	± .25mm	± 1/32"
.XXX	± .005"	± .025mm	-
ANGULAR ± 1°			
125 UNLESS OTHERWISE SPECIFIED			

CUSTOMER -
PROJECT -
DRAWN - 515746 DATE - 4/4/2017
CHECKED - DATE -
APPROVED - DATE -
DRY WT: N/A
WET WT:
CONTRACT NO

Parker Sea Recovery
Parker Hannifin Corporation
Filtration Group / Water Purification
2630 E. El Presidio Street
Carson, CA 90810
Contact
Office: 310-608-5600
Fax: 310-608-5602
www.parker.com

AQUA DUAL COMPACT

SIZE D | DWG NO A400C | REV -
SCALE | 1 OF 1

Chapter 4

SYSTEM INSTALLATION PRECAUTIONS AND INFORMATION

Special Considerations

1. Length of Connection Lines:

   • All connection lines should be as short and straight as possible, using minimum fittings.

   Increased length causes line-loss in the Feed Water line.

   Increased length causes excessive pressure build-up in the Brine Discharge line.

   Increased length causes excessive pressure build-up in the Product Water line.

   • The connection lines must not be “kinked”.

   Kinks in the Feed Water line cause cavitation and continual System shut down.

   Kinks in the Brine Discharge line will cause excessive pressure build-up and damage.

   Kinks in the Product Water line will cause excessive pressure build-up and damage.

2. Accessibility

   • This is a simple rule: Install the system and it’s supporting components in an accessible manner. The Aqua Matic Dual Pass system requires regular operator maintenance, such as filter element changing. As with any Electro Mechanical system utilized in the Marine environment the Aqua Matic Dual Pass system will require repair from time to time. Hidden or out of reach items may become forgotten, not maintained, and cause damage to other system components.
   • The Electrical Control Panel Touch must be accessible for starting, stopping, and adjusting pressure of the system.

Storage Prior to Uncrating

1. Adhere to crate markings

• DO NOT store in direct sunlight;
• DO NOT store above 120 degrees F / 50 degrees C;
• DO NOT freeze;
• DO NOT store longer than 4 months without flushing with storage chemical;
• STORE ONLY on base with ARROWS UP.

Uncrating

1. DO NOT DISCARD ANY PACKAGING UNTIL YOU HAVE FOUND AND IDENTIFIED ALL PARTS!
2. Remove the Aqua Matic Dual Pass system from the shipping carton.

3. Some of the components are loose or separately packaged in the shipping container.
4. Refer to the prior pages illustrating the contents of the System.

Installation Cautions

1. Do not over tighten PVC fittings. If threaded pipe fittings leak after installation, remove the fitting, clean the mating threads, apply 3 to 4 wraps of Teflon tape to the male threads and thread the parts back together. PVC fittings should only be hand tightened.

2. The Inlet Connection [1], Sea Strainer [3], Inlet 3-way Clean/Rinse Valve [30], and Booster Pump [4] should be below water level. This will aid the Booster Pump in priming.

3. Always allow hoses and tubes to enter and exit straight from the connection for a minimum of one inch prior to a bend.

4. 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. Membrane Elements are stored in sodium bisulfite.

5. NEVER mount any liquid holding component of the system above an electrical or electronic circuit or device. Extensive damage to the electrical or electronic device or circuit will result if water spills from the system during maintenance and or component failure.

Reverse Osmosis Membrane Element Susceptibility to Chemical Attack

CAUTION Do not expose the Parker System to intake Feed Water containing:

Hydrogen peroxide	chloramines	chloramines-T	N-chlorioisocyanurates
Chlorine dioxide	hypochlorite	chlorine	iodine
Bromine	Bromide	phenolic disinfectants	petroleum products

Any chemical, not approved in writing by Parker.

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 above listed chemicals. Example: Do not connect the inlet of the System to the ship's potable water system if the system contains chlorinated or brominated water. These chemicals destroy the copolymer components within the system. These oxidants and others also damage the R.O. Membrane Element. The Parker Optional Fresh Water Flush Accessory removes chlorine and bromine from the ship's potable water system.

High Pressure Pump Preparation

1. Remove the shipping tape from the High-Pressure Pump Oil Fill Cap to expose the Oil Fill Cap air breather hole.
2. Ensure that the pump oil level is even with or higher than the center of the pump sight glass.

Caution: Damage to the High-Pressure Pump will occur if the wrong oil is used in its crankcase. Use only Parker supplied pump oil.

Tools Required for Installation

Not all installations are typical, therefore, it is recommended to have a full set of Mechanic's and Electrician's tools available. No special system tools are required for installation. A separate TDS Meter, available from Parker will assist in confirming system product water quality. A volt/ohm meter (VOM) is required for system installation and commissioning to ensure proper electrical power and connection.

Components Supplied by Installer or Owner - (Optional)

CAUTION All fittings, valves, and piping installed prior to, within, and after the Parker system must not contain iron. They must be non-ferrous material (not containing iron). Iron fittings or piping will cause rust fouling and failure of the R.O. Membrane Element. The resulting failure, of the R.O. Membrane Element is attributed to improper installation, is the liability of the installer, and is not covered by the Parker warranty.

1. Water Connections to be supplied by the installer

Sea Cock	3/4 MNPT - Male National Pipe Thread U.S. Standard
Brine Discharge Over Board	1/2 MNPT - Male National Pipe Thread U.S. Standard
Fresh Water Tank	3/8 FNPT - Female National Pipe Thread U.S. Standard

2. Inlet Thru Fitting with Forward Facing Scoop [1]

The inlet Thru Hull Fitting must be dedicated to only Parker system. It is important that the installer utilizes a forward-facing scoop so that the system receives a positive flow of water as the boat is under way. The fitting must be installed on the boat's hull in a position that provides continual feed water flow without air to the system.

CAUTION A flush inlet thru-hull fitting will cause a vacuum as the boat is under way, and this will cause loss of feed water flow and cavitation of the Booster Pump and High-Pressure Pump, resulting in continual system shut down due to low feed water flow and low pressure. The resulting failure of the system to remain in operation, is attributed to improper installation, is the liability of the installer, and is not covered by the Parker warranty.

CAUTION The Aqua Matic Dual Pass Series systems must receive an uninterrupted supply of feed water without air. If the thru-hull fitting is placed in a position on the underside of the hull that allows air to continually enter the thru-hull fitting, this will cause the system to continually shut down due to loss of feed water. The resulting failure of the system to remain in operation is attributed to improper installation, is the liability of the installer, and is not covered by the Parker warranty.

CAUTION The Aqua Matic Dual Pass Series systems must not be tied into another existing auxiliary water line already supplying another accessory on the boat. Using one

Thru Hull fitting for other equipment will cause the Aqua Matic Dual Pass Series systems to draw air or cavitate leading to continual system shut down. The resulting failure of the system to remain in operation is attributed to improper installation, is the liability of the installer, and is not covered by the Parker warranty.

CAUTION If the Aqua Matic Dual Pass Series systems is connected to a Sea Chest or Stand Up Pipe, do not plumb the Aqua Matic Dual Pass Series systems feed line to the "top" of the Sea Chest or Stand Up Pipe. If plumbed into the top of these feed water arrangements, the Aqua Matic Dual Pass Series system will experience continual shut down due to air inducement into the system. Plumb the Aqua Matic Dual Pass to the "bottom" of such feed water arrangements to ensure a continual air free supply of feed water to the system.

3. Inlet Sea Cock Valve [2]

Use a quarter turn ball valve min. 1/2" size, with a 1/2" MNPT connection for mating to the supplied 1/2" FNPT fitting.

4. Brine Discharge Thru Hull Fitting [18]

Use a minimum 1/2" size with a 1/2" MNPT connection for mating to the supplied 1/2" FNPT fitting. The Brine Discharge Thru Hull Fitting should be installed above water level. No valves should be installed in this line. If a closed valve was the cause of damage and failed the system, it will not be covered by the Parker Warranty.

5. Connection to the boat's Potable Water Storage Tank [24]

It requires a 1/4" FNPT connection for mating to the supplied 1/4" MNPT fitting. To avoid problems such as reverse flow (osmosis) from the tank to the system and chlorination attack of the R.O. Membrane Element, the fitting must terminate above the maximum water level. No valves should be installed in this line. If a closed valve was the cause of damage and failed the system, it will not be covered by the Parker Warranty. Refer to Electrical Specifications at the beginning of this booklet.

System and Component Mounting

The following steps discuss the installation of the Aqua Matic Dual Pass 1800-2/1400, 2600-3/2200, 3400-4/2900. The prior illustrations show the system installed in the port after section of a boat, as an example. It is understood that this location or configuration may not always be possible, and there are a variety of locations the system may be mounted. The components in the illustrations are spaced far apart only to allow illustration of the hose and tube connections between components.
The mounting surfaces must be flat to avoid warping of brackets and frames. Use appropriate shims on uneven surfaces to ensure that mounting of the system components does not cause bending or warping.

1. The Sea Strainer is mounted below water level between the Inlet Sea Cock Valve and Booster Pump. Allow at least 4 inches (10 cm) of clearance below the bowl to access the mesh screen for cleaning or replacement.

2. The Fresh Water Flush Filter Canister is mounted to a Vertical Bulkhead. Allow at least 4 inches (10 cm) of clearance below the bowl for element replacement.
3. Mount the Fresh Water Flush Check Valve Assembly vertically in close proximity to the Booster Pump, Fresh Water Flush Filter Canister, and the Pre-Filter.
4. The Dock Water Charcoal Filter Canister is mounted to a Vertical Bulkhead. Allow at least 4 inches (10 cm) of clearance below the bowl for element replacement.
5. The Booster Pump is mounted to a flat surface using the 4 supplied #10 x 1 1/4" long Type "A" screws. The Booster Pump is mounted below water level to assist priming, and in an accessible location to allow access for maintenance. Mount Booster Pump close to the Inlet Thru Hull/ Sea Cock Valve** and the Sea Strainer. If the booster pump is mounted vertically, mount the motor up and pump head down. Do not mount the pump head above the motor, else motor damage will occur if the pump or its fittings should develop a leak.
6. The Pre-filter is mounted to a flat surface using the 4 supplied #10 Type "A" 1" long screws. Allow Filter housing length above the filter housing for filter element removal. Feed water may spill during filter element replacing.
7. The Charcoal Filter is mounted to a vertical bulkhead using the 4 supplied #10 x 1" long Type "A" screws.
8. The system is mounted to a flat surface using the 4 supplied 1/4" x 1" Type "A" screws.
9. Attach the supplied Sea Cock** Inlet Fitting Assembly, 1/2"FNPT elbow with attached 1/2" hose barb to the boats Sea Cock** 1/4 turn ball valve.
10. Attach the supplied Brine Discharge Outlet Fitting** Assembly, 1/2"FNPT elbow with attached 1/2" Tube Fitting to the boats Over Board Discharge Fitting**.
11. Attach the supplied Product Water Tank Connector 1/2" MNPT x 1/4" Tube Fitting to the 1/4" FNPT tap at the Potable Water Tank**.

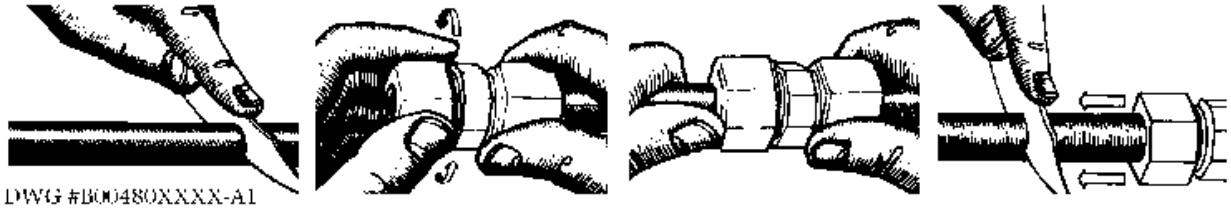
Plumbing Connections

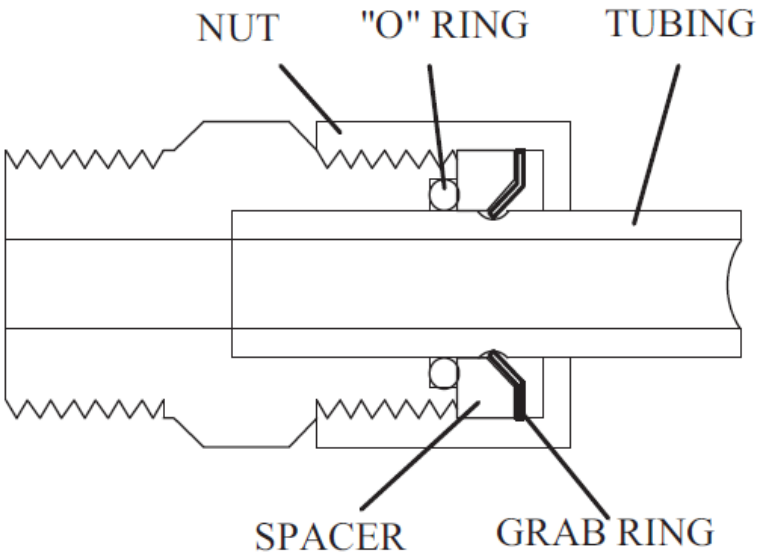
1. Connect all inlet feed lines with the supplied 50 feet (17 meters) of 3/4" (19. mm) I.D. Inlet Suction Hose:

Outlet of	**To Inlet of**
Sea Cock Valve **	Sea Strainer
Sea Strainer	Feed Selector Valve
Feed Selector Valve	Boost Pump
Boost Pump	Pre-Filters
Pre-Filters	System Feed

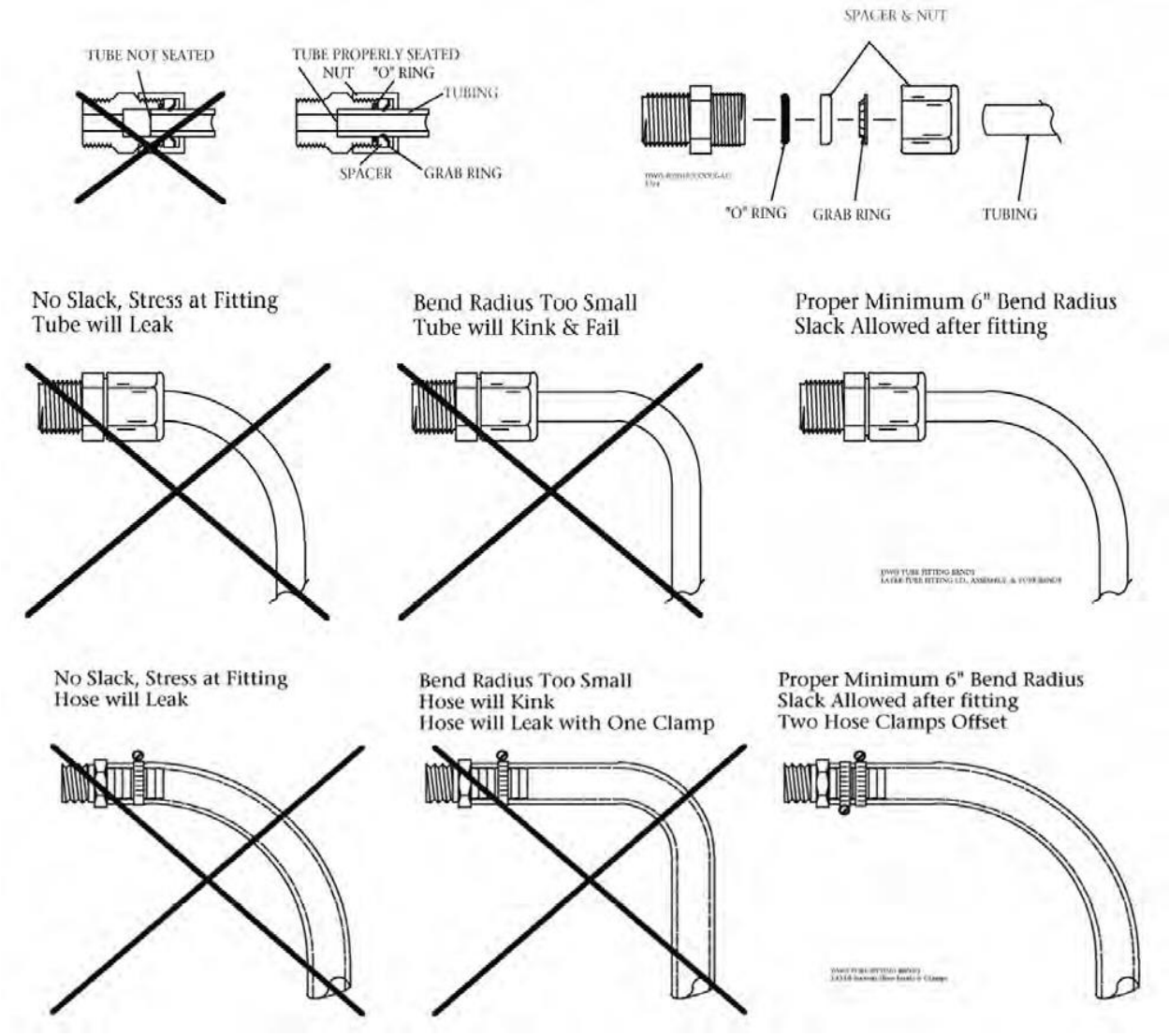
Tube Fitting Connections Assembly [24]

- Cut tube end square and clean.
- Loosen nut on fitting three turns.
- Insert tube into fitting until it bottoms. Loosen nut completely and remove tube with attached parts from body. Check to ensure that the O-Ring is seated onto the tube under the spacer (and not pinched into the body). Insert tube with attached parts into the body and tighten nut finger tight.





CAUTION Always allow slack in water lines. 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. If water lines are pulled tight causing them to bend at the fitting they will leak, allow air to enter, fail prematurely, and/or break the fitting that they are attached to.



TUBING POSITIONS

4. Connect Brine Discharge line with the supplied 20 feet (6 meters) of 3/8” (9.5 mm) O.D. Brine Discharge Tubing (refer to illustrations on the following page):

Outlet of	**To Inlet of**
System Brine Discharge	3-way Clean/Rinse Valve [31]
Discharge 3-way Clean/Rinse Valve [31]	Rinse/Clean Bucket or container
Discharge 3-way Clean/Rinse Valve [31]	Thru Hull Discharge fitting [18]

5. Connect Product Water line with the supplied 30 feet (9.14 meters) of 1/4” (6.35 mm) O.D. nylon tubing (refer to illustrations on the following page):

Outlet of	To Inlet of
Potable Product Water from System	Charcoal Filter {22}
Charcoal Filter [22]	U.V. Sterilizer [23]
U.V. Sterilizer [23]	pH Neutralizing Filter
pH Neutralizing Filter	Boats Potable Water Storage Tank [24]

Installation Kit Hose & Tubing for Sub Component

1. 50 feet (6 meters) of 3/4" (19.1 mm) ID inlet suction hose is supplied for connecting:

2. 50 feet (6 meters) of 1/2" O.D. (12.7 mm) nylon tube is supplied for connecting:

Outlet of	To Inlet of
1st Pass Membrane Product	System 1st Pass Product Manifold
Post Filters	Potable Water Storage Tank**
2nd Pass Membrane Feed	2nd Pass Membrane
2nd Pass Membrane Product	2nd Pass Product Connection
2nd Pass Tech Water	Tech Water Tank**
Brine Discharge	Thru Hull Discharge Fitting **
Dock Water Feed Valve	Dock Water Strainer
Dock Water Strainer	Dock Water Charcoal Filter
Dock Water Charcoal Filter	Boost Pump

3. 30 feet (9.14 meters) of 1/4" (6.35 mm) OD nylon tubing is supplied for connecting:

Outlet of	To Inlet of
Potable Product Water from System	Charcoal Filter {22}
Charcoal Filter [22]	U.V. Sterilizer [23]
U.V. Sterilizer [23]	pH Neutralizing Filter
pH Neutralizing Filter	Potable Water Storage Tank**

NOTE: If the Reverse Osmosis Membrane Element has been installed, there will be a Reverse Osmosis Membrane Element Serial Number tag, attached to the High-Pressure Vessel. If the R.O. Membrane Element Serial Number tag is missing or does not contain a serial number and date, then immediately contact the company that sold the system to you, the installer, or Parker.

WARNING! DO NOT attempt to operate the system without a Reverse Osmosis Membrane Element installed in the system otherwise extensive damage will result.

WARNING! Damage caused to the system due to operation of the System without an R.O. Membrane Element correctly installed is the liability of the installer and the operator.

Chapter 5

COMMISSIONING

COMMISSIONING NOTES

These Commissioning instructions must be carried out for initial start-up of a NEW system.

Failure to follow these instructions will lead to system failure and cause damage to components.

CHECK INSTALLATION
Ensure that the installation has been properly performed.
Do not rely on the installer's word, do not assume the System has been installed correctly.

WARNING! Damage caused to the system due to operation of an improperly installed system is the liability of the installer and the operator.

Check each water connection to the system to ensure that the installer has properly connected and properly routed each tube. Improper routing and any blockage in any line causes damage to the system. Improperly connected or loose connected lines resulting in leaks causing damage is the liability of the installer and the operator, and is not covered by the Parker warranty.
Do not assume and do not rely on the installer's word; check it yourself.

Make sure that the Electrical Power Source, boat's circuit breaker to the system, is switched "OFF". Open the unit cover and check all electrical and electronic connections for proper wiring and attachment. After checking all wiring for correct and tight connection, close the cover. Switch the Electrical Power Source, boat's circuit breaker to the system, to the "ON" position.

CHECK RO MEMBRANE

Check to ensure that the Reverse Osmosis Membrane Elements are installed within the Pressure Vessels.

CAUTION Some systems are shipped WITHOUT the Reverse Osmosis Membrane Element. This is to accommodate Boat Builders that install the system well in advance of commissioning the System.

If the Reverse Osmosis Membrane Element has been installed, there will be a Reverse Osmosis Membrane Element Serial Number tag, attached to the High Pressure Vessel.
If the R.O. Membrane Element Serial Number tag is missing or does not contain a serial number and date, then immediately contact the company that sold the system to you, the installer, or Parker.

WARNING! **DO NOT** attempt to operate the system without a Reverse Osmosis Membrane Element installed in the system otherwise extensive damage will result.

WARNING! Damage caused to the system due to operation of the System without an R.O. Membrane Element correctly installed is the liability of the installer and the operator.

SETUP CONTROLLER

The controller is set by Parker prior to shipping, based on the features and optional equipment that shipped with the System at the time of ordering. Addition of the Fresh Water Flush to the System after it has shipped from Parker will require new set up of the computer logic. Addition of, removal of, or changes in the length of the R.O. Membrane / Pressure Vessel Assembly will require control logic setup. Refer to the NMEA Configuration Guide.

CHECK SYSTEM MANUALLY

Refer to the P&ID in this manual.

1. Ensure that the manual By-Pass lever on the 3-Way Product Water Diversion Valve is positioned outward (away from the coil body).

2. Open any auxiliary valve within the incoming Feed Line, Outgoing Brine Discharge Line, and Outgoing Product Water Line.

WARNING! If any auxiliary valve is installed in these lines, it will damage the System if left closed during starting and/or operation of the system. The resulting damage is the liability of the operator.

3. Position Rinse Clean Inlet Valve to normal operation towards the Sea Restrainer.

4. Position Rinse Clean Outlet Valve to normal operation towards the Thru Hull Discharge Fitting.

5. Unwind the Back Pressure Regulator to fully open position (counter clockwise).

6. Check all filter housings to ensure that they contain the proper filter element:
   a. Sea Strainer - check for Monel screen
   b. Multi Media Filter, if installed - check for media (#20 silica sand).
   c. Dual Pre-filter or Commercial Pre-filter - check for pleated cartridge filter elements
   d. Oil/water Separator - check for Oil/Water Separator filter element
   e. R.O. Membrane(s) check for Parker Serial Number and Date on the label attached to each pressure vessel.
   f. Charcoal Filter - check for charcoal filter element
   g. pH Neutralizer - check for pH Neutralizer cartridge
   h. Fresh Water Flush Carbon Filter - check for Carbon element.

FEATURES PROGRAMMABLE BY OPERATOR

The following is an explanation of features in the main controller that are programmable by the operator. It is required that each feature be set properly in order to gain maximum performance of the System. Only preinstalled features will be displayed on this screen.

1. MANUAL MODE

Enable user to control the Booster Pump, HP Pump, Diversion Valve and Pressure.

a) BOOSTER PUMP

Manually start and stop the Booster Pump.

b) HIGH PRESSURE PUMP

Manually start and stop the HP Pump when the Booster Pump is running.

c) DIVERSION VALVE SET POINT

Manually energize the 3-Way Product Water Diversion Valve when the specified product water quality level has been reached, in PPM (Parts Per Million). The factory setting is 500.

PPM TDS (Five Hundred Parts Per Million Total Dissolved Solids expressed as NaCl [sodium chloride - salt]).

2. DISPLAY

Changes the color contrast of the touch screen for better viewing.

3. ACCEPTED SALINITY LEVEL

Changes the accepted salinity level by adjusting the PPM level.

4. BACK WASH TIME

Changes the interval for automatic FWF by adjusting the number of days.

5. LANGUAGE

Changes the current language used on the controller by selecting new language option.

6. UNIT

Toggles the measurement standards between U.S. Standards and Metric Standards

	U.S. Standard	Metric
Pressure:	PSI – Pounds Per Square Inch	kPa – kilo pascal
Flow:	GPM – Gallons Per Minute	LPM – Liters Per Minute
	GPH – Gallons Per Hour	LPH – Liters Per Hour

INITIAL START-UP PROCEDURE OF AN AQUA MATIC DUAL PASS 1800/1400, 2600/2200, 3400/2900:

NOTE: The Commissioning instructions must be carried out for initial start-up of a NEW system. Failure to follow these instructions exactly leads to system failure and causes damage to the components.

Read this section and other appropriate sections of the manual to gain familiarity with the requirements of the system and functions of each component.

1. Ensure that the installation has been properly performed as per the instructions in the section above.
2. Ensure that the shipping tape from the High-Pressure Pump Oil Fill Cap has been removed to expose the Oil Fill Cap air breather hole.
3. Ensure that the pump oil level is even with or higher than the center of the pump sight glass.

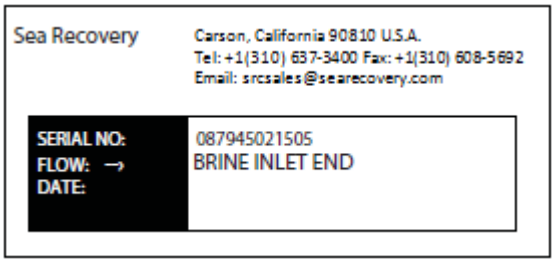
WARNING! Damage to the High-Pressure Pump will occur if the wrong oil is used in its crankcase or if the oil level is not at minimum required level. Use only Parker supplied pump oil. The supplied Pump Oil is special hydraulic oil, which contains anti-rust and wear inhibitors essential to the high-pressure pump crankcase section.

4. Ensure that the tube shipping plug has been removed from the Potable Water outlet port of the Water Control Manifold and that 1/4" product water tube is connected.

5. Reverse Osmosis Element:

   If the Reverse Osmosis Membrane Element has been installed, there will be a Reverse Osmosis Membrane Element Serial Number tag, illustrated below, attached to the High-Pressure Vessel. Find this Serial Number tag to ensure that the R.O. Membrane Element has been installed. If the R.O. Membrane Element Serial Number tag is missing or does not contain a serial number and date, then immediately contact the company that sold the system to you, the installer, or Parker.

CAUTION Some systems are shipped WITHOUT the Reverse Osmosis Membrane Element. This is to accommodate, for example, Boat Builders that install the system well in advance of commissioning the boat and the Aqua Matic Dual Pass.



WARNING! **DO NOT attempt to operate the system without a Reverse Osmosis Membrane Element installed in the system otherwise extensive damage will result.**

6. Check each tube connection to the system to ensure that the installer has properly connected and properly routed each tube. Improper routing and any blockage in any line causes damage to the system. ***Do not rely on the installer's word; check it yourself.***

7. Make sure that the Electrical Power Source, boat's circuit breaker to the system, is switched "OFF".

8. Open the front panel of the Main Power Enclosure and check all electrical and electronic connections for proper wiring and attachment. Refer to the wiring diagrams in this manual.

9. Close the Main Power Enclosure front panel.

10. Ensure that the manual By-Pass lever on the Diversion Valve is positioned outward (away from the coil body).

11. Open any auxiliary valve within the incoming Feed Line, Outgoing Brine Discharge Line, and Outgoing Product Water Line.

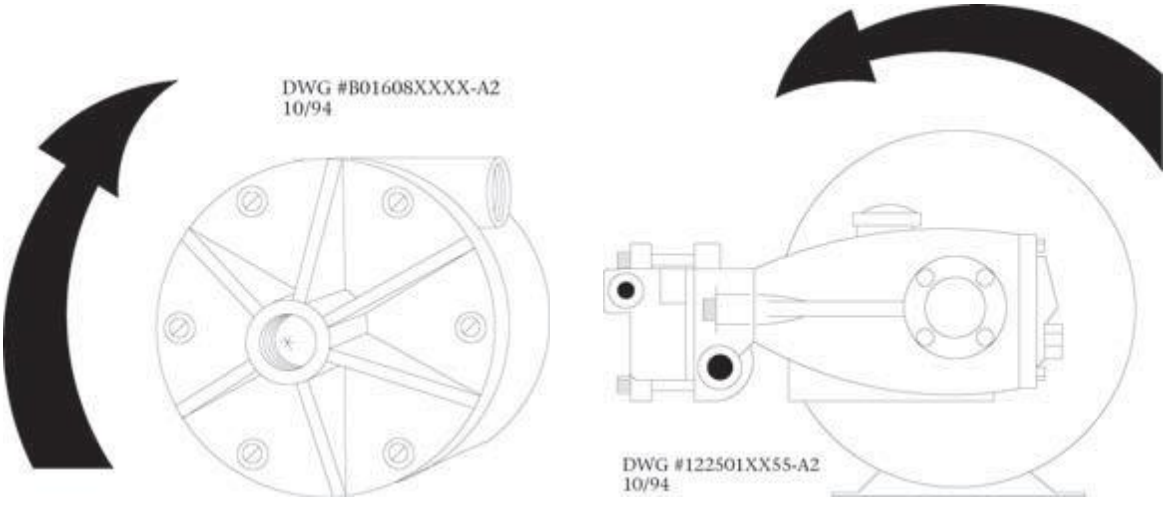
CAUTION If any auxiliary valve is installed in these lines, it may damage the Aqua Matic Dual Pass if left closed during starting and/or operation of the system.

12. Switch the Electrical Power Source, boat's circuit breaker to the system "ON".

13. HIGH PRESSURE ELECTRIC MOTOR ROTATIONAL CHECK:

    Ask an assistant to view the fan section of the Booster Pump Motor and High-Pressure Pump Motor. while you "Jog" the system. (refer to unit controls section)

    Press the "Booster Pump" icon, and then immediately press the "Stop" icon. Ensure that the Booster Pump Electric Motor is turned in the proper rotation as indicated by an arrow on the front of the pump. If the motor is turned in the wrong direction, refer to the wiring diagrams in this section to correct.



Press the “Start” icon, and then immediately press the “Stop” icon. Ensure that the High-Pressure Pump Electric Motor is turned in the proper rotation. If the motor is turned in the wrong direction, refer to the wiring diagrams in this manual.

14. To start the system in manual mode, press the “Boost Pump” icon on the control screen. If the system automatically shuts off after several seconds of operation, this may be due to a system fault. Look at the control screen to confirm whether a fault has occurred. There should be a pop up warning message on the control screen. The warning message will direct you to the problem, ensure that the System Feed Line is primed and that there is no air in the Feed Water Line. Press the Fault Reset button on the control screen and restart boost pump then press HP pump. Initial New System Commissioning will require priming of the Feed Water through the pre-filtration section to build sufficient feed water pressure to maintain operation.

15. After 5 minutes of running un-pressurized, slowly adjust the pressure by pressure icon increase arrow. Adjust pressure to the proper setting.
(Example: Approximately 850 psi for 35,000 ppm seawater @ 77 F)

16. If any abnormality develops, stop the system and correct the problem.

17. Although the system is producing “Product Water”, the “Product Water” may not be “Potable” for up to 30 minutes. The salinity of the Product Water diminishes gradually, until it reaches the factory setting at which time it is directed to the "Potable" (good water) position and into the Post Filtration components onward to the Ship’s Storage Tank. At the same time, the Diversion Valve icon will light up allowing you to press it.

18. Check for:

    - A constant feed water flow.
    - A consistent system pressure.
    - Leaks in the system.
    - Abnormal noises or other occurrences.

Aqua Matic Dual Pass

Control Operation Manual

For RO Systems:

1800 GPD, 1.25 GPM Potable Water
1400 GPD, 0.97 GPM Technical Water

2600 GPD, 1.81 GPM Potable Water
2200 GPD, 1.53 GPM Technical Water

3400 GPD, 2.36 GPM Potable Water
2900 GPD, 2.01 GPM Technical Water

Contents

Aqua Matic Dual Pass Series Information

This manual is for the Aqua Matic Dual Pass RO systems. This manual also covers all optional equipment used by these systems.

First Time Startup Information

Make sure all external plumbing connections are made according to the P&ID diagram. Make sure all electrical connections to any and all external devices are connected properly per the electrical schematics.

Install the membranes and verify that the membranes are facing the correct direction.

The direction of the 3-phase power coming into the Electrical Power panel can be confirmed by briefly running the high pressure pump in manual mode to verify that the motor fan is turning clockwise. If the fan is running counter-clockwise, isolate the power coming into the power panel and then reverse two of the three incoming wires. Restore the power and recheck the direction of the high pressure pump fan rotation.

The external power cable connection to the external Booster pump may also have to be reversed if the pump rotation is backwards. If the Booster pump is run in reverse, the impeller may become dislodged within the pump housing and the motor shaft may get locked up.

Verify that all the optional product tank low and high level switches are connected properly and enabled on the Configuration screen.

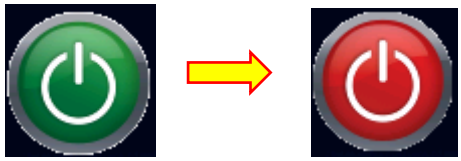
Verify that the manual three-way Reject/Chem selector valve is pointing to the Reject discharge. Verify that all bleed valves and sample ports are closed.

The entire RO system needs to be properly primed and filled up with water. The Booster pump can be used to push seawater through the system when the RO is empty. Manual control of this pumps can be accesses from the Manual Control screen. The air purge valves on top of the two prefilter housings can be used to vent air from the system as it is being primed.

Startup - Automatic Mode

While the system is stopped and there are no active alarms, the system can be started several ways:

1. Press the Start/Stop button on the Main screen or on the Overview screen.



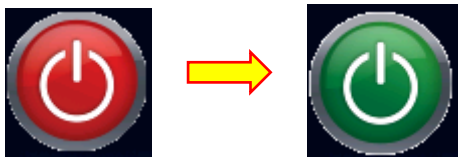
2. Press the Start button on the Operation screen

3. Turn on the Start command signal from Modbus or Canbus.

Shutdown – Automatic Mode

While the RO system is running, the system can be stopped several ways:

1. Press the Start/Stop button on the Main screen or on the Overview screen.



2. Press the Stop button on the Operation screen

3. Turn on the Stop command signal from Modbus or Canbus.

During normal automatic operation, if any pressure values or other setpoints are not within normal parameters, the system will notify the operator about the specific condition.
When a Warning condition occurs, the system will display the waring message on the Alarms and Warning Messages screen.
When an Alarms occurs, the system will automatically shutdown and display the alarm message on the Alarms and Warning Messages screen.

Automatic Startup Sequence

Here is the normal sequence of events that occur after an automatic startup is initiated:

1. Stage 1.
   Any equipment that was turned on manually will be automatically turned off.
   For Sea Water Inlet/Technical Outlet Mode, the 2nd Pass Selection valve (SV-1004) opens
   For Dock Water Inlet / Technical Outlet Mode, the Dock Water inlet valve (MOV-1005) opens.
   The Stage 1 timer counts down to zero before beginning Stage 2.
2. Stage 2.
   For Dock Water Inlet / Technical Outlet Mode, the 1st Pass Bypass valve (SV-1002) opens.
   For Dock Water Inlet / Technical Outlet Mode, the 2nd Pass Selection valve (SV-1004) opens.
   If the FWF is enabled during startup, the FWF inlet valve (MOV-1000) opens.
   The Stage 2 timer counts down to zero before beginning Stage 3.
3. Stage 3.
   If the FWF is enabled during startup, the FWF inlet valve (MOV-1000) closes.
   The Booster Pump is activated (unless Dock Water Mode is selected and the Booster Pump is disabled).
   For either Technical Outlet Mode, the Product Selection valve (SV-1003) opens.
   The Stage 3 timer counts down to zero before beginning Stage 4.
4. Stage 4.
   For either Sea Water Inlet Mode, the High Pressure Pump is activated.
   The Back Pressure Regulator valve (BPR-1001) adjusts the pressure to achieve the appropriate target flow.
   The Stage 4 timer counts down to zero before beginning Stage 5.
5. Stage 5.
   The will open if the conductivity level at TDS-1001 is below the high setpoint. If the conductivity level remains high, a “High Product Salinity Shutdown Delay Timer” will count down and will eventually stop the system with an Alarm.
   If the salinity level comes down to an acceptable level, the Stage 5 timer will then countdown and the system will display “SYSTEM ONLINE (RUNNING)” on the status bar.
   The system will return to Stage 5 if the salinity level goes above the high setpoint.

A summary of the Stage 1 through Stage 5 events can be viewed on the “Stage Info” screens which can be accessed from the Information screen.

Automatic Shutdown Sequence

Here is the normal sequence of events that occur after a normal automatic shutdown is initiated:

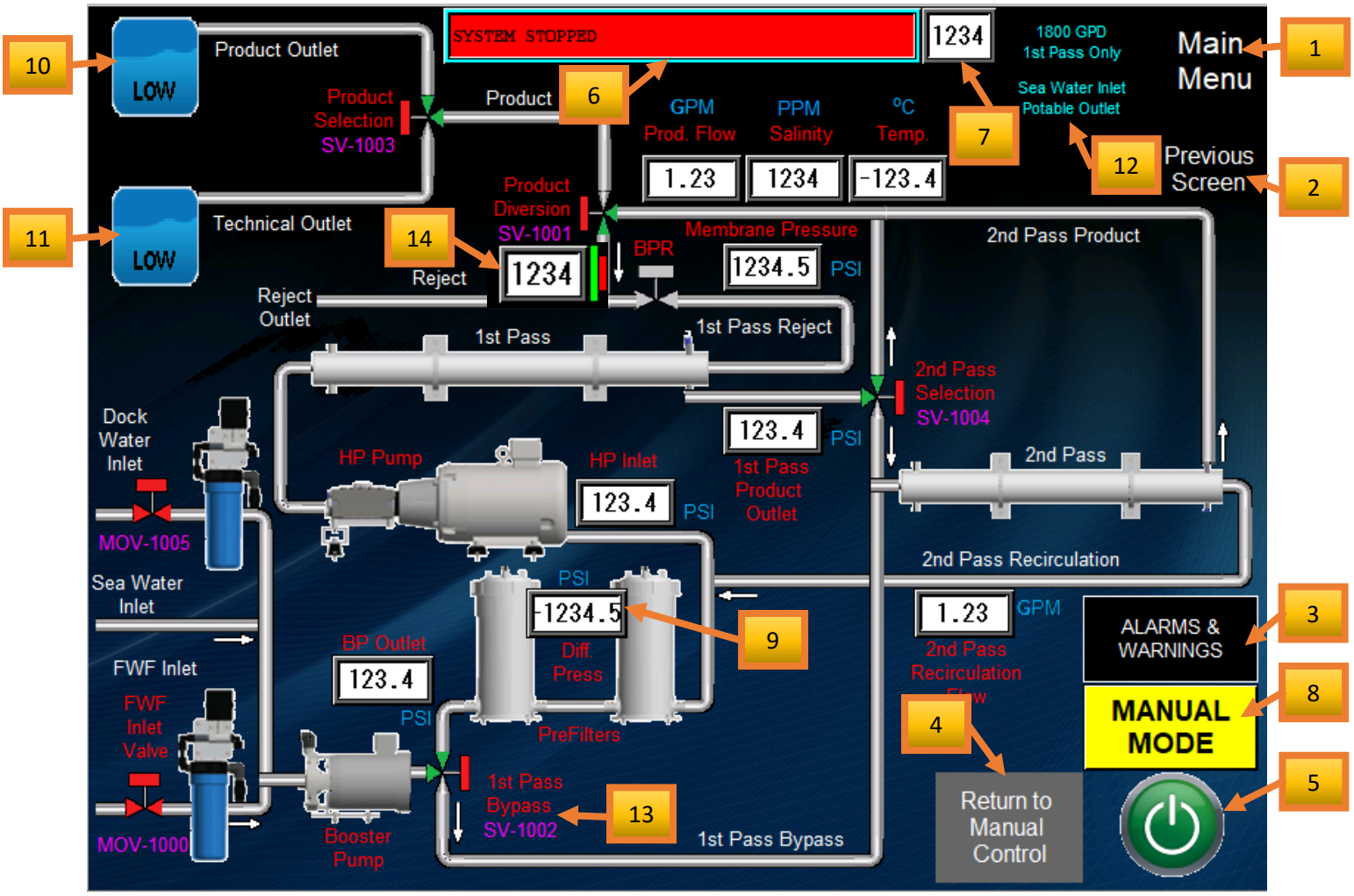
1. Stage A
2. The Product Diversion valve (SV-1001) closes and the Back Pressure Regulator valve (BPR-1001) returns to its default open position (if applicable).
   Then, the High Pressure pump turns off (if applicable).
   For Dock Water Inlet / Technical Outlet Mode, the Dock Water inlet valve (MOV-1005) closes.
   For Dock Water Inlet / Technical Outlet Mode, the 2nd Pass Selection valve (SV-1004) closes.
   Once the High Pressure pump turns off, the Stage A timer counts down to zero before beginning Stage B.
3. Stage B.
   For either Technical Output Mode, the Product Selection valve (SV-1003) turns off
   The Booster pump turns off.
   The Stage B timer counts down to zero before beginning Stage C.
4. Stage C.
   For Sea Water Inlet / Technical Outlet Mode, the 2nd Pass Selection valve (SV-1004) closes
   The Stage C timer counts down to zero before beginning Stage D.
5. Stage D.
   The FWF valve (MOV-1000) opens for the Fresh Water Flush.
   The Stage D timer counts down to zero before beginning Stage E.
   This stage D timer is also known as the Fresh Water Flush Duration timer.
6. Stage E.
   For Dock Water Inlet / Technical Outlet Mode, the 1st Pass Bypass valve (SV-1002) closes.
   The FWF valve (MOV-1000) closes and turns back toward the sea water feed inlet line
   The Stage E timer counts down to zero.
   The system is now fully stopped.

A summary of the Stage A through Stage E events can be viewed on the Startup Stage and Shutdown Stage information screens which can be accessed from the Information screen.

Note: Whenever system power is turned on, the controller will reset itself to the stopped (shutdown) state. Therefore, the system will have to be manually restarted when switching from generator to shore power. The system will never automatically turn on when power is first applied.

The P&ID Overview Screen

The analog values of all the sensors can be monitored from this overview screen. The status of the valves, motors and optional product tank level switched are also shown. If the optional tank level switches are not used, these can be disabled and the product tank will not be shown on this screen.



Valves:
For the valves, the green triangles indicate the open ports while white or red triangles represent closed ports. The colored rectangle on the top or side of the valve image represents whether the valve is considered “on” (green) or “off” (red). When the valve solenoid is on (powered), this rectangular portion is green. All valves are off by default when the system is not running.

Display Values:
The numerical display values are shown in the white rectangles next to the respective sensor reading locations. If a sensor is disabled, the numeric display will be blank. The appropriate unit is displayed near the value reading.

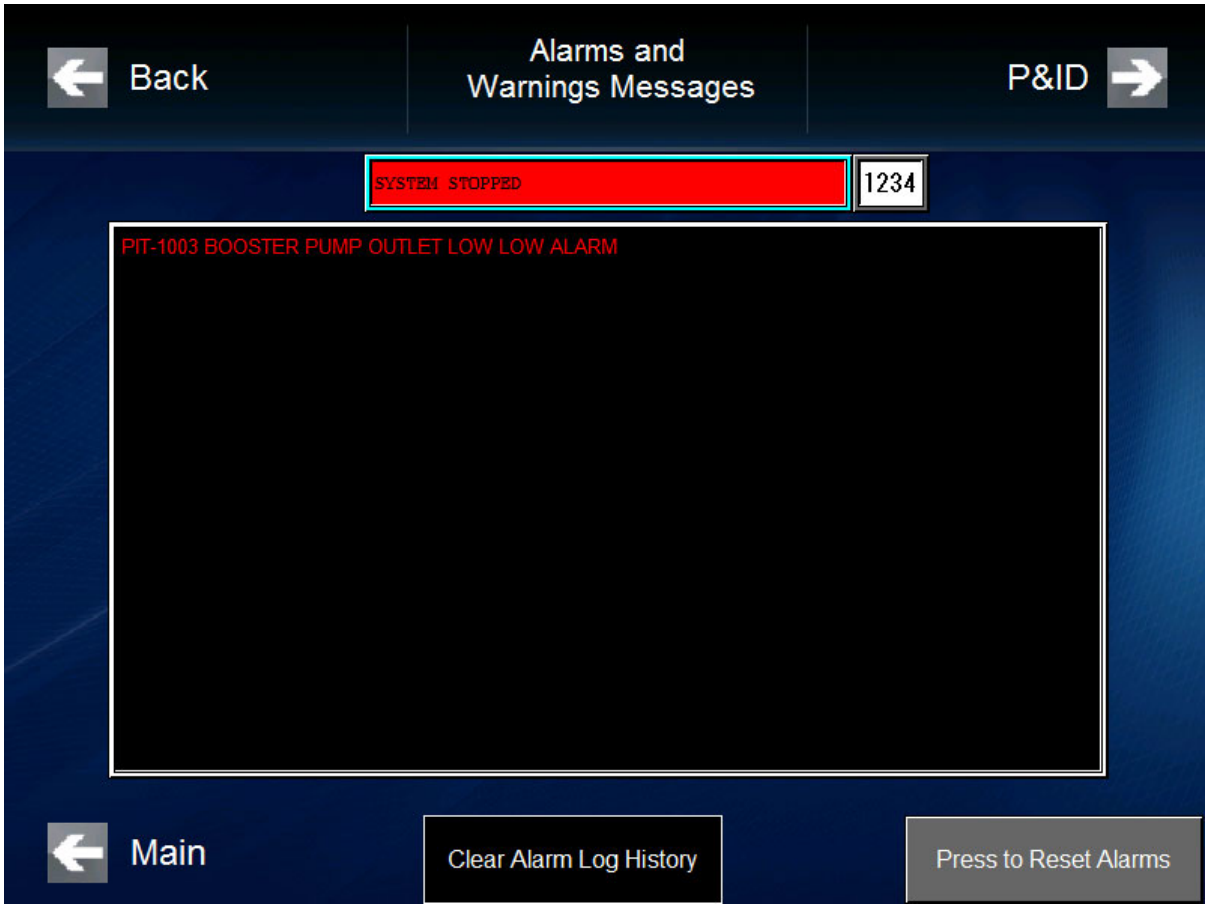
Pumps:
When a pump is not running, the “OFF” text will be displayed on the pump. When a pump is running, the “OFF” text is replaced with a green circle.

1. The Main Menu button will switch to the Main Menu
2. The Previous Screen button will switch to the previous screen.
3. The Alarms and Warnings button will open the Alarm and Warning Messages screen. This button will be yellow if there is an active alarm or warning condition present.
4. This button will switch to the Manual control screen. This button will only appear when Manual Control is active.

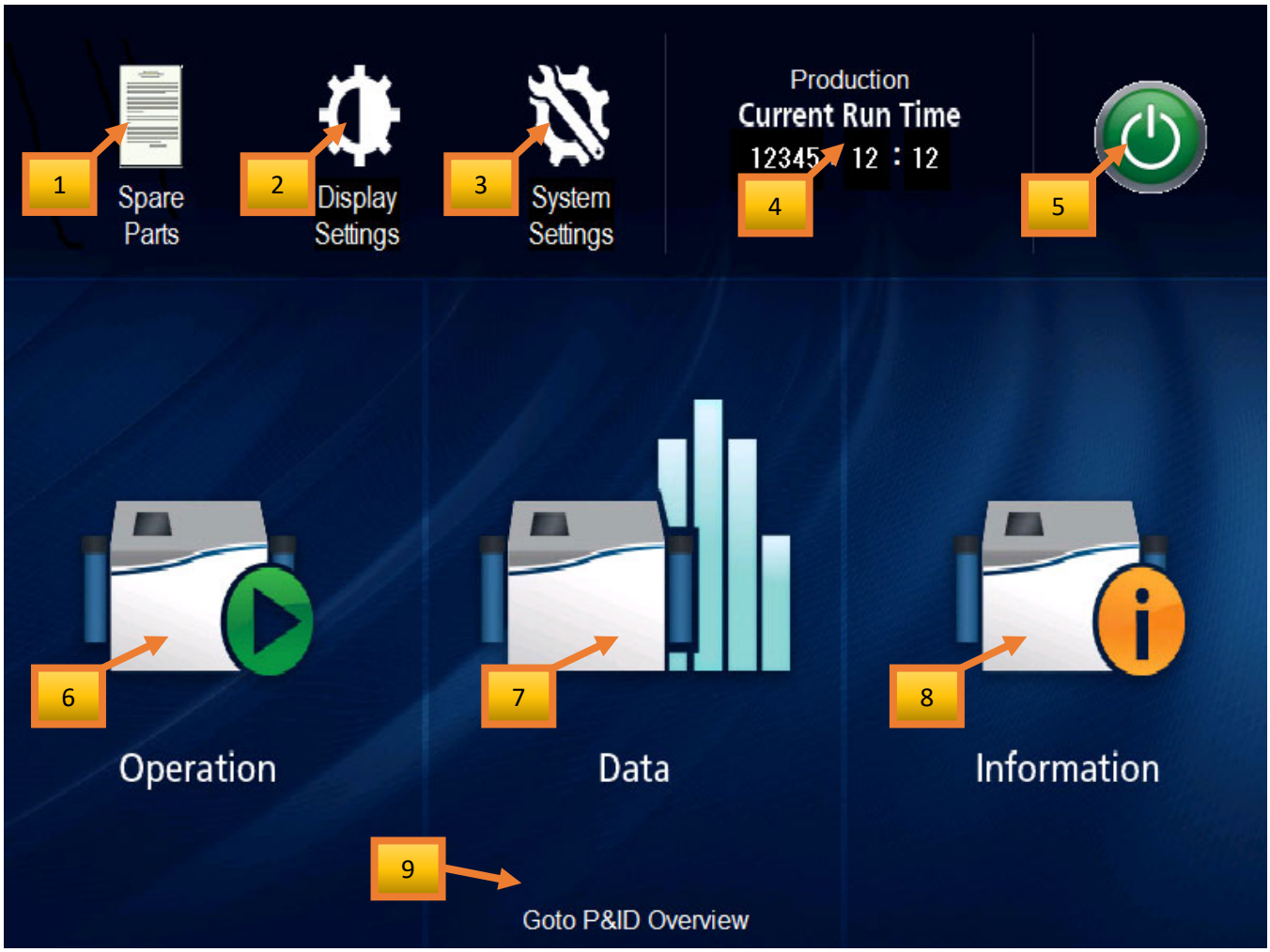
5. Press the green Start button to start the system. When running, this button will change to red. Press the red Stop button to stop the system. This button will not be visible when in Manual mode.
6. The status indicator will display a text description of the current status of the RO system.
7. The active timer countdown value associated with the message in the status indicator. This display is only visible when there is an active countdown in progress.
8. An indicator to remind the operator when Manual Mode is active. This indicator will not appear when the system is not in Manual Mode.
9. The differential pressure across the Prefilters. (The HP Inlet pressure subtracted from the Prefilter Inlet pressure.)
10. If the optional Product Tank Low Level and High Level switches are installed and enabled, then the product tank level image will be shown here. The Product Tank image will not appear if both of its level switches are disabled. The high-level switch can be used without the low-level switch to automatically stop the RO. However, if the low-level switch is used, then the high-level switch must be used too.
11. If the optional Technical Tank Low Level and High Level switches are installed and enabled, then the technical tank level image will be shown here. The Technical Tank image will not appear if both of its level switches are disabled. The high-level switch can be used without the low-level switch to automatically stop the RO. However, if the low-level switch is used, then the high-level switch must be used too.
12. The current capacity and Mode selection is displayed here. (Refer to the Mode Selection part of System Settings.)
13. Although visually represented by a three way valve, SV-1002 is actually two two-way valves that act like a three way valve. SV-1002A and SV-1002B are controlled by the same output but behave opposite of each other. When one is open, the other is closed. It is shown as a three way valve on this screen for simplicity. The individual valves are shown accurately on the P&ID and schematic drawings.
14. BPR position indication value. (Refer to the BPR and Other Setting section.)

Alarms and Warnings Screen

From the P&ID Overview screen, the Alarms and Warnings button will turn yellow when there is an active alarm or warning. Pressing this button will take the operator to the Alarms and Warnings screen which displays all active alarms and warnings. Active alarms and warnings will be shown in red text while inactive alarms and warnings will be blue. Active alarms can be reset once the condition is no longer present. Warnings cannot be reset manually because they automatically reset themselves when the condition no longer exists or the RO system is stopped. All inactive warnings or alarms that have been reset will remain on the list until the "Clear Alarm Log History" button is pressed. Alarms and warnings for disabled parameters are not shown on the list. The "Press to Reset Alarms" button in the lower right corner will be red when there is an active alarm.



Main Menu

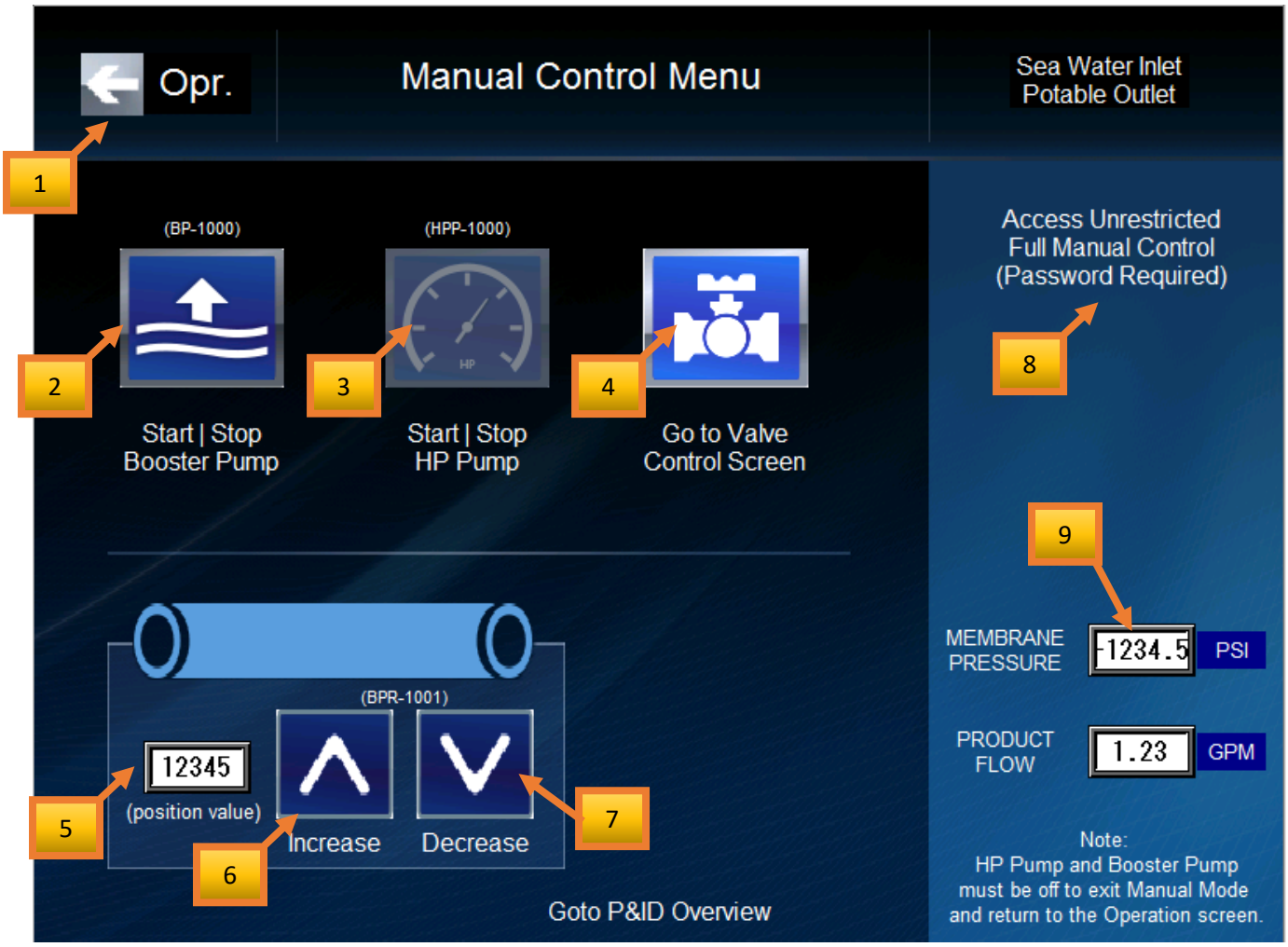


1. Press here to go to the recommended Spare Parts list. All the Parker part numbers for the common spare parts are listed on the Spare Parts screen.
2. Press here to go to the Display Settings screen where the operator can choose between Metric and US units.
3. Press here to go to the System Settings screens.
4. The current runtime is shown here. The production runtime counter is only active when the system is producing good water.
5. Press the green Start button to start the system. When running, this button will change to red. Press the red Stop button to stop the system.
6. Press here to go to the Operation and Manual Control Screens.
7. Press here to see graphs for the pressure, flow, salinity and temperature readings.
8. Press here to view information about the system such as program version, capacity, model number, serial number, configuration date, and commissioning date. Detailed descriptions about the startup and shutdown stages can also be accessed from the information screen.
9. Press here to go to the detailed PI&D Overview screen.

Operation

1. The Mode can be selected here. The “Sea Water Inlet with Potable Outlet” mode uses the first pass only. The “Sea Water Inlet with Technical Outlet” mode uses both the first and second pass. The “Dock Water Inlet with Technical Outlet” mode uses only the second pass. Only one mode can be selected at a time and the system must be stopped to change mode.
2. Press here to Start the system. All alarms must be reset.
3. Press here to Start the system. The normal Shutdown stages will be initiated.
4. Press here to reset any alarms.
5. Press here to go to the Alarms and Warning Messages screen. This button will only appear if there is an active alarm or warning message.
6. Press here to go to the Manual Control screen. This button only functions if the system is stopped.
7. Press here to initiate the Fresh Water Flush cycle. This button only functions if the system is stopped.
8. The values of all the analog readings are shown here with the appropriate selected display units.
9. If Dock Water Mode is selected, the operator may also enable the Booster Pump during automatic operation. (This option is not shown if Dock Water mode is not selected.)

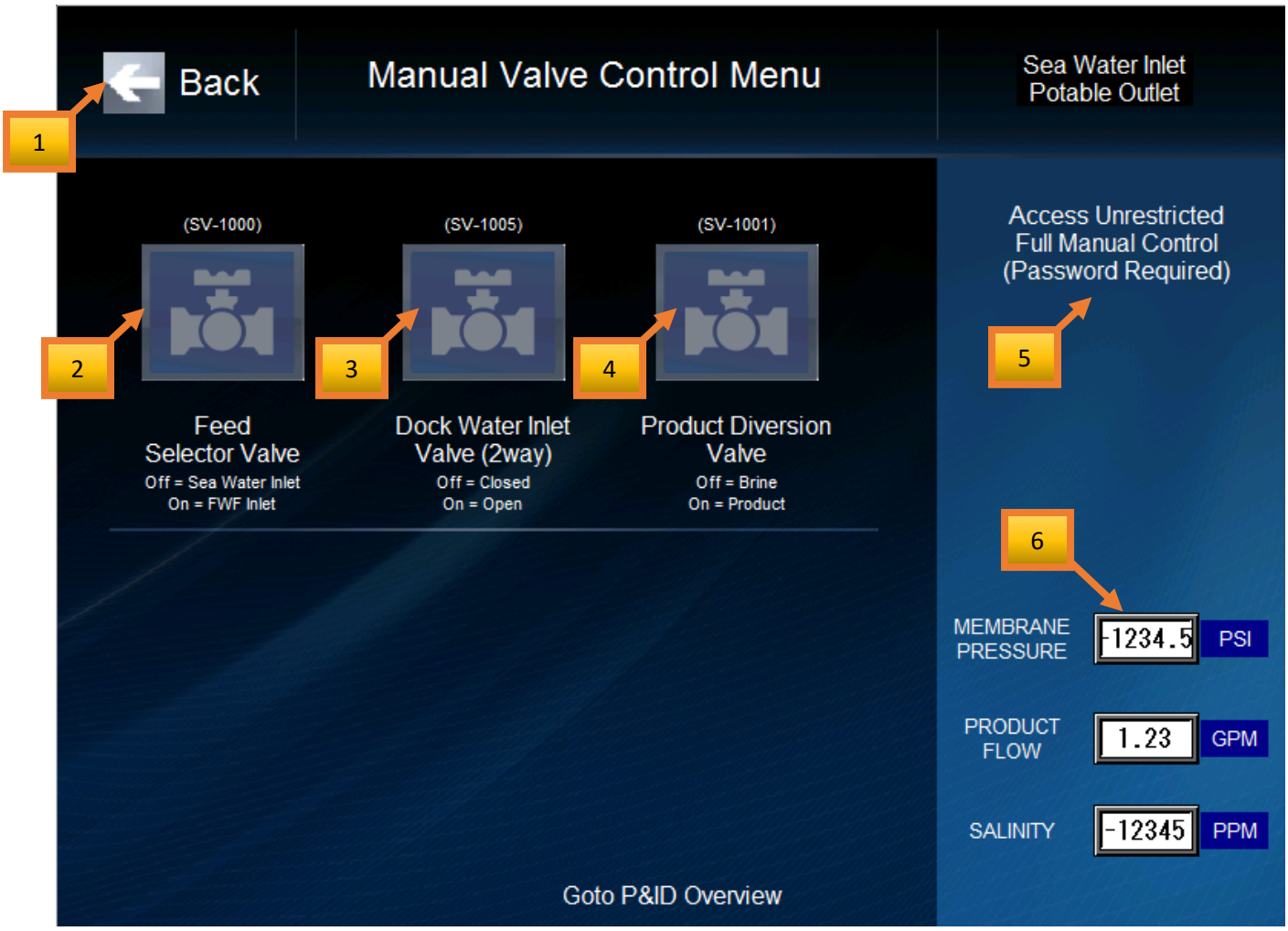
Manual Control



1. Press here to return to the Operation screen. This button will only be visible if the HP pump and Booster pump are turned off.
2. Press here to start or stop the Booster pump in Manual mode.
3. Press here to start or stop the HP Pump. The Booster pump must be on before the HP pump can be turned on. The HP pump will automatically turn off if the Booster pump is turned off.
4. Press here to go to the Valve control screen.
5. This shows the position value of the back pressure regulator valve. A value of 0 represents that valve BPR-001 is fully open. The maximum position valve (fully closed) is configured in the advanced system configuration (refer to the advanced configuration screens).
6. Press here to manually open the Back Pressure Regulator valve. The BPR will automatically stop when the minimum position value of 0 had been reached.
7. Press here to manually close the Back Pressure Regulator valve. The BPR will automatically stop when the maximum position has been reached. The maximum position value is defined in the advanced configuration.
8. Press here to access Full Manual Control. Full control means that any pump or valve can be manually turned on or off at any time. This password protected screen should only be used by system technicians for troubleshooting purposes.
9. The Membrane Pressure and Product Flow values are shown here for reference.

To view all the system values, the P&ID screen can be accessed while in Manual control mode. To protect the system, alarm monitoring is always active in Manual control. In Full Manual Control (unrestricted), any pump or valve can be activated at any time without any restrictions or alarms.

Valve Control



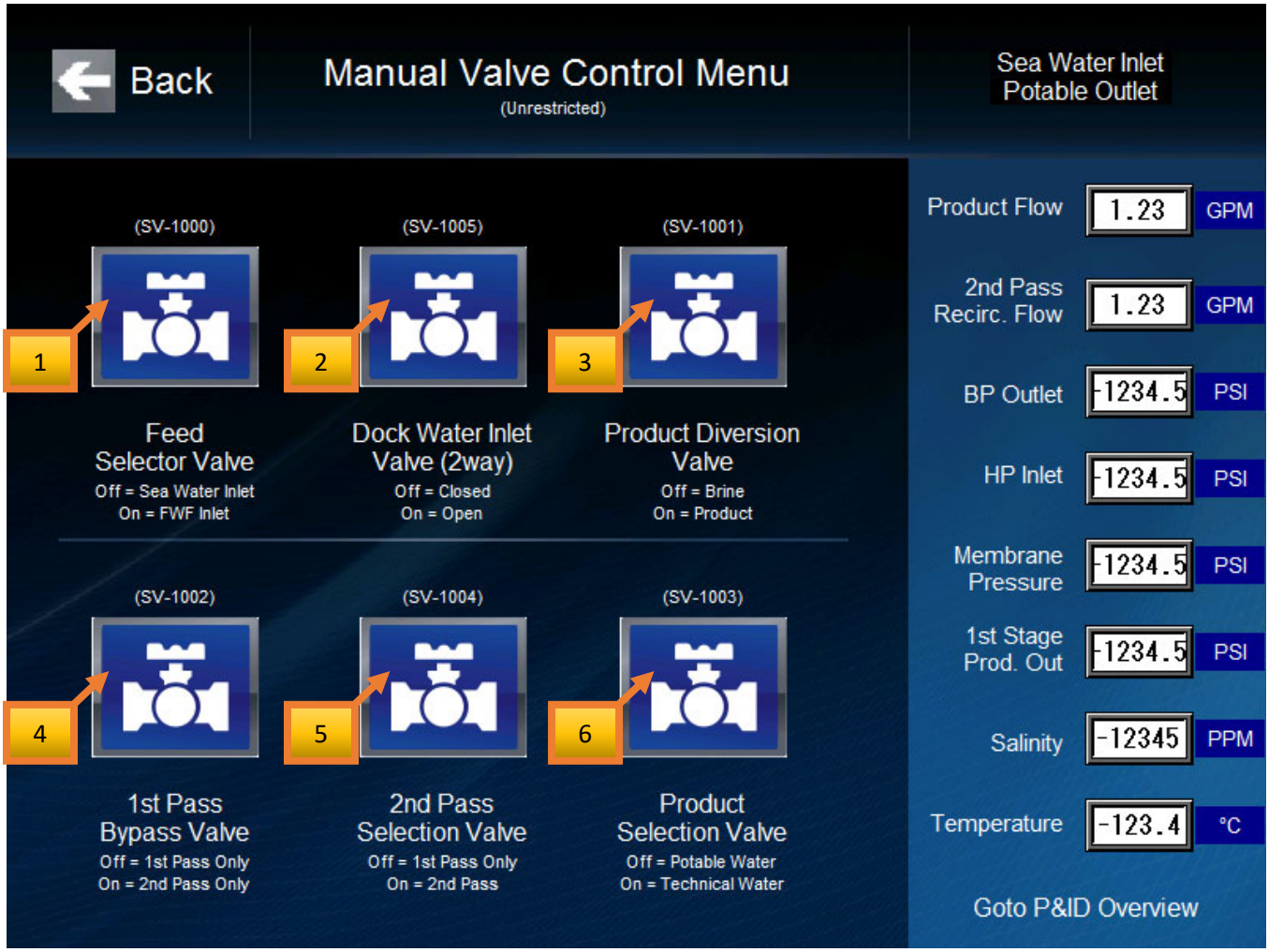
1. Press here to return to the Manual Control screen.
2. Press here to activate the Feed Selector valve. The text below the button describes the position of the valve.
3. Press here to activate the Dock Water Inlet valve. The text below the button describes the position of the valve. This valve can only be toggled when in Dock Water mode.
4. Press here to activate the Product Diversion valve. The text below the button describes the position of the valve. This valve can only be turned on if the salinity level good.
5. Press here to access Full Manual Control. Full control means that any pump or valve can be manually turned on or off at any time. This password protected screen should only be used by system technicians for troubleshooting purposes.
6. Some sensor values are shown here for reference.

The buttons will be illuminated (brighter) when the valves are activated (turned on).

Full Manual Control

The Full manual control screen looks the same as the normal Manual Control screen. The difference is that any pump or valve can be manually turned on or off at any time without restrictions or alarms.

Full Manual Valve Control

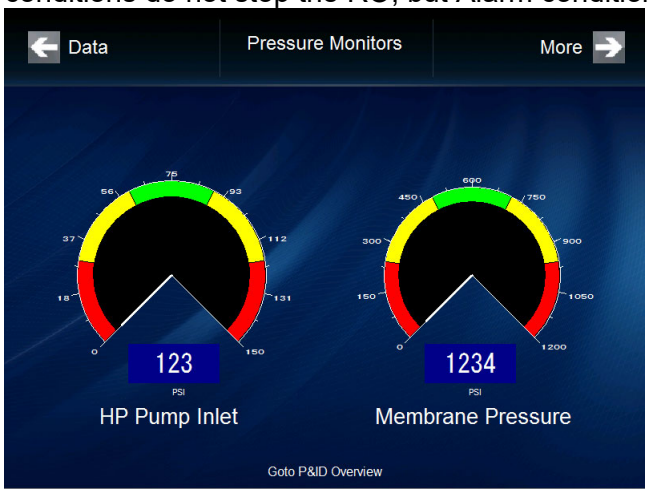


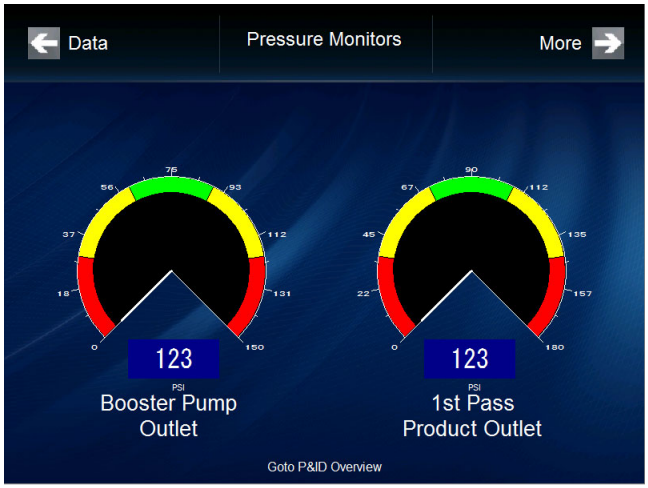
1. Press here to activate the Feed Selector valve. The text below the button describes the position of the valve.
2. Press here to activate the Dock Water Inlet valve. The text below the button describes the position of the valve.
3. Press here to activate the Product Diversion valve. The text below the button describes the position of the valve.
4. Press here to activate the 1st Pass Bypass valve. The text below the button describes the position of the valve.
5. Press here to activate the 2nd Pass Selection valve. The text below the button describes the position of the valve.
6. Press here to activate the Product Selection valve. The text below the button describes the position of the valve.

The buttons will be illuminated (brighter) when the valves are activated (turned on).

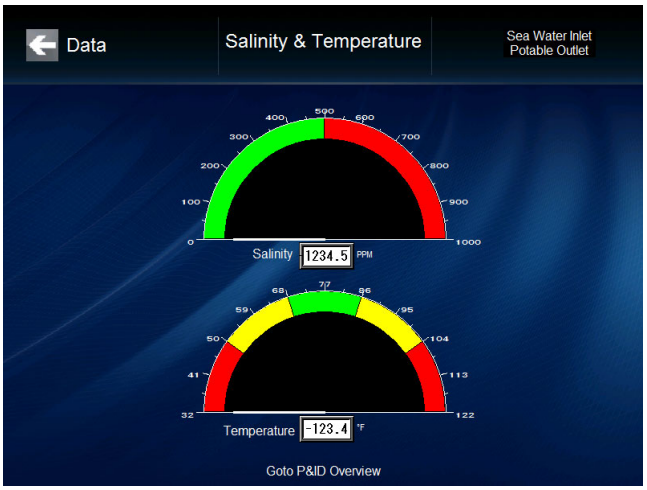
Data

The pressure graphs on the data screens show the current pressures. The red areas around the graphs represent the High High and Low Low Alarm zones associated with the sensor values. The yellow areas represent the High and Low Warning zones associated with the sensor values. Warning conditions do not stop the RO, but Alarm conditions will.





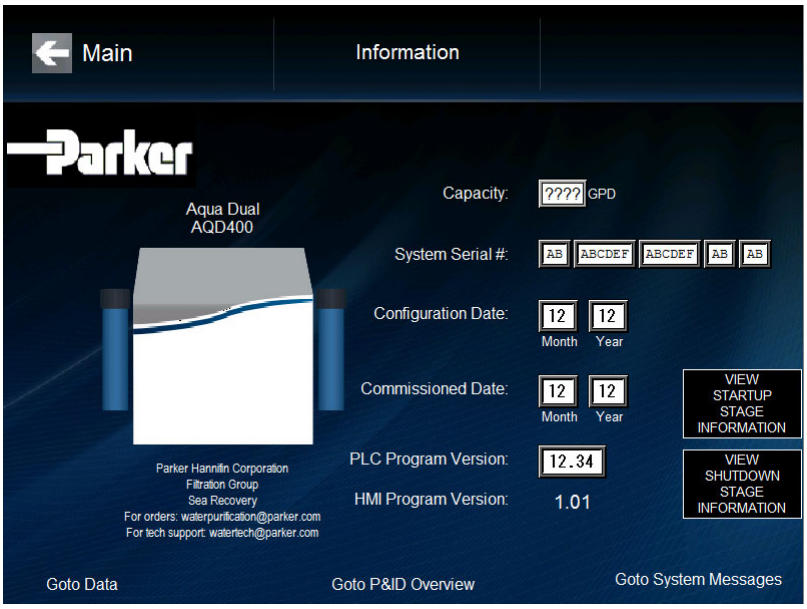
The two Pressure Monitors screens can be accessed by pressing on the appropriate part of the main Data screen.



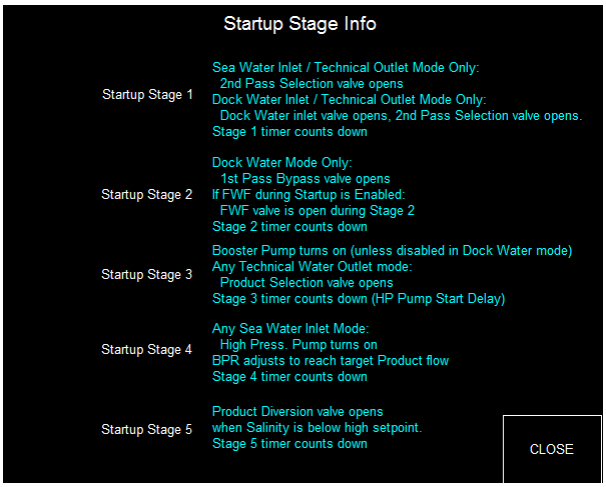
The Salinity and Temperature monitor screen can be accessed by pressing on the “View Salinity and Temperature” text in the lower right corner of the Data screen.
The green and red zones on the salinity graph represent good or bad quality water. For this sensor, the red zone is not an Alarm condition.

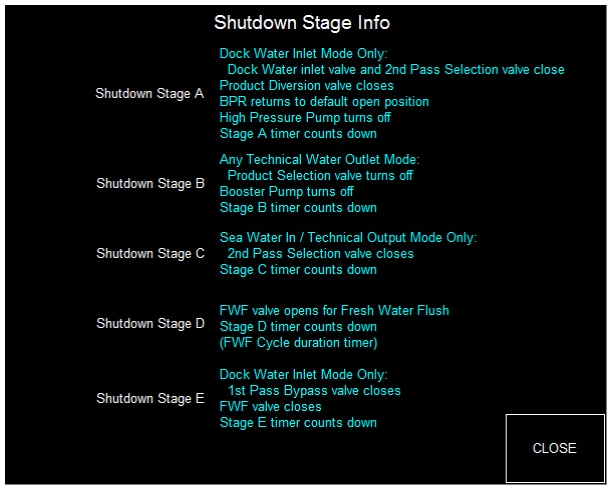
The flow bar graphs can be accessed by pressing on the flow section of the Data screen. These bar graphs, will flash yellow when the system is running and the flow value is below or above the Low or High setpoints. These setpoints are based on the capacity (size) of the system. The Flow Sensor Setup screen is password protected and it can be accessed from the lower right corner of the Flow Monitors screen.

Information



The Information screen displays the model number, capacity, serial number, configuration date, commissioning date, PLC program version, and HMI program version. The System Serial Number and Configuration Date are set up at the factory. The Commissioning Date is entered when the system is installed and commissioned. Detailed descriptions about the startup and shutdown stages can also be accessed from this Information screen.

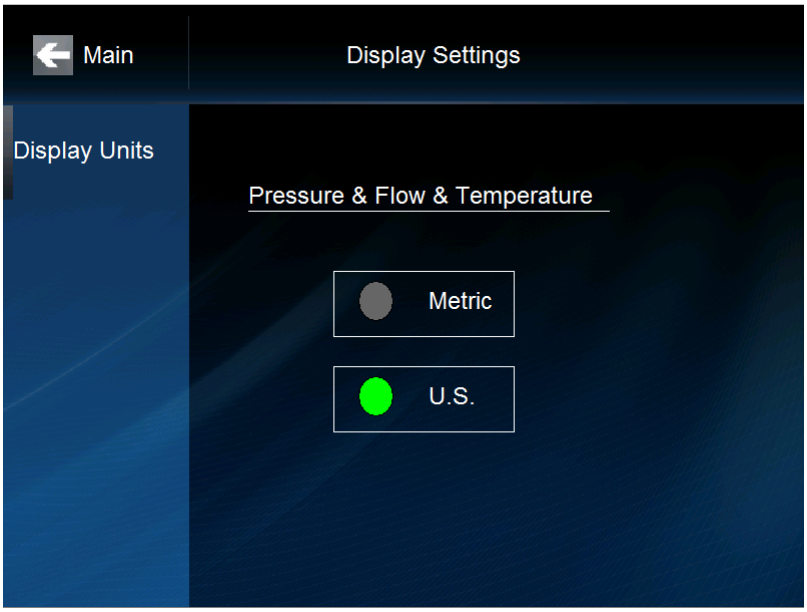




Spare Parts

The Parker part numbers and recommended quantities for the common spare parts are listed on this Spare Parts screen.

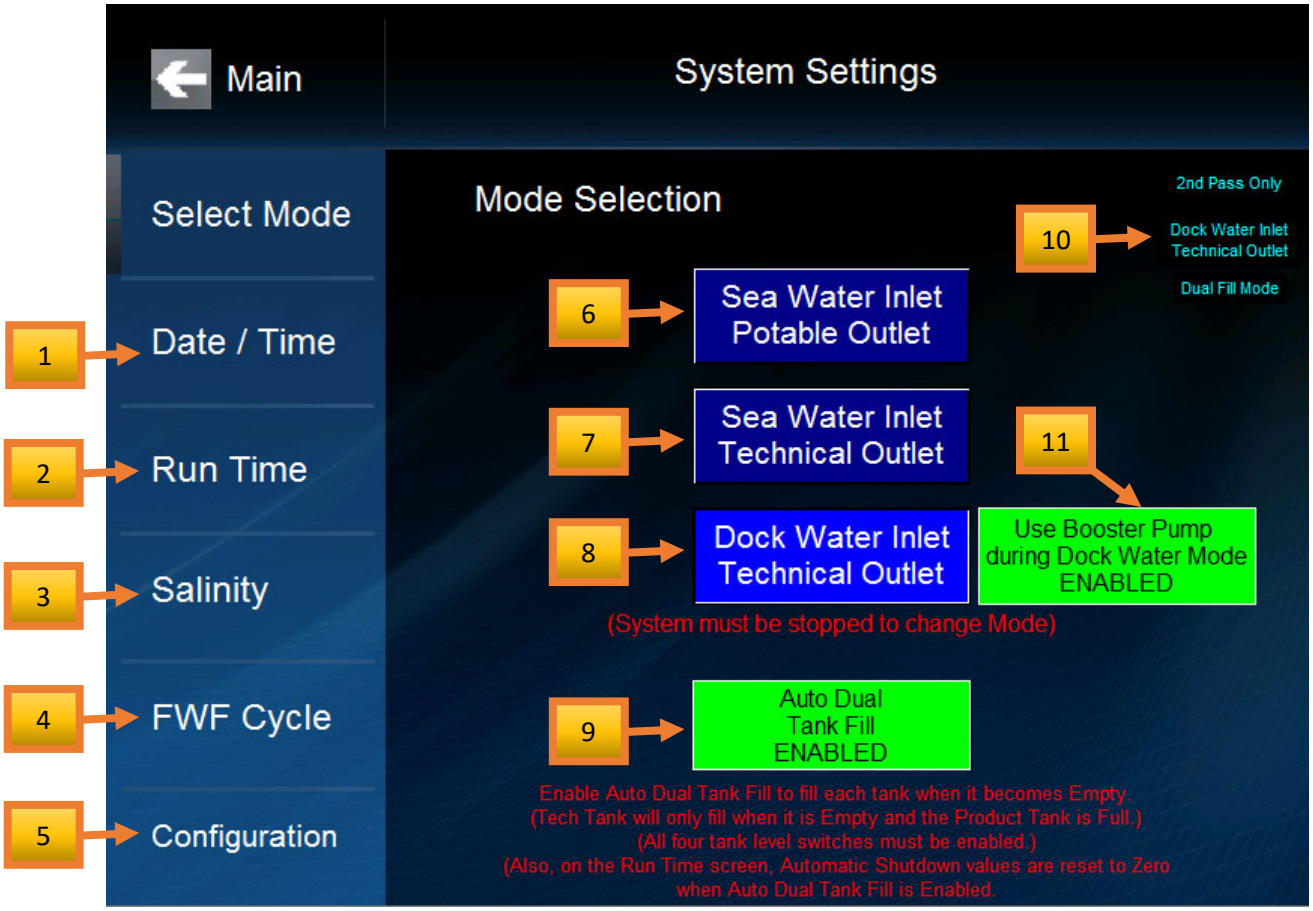
Display Settings



Select the preferred display units. All display screens will change to the selected units.

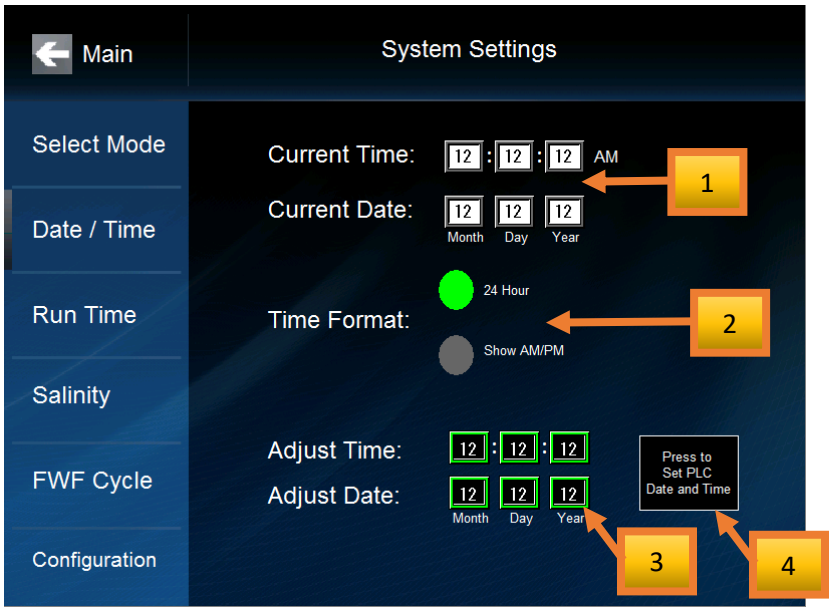
System Settings

Select Mode



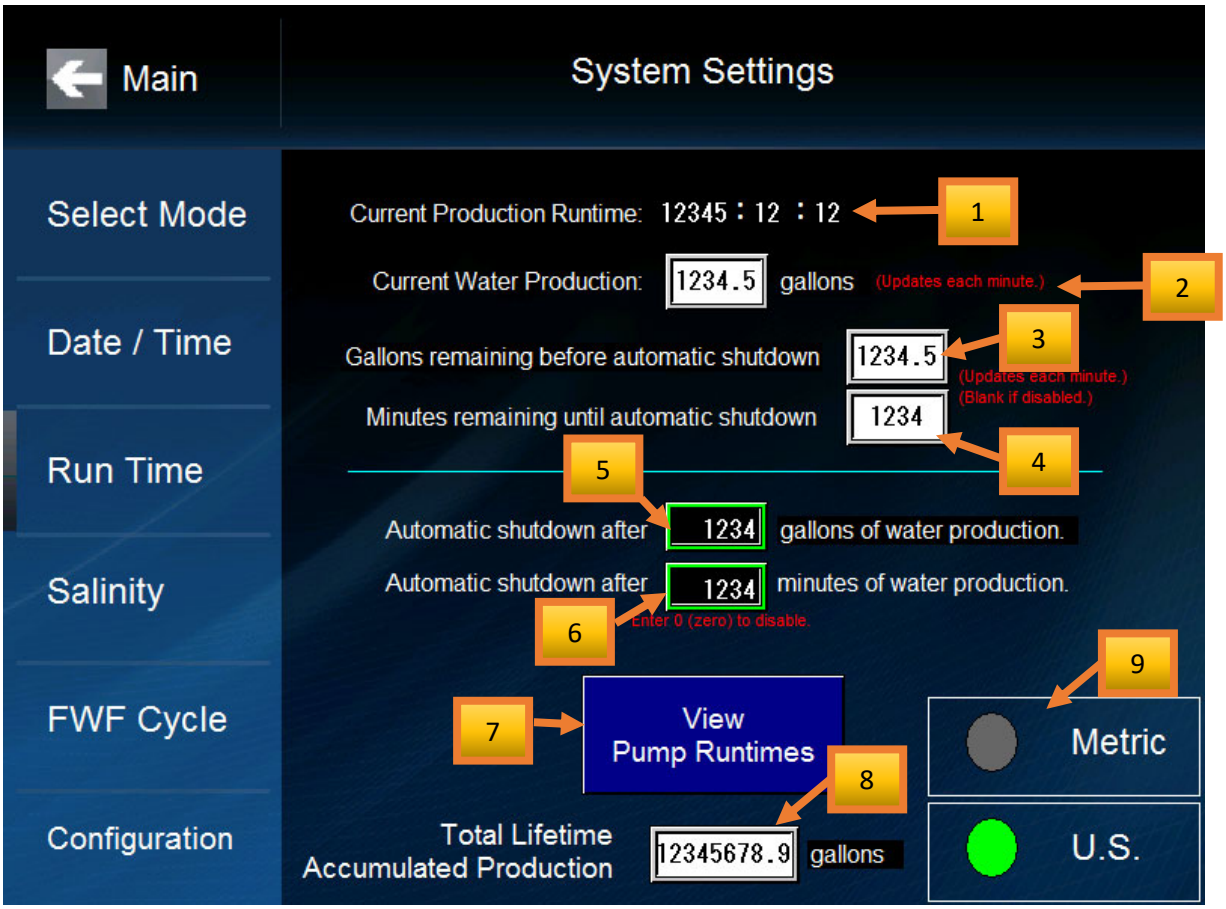
1. Press here to go to the Date and Time portion of the System Settings.
2. Press here to go to the Run Time portion of the System Settings.
3. Press here to go to the Salinity portion of the System Settings.
4. Press here to go to the Fresh Water Flush Cycle portion of the System Settings.
5. Press here to go to the Configuration portion of the System Settings.
6. Press here to enable the “Sea Water Inlet with Potable Outlet” mode. This mode uses the first pass only.
7. Press here to enable the “Sea Water Inlet with Technical Outlet” mode. This mode uses both the first and second pass.
8. Press here to enable the “Dock Water Inlet with Technical Outlet” mode. This mode uses only the second pass.
9. If a separate Potable water tank and Technical Water tank are used and the corresponding level switches are enabled, enabling Auto Dual Tank Fill” will automatically fill up both tanks. The system automatically switches between “Sea Water Inlet with Potable Outlet” mode and “Sea Water Inlet with Technical Outlet” mode as necessary. Refer to the on-screen notes about the functionality of this feature.
10. The current capacity and mode information is displayed here.
11. If Dock Water Mode is selected, the operator may also enable the Booster Pump during automatic operation. (This option is not shown if Dock Water mode is not selected.)

Date and Time



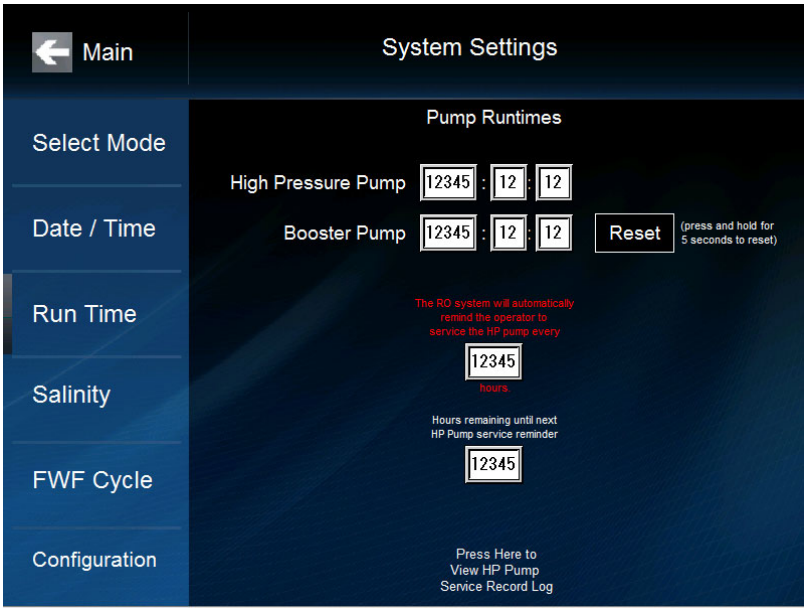
1. The current time and date are displayed here. This time and date data is stored in the PLC.
2. The time format can be selected here.
3. Enter the new time and day information here (24 hour format) and then
4. Press here to update the PLC time and date.

Run Time

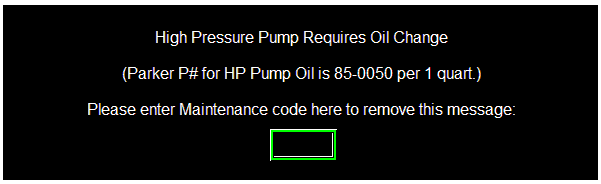


1. The current runtime is shown here. The production runtime counter is only active when the system is producing good water.
2. The amount of water production during the current production is displayed here. This value updates every 60 seconds based on the current product flow reading.
3. The current amount of water production remaining before the system automatically shuts down. This value is only applicable if the automatic shutdown value is entered (see #5)
4. The current amount of water production time remaining before the system automatically shuts down. This value is only applicable if the automatic shutdown time is entered (see #6)
5. The operator can set the amount of water production before automatic shutdown.
6. The operator can set the amount of production time before automatic shutdown.
7. Press here to see the runtimes of each pump as well as information about the HP pump service reminders.
8. The total accumulated amount of water this system has produced over its lifetime.
9. Unit selection.

Pump Runtimes

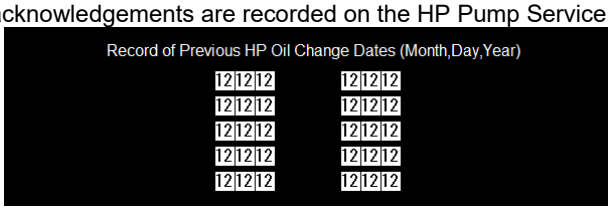


This screen displays the runtimes of the two pumps controlled by the system.
As indicated on the screen (in red), the system will notify the operator when the HP pump needs to be serviced.

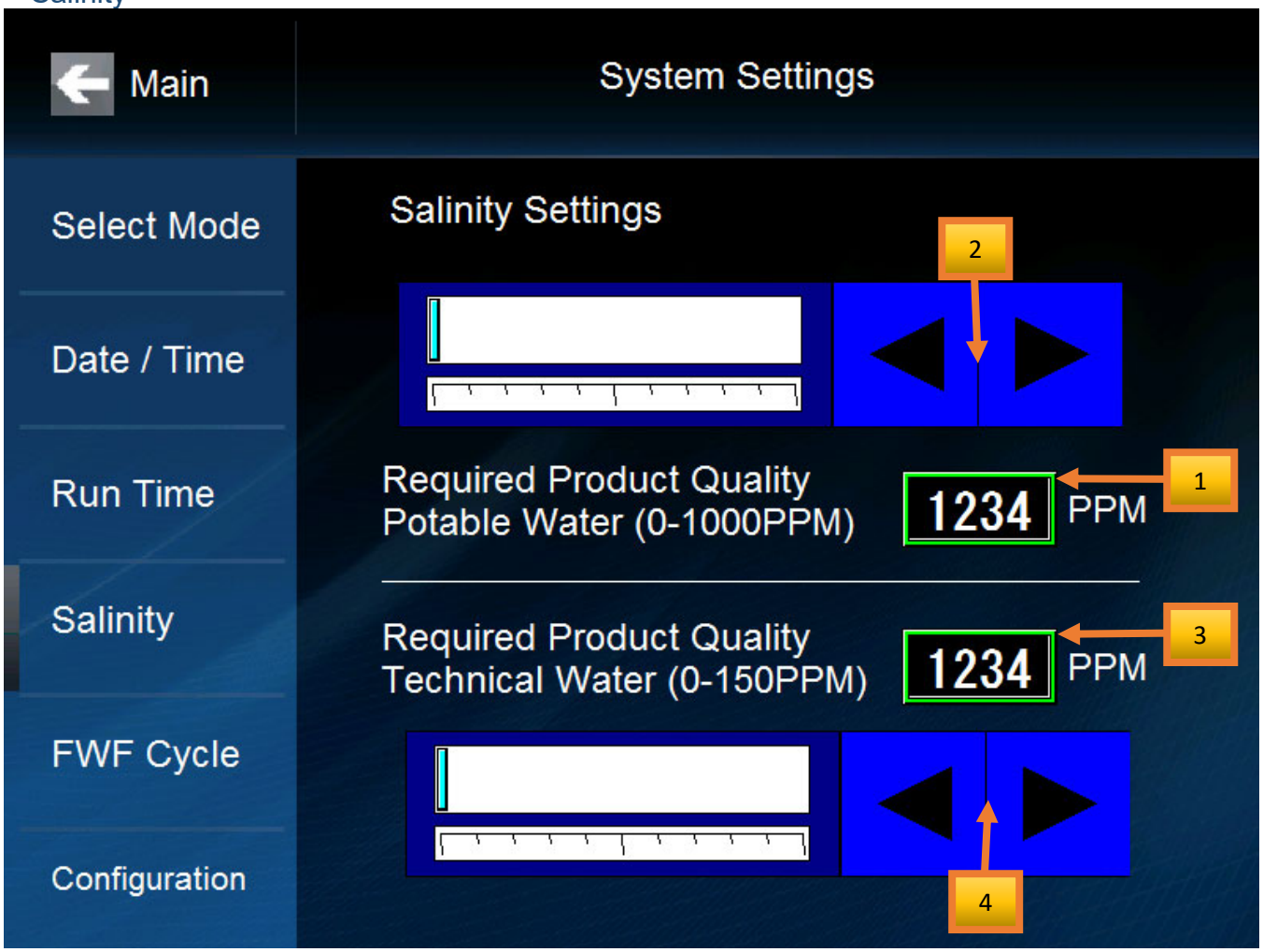


The high pressure pump runtime will be automatically reset after the operator acknowledges the service reminder and enters the maintenance code.

The dates of the last 10 service acknowledgements are recorded on the HP Pump Service Log.

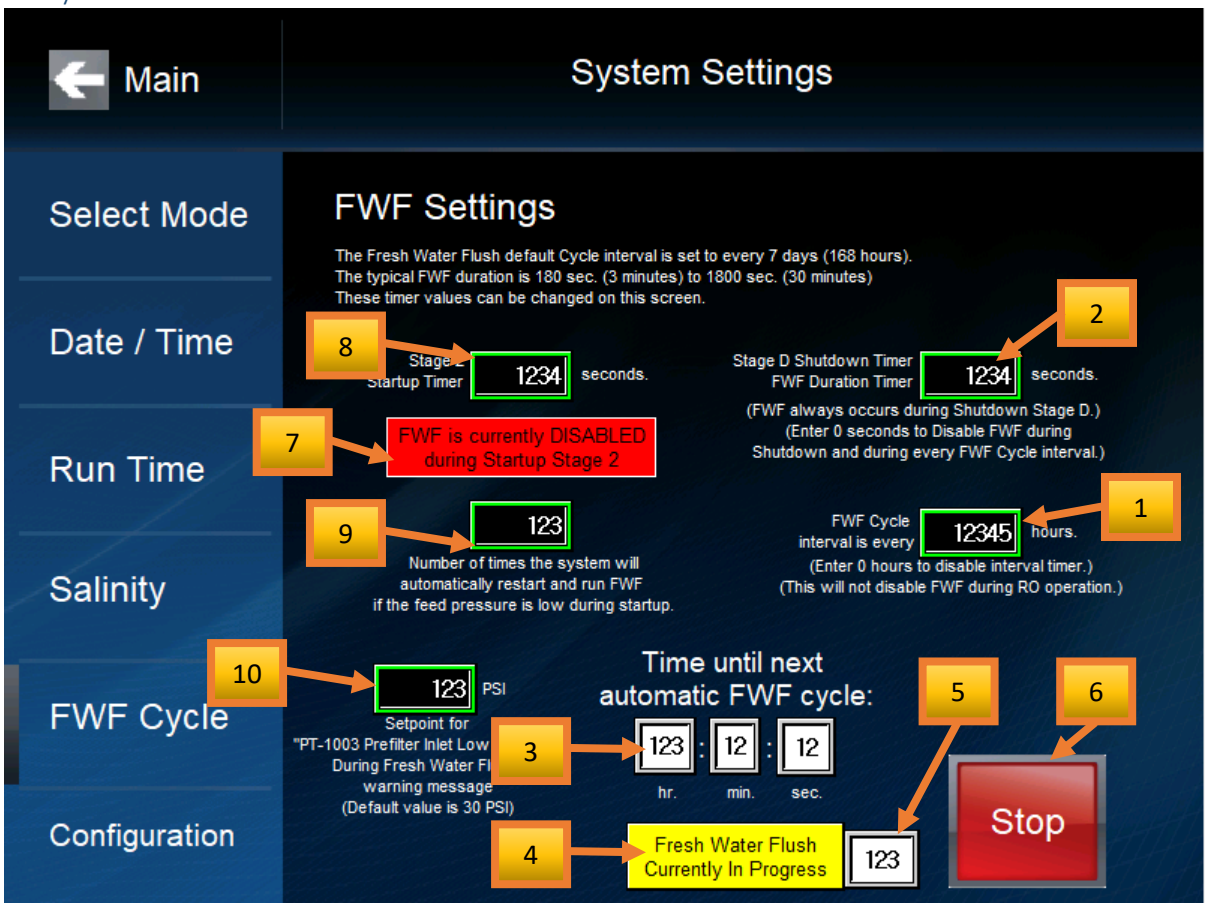


Salinity



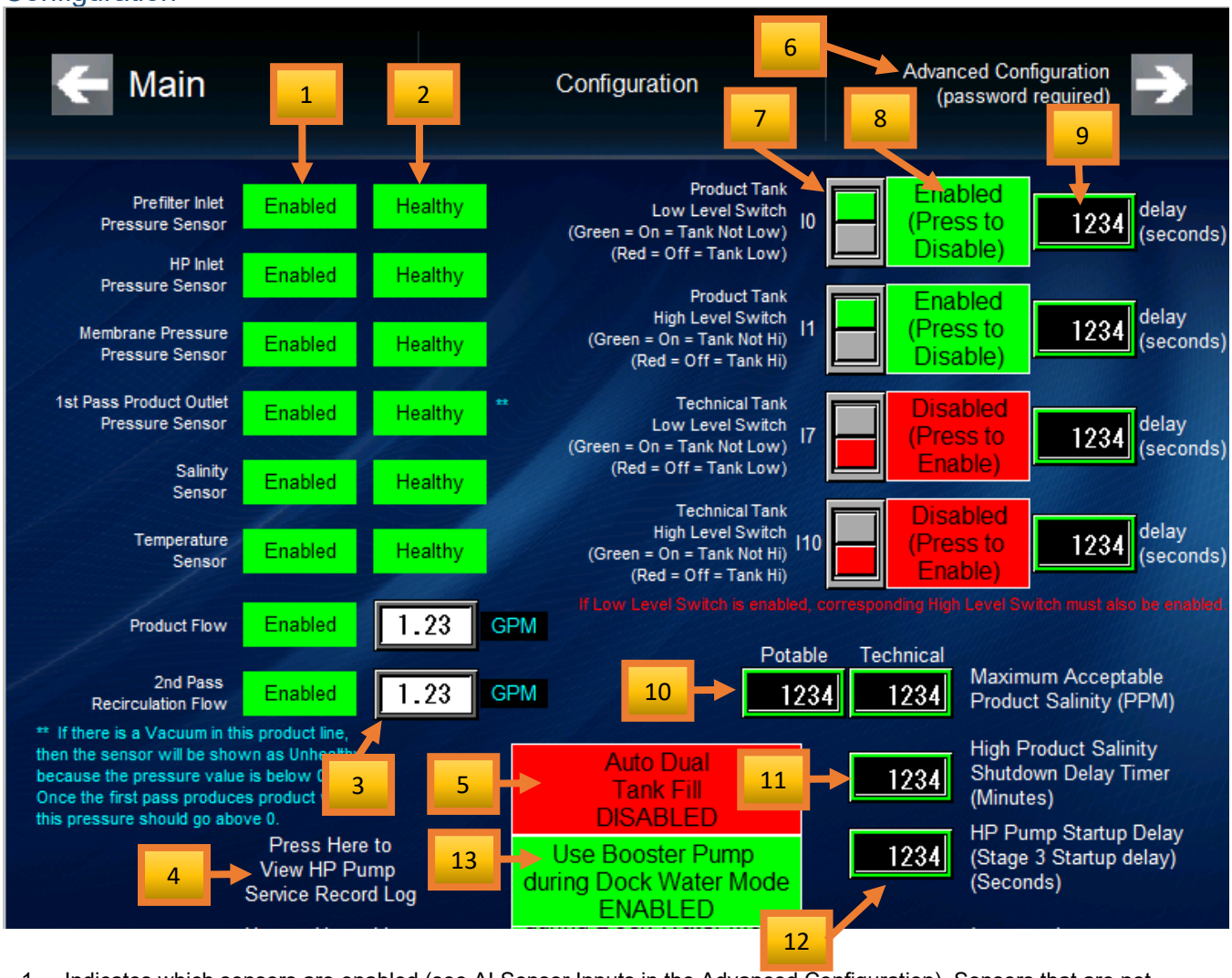
1. The desired maximum product water salinity level is entered here.
2. The operator may also use the arrow buttons to increase or decrease the product salinity setting.
3. The desired maximum technical water salinity level is entered here.
4. The operator may also use the arrow buttons to increase or decrease the technical salinity setting.

FWF Cycle



1. The interval between automatic FWF cycles can be set here. Typically, FWF should be at least once a week (168 hours) if the system is not in use.
2. The duration of the FWF cycle can be set here.
3. When the RO system is stopped and there are no alarms, then the FWF cycle timer will countdown.
4. The “Fresh Water Flush In Progress” indicator will only appear when FWF is running.
5. The FWF countdown is only displayed when FWF is running
6. The FWF can be manually stopped by pressing this button.
7. If the “FWF During Startup Stage 2” is enabled, the FWF valve will open for the duration of Stage 2. This optional feature can be used to help prime the Booster pump during startup.
8. If the “FWF During Startup Stage 2” is enabled, the Stage 2 timer dictates how long this FWF will run.
9. If the “FWF During Startup Stage 2” is enabled and the pressure at PT-1003 is still low during startup Stage 3, then the RO will automatically restart this many times in an attempt to re-prime the Booster pump.
10. During Fresh Water Flush (Shutdown Stage D), this setpoint is used to warn the operator if the pressure at PT-1003 is low during Fresh Water Flush. This is only a warning message, and it does not stop the FWF procedure from running. The default value is 30PSI.

Configuration



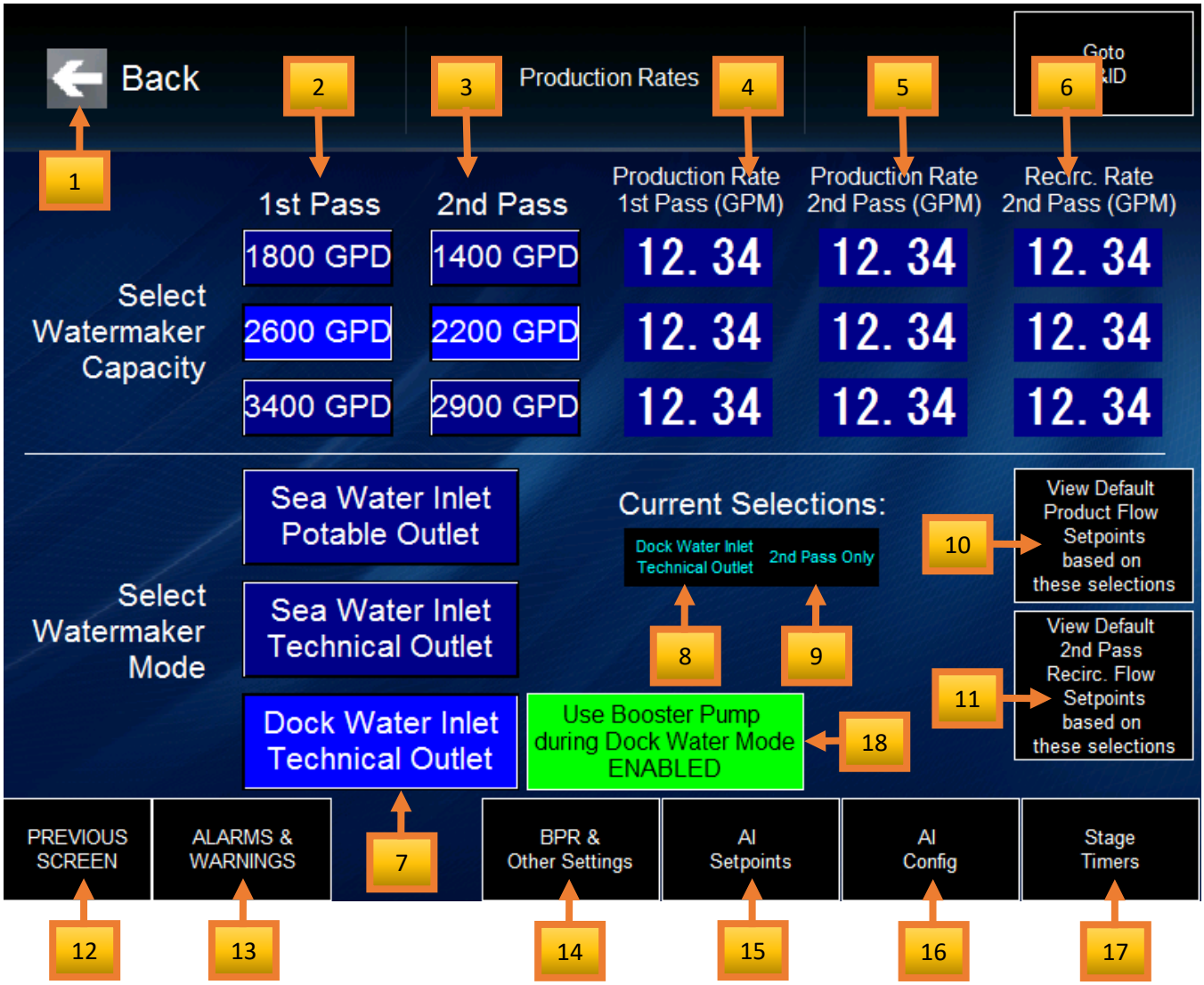
1. Indicates which sensors are enabled (see AI Sensor Inputs in the Advanced Configuration). Sensors that are not enabled are ignored.
2. Sensors are considered healthy if the 4-20mA signal is within the 4-20mA range. A disconnected sensor (0 mA) is unhealthy.
3. The current flow values are indicated here.
4. The HP Pump Service record can be accessed from here.
5. The Auto Dual Tank Fill feature can be toggled here. (All the level switched must be enabled.) Refer to the Select Mode screen for more details about this feature
6. Press this to access the advanced configuration (password required). Refer to the Advanced Configuration section.
7. Indicated the input status as described to the left of the indicator.
8. Each level switch can be enabled or disabled here.
9. The delay timer for each level switch signal (to prevent chattering input signals due to waves in the tanks.)
10. The minimum salinity level for each type of output.
11. This timer is used to stop the RO if it is running and the salinity level is high for this amount of time. The timer is used to shutdown the system automatically if it is failing to make good water.
12. The delay between when the Booster pump turns on and when the HP pump turns. This value is also known as the Stage 3 Startup delay.
13. When Dock Water Mode is selected, the operator may also enable the Booster Pump during automatic operation.

Starting with PLC version v1.04, PLC Input I2 may be used as an optional external start stop/signal. With an external dry contact, turn input I2 on to remotely start the RO. Turn input I2 off to remotely stop the RO. This functionality is the same as pressing the start/stop button on the main screen or P&ID screen.

Advanced Configuration

The screens under Advanced Configuration can only be accessed from the main Configuration screen with a password.

Production Rates



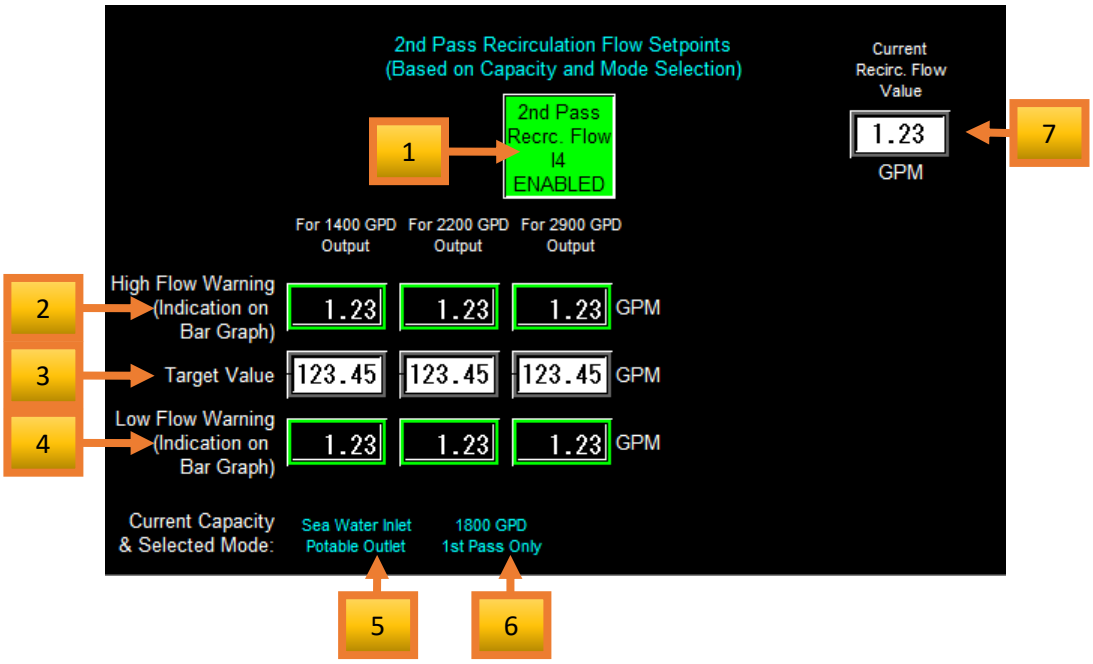
1. Press here to go back to the main Configuration screen.
2. Select from the three 1st Pass production rates. Only one can be selected at a time. Corresponding 2nd pass production rate will automatically be selected.
3. Select from the three 2nd Pass production rates. Only one can be selected at a time. Corresponding 1st pass production rate will automatically be selected.
4. The default 1st Pass Production flow rates will be displayed here. These are the values used when monitoring flow warnings and alarms during 1st Pass Only (see #9)
5. The default 2nd Pass Production flow rates will be displayed here. These are the values used when monitoring flow warnings and alarms during Dual Pass or 2nd Pass Only (see #9)
6. The default 2nd Pass Recirculation flow rates will be displayed here. These are the values used when monitoring flow warnings and alarms during 2nd Pass Only (see #9)
7. Select from the three mode choices. These options can also be accessed from the Operation screen.
8. The selected mode from #7 will be displayed here.

9. The selected capacity and mode description is displayed here. These are based on the selections in #2 and #7.
10. Press here to open the popup window for the default Product Flow Setpoints.
11. Press here to open the popup window for the default 2nd Pass Recirc. Flow Setpoints.
12. Press here to return to the previous screen.
13. Press here to go to the Alarms and Warnings screen.
14. Press here to go to the BPR and Other Settings screen.
15. Press here to go to the AI Setpoints screen.
16. Press here to go to the AI Configuration screen.
17. Press here to go to the Stage Timers screen.
18. When Dock Water Mode is selected, the operator may also enable the Booster Pump during automatic operation.

Product Flow Setpoints

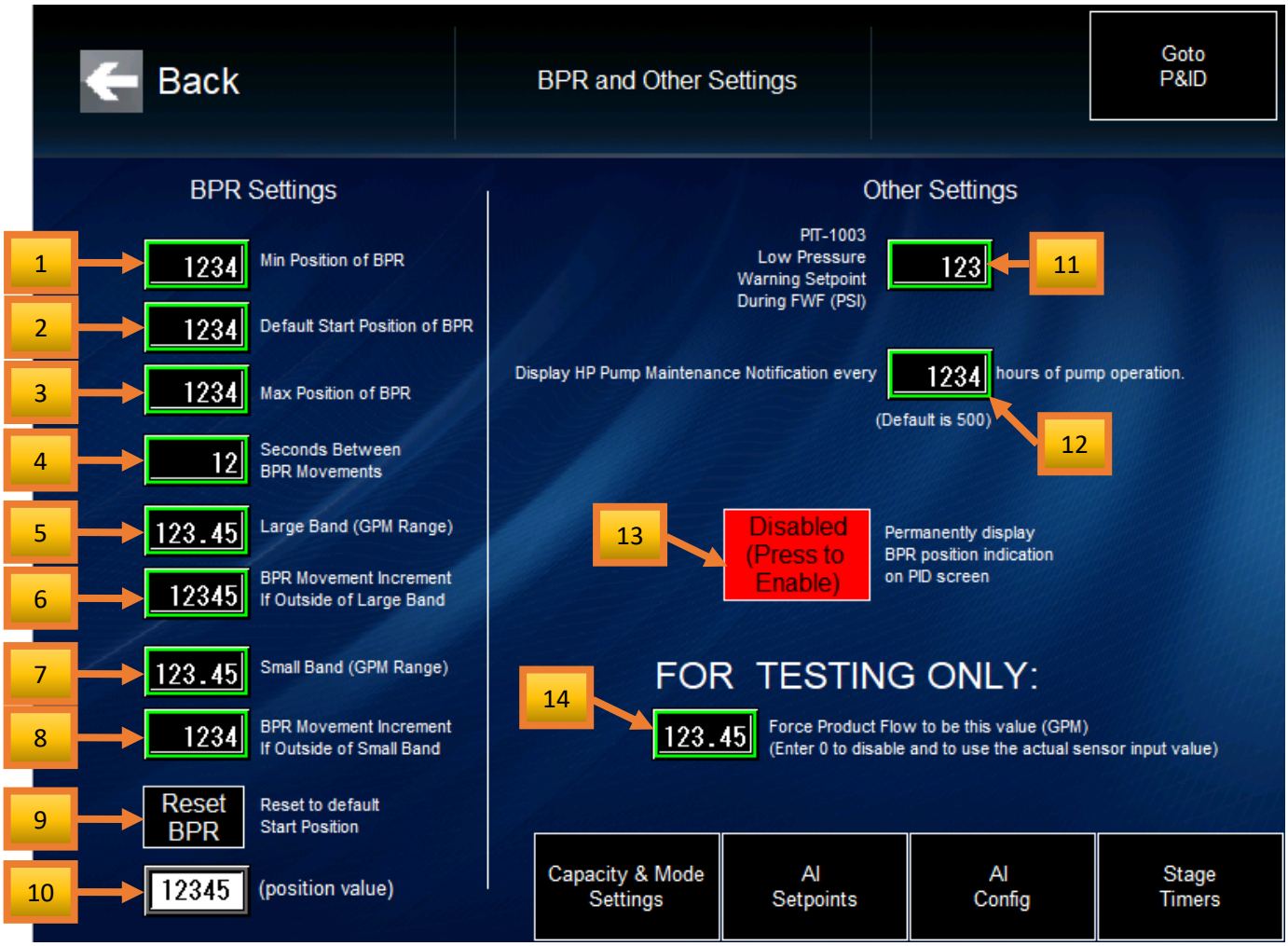
1. Press this button to Enabled or Disable the product flow sensor (FIT-1002). If disabled, all alarms associated with this flow value are also disabled.
2. These setpoints can be changed here. By default, these values are approximately 10% higher than the target value. These values affect the Flow bar graphs on the Data and Flow Monitor screens
3. The target flow rates for each capacity are shown here for reference. The last three (2nd Pass Only) are just for reference because the actual output will be based on the Dock Water inlet pressure.
4. These setpoints can be changed here. By default, these values are approximately 10% lower than the target value. These values affect the Flow bar graphs on the Data and Flow Monitor screens
5. The selected mode will be displayed here.
6. The selected capacity and mode description is displayed here.
7. The current Product Flow value is displayed here (in GPM) for reference.

2nd Pass Recirc. Flow Setpoints



1. Press this button to Enabled or Disable the 2nd Pass Recirculation flow sensor (FIT-1000). If disabled, all alarms associated with this flow value are also disabled.
2. These 3 setpoints can be changed here. By default, these values are approximately 10% higher than the target value.
3. The target flow rates for each capacity are shown here for reference.
4. These 3 setpoints can be changed here. By default, these values are approximately 10% lower than the target value.
5. The selected mode will be displayed here.
6. The selected capacity and mode description is displayed here.
7. The current 2nd Pass Recirculation Flow value is displayed here (in GPM) for reference.

BPR and Other Settings



1. The position of the BPR when it is entirely open (fully backed out).
2. The default start position the BPR will go to when the system is stopped.
3. The position of the BPR when it is entirely closed (fully turned in).
4. The seconds between automatic adjustments of the BPR based on a comparison of the measured product flow versus the target flow value.
5. The total range of the large band around the target value. See example below.
6. The number of position values the BPR will move for a large increment.
7. The total range of the small band around the target value. See example below.
8. The number of position values the BPR will move for a small increment.
9. When pressed, the BPR will back out to 0 and then return to the default start position (see #2).
10. The position of the BPR. 0 position should correspond to the BPR fully open.
11. The low pressure warning setpoint value for PT-1003 during FWF. This is just a warning and it will not stop the FWF process.
12. The number of hours between HP pump Maintenance Notifications. (See Pump Runtimes section for more information.)
13. The position indicator next to the BPR on the Main PID screen can be permanently toggled on or off.
    - The longer vertical bar turns green when the flow value is within the large band.
    - The shorter vertical bar turns green when the flow value is within the small band.

14. This flow input is for testing only. This value should be 0 during normal operation.

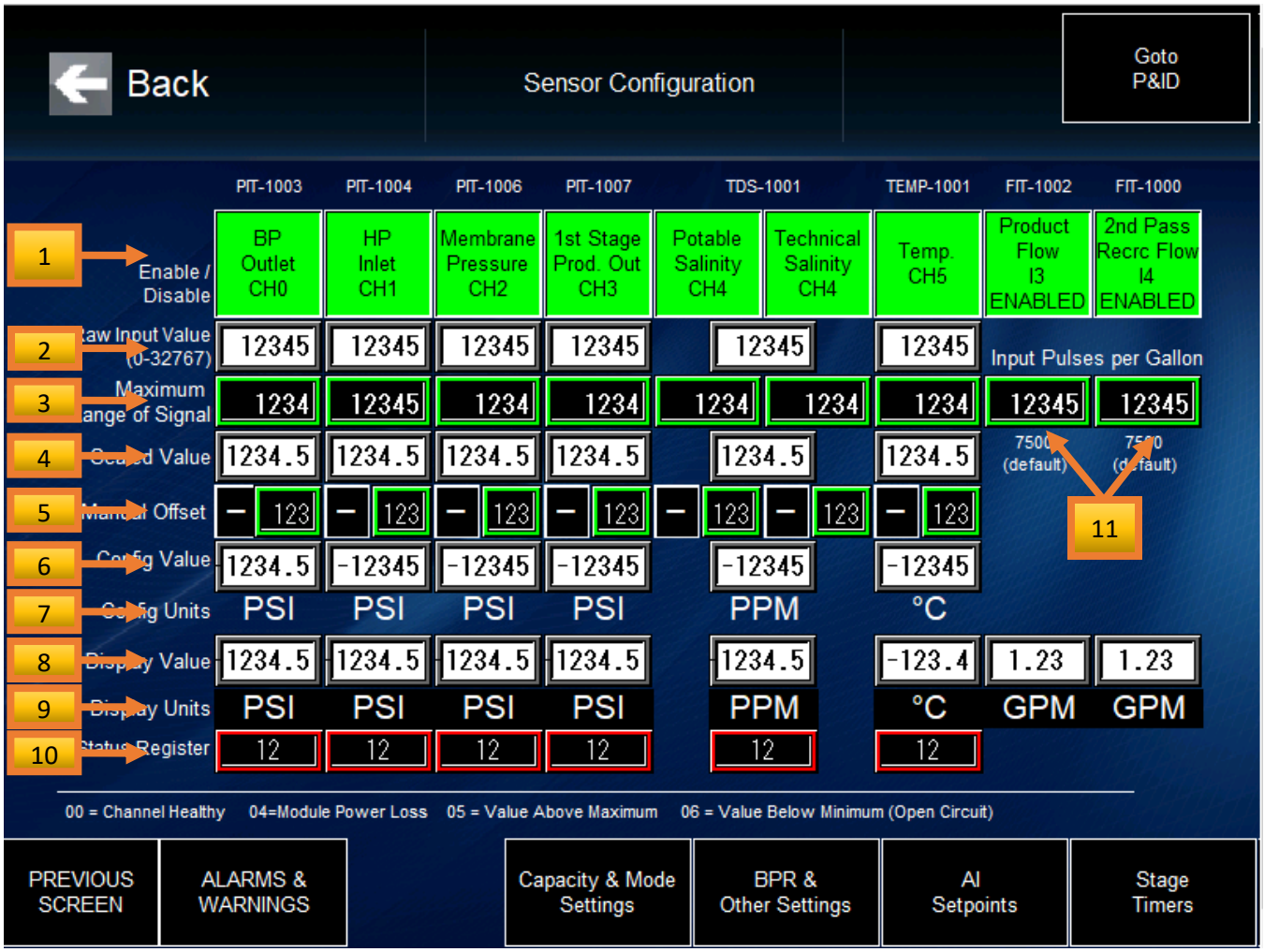
Example:
If the large band is 1.0 and the small band is 0.5 and the target flow is 1.90, then the BPR will move in large increments if the measured value is below 1.4 or above 2.4. The BPR will move in small increments if the measured value is between 1.4 and 1.65 or between 2.15 and 2.4. The BPR will not move if the measured value is between 1.65 and 2.15 (the small band).

Some setpoints are only applicable in certain Modes.

1. These analog input variables can be enabled or disabled by toggling the buttons in this row. Disabling a sensor will disable all alarms and warning associated with it. Some setpoint columns are only applicable in certain modes (see button text for details).
2. The High High alarm setting is used stop the system if the corresponding value goes above this setpoint and the corresponding High High delay timer (seconds) has expired.
3. The High warning setting is used to display the warning message if the corresponding value goes above this setpoint and the corresponding High delay timer (seconds) has expired.
4. The Low warning setting is used to display the warning message if the corresponding value goes below this setpoint and the corresponding Low delay timer (seconds) has expired.
5. The Low Low alarm setting is used stop the system if the corresponding value goes below this setpoint and the corresponding Low Low delay timer (seconds) has expired.
6. The current value of each input is shown here. This value uses the fixed setpoint units.
7. The units of the setpoints are displayed here. These are fixed. All setpoints are to be done in these units.
8. Two different salinity setpoints are used depending on the selected mode. These setpoints determine when the diversion valve opens and allows the product water to go exit the RO system through the Product or Technical outlets.
9. This delay is the time between when the salinity level is below the appropriate setpoint and when the diversion valve opens.

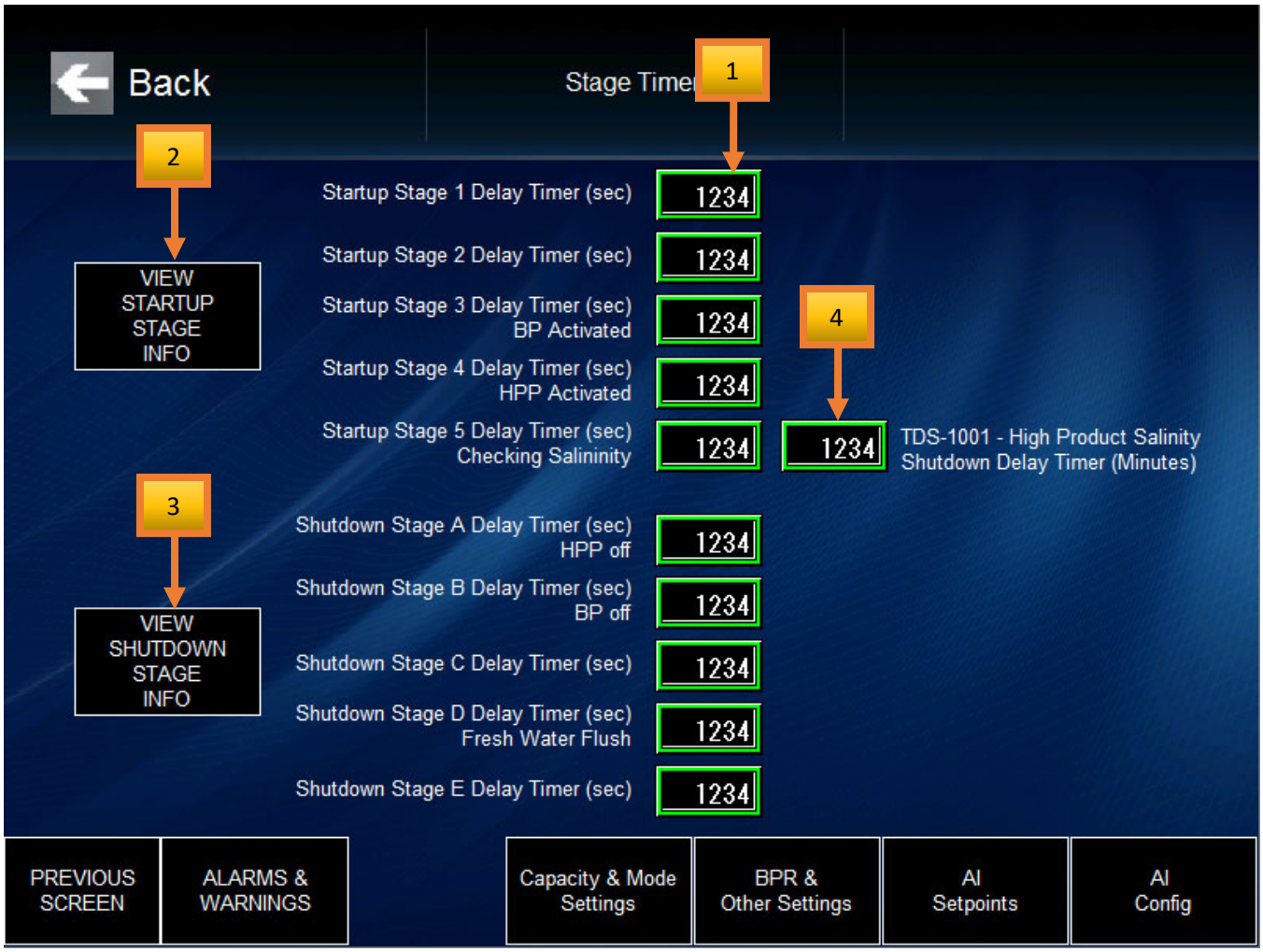
NOTE: Refer to the first page of this manual for the target production rates. During automatic startup, the BPR automatically closes (increases incrementally) until the product flow output reaches the target production rate. However, the BPR will stop closing automatically if the membrane pressure reaches the PIT-1006 High warning setpoint (circled in red in the image above). This will help prevent the RO system from faulting due to the High High membrane pressure alarm setpoint.
For dual pass mode, the manual second pass BPR (PRV-1002) must first be set before starting the system. It may take several tries to find the precise setting on this second pass BPR to achieve the proper technical product flow.

AI Config



1. These analog input variables can be enabled or disabled by toggling the buttons in this row. Disabling a sensor will disable all alarms and warning associated with it. Some setpoint columns are only applicable in certain modes (see button text for details).
2. This value represents the raw 4-20mA analog input signal converted into a 0-32767 value.
3. This is the maximum range of the analog device. Most pressure transmitters are 0-300PSI or 0-2000PSI. The flow range should match the settable output range of the flow sensor (typically 20 GPM).
4. The units of these ranges are fixed (see #6 below).
5. The positive or negative offset to be applied to the Scaled Value
6. The value of the analog input based on the analog signal and the maximum range scaling.
7. The units of the setpoints are displayed here. These are fixed. All setpoints are to be done in these units.
8. The final value based on all the above choices and based on the selected display units (US or Metric).
9. The units of the display value.
10. The status register of the analog input channel. See definition key along the bottom of the screen. If the sensor wires are not connected, the status register will be 6. If the channel signal is good (within range), the status register will be 0.
11. The pulses per gallon for the flow sensors. (These are digital inputs, not analog inputs.)

Stage Timers



The Startup Stage Info and Shutdown Stage Info screens can also be accessed from the main Information screen.

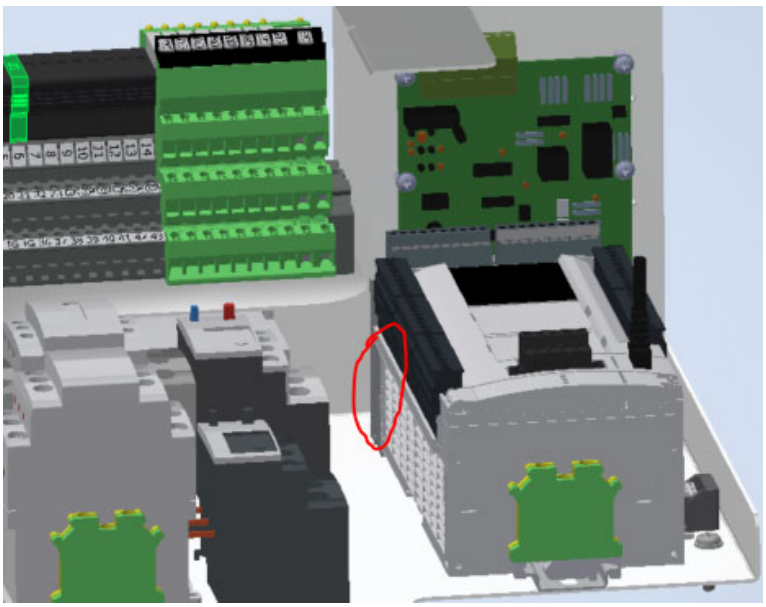
The ten timers for the ten stages can be adjusted here. Some stage timers can be set to 0 if that stage is not used (Refer to the text on the Stage Info screens for a list of which optional events happen in each stage.)

1. The ten stage delay timers can be adjusted from this screen.
2. This button opens the Startup Stage information screen where the events of each startup stage are listed in detail.
3. This button opens the Shutdown Stage information screen where the events of each shutdown stage are listed in detail.
4. In stage 5, this delay timer represents the amount of time that the system is allowed to run without producing good quality water. This prevents the RO system from running for an extended amount of time without producing any good quality water. The status display will indicate “Stage 5 – High TDS Warning” while this timer is active. If the water quality remains high until the end of this timer, the system will shut down with the alarm: “HIGH PRODUCT SALINITY FOR AN EXTENDED PERIOD OF TIME”.

Battery Failure

If the battery on the PLC ever fails, all the stored setpoints will revert back to zero.
This “Factory Reset” screen will automatically display if this occurs.
Follow the instruction on the screen to restore the settings.

Replace the battery with a standard “CR-2032” or “BR-2032” 3-volt coin battery.
The battery is located inside the PLC in this location:



Chapter 7

SYSTEM STORAGE AND CLEANING

R.O Membrane Element Handling and System Storage Cautions

1. **TEMPERATURE:** Never store the R.O. Membrane Element or Membrane/Vessel Assembly in direct sunlight. Never expose the R.O. Membrane Element or Membrane/Vessel Assembly to storage temperatures above 120 F / 50 C or below 32 F / 0 C. High temperatures cause up to 40% loss of production from the R.O. membrane element. This damage is irreversible. Freezing temperatures cause mechanical damage to the system and irreversible damage to the R.O. membrane element.

2. **DRYING OUT:** Never allow the R.O. membrane element to dry out, as 40% production loss occurs. This membrane damage may be irreversible. Some, but not all, production may be restored by saturating the R.O. Membrane Element in product water for several days and then operating the system using product water, feeding into the system for a continuous 48-hour period. The R.O. membrane element must remain wet at all times.

3. **BIOLOGICAL FOULING:** Protect the R.O. membrane element from biological fouling. Production loss occurs if the element becomes fouled by biological slimes. Some, but not all, production may be restored after cleaning.

4. **CHEMICAL FOULING:** Never expose the R.O. Membrane Element to chemicals other than those supplied by Parker. Use caution when operating the system in harbors that may be polluted with chemicals, oil, or fuel. Chemicals may damage the R.O. Membrane Element beyond repair.

5. **STORAGE:** The dark and moist interior of a membrane element is an excellent breeding ground for microorganisms. Simply operating the system does not protect the R.O. Membrane Element from up to 40% production loss due to biological fouling. During short-term shutdowns, the system must be rinsed as explained in the following pages. During long-term shutdowns, the system must be rinsed as well as chemically treated as explained later in this chapter.

6. **NEW SYSTEM STORAGE:** If you are storing the system for longer than 3 months, do not install the membrane. Install the membrane prior to actual use. If storage of the new system is longer than 3 months, the system must be rinsed with fresh water and stored with fresh storage solution every 3 months, otherwise biological fouling and/or drying out will damage the R.O. Membrane Element.

ONCE THROUGH RINSE

"Once Through Configuration Rinse" - proceed as follows:

1. Configure the Suction line for a Once Through Configuration as illustrated in this section. Disconnect the outlet line from the Sea Strainer [3] and place it in the container or bucket. Or if the system is equipped with an Optional Inlet Clean/Rinse 3-way ball valve [30] between the Sea Strainer [3] and Booster Pump [4], then position this valve to draw from the bucket.

2. Configure the Brine Discharge line for a Once Through Configuration. Connect the Brine Discharge Line from the system to the Thru-Hull over board discharge fitting [18], normal connection for normal operation. Or if the system is equipped with an Optional Discharge Clean/Rinse 3-way ball valve [31] between the System and the Thru-Hull over board discharge fitting [18], then position this valve to discharge through the Thru-Hull fitting, normal connection for normal operation

Configure for Closed Loop - proceed as follows:

1. Configure the Suction line for a Closed Loop Configuration as illustrated in the this section. Disconnect the outlet line from the Sea Strainer [3] and place it in the container or bucket. Or if the system is equipped with an Optional Inlet Clean/Rinse 3-way ball valve [30] between the Sea Strainer [3] and Booster Pump [4], then position this valve to draw from the bucket.

2. Configure the Brine Discharge line for a Closed Loop Configuration. Disconnect the Brine Discharge Line from the Thru-Hull over board discharge fitting [18] and place it in the container or bucket. Or if the system is equipped with an Optional Discharge Clean/Rinse 3-way ball valve [31] between the system and the Thru-Hull over board discharge fitting [18], then position this valve to return to the container or bucket.

SHORT TERM SHUTDOWN

A short-term shutdown is defined as a period of time in which the system is not utilized for up to four weeks. An effective short-term method for protecting the system and R.O. membrane element is a Fresh Water Rinse of the entire system with fresh water (product water from the system). This prolongs the system life by minimizing electrolysis and retarding biological growth.

Note: If the system is equipped with an automatic Fresh Water Flush Accessory, then it is not necessary to read this section. The Automatic Fresh Water Flush accessory rinses the system every 7 days automatically as described previously. However, see “Winterizing and Freezing” note below.

NOTE: WINTERIZING AND FREEZING TEMPERATURE STORAGE

If the system is exposed to freezing temperatures, DO NOT activate the Automatic Fresh Water Flush. Instead, perform a Manual Fresh Water Rinse as described below. Deactivate the Automatic Fresh Water Flush cycle by pressing the “Stop” switch twice (2 times).

MANUAL FRESH WATER RINSE PROCEDURE:
Follow the directions below if the system is not equipped with an Automatic Fresh Water Flush accessory.

This procedure displaces the system feed water with fresh water and allows a short-term shutdown for up to four weeks.

Five gallons (19 liters) of fresh product or potable water is required for the fresh water rinse.

1. Close the Cock Valve [2].
2. Fill a 5-gallon container with clean, fresh water.
3. Configure the system for a Once Through Rinse.
4. Fully open the Back Pressure Regulating Valve [17] counter clockwise.
5. Press the “Start” switch. The fresh water rinses the system and discharges out to waste [18].
6. Apply 200 psi of pressure to the system by turning the Back-Pressure Regulator [17] clockwise. This allows the system to produce a minimal amount of product water, which ensures that the product water line remains wet.
7. Just prior to depleting the rinse water from the bucket, fully open the Back-Pressure Regulator Valve [17] counter clockwise and stop the system.

NOTE: **IN NON-FREEZING TEMPERATURES, THE SYSTEM MAY NOW BE LEFT UNATTENDED FOR SEVERAL WEEKS.**

HOWEVER, IF THE SYSTEM WILL BE EXPOSED TO FREEZING TEMPERATURES, CONTINUE WITH THE FOLLOWING PROCEDURES:

8. Again, fill a 5-gallon container with clean, fresh water. Add twenty percent (1 gallon / 4 liters) food grade glycerin (propylene glycol) to the Storage Chemical Solution. This prevents the water in the system from freezing.
9. Configure the system for a Once Through Rinse.
10. Fully open the Back Pressure Regulating Valve [17] counter clockwise.
11. Press the “Start” switch. The fresh water rinses the system and discharges out to waste [18].
12. Just prior to depleting the rinse water from the bucket, fully open the Back-Pressure Regulator Valve [17] counter clockwise and stop the system. Deactivate the Automatic Fresh Water Flush Cycle by pressing the “Stop” switch twice (2 times).
13. Reconfigure the system for normal operation by reconnecting the Sea Strainer [3] outlet line, or reposition the Inlet Rinse/Clean 3-way ball valve [30] to normal operation position. The system is now exposed to fresh rinse water and may be left unattended for up to four weeks.
14. Remove product water from the Post Filtration Section.
    a) Open the Charcoal Filter Bowl and drain the product water from it.
    b) Disconnect the bottom tube fitting from the Ultra Violet Sterilizer and drain the product water from it.
    c) Open the pH Neutralizer Filter Bowl and drain the product water from it.
    d) Disconnect or Close the valve from the fresh water tank to the Automatic Fresh Water Flush and drain the Fresh Water Flush Charcoal Filter bowl.

The Manual Fresh Water Rinse Procedure should be repeated every four weeks if the system is not in use and if the system does not have the Optional Automatic Fresh Water Flush.

LONG TERM SHUTDOWN:

Long Term or Prolonged Shutdown is a period in which the system goes un-used for longer than three months, depending on conditions. For this interval, the system should first be rinsed with fresh water then stored with system and Membrane Element Storage Chemical (Parker SC). This chemical inhibits bacterial growth while maintaining the high flux and salt rejection of the R.O. Membrane Element. The Long-Term Shutdown procedure requires 10 gallons (38 liters) of potable water. Follow the directions listed below.

NOTE: **WINTERIZING AND FREEZING TEMPERATURE STORAGE:**
If the system is exposed to freezing temperatures, add twenty percent (1 gallon / 4 liters) food grade glycerin (propylene glycol) to the Storage Chemical Solution. This prevents the water in the system from freezing.

1. Close the Cock Valve [2].
2. Replace the Pre-filtration Cartridges [6] with new Parker Pre-filtration Elements.
3. Fill a clean 5-gallon container with non-chlorinated product water.
4. Configure the system for a Once Through Rinse.
5. Fully open the Back Pressure Regulating Valve [17] counter clockwise.
6. Press the “Start” switch. The fresh water rinses the system and discharges out to waste [18].
7. Apply 200 psi of pressure to the system by turning the Back-Pressure Regulator [17] clockwise. This allows the system to produce a minimal amount of product water, which ensures that the product water line remains wet.
8. Just prior to depleting the rinse water from the bucket, fully open the Back-Pressure Regulator Valve [17] counter clockwise and stop the system (press stop button twice to abort Fresh Water Flush Cycle).
9. Fully open the Back Pressure Regulating Valve [17] counter clockwise.
10. Fill the 5-gallon bucket with product water. Add 4 ounces (1/6th bottle) of Parker SC Storage Chemical to the water in the plastic bucket.
    DO NOT ADD ANY OTHER CHEMICAL.
11. Mix and thoroughly dissolve the solution in the container.
12. If the system will be exposed to freezing temperatures, add 1-gallon (4 liters) food grade glycerin (propylene glycol) to the 5 gallons of Storage Solution. This prevents the water in the system from freezing.
    DO NOT ADD ANY OTHER CHEMICAL.
13. Configure the system for a **Closed Loop Configuration**.
14. Operate the system by pressing the "Start" Switch. The Storage Chemical Solution flows from the container through the system and back into the container in a Closed Loop configuration.
    Do not pressurize the system; leave the Back-Pressure Regulator [17] fully open.
15. After approximately 10 minutes of circulation, stop the system (Press stop button twice to abort Fresh Water Flush Cycle).
16. Configure the system for a **Once Through Rinse**.
17. Start the system, which discharges the Storage Chemical Mixture through the Brine Discharge Thru Hull Fitting [18].
18. Stop the system just before depleting the Storage Chemical Solution from the tank. Press the Stop switch twice to abort the Automatic Fresh Water Flush cycle.
19. Reconfigure the system for normal operation by reconnecting the Sea Strainer [3] outlet line for normal operation. Or if the system is equipped with an Inlet Clean/Rinse 3-way ball valve [30], position this valve to the normal operating position towards the Sea Strainer.

NOTE: **WINTERIZING AND FREEZING TEMPERATURE STORAGE:**

HOWEVER, IF THE SYSTEM WILL BE EXPOSED TO FREEZING TEMPERATURES, CONTINUE WITH THE FOLLOWING PROCEDURES:

If the system is exposed to freezing temperatures, remove product water from the Post Filtration Section.

a) Open the Charcoal Filter Bowl and drain the product water from it.
b) Disconnect the bottom tube fitting from the Ultra Violet Sterilizer and drain the product water from it.
c) Open the pH Neutralizer Filter Bowl and drain the product water from it.
d) Disconnect or Close the valve from the fresh water tank to the Automatic Fresh Water Flush and drain the Fresh Water Flush Charcoal Filter bowl.

The system may now be left unattended for 3 to 6 months. With ideal conditions, including: a relatively new R.O. Membrane Element, a clean system prior to storage, cool temperatures, and no leakage of storage chemical within the system, this process will protect the system for up to 6 months. Adverse conditions may provide less protection.

Evaluate these factors before determining the proper interval between repeated rinsing and storage periods.

R.O. MEMBRANE ELEMENT CLEANING PROCEDURES:

Do not arbitrarily clean the R.O. Membrane in a NEW system. If a New system experiences low production or high salinity then it should be operated for up to 48 hours continuously to clear and saturate the R.O. Membrane Element and product water channel. If a new system still experiences low production and or high salinity after 48 hours of continual operation, then contact the factory.

The membrane element requires cleaning from time to time. Biological growth and salt accumulation eventually make replacement necessary. The frequency of required cleaning depends on the amount of production loss and salt rejection loss resulting from normal use. To properly assess performance changes, it is important to maintain daily log readings for comparison.

During performance comparisons, Feed Water Temp, Feed Water Salinity, and System Operating Pressure must be taken into consideration and compensated for. After compensations, a 10% decline in productivity (GPH Flow) and/or a 10% increase in salt passage indicate that the R.O. Membrane Element may requires cleaning. If production rate has dropped dramatically since the last time the system was used, this may be due to drying out of the R.O. Membrane Element and/or fouling during storage. If the system has not been used for several months and the production rate has dropped dramatically since the last time used, try operating the system for 48 or more continuous hours to saturate the Product Water Channel within the R.O. Membrane Element. If production rate drops dramatically from one day to another, this may be due to chemical attack which is not cleanable. Sewage chemicals or petroleum products cause irreparable damage to the R.O. Membrane Element. Suspended solids fouling results from silt, coral dust, river or inland waterway debris, or other small solid matter.

R.O. Membrane Element Cleaning - Water and Chemical Requirements:

1. The system must be rinsed with fresh water before any cleaning procedure.
2. The process of rinsing and cleaning the R.O. Membrane Elements requires 20 gallons / 76 liters of fresh non-chlorinated product water.
3. The Parker Reverse Osmosis cleaning compounds are designed to clean in a closed loop configuration moderate fouling from the R.O. membrane element. If the R.O. Membrane Element is excessively fouled and in-field cleaning is not successful, the R.O. Membrane Element may be returned to Parker or to one of Parker's many Service Dealers for professional chemical cleaning. If your membrane requires professional cleaning, please contact Parker for a Return Authorization Number, price quotation, and return instructions.
4. Parker MCC-1, Membrane Cleaning Compound "# 1" is an alkaline cleaner designed to clean biological fouling and slight oil fouling from the R.O. Membrane Element. Biological fouling is usually the first cause of the R.O. Membrane Element fouling. The system is constantly exposed to seawater and biological growth occurs from the first day forward. If exposed to seawater and left to sit, the R.O. Membrane Element becomes fouled even with no actual system use. This fouling is minimized with fresh water rinsing whenever the system is not in use.
5. Parker MCC-2, Membrane Cleaning Compound "# 2" is an acid cleaner designed to clean calcium carbonate and other mineral deposits from the R.O. Membrane Element. Mineral fouling is a slow process, which takes place during use of the system. Therefore, if the system has relatively few hours of use yet shows signs of R.O. Membrane Element fouling then that fouling is likely biological fouling. If the system has an excess of 1000 hours of use, then there may be some mineral fouling combined with biological fouling.
6. Parker MCC-3, Membrane Cleaning Compound "# 3" is used for iron fouling. It is not included in the Parker Membrane Cleaning Chemical Kit. If the system's R.O. membrane element is fouled with rust from iron piping, then Parker MCC-3 may be used for effective removal of light or moderate rust fouling. Heavily rust fouled RO Membranes may not be recoverable as rust not only fouls the Membrane Element but also damages the membrane surface.

CAUTION DO NOT MIX DIFFERENT CLEANING CHEMICALS TOGETHER.
DO NOT USE DIFFERENT CLEANING CHEMICALS TOGETHER AT THE SAME TIME. MIX THE CLEANING CHEMICALS SEPARATELY AND USE THEM SEPARATELY.

Chemical	Rinse water required	Cleaning water required	Second Rinse water required	Final Rinse water required	Total water required
MCC-1	5	5	5	5	20
MCC-2	5	5	5	5	20
MCC-3	5	5	5	5	20

1. Close the Cock Valve [2].
2. Replace the Pre-filtration Cartridge with a new Parker supplied Pre-filtration Element.
3. Configure the system for a Once Through Rinse.

4. Fill the 5-gallon container completely with non-chlorinated product water. The bucket must contain enough product water to rinse the system until the feed water is displaced.
5. Open the Back Pressure Regulating Valve [17] fully open counterclockwise.
6. Operate the system by pressing the “Start” switch. The rinse water rinses the entire system and discharges out to waste.
7. Just prior to depleting the rinse water from the 5-gallon container, stop the system.
8. Fill the 5-gallon container completely with product water.

NOTE: FOR OPTIMUM CLEANING RESULTS, USE WATER BETWEEN 90 F-110 F / 32 C –43 C. DO NOT EXCEED 120 F / 50 C.

9. Add 6 ounces (1/4 bottle) of either the Parker MCC-1, MCC-2, or MCC-3 Cleaning Chemical to the water in the plastic bucket.
   USE ONLY ONE CHEMICAL AT A TIME.
10. Mix and thoroughly dissolve the solution in the container.
11. The ratio for the Membrane Cleaning Chemical (MCC) is one bottle per 20 gallons of product water.
12. Configure the system for a Closed Loop Configuration.
13. Press the “Start” switch to begin circulating the Cleaning Chemical solution from the container through the system and back into the container. Do not pressurize the system; leave the Back-Pressure Regulator Valve [17] fully open.
14. After approximately 60 minutes of circulation, stop the system (Press the stop button twice to abort the Fresh Water Flush Cycle).

NOTE: If time permits, for best cleaning results, allow the cleaning solution to sit in the system for 4 to 6 hours and then reticulate the solution for an additional 20 minutes. This will allow the solution to soak, dislodge, and dissolve fouling.

15. Empty the 5-gallon container by reconfiguring the system for a Once Through Rinse.
16. Press the “Start” switch to discharge the solution out the Brine Discharge Thru Hull Fitting [18].
17. Just prior to depleting the Cleaning Chemical solution from the container, stop the system (Press the stop button twice to abort the Fresh Water Flush Cycle).
18. Fill the 5-gallon container completely with non-chlorinated product water.
19. Again, configure the system for a Closed Loop Configuration.
20. Press the “Start” switch to circulate the water from the container through the system and back into the container. Continue rinsing for 20 minutes.
21. After 20 minutes, stop the system by pressing the “Stop” switch (Press the stop button twice to abort the Fresh Water Flush Cycle).
22. Empty the 5-gallon container by again reconnecting the Brine Discharge line to the normal position as described in Step 15.
23. Press the “Start” switch to discharge the rinse water out the Brine Discharge Thru Hull Fitting [18].
24. Just prior to depleting the rinse water from the 5-gallon container, stop the system (Press the stop button twice to abort the Fresh Water Flush Cycle).
25. Fill the 5-gallon container with non-chlorinated product water.
26. Start the system to begin final rinsing of the system and discharging out the Brine Discharge Thru Hull Fitting to waste.

27. Just prior to depleting the Final Rinse Water from the container, stop the system (Press the stop button twice to abort the Fresh Water Flush Cycle). The system is now ready for additional cleaning, storage, or use.
28. If further membrane cleaning is necessary, repeat Steps 8 through 27 for each additional cleaning.
29. If cleaning is completed and the system is to be stored:
    a) Press the “stop” switch once to place the Fresh Water Flush in the stand-by mode
    b) Reconnect the system’s Suction and Discharge Lines to normal operating position.
    c) Leave the Inlet Seacock Valve in the closed position.
30. If cleaning is complete and the system will be operated again within a short period of time:
    a) Reconnect the system’s Suction and Discharge Lines to normal operating position.

Chapter 8

TROUBLESHOOTING / MAINTENANCE AND REPAIR

Individual Component Maintenance and Repair

1. Inlet Thru Fitting***: Non-Parker component - Keep the Inlet Thru Hull Fitting free and clear of debris and marine growth. If the Inlet Thru Hull Fitting is clogged, this results in a low feed pressure condition, which causes the system to shut off.

2. Cock Valve***: Non-Parker component - The packings and connections of the Inlet Sea Cock Valve must be tight and must properly seal. Clean the valve cavity of debris or replace the seal and seat or the entire valve, as required. Loose fittings or worn seal will allow air to enter the Parker system causing continual shut down due to subsequent low feed water pressure.

3. Sea Strainer**: Keep the mesh screen free and clear of debris. When the mesh screen is clogged, it results in a low-pressure condition causing system shut off. If the Sea Strainer's bowl is loose or if the O-ring seal is worn or not properly seated, air will enter the system causing continual shut down due to subsequent low feed water pressure.

   To Clean the Sea Strainer:
   1. Remove the bowl by turning it counter-clockwise.
   2. Remove the Mesh Screen from the bowl.
   3. Remove the flat sealing gasket carefully from the bowl. The gaskets are fragile, so handle with care.
   4. Wipe the sealing gasket with a damp cloth. Lubricate it sparingly with Parker "O" ring lubricant.
   5. Place the seal back onto the bowl. Seat the mesh screen back into the bowl.
   6. Screw the lid on clockwise. Hand-tighten only enough to seal water in and air out.

4. Charcoal Filter

   A sulfurous (rotten eggs) odor from the product water requires the replacement of the Charcoal Element. Otherwise, the Charcoal Element should be replaced every 3 to 4 months. It is not cleanable.

   To replace the Charcoal Filter Element:
   1. Unscrew the bowl counter clockwise.
   2. Remove the Charcoal Filter Element from the bowl.
   3. Remove the O-Ring from the top of the bowl and take care to not damage it.
   4. Replace the Charcoal Filter Element with a new Parker element.
   5. Wipe the O-Ring with a damp cloth.

6. Lubricate the O-Ring lightly using a sparingly amount of O-Ring lubricant.
7. Place the O-Ring back onto the bowl.
8. Insert the new, Parker Charcoal Filter Element into the bowl.
9. Screw the bowl on clockwise.
10. Hand snug to seal the O-Ring, do not use a wrench or other tool to tighten, do not over tighten. Over tightening may damage the threads in the bowl or housing and over tightening will cause removal to be difficult.

5. 3-Way Solenoid Valves

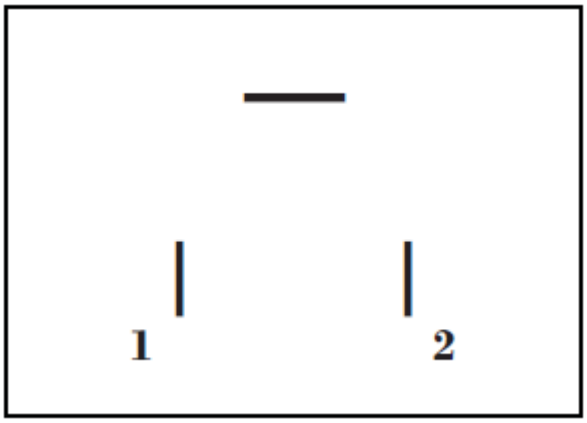
Over tightening of the tube fittings into the valve's body can cause damage.

In the event of faults, make sure that:
a) the device has been installed correctly.
b) the connection has been established properly.
c) the device is not damaged.
d) all screws have been tightened.
e) the voltage and the pressure have been switched on.
f) the pipelines are free.

6. Solenoid Valve Coil Check

The 3-way Product Diversion Valve Solenoid operates from 12 VDC. To check the condition of the Diversion Valve solenoid coil:

a) While System is operating and while the Water Quality less than 1000ppm, remove the DIN connector from the valve's coil. Using a voltmeter set to DC, check the voltage at the DIN connector terminals.
b) If 12 VDC is present at the DIN connector terminals then the control circuit is operating normally, but the 3-way Diversion Valve Coil may be defective. Check the solenoid coil continuity.
c) Using an Ohm meter measure the continuity of the solenoid coil as shown below. Measure the DC resistance between pins 1 & 2. Proper resistance reading is approx. 12 to 15 W.



d) If an open circuit exists, or if the resistance is much greater than or less than 12 to 15, then replace the solenoid coil or the entire valve.

e) If 12 VDC is not present at the DIN connector terminals, then the cable connections may be loose, the cable may be broken, or the control circuit may be defective. Check these components.
f) Check for 12 VDC at the connection points of the Diversion Valve Solenoid Coil on the Control Printed Circuit Board terminals.
g) If 12 VDC is present while system is operating and the Water Quality less than 1000ppm, then the Diversion Valve cable is loose at one of the connections or the cable is defective.
h) If there is no voltage present while system is operating and while the controller showing good quality water, then troubleshoot the Control Printed Circuit Board.

7. Flow Meter

The Product Water Flow Meter measures the Product water rate of flow from the R.O. Membrane Element and Vessel. By adding the amount of Product Water flow to the Brine Discharge Flow the operator is able to determine the total Feed Water Flow which is helpful in diagnosing problems with the High Pressure Pump. Problems and Symptoms appearing and caused by the Product Water Flow Meter, prior to assuming that the Product Water Flow Meter has failed, check the Control Logic model setup.

a) The Product Flow Meter registers higher than System Product Water Flow specification at the controller. Model set up was performed incorrectly at the controller.

Solution: Check control logic setup.

One of the following abnormalities is causing High Product Water Flow: Damage to the R.O. membrane element; a Product Water O-Ring; an End Plug is cracked and allowing Brine Water by-pass into the Product Water; a blockage in the Brine Discharge Line is causing reverse flow of Brine Water into the 3-way Product Water Diversion Valve.

Solution: Locate the damaged R.O. membrane element(s) and replace it/them. Locate the damaged or missing Product Water O-Ring and replace it. Locate the cracked End Plug and replace it.

8. High Pressure Pump Electric Motor

Troubleshoot electric motor failure to ensure that any abnormality from the power, wiring, wiring connections, contactor, or control circuit are not at fault or at cause. If the electric motor has failed, it may require replacement. Depending upon failure, type, replacement may be more cost effective than repair. If failure of the motor is due to external source, not the motor itself, then correct the cause or else the replacement or repaired motor will fail again.

Failures of the electric motor may be:

- Bearing failure. Bearings are field replaceable.

- Winding failure. Generally caused by low or high power, below or above the specified voltage requirements of the system, and feeding the motor. This is Not economically repairable.
- Internal centrifugal switch. Generally mechanical failure of the switch. Field replaceable.
- Capacitor failure. Generally caused by low power feeding the motor. Also caused by rapidly repeating starting and stopping of the motor. Field replaceable.

9. Back Pressure Regulator

   If the Back-Pressure Regulator valve leaks from the valve stem, lightly tighten the packing gland nut located below the valve stem. Should adjustment fail to stop the leak, replace the stem and internal packing or replace the entire valve.

10. High Pressure Pump

    Failure Signs and Possible Causes (Troubleshooting):

    1. Abnormally High Pulsations at the High-Pressure sensors are caused by:
       - Worn or broken Valve
       - Worn or broken Valve Spring
       - Worn or broken Valve Seat
       - Debris in Valve Chamber

    2. Water Leak between the High-Pressure Pump Manifold and Rear Section caused by:
       - Worn Low Pressure Seals
       - Low Pressure Seals damaged due to running dry.

    3. Flow drops dramatically when attempting to pressurize and/or unable to build pressure. This is caused by:
       - Worn High Pressure Seals
       - High Pressure Seals damaged due to running dry.
       - Broken Valve
       - Broken Valve Spring
       - Debris in Valve Chamber

High Pressure Pump Service:

Disassembly of the Discharge Valve Assembly:

Tools required: 3/8” Drive Ratchet; 6 mm Hex Socket; O-Ring Pick; Two slotted screwdrivers, Torque Wrench; Needle Noise Pliers.

Only one valve kit is required to repair all the valves in one pump. The Valve Kit includes new valve O-Rings, valve seats, valves, and springs.

1. Disconnect all plumbing.
2. Remove the six socket head screws from the manifold. Remove the outer screws first, then the inner screw.

3. Using a soft mallet, tap the back side of the Discharge Manifold from alternate sides to maintain alignment and avoid damage to the plungers
4. Grasp the Discharge Manifold from the underside and gradually lift manifold while you pull away from the Crankcase.
5. The Adapter/Spacers may stay with either the Discharge or Inlet Manifold. By inserting two opposing screwdrivers between Spacer and manifold, you can easily remove them from the Discharge Manifold. If they stay in the Inlet Manifold, gently work them up and down as you pull away from the Inlet Manifold.
6. The Valve Assemblies are in the Discharge Manifold ports and will fall out when manifold is turned over.

Reassembly of the Discharge Valve Assembly:

1. Examine Adapter Spacer O-Rings and replace if worn. Lubricate and install O-Rings and Back-up-Rings on both front and rear of the Adapter Spacer.
2. Examine the Valve Retainers for scale build up or war and install into each Discharge Manifold port with tab down into the manifold chamber.
3. Replace worn or damaged springs and place into Retainers.
4. Examine Valve and Seats for pitting, grooves, or wear and replace as needed.
5. Place Valves over springs with concave side down.
6. Place Valve Seats on Valves with concave side down.
7. Lubricate O.D. of Adapter/Spacer and insert smaller I.D. into Discharge Manifold ports. Snap into position. Exercise caution not to cut or pinch O-Rings.
8. Carefully guide Discharge Manifold with Spacers over Plunger Rod ends and press into Inlet Manifold.
9. Replace Socket Head Screws and torque to 115 in. lbs. / 9.4 ft. lbs. / 13 Nm
10. If oil was not changed, be sure oil it is at the proper level on the sight gauge.
11. Torque sequence for tightening the manifold:

3	1	5
x	x	x
x	x	x
6	2	4

Disassembly of the Seal Assembly:

Tools Required: 3/8” Drive Ratchet; 6mm Hex Socket; Packing Extractor; and Cotter.

1. Remove the Inlet Valve Assembly from the exposed plunger rod ends, including Cotter pin, Nut, Washer, Spring, Spacer and Inlet Valve.
2. Grasp the Inlet Manifold from the front and underside and pull to remove from Plunger Rods.
3. Carefully examine backside of Low Pressure Seal before removing from manifold as it will be damaged during removal. If worn, insert screwdriver into I.D. of seal and pry out. Exercise caution to avoid damage to the Inlet Manifold.
4. Press ceramic Plunger with thumb or soft tool from backside of Inlet Manifold. (The High-Pressure Seal may stay with the plungers or remain in the Inlet Manifold. If on the plungers, slide off by hand. If in the manifold, use reverse pliers to remove.)
5. Remove Seal Retainers from Crankcase by grasping tab with pliers and pulling out.

6. Examine Crankcase Oil Seal to determine if Crankcase servicing is needed.
7. Examine Ceramic Plunger, Low Pressure Seals, V-Packings for scoring, cracks, and wear and replace if needed.

Reassembly of Seal Assembly:

1. Examine Seal Retainers and replace if worn or damaged. Install on Plunger Rod and press into Crankcase with tab out.
2. Place Inlet Manifold on work surface with Crankcase Side up.
3. Lubricate new Low-Pressure Seals and press into position with garter spring down. Be certain the seal is seated squarely on the shoulder on the inlet manifold chamber.
4. Place the inlet Manifold on work surface with Crankcase side down (Larger ID ports up).
5. Carefully examine the Plungers for scoring or cracks and replace if worn.
6. Lubricate Ceramic Plungers and new High-Pressure Seals. Press the plunger into the seal and position seal in middle of plunger.
   NOTE: Place the deeper recessed end of the plunger into the seal from the metal backside.
7. Insert the Plungers into the manifold ports. Press into position using the larger I.D. end of Discharge Valve Spacer. Examine the O-Ring and Back-up-ring under the Sleeve for cuts or wear and replace. Examine the Barrier Slinger for wear and replace as needed. Install the Barrier Slinger with the concave side facing away from the Crankcase. Lubricate the Plunger Rod O-Ring to avoid cutting during installation. Install the Back-up-ring first then the O-Ring into the groove on the Plunger Rod. Install the Sleeve with the tapered end facing out. Gently press towards the Plunger Rod shoulder until flush with the Barrier Slinger.
8. Carefully install Inlet Manifold over Plunger Rod ends and slowly press into Crankcase.
9. Examine Inlet Valve and replace if worn. Inlet valves cannot be reversed if worn. The SS Inlet Valves may be lapped if not badly worn. Install the SS Inlet Valves with square edges towards the plungers (round edges towards the discharge). Install the Nylon Inlet Valve with ridged side towards the discharge.
10. Examine Spacers for wear and replace as needed. Install Spacer on each Plunger Rod with smaller O.D. towards inlet valve.
11. Examine Springs for damage or fatigue and replace as needed. Place on Plunger Rods.
12. Install Washers next with concave side towards Inlet Manifold.
13. Install Nuts and torque to 55 in. lbs. / 4 ft. lbs. / 4 Nm.
14. Always install new Cotter pins and turn ends to secure in position.

Reverse Osmosis Membrane Element Replacement:

NOTE:

- The Aqua Matic Dual Pass Membrane Element is accessible with the Vessel still attached to the frame.
- Replace all Brine and Product Water O-Rings attached to the End Plugs within the High-Pressure Vessel Assembly each time the Reverse Osmosis Membrane Element is removed or replaced. Ensure these O-Rings are on hand prior to repair.
- Membranes are only installed and removed from the INLET end of the High-Pressure Vessel.

Tools Required:
5/16” Allen wrench regular pliers Needle-Nose Pliers

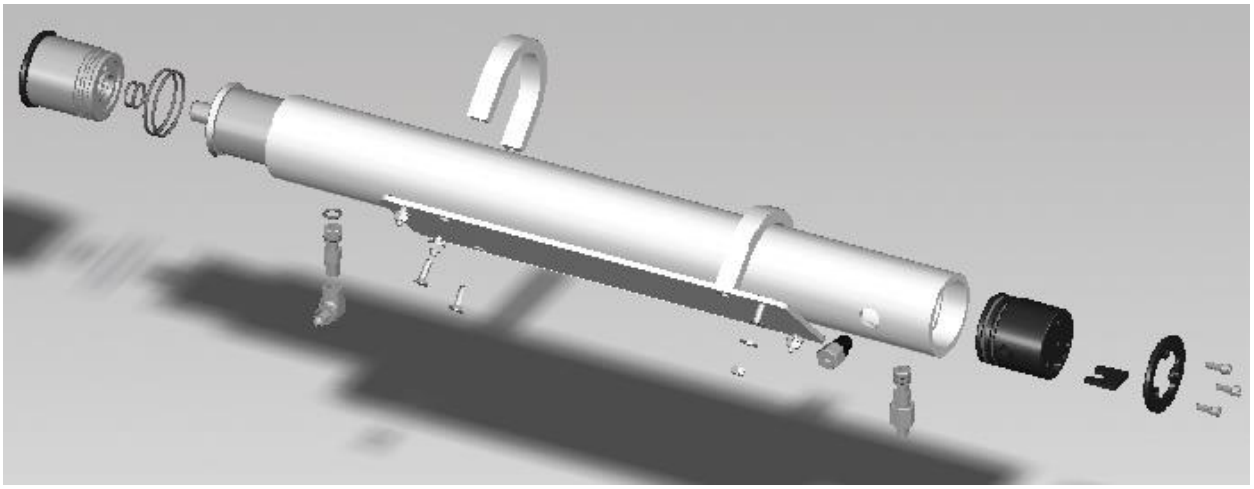
1. Disconnect the High-Pressure Hose from each end of the High-Pressure Vessel Assembly.
2. Using a 5/16” Allen wrench removes the 3 Socket Head Cap Screws from the three-piece Segment Rings located at each end of the Pressure Vessel.
3. Push inward on the End Plug and Remove the three-piece segment ring from one end, repeat for the other end.
4. Remove the Port Retainer from each end.
5. Remove them from each end.
6. Remove the product water tube from the respective end.
7. Insert all three of the Socket Head Cap Screws back into the End Plug. These screws are used as a grip to remove the End Plug.
8. Grasp one or more of the Socket Head Cap Screws with a pair of pliers and pull slowly outward to remove the End Plug. There is some resistance due to the two Brine O-Rings exerting friction against the Vessel wall. With the End Plug removed from the High-Pressure Vessel, the Reverse Osmosis Membrane Element is visible.
9. Remove and discard the brine O-rings from each of the End Plugs.
10. Remove and discard the Product Water O-rings from each of the End Plugs.
11. Clean the end plugs with a cloth and inspect each for any sign of wear, cracks, or damage.
12. Sparingly, lightly, lubricate:
    - 4 (four) NEW Brine O-Rings and 2 (two) new Product Water O-Rings for the Aqua Matic Dual Pass.
13. Place the NEW Product Water O-Rings into the product port inner O-Ring groove in each of the End Plugs.
14. Place the NEW Brine O-Rings onto the outer Brine O-Ring grooves of each of the End Plugs.

CAUTION At each end of the Reverse Osmosis Membrane Element is a Product Water Tube approximately ½” diameter by 1” long. The outside diameter surface of this product water tube is a sealing surface, which isolates the Product Water from the Feed Water. The surface of the Product Water Tube must be scratch free. Never use pliers or other grabbing tools on the Product Water Tube. Do not drop the R.O. Membrane onto a hard surface as the Product Water Tube may be damaged.

15. With your fingers grasp the Product Water Tube attached to the R.O. Membrane Element from the INLET end of the Pressure Vessel and pull outward. If resistance is met then cup the INLET end of the High-Pressure Vessel with one hand and shake downward to dislodge the R.O. Membrane Element.
16. Run a rag through the High-Pressure Vessel to remove any biological film or debris from the High-Pressure Vessel.

A new Parker R.O. Membrane Element comes complete with a “U” cup Brine Seal at one end of the Element. This Brine Seal must be positioned at the INLET end of the Pressure Vessel.

INLET End	OUTLET End
Feed Water Entry End	Brine Discharge End
R.O. Membrane Element Brine Seal End	No brine seal on this end



Install a new R.O. Membrane Element with attached "U" cup Brine Seal into the Pressure Vessel. Place the end of the R.O. Membrane Element, that DOES NOT have the Brine Seal attached into the INLET end of the Pressure Vessel and slide it into the Pressure Vessel. (Insert the downstream end [end without a brine seal] of the Reverse Osmosis Membrane Element into the upstream inlet end of the High-Pressure Vessel.)

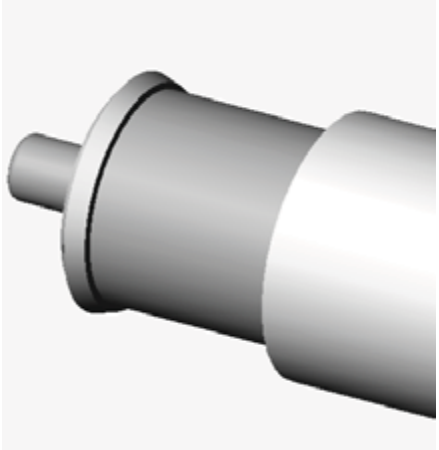


Figure 1: Inlet end of Pressure Vessel Brine Seal End of R.O. Membrane Element

17. Slide the Membrane Element into the High-Pressure Vessel, past the brine seal, until the Membrane Element product water tube is 4 inches past the end lip of the High-Pressure Vessel.
18. Insert the End Plug with new attached O-Rings into the High-Pressure Vessel while aligning the High-Pressure Port and Product Water Port to the respective holes in the High-Pressure Vessel. Continue pushing inward on the End Plug until its exposed end travels just past the Segment Ring Groove in the Pressure Vessel. Ensure that the Ports of the End Plug are aligned with the Port Holes of the High-Pressure Vessel.
19. Insert the High-Pressure Port Fitting with attached O-Rings into the High-Pressure Port.
20. Replace the Port Retainer.
21. Insert the three-piece Segment Ring Set into the Segment Ring Groove of the High-Pressure Vessel. Align the Segment Ring Set with the tapped holes in the End Plug for insertion of the three Socket Head Cap Screws. Attach the three Socket Head Cap Screws and tighten.
22. Connect the High-Pressure Hoses to the respective fitting on the Pressure Vessel.

Pre-filter Element Replacement:

The Pre-filter Pleated Cartridge Element may be cleaned with water spray once or twice. After cleaning the expected life will be reduced in half. Attempts to clean the element more than twice will result in a very short life and will damage the element, rendering it useless. Change the element after the first or second cleaning. Clean or replace the element when plugged to the extent that the Low-Pressure Gauge at the control panel reads 10 to 6 psi. At slightly below 6 PSI, the Low-Pressure Transducer shuts the system off.

CAUTION Do not use third party pre-filter elements; use only Parker Pre-filter Elements. Third party pre-filter elements on the market do not properly fit, the seams fall apart, they will allow by-pass, and will allow the R.O. Membrane Element to foul prematurely. Use of third party pre-filter elements will void all Parker warranty.

Important: Do not use “string wound” or “fiber” pre-filter elements. These types of elements are designed for the Photographic Film Developing industry. When used in sea water, they will plug up rapidly in 1/10th or less the time causing frequent shut down of the system and very frequent changing, which will also lead to very high cost of maintenance. Use of String Wound or Fiber type elements will lead to user frustration and very high maintenance costs. Use of third party pre-filter elements will void any Parker warranty.

To clean or replace the Pre-filter Element:

1. Unscrew the bowl counter clockwise.
2. Remove the Pre-filter Pleated Cartridge Element from the bowl.
3. Remove the O-Ring from the top of the bowl. The O-Ring is fragile, so handle it with care.
4. Replace the Pre-filter Pleated Cartridge Element with a new Parker element.
5. Wipe the O-Ring with a damp cloth.
6. Lubricate the O-Ring lightly using a sparingly amount of O-Ring lubricant.
7. Place the O-Ring back onto the bowl.
8. Insert the cleaned or new Parker Pre-filter Pleated Cartridge Element into the bowl.
9. Screw the bowl on clockwise.
10. Hand snug to seal the O-Ring; do not use a wrench or other tool to tighten; do not over tighten. Over tightening may damage the threads in the bowl or housing and cause removal to be difficult.

Brine Discharge Thru Hull Fitting Cleaning:

Non-Parker component - Keep the Brine Discharge Thru Hull Fitting free and clear of debris and corrosion.

Booster Pump with 1 to 2 Horse Power Electric Motor:

Booster Pump Disassembly:

1. Disconnect Power Source to motor.
2. Disconnect electrical connections tagging wires carefully to preserve correct rotation.
3. Remove pump and motor assembly to repair area.
4. Remove bolts and volute cover from pump.
5. Remove impeller locknut and impeller. Unscrew CCW.
6. Remove seal head from the shaft. Slide from the shaft.
7. Remove four motor bolts and volute bracket from motor.

8. Remove seal seat from bracket.

Booster Pump Reassembly:

1. Clean seat cavity of the volute bracket thoroughly.
2. Thoroughly clean pump shaft. Assure that the shaft is not grooved and that there is no evidence of pitting or fretting. If the shaft is grooved, fretted, or worn, replace it.
3. Install the pump shaft onto the motor shaft. Ensure all debris and burrs are removed from the motor shaft.
4. Place the volute bracket on a firm surface with the seat cavity (pump end) up. Then place a small amount of vegetable oil on the seat cup or O-ring seat. Place the seat in the cavity with the polished face up toward the pump end. Evenly push seat into cavity with fingers then gently tap seat into place with a wooden dowel or plastic rod (1 1/8” outside diameter / 28 mm). To help ensure the seat is not damaged, place the cardboard disk supplied with the seal over the seat face.
5. Place volute bracket on motor (aligning the base if applicable). Secure volute bracket with four motor bolts.
6. Pull pump shaft forward until shoulder of pump shaft contacts back of volute bracket and slightly snug one setscrew to hold shaft in place.
7. Install seal head assembly

a) Lubricate shaft and elastomer with vegetable oil.
b) Install rotary seal head onto pump shaft and slide toward seat until carbon face touches seal seat.
c) Install seal spring and retainer.
d) Thread impeller onto pump shaft ensuring that the spring retainer does not slip between the shoulder of the shaft and the hub of the impeller. Install locknut with small amount of removable Loctite. Hold shaft with locking type pliers (vice grips) and tighten impeller locknut.
e) Loosen pump shaft setscrew.
f) Install new volute cover gasket and mount volute cover. Secure with bolts and tighten evenly.
g) Slide pump shaft forward until impeller touches volute cover. Slide shaft back with a screwdriver .010 - .015” (0.254 - 0.381 mm). Tighten pump shaft setscrews. Rotate shaft by hand to ensure impeller does not rub against volute cover.

8. Return pump to installation and reconnect electrical connections.
9. Start pump momentarily to observe shaft rotation. If rotation corresponds to the rotation arrow, pump may be put into service. If rotation is incorrect, refer to the wiring diagrams within this manual.

Chapter 9

GLOSSARY

TERMS:

Cascading Failure
Failure in a system of interconnected parts, in which the failure of a part, can trigger the failure of successive parts in the system.

Boundary Layer
(Also known as, Concentration Polarization.) When water permeates through the membrane, nearly all the salt is left behind in the brine channel. In any dynamic hydraulic system, the fluid adjacent to the wall of the vessel is moving relatively slow. Even though the main body of the stream is turbulent, a thin film adjacent to the wall (membrane) is laminar. This thin film is called the boundary layer. At the boundary layer the salts are saturated and can readily adhere to and pack into the RO membrane element surface if the Feed Water Flow is insufficient. For this reason, it is important to maintain sufficient Feed Water Flow, to prevent Concentration Polarization, through the RO membrane element.

Brine Velocity
The brine flow over the membrane surface is very important to both product water quality and quantity. At low flows, concentration polarization occurs, causing the water quality to decline. In addition to inferior product water quality, low brine flows can increase the precipitation of sparingly soluble salts which will foul the RO membrane element surface (concentration polarization). If this occurs, the product water flux (production) will decline. The Feed Pump integrated design provides a relatively smooth and continual flow of Feed Water across and through the RO membrane element.

Compaction
Some densification of the membrane structure may take place while operating at elevated pressures, above 1000 PSI. The change is known as compaction and is accompanied by a reduction in the water permeation rate. When the RO membrane element is subjected to elevated pressures beyond 1000 PSI, the Product Water Channel becomes squeezed which results in restriction and in turn product water recovery reduction.

Osmotic Pressure
The transfer of the water from one side of the membrane to the other will continue until the head (pressure) is great enough to prevent any net transfer of the solvent (water) to the more concentrated (feed water) solution. At equilibrium, the quantity of water passing in either direction is equal, and the head pressure is then defined as the “Osmotic Pressure” of the solution having that concentration of dissolved solids.

Pressure
The operating pressure has a direct effect on product water quality and quantity. Both factors will increase as the system pressure increases (higher quantity and higher quality within design limits). The system must be operated at the lowest pressure required to achieve the designed

product water flow rate. This parameter also minimizes compaction, which proceeds at a faster rate at higher pressures as well as at higher temperatures. The System self-adjusts its operating pressure to maintain a precise amount of Product Water Flow. However, in so doing, at low temperatures and or high salinity feed water conditions the system will operate at higher than normal pressure in maintaining the specified amount of product water flow. This is normal, to be expected, and is due to the design characteristics of the system.

Spiral-Wound Membrane
The spiral-wound membrane consists of multiple membrane envelopes each formed by enclosing a channelized product water carrying material between two large flat membrane sheets. The membrane envelope is sealed on three edges with a special adhesive and attached with the adhesive to a small diameter pipe. A polypropylene screen is used to form the feed water channel between the membrane envelopes. A wrap is applied to the membrane element to maintain the cylindrical configuration. The center tube is also the permeate (product water) collecting channel. (Several elements may be connected in series within a single or multiple pressure vessels).

Water Temperature Effect
The product water flow through the membrane is significantly affected by the water temperature. At any given pressure this flow increases with increasing water temperature and is reduced at lower temperatures. The System over comes this factor by self-adjusting the operating pressure to maintain a precise amount of Product Water Flow.

IMPORTANT DOCUMENTATION

ELECTRICAL SCHEMATICS

AQUA DUAL
CONTROL PANEL SCHEMATICS
230V, 1 PHASE, 50/60hz

REV	ENGINEER	DESCRIPTION	DATED
–	JPD	ORIGINAL COMPLETED RELEASE	12–19–17
A	JPD	ADDED OPTIONAL INPUT I2, I11 AND I12, ADDED OPTIONAL OUTPUT Q16, ADDED OPTIONAL AUX MOTOR RUNNING SIGNAL TO C20, (THESE UPDATES CORRESPOND TO PROGRAM VERSION 1.05)	02–21–20

DIMENSIONAL TOLERANCES - UNLESS OTHERWISE SPECIFIED			
MACHINED			WELDMENT
FRACTION	±1/32"		± 1/16"
X	-	± 4mm	± 1/8"
.X	± .1"	± 2mm	± 1/16"
.XX	± .01"	± .25mm	± 1/32"
.XXX	± .005"	± .025mm	-
ANGULAR ± 1'			
125 UNLESS OTHERWISE SPECIFIED			

CUSTOMER - --

PROJECT - --

DRAWN - JPD DATE - 19-DEC-2017

CHECKED - -- DATE - --

APPROVED - -- DATE - --

DRY WT:

WET WT:

CONTRACT NO

Parker Hannifin Corporation
Filtration Group / Water Purification
2630 E. El Presidio Street
Carson, CA 90810

Contact
Office: 310-608-5600
Fax: 310-608-5692
www.parker.com

AQUA DUAL
230V, 1 PHASE
ELECTRICAL SCHEMATICS

SIZE	DWG NO	REV
D	0901103E	A

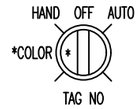
SCALE NONE

PANEL LAYOUT SYMBOLS

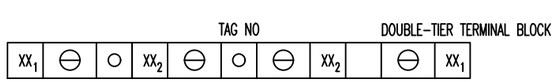
PILOT LIGHT ACTION

PUSHBUTTON, ILLUMINATED ACTION

HANDSWITCH, 3 POSITION, ILLUMINATED



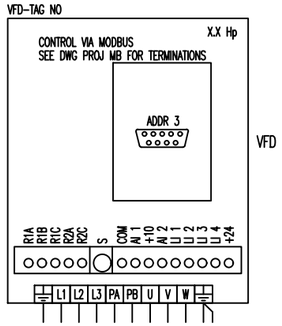
HANDSWITCH, 2 POSITION, ILLUMINATED

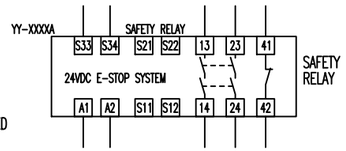


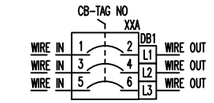
ABBREVIATIONS

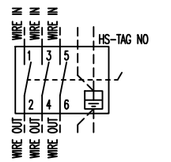
VFD – VARIABLE FREQUENCY DRIVE
MS – MOTOR STARTER
NO – NORMALLY OPEN
NC – NORMALLY CLOSED
C – COMMON
LC – LIGHTING CONTACTOR
HS – HANDSWITCH
CB – CIRCUIT BREAKER
F – FUSE
LS(x) – LEVEL SWITCH (HIGH, LOW, LOW-LOW)
LA(x) – LEVEL ALARM (LOW, LOW-LOW)
PS(x) – PRESSURE SWITCH (LOW, LOW-LOW)
FLS(x) – FLOW SWITCH
PA(x) – PRESSURE ALARM (LOW, LOW-LOW)
PDS(x) – PRESSURE DIFFERENTIAL SWITCH (HIGH)
PDA(x) – PRESSURE DIFFERENTIAL ALARM (HIGH)
PT – PRESSURE TRANSMITTER

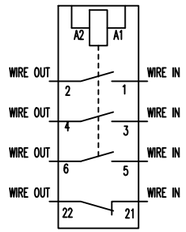
POWER WIRING SYMBOLS

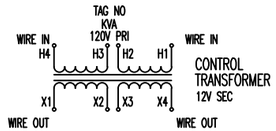


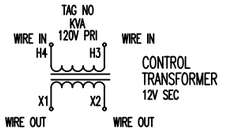








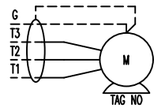


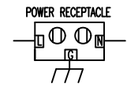


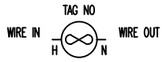
EQUIPMENT GROUND
LANDED IN GREEN RAIL
CONNECTED TERMINAL BLOCKS

ISOLATED CONTROL GROUND
LANDED IN GRAY COLOR
ISOLATED TERMINAL BLOCKS

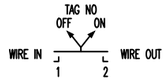
WIRING DIAGRAM SYMBOLS
POWER WIRING SYMBOLS

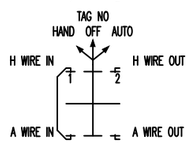


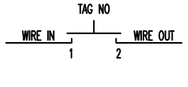


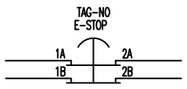


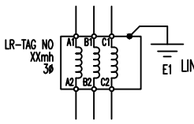
CONTROL WIRING SYMBOLS











WIRE-LINE SYMBOLS

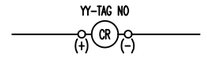
SOLID LINE
PREWIRED BY SEA RECOVERY
INTERNAL TO PANEL

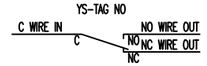
DOT-DASH LINE
WIRED BY INSTALLER
EXTERNAL TO PANEL

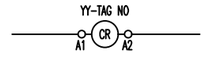
LONG-DASHED LINE
WIRED BY SEA RECOVERY
EXTERNAL TO PANEL

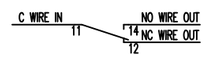
BOLD SOLID LINE
PRE-INSTALLED BY SEA RECOVERY
TERMINAL BLOCK JUMPER COMB
OR BUS LINE

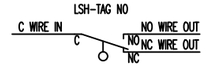
CONTROL WIRING SYMBOLS

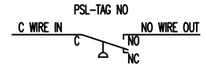


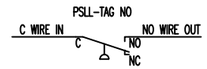


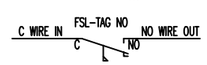


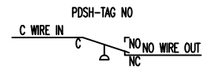


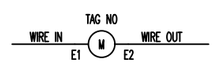


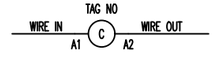


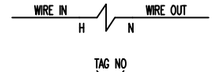


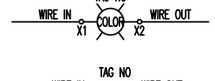


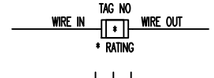












DIMENSIONAL TOLERANCES - UNLESS OTHERWISE SPECIFIED			
MACHINED			WELDMENT
FRACTION	±1/32"		± 1/16"
X	-	± 4mm	± 1/8"
.X	± .1"	± 2mm	± 1/16"
.XX	± .01"	± .25mm	± 1/32"
.XXX	± .005"	± .025mm	-
ANGULAR ± 1'			
125 UNLESS OTHERWISE SPECIFIED			

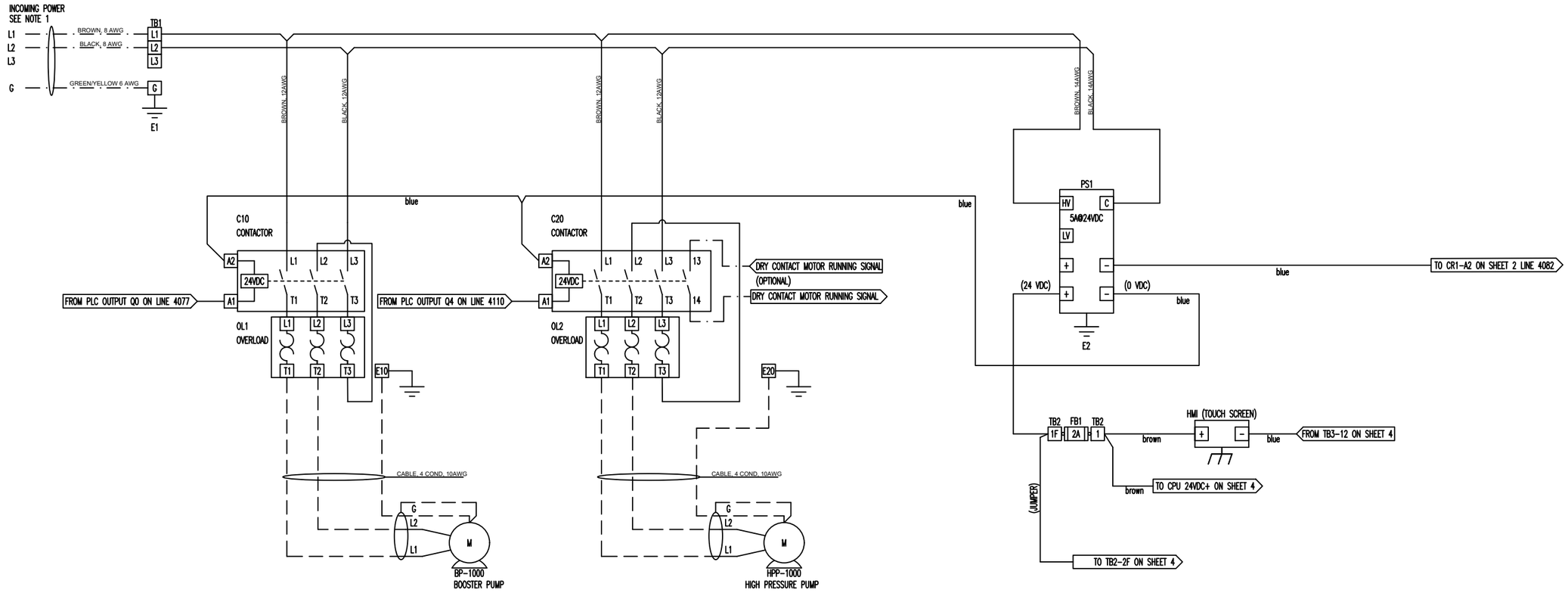
CUSTOMER - --	
PROJECT - --	
DRAWN - JPD	DATE - 19-DEC-2017
CHECKED - --	DATE - --
APPROVED - --	DATE - --
DRY WT:	
WET WT:	
CONTRACT NO	

Parker Hannifin Corporation
Filtration Group / Water Purification
2630 E. El Presidio Street
Carson, CA 90810

Contact
Office: 310-608-5600
Fax: 310-608-5692
www.parker.com

AQUA DUAL
230V, 1 PHASE
ELECTRICAL SCHEMATICS

SIZE	DWG NO	REV
D	0901103E	A
SCALE NONE	2 OF 6	



For 230V, 1ph, 50hz:
Booster Pump - 1.5HP, 9.1Amps
High Press. Pump - 5HP, 24Amps

For 230V, 1ph, 50hz:
Use assembly 0901103-A
BP Contactor - 18A
HP Contactor - 25A
BP Overload - 9-13A
HP Overload - 16-24A

For 230V, 1ph, 60hz:
Booster Pump - 1.5HP, 7.1Amps
High Press. Pump - 5HP, 21.8Amps

For 230V, 1ph, 60hz:
Use assembly 0901103-B
BP Contactor - 18A
HP Contactor - 25A
BP Overload - 1.6-8A
HP Overload - 16-24A

KEY

— · — · —	CUSTOMER INSTALLED WIRING
— — — —	SEA RECOVERY INSTALLED WIRING

DIMENSIONAL TOLERANCES - UNLESS OTHERWISE SPECIFIED			
MACHINED			WELDMENT
FRACTION	±1/32"		± 1/16"
X	-	± 4mm	± 1/8"
.X	± .1"	± 2mm	± 1/16"
.XX	± .01"	± .25mm	± 1/32"
.XXX	± .005"	± .025mm	-
ANGULAR ± 1°			
125 UNLESS OTHERWISE SPECIFIED			

CUSTOMER - --
PROJECT - --
DRAWN - JPD DATE - 19-DEC-2017
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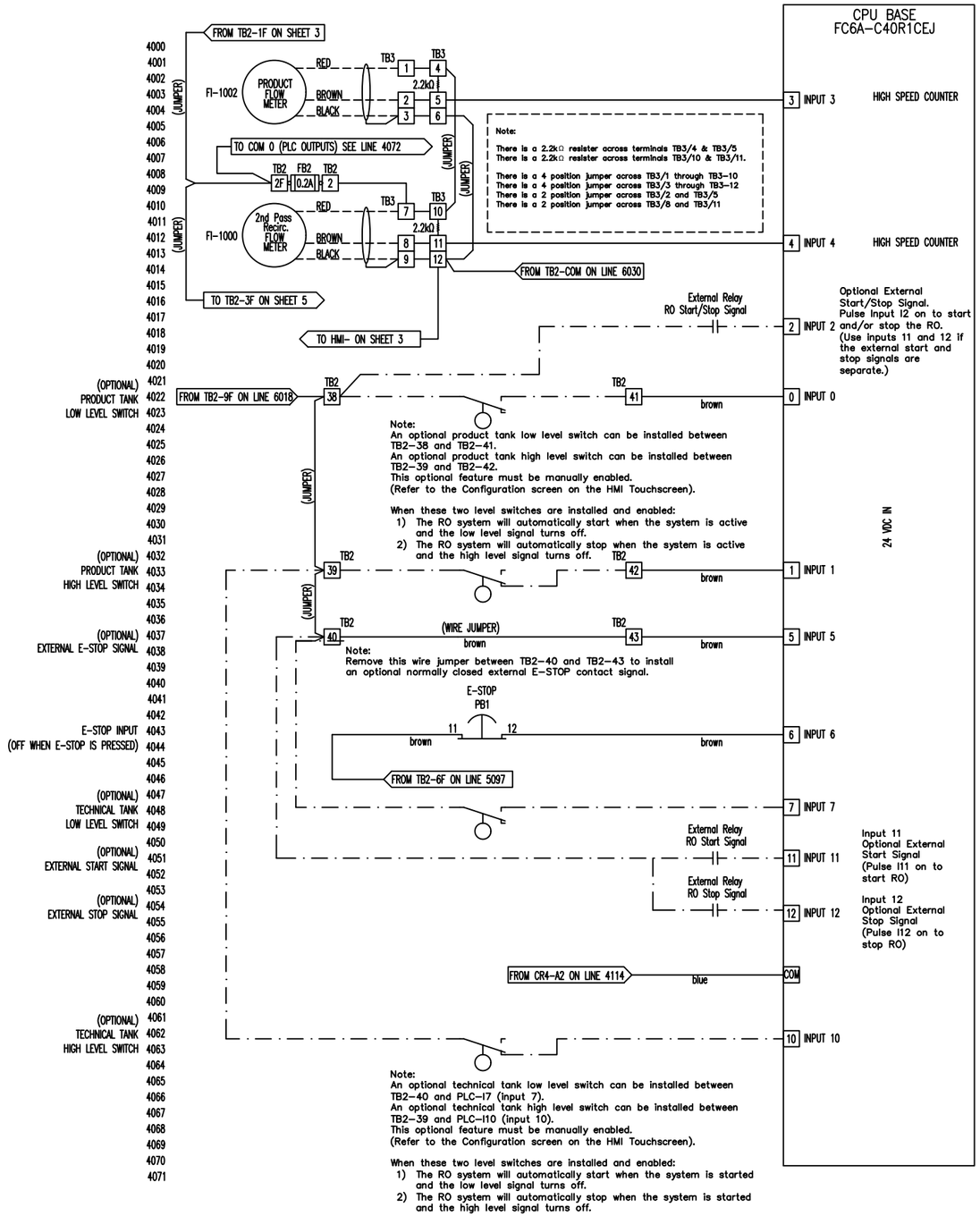
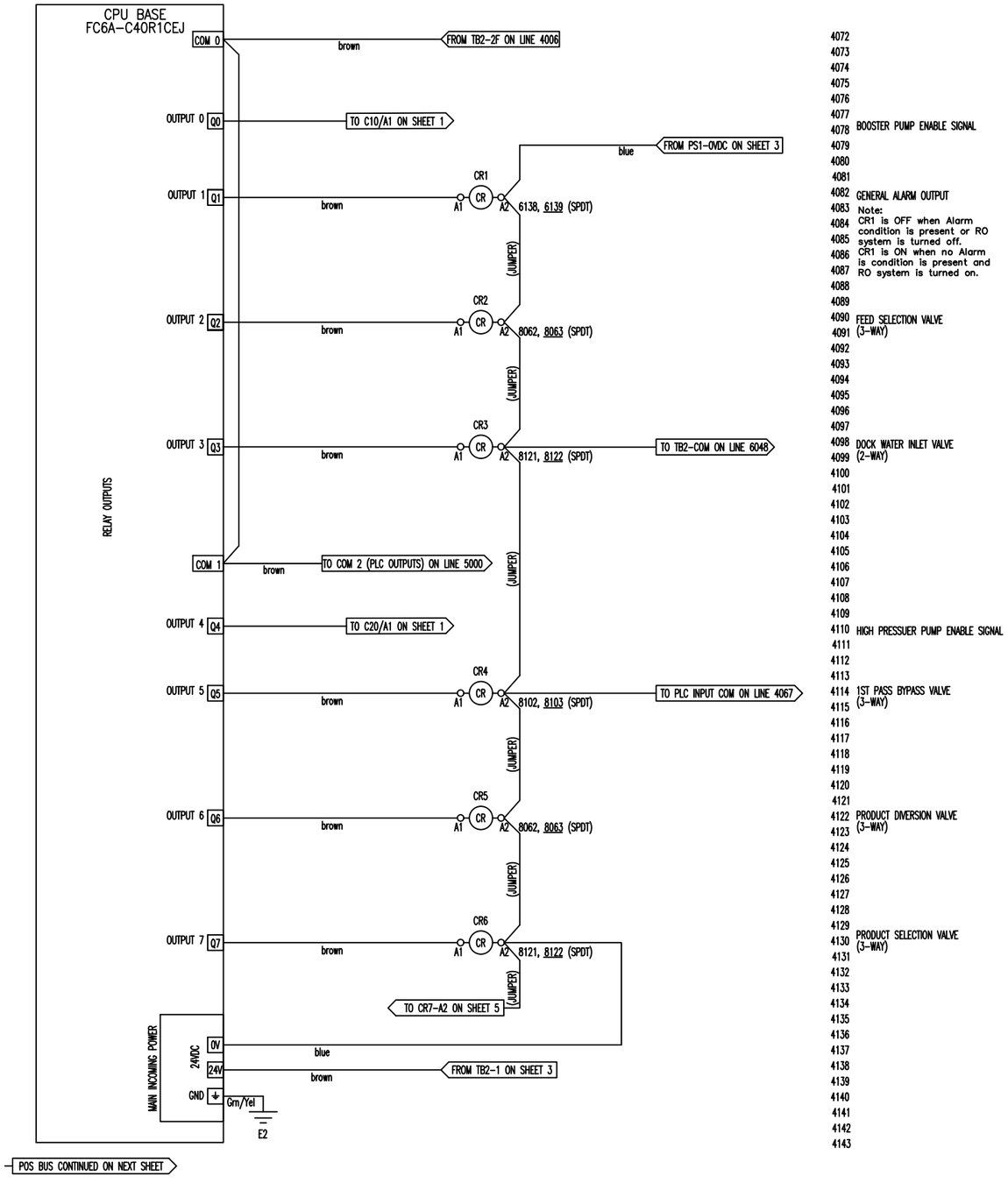
AQUA DUAL
230V, 1 PHASE
ELECTRICAL SCHEMATICS

SIZE D | DWG NO 0901103E | REV A
SCALE NONE | 3 OF 6





POS BUS CONTINUED ON NEXT SHEET

KEY

— · — · —	CUSTOMER INSTALLED WIRING
— — — —	SEA RECOVERY INSTALLED WIRING

DIMENSIONAL TOLERANCES - UNLESS OTHERWISE SPECIFIED			
MACHINED			WELDMENT
FRACTION	±1/32"		± 1/16"
X	-	± 4mm	± 1/8"
.X	± .1"	± 2mm	± 1/16"
.XX	± .01"	± .25mm	± 1/32"
.XXX	± .005"	± .025mm	-
ANGULAR ± 1°			

125 UNLESS OTHERWISE SPECIFIED

CUSTOMER - --
PROJECT - --
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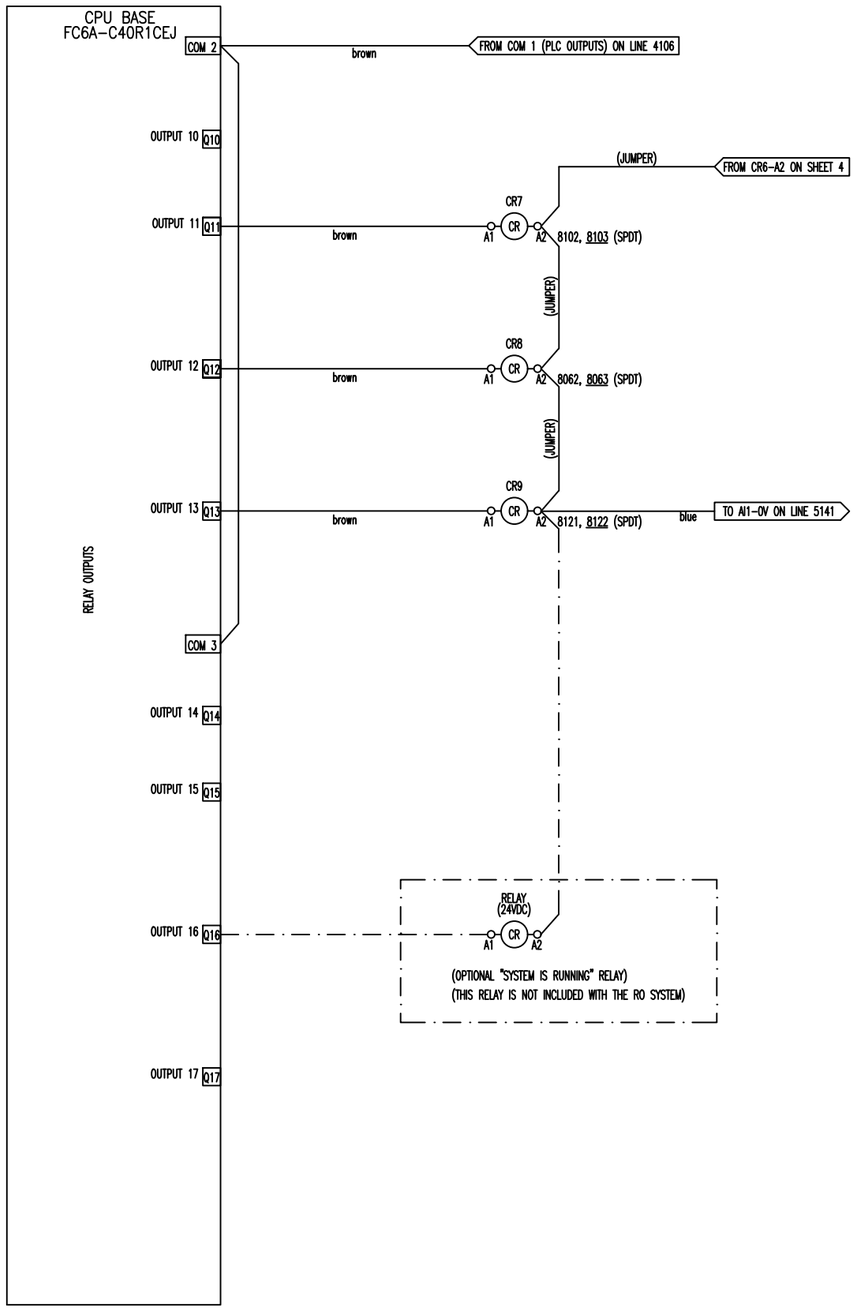
AQUA DUAL
230V, 1 PHASE
ELECTRICAL SCHEMATICS

SIZE D | DWG NO 0901103E | REV A
SCALE NONE | 4 OF 6



TB4, COM BUS CONTINUED FROM PREV SHEET

5000
5001
5002
5003
5004
5005 SPARE
5006
5007
5008
5009
5010 2ND PASS SELECTION VALVE
5011 (3-WAY)
5012
5013
5014
5015
5016
5017
5018 BACK PRESSURE REGULATOR VALVE
5019 ENABLE SIGNAL
5020
5021
5022
5023
5024
5025 BACK PRESSURE DIRECTION
5026
5027
5028
5029
5030
5031
5032
5033
5034
5035
5036
5037
5038
5039
5040
5041
5042
5043
5044
5045
5046
5047
5048
5049 PLC OUTPUT Q16
5050 (OPTIONAL "SYSTEM IS RUNNING"
5051 OUTPUT SIGNAL)
5052
5053
5054
5055
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5072
5073
5074
5075
5076 PRESSURE TRANSMITTER
5077 20 MICRON PREFILTER INLET
5078
5079
5080
5081
5082
5083 PRESSURE TRANSMITTER
5084 5 MICRON PREFILTER OUTLET
5085
5086
5087
5088
5089
5090 PRESSURE TRANSMITTER
5091 HIGH PRESSURE PUMP OUTLET
5092
5093
5094
5095
5096
5097 PRESSURE TRANSMITTER
5098 1ST PASS PRODUCT OUTLET PRESSURE
5099
5100
5101
5102
5103
5104
5105
5106
5107
5108
5109 SALINITY VALUE
5110
5111
5112
5113
5114
5115
5116
5117 TEMPERATURE VALUE
5118
5119
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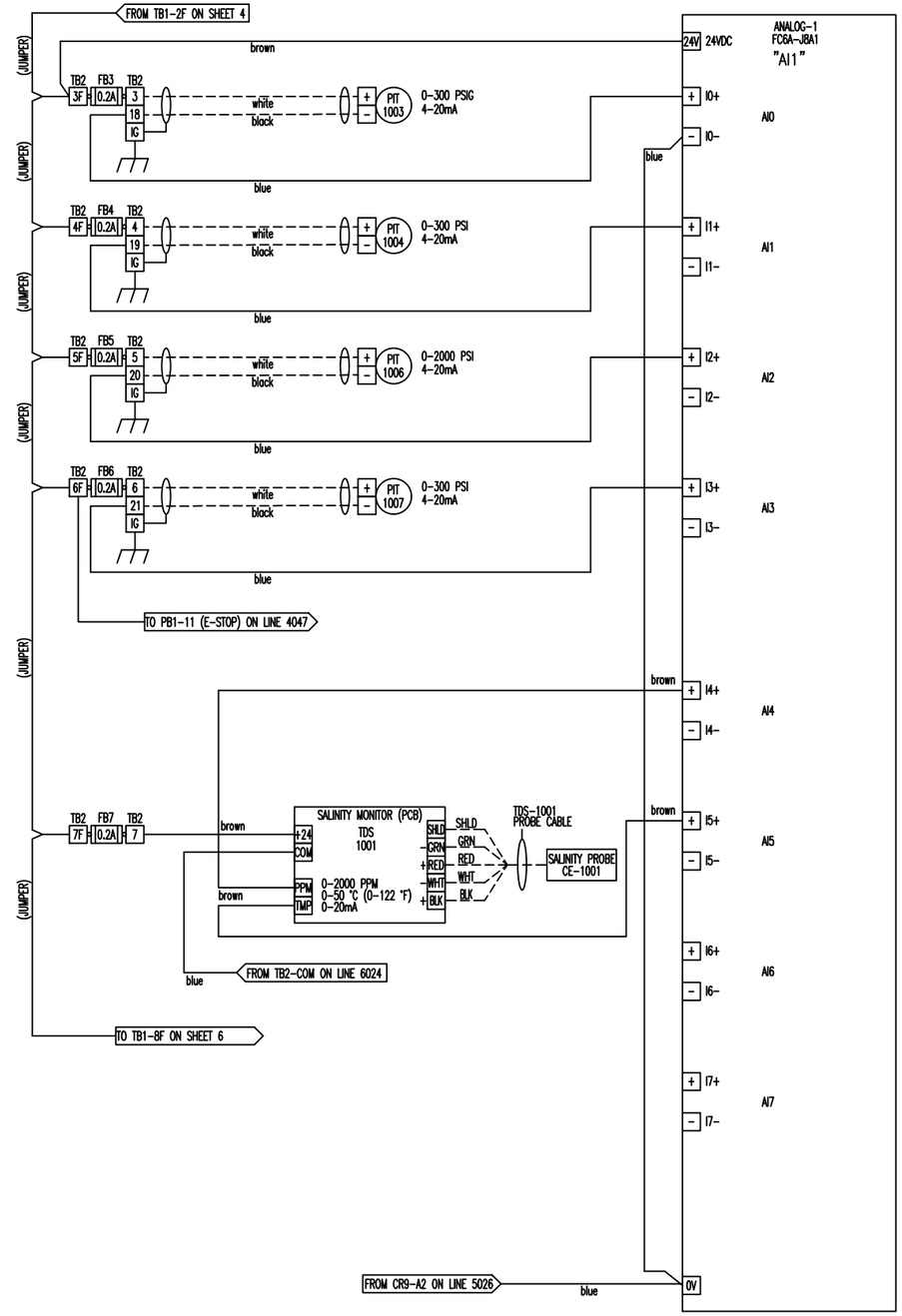

DIMENSIONAL TOLERANCES - UNLESS OTHERWISE SPECIFIED			
MACHINED			WELDMENT
FRACTION	±1/32"		± 1/16"
X	-	± 4mm	± 1/8"
.X	± .1"	± 2mm	± 1/16"
.XX	± .01"	± .25mm	± 1/32"
.XXX	± .005"	± .025mm	-
ANGULAR ± 1'			
125 UNLESS OTHERWISE SPECIFIED			

CUSTOMER - --
PROJECT - --
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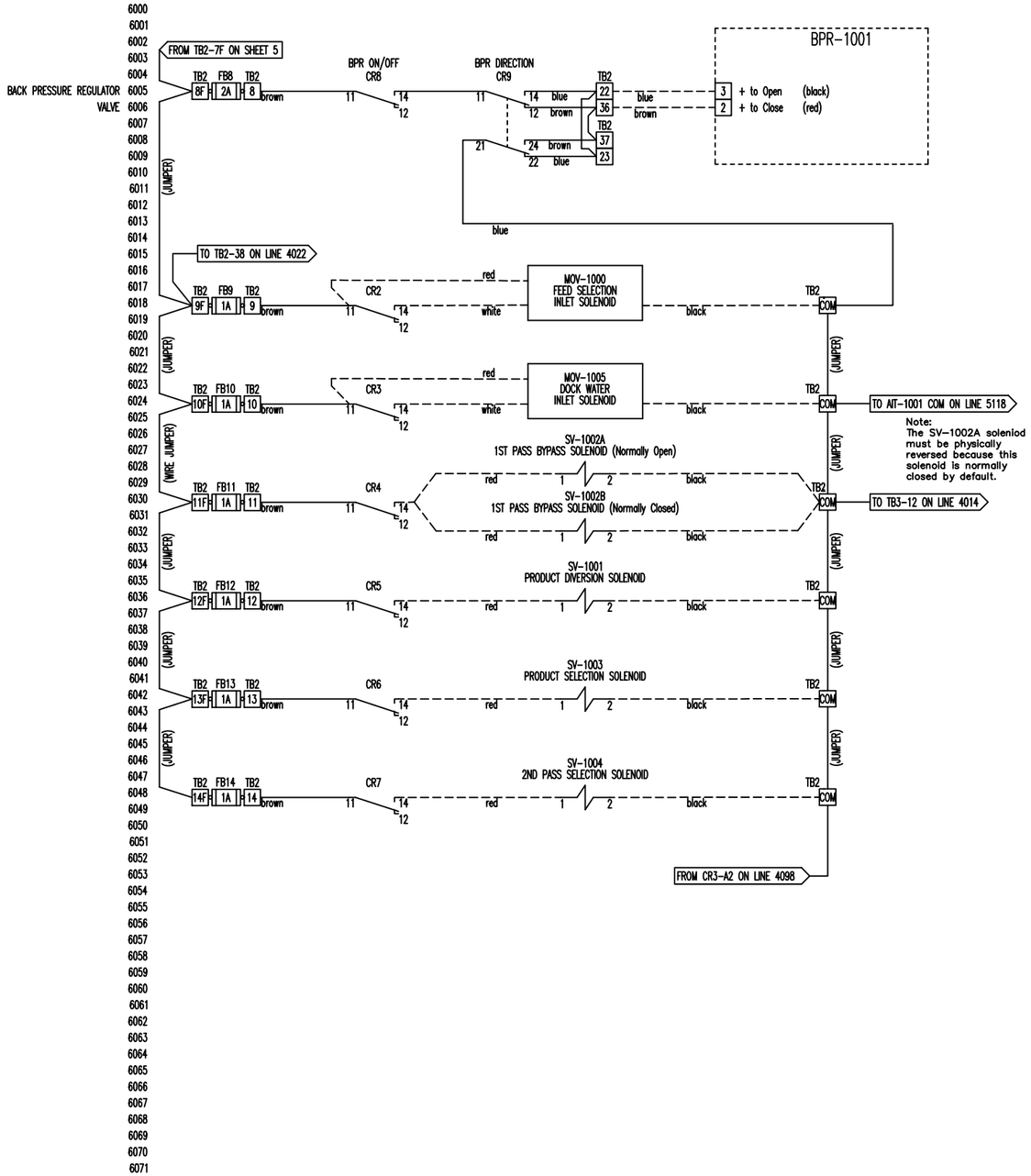
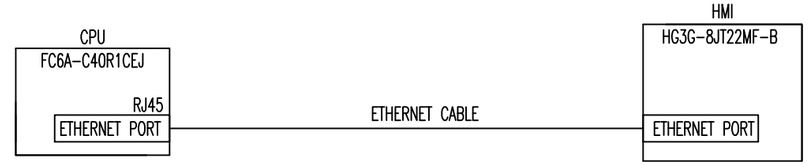
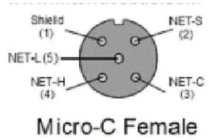
AQUA DUAL
230V, 1 PHASE
ELECTRICAL SCHEMATICS

SIZE D | DWG NO 0901103E | REV A
SCALE NONE | 5 OF 6

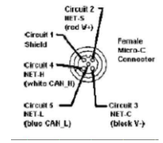


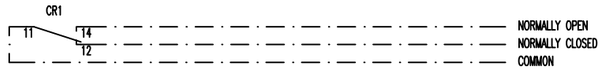
HMI COMMUNICATIONS WIRING





Micro-C Female





COMMON ALARM (RELAY IS OFF WHEN ALARM IS ACTIVE)

DIMENSIONAL TOLERANCES - UNLESS OTHERWISE SPECIFIED			
MACHINED			WELDMENT
FRACTION	±1/32"		± 1/16"
X	-	± 4mm	± 1/8"
.X	± .1"	± 2mm	± 1/16"
.XX	± .01"	± .25mm	± 1/32"
.XXX	± .005"	± .025mm	-
ANGULAR ± 1'			

125 UNLESS OTHERWISE SPECIFIED

CUSTOMER - --

PROJECT - --

DRAWN - JPD DATE - 19-DEC-2017

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DRY WT:

WET WT:

CONTRACT NO

Parker Sea Recovery

Parker Hannifin Corporation
Filtration Group / Water Purification
2630 E. El Presidio Street
Carson, CA 90810

Contact
Office: 310-608-5600
Fax: 310-608-5692
www.parker.com

AQUA DUAL 230V, 1 PHASE ELECTRICAL SCHEMATICS

SIZE D | DWG NO 0901103E | REV A

SCALE NONE | 6 OF 6

AQUA DUAL
CONTROL PANEL SCHEMATICS
230V, 380V, 480V, 3 PHASE

REV	ENGINEER	DESCRIPTION	DATED
–	JPD	ORIGINAL COMPLETED RELEASE	12–19–17
A	JPD	ADDED OPTIONAL INPUT I2, I11 AND I12, ADDED OPTIONAL OUTPUT Q16, ADDED OPTIONAL AUX MOTOR RUNNING SIGNAL TO C20, (THESE UPDATES CORRESPOND TO PROGRAM VERSION 1.05)	02–21–20

DIMENSIONAL TOLERANCES - UNLESS OTHERWISE SPECIFIED			
MACHINED			WELDMENT
FRACTION	±1/32"		± 1/16"
X	-	± 4mm	± 1/8"
.X	± .1"	± 2mm	± 1/16"
.XX	± .01"	± .25mm	± 1/32"
.XXX	± .005"	± .025mm	-
ANGULAR ± 1'			
125 UNLESS OTHERWISE SPECIFIED			

CUSTOMER - --

PROJECT - --

DRAWN - JPD DATE - 19-DEC-2017

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DRY WT:

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AQUA DUAL
230V, 380V, 480V, 3 PHASE
ELECTRICAL SCHEMATICS

SIZE	DWG NO	REV
D	0901104E	A

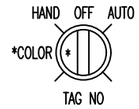
SCALE NONE

PANEL LAYOUT SYMBOLS

PILOT LIGHT ACTION

PUSHBUTTON, ILLUMINATED ACTION

HANDSWITCH, 3 POSITION, ILLUMINATED

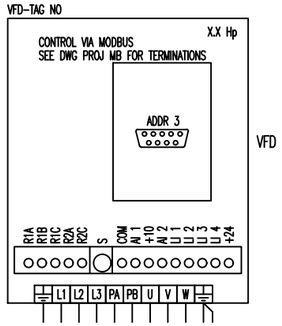


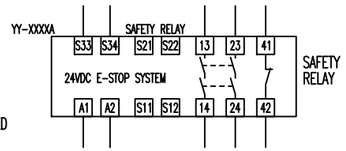
HANDSWITCH, 2 POSITION, ILLUMINATED

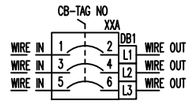
ABBREVIATIONS

VFD – VARIABLE FREQUENCY DRIVE
MS – MOTOR STARTER
NO – NORMALLY OPEN
NC – NORMALLY CLOSED
C – COMMON
LC – LIGHTING CONTACTOR
HS – HANDSWITCH
CB – CIRCUIT BREAKER
F – FUSE
LS(x) – LEVEL SWITCH (HIGH, LOW, LOW-LOW)
LA(x) – LEVEL ALARM (LOW, LOW-LOW)
PS(x) – PRESSURE SWITCH (LOW, LOW-LOW)
FLS(x) – FLOW SWITCH
PA(x) – PRESSURE ALARM (LOW, LOW-LOW)
PDS(x) – PRESSURE DIFFERENTIAL SWITCH (HIGH)
PDA(x) – PRESSURE DIFFERENTIAL ALARM (HIGH)
PT – PRESSURE TRANSMITTER

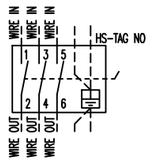
POWER WIRING SYMBOLS



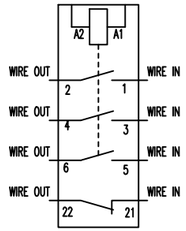




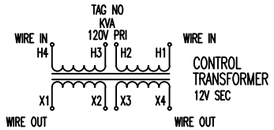
CIRCUIT BREAKER

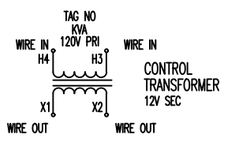


DISCONNECT



CONTACTOR

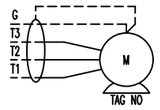




EQUIPMENT GROUND
LANDED IN GREEN RAIL
CONNECTED TERMINAL BLOCKS

ISOLATED CONTROL GROUND
LANDED IN GRAY COLOR
ISOLATED TERMINAL BLOCKS

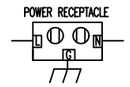
WIRING DIAGRAM SYMBOLS
POWER WIRING SYMBOLS



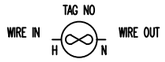
MOTOR

DC POWER SUPPLY

SURGE SUPPRESSOR

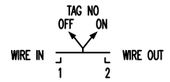


RECEPTACLE

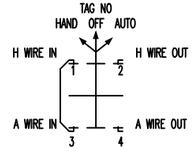


FAN

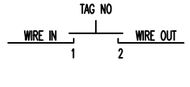
CONTROL WIRING SYMBOLS



HANDSWITCH, 2 POSITION

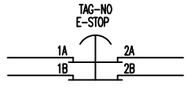


HANDSWITCH, 3 POSITION

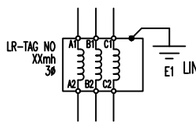


PUSHBUTTON (N.O.)

PUSHBUTTON (N.C.)



E-STOP



LINE REACTOR

WIRE-LINE SYMBOLS

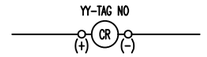
SOLID LINE
PREWIRED BY SEA RECOVERY
INTERNAL TO PANEL

DOT-DASH LINE
WIRED BY INSTALLER
EXTERNAL TO PANEL

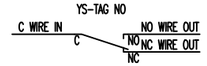
LONG-DASHED LINE
WIRED BY SEA RECOVERY
EXTERNAL TO PANEL

BOLD SOLID LINE
PRE-INSTALLED BY SEA RECOVERY
TERMINAL BLOCK JUMPER COMB
OR BUS LINE

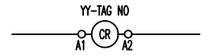
CONTROL WIRING SYMBOLS



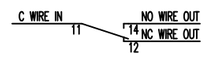
CONTROL RELAY STYLE 1



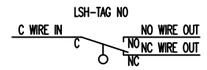
CONTROL RELAY CONTACT STYLE 1



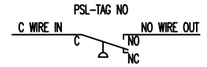
CONTROL RELAY STYLE 2



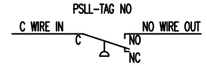
CONTROL RELAY CONTACT STYLE 2



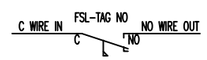
LEVEL SWITCH, HIGH



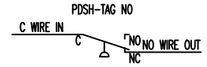
PRESSURE SWITCH, LOW



PRESSURE SWITCH, LOW, LOW

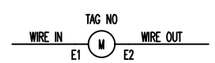


FLOW SWITCH

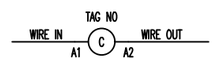


HIGH DIFFERENTIAL PRESSURE SWITCH

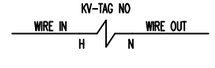
TRANSMITTER



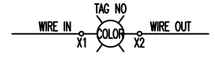
MOTOR STARTER



CONTACTOR



SOLENOID



PILOT LIGHT

FUSE BLOCK

3 PHASE
FUSE BLOCK

TERMINAL BLOCK

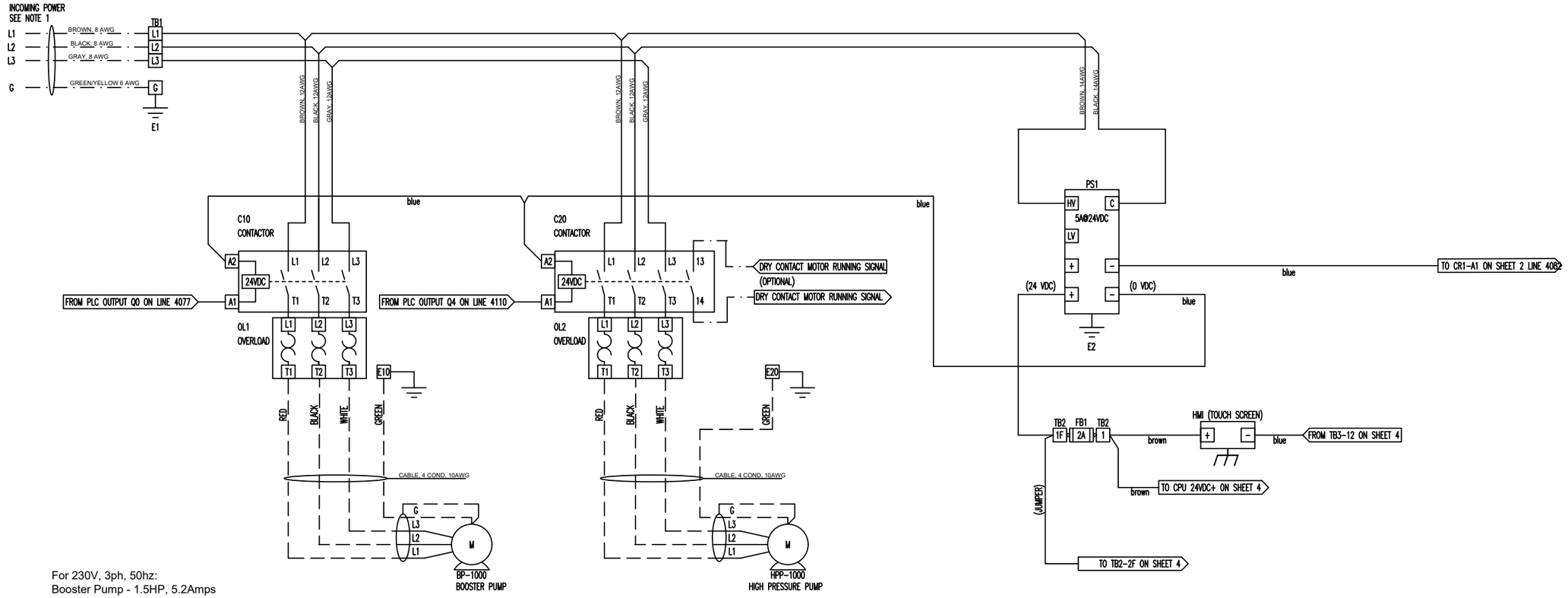
DIMENSIONAL TOLERANCES - UNLESS OTHERWISE SPECIFIED			
MACHINED			WELDMENT
FRACTION	±1/32"		± 1/16"
X	-	± 4mm	± 1/8"
.X	± .1"	± 2mm	± 1/16"
.XX	± .01"	± .25mm	± 1/32"
.XXX	± .005"	± .025mm	-
ANGULAR ± 1°			
125 UNLESS OTHERWISE SPECIFIED			

CUSTOMER - --
PROJECT - --
DRAWN - JPD DATE - 19-DEC-2017
CHECKED - -- DATE - --
APPROVED - -- DATE - --
DRY WT:
WET WT:
CONTRACT NO

Parker Hannifin Corporation
Filtration Group / Water Purification
2630 E. El Presidio Street
Carson, CA 90810
Contact
Office: 310-608-5600
Fax: 310-608-5692
www.parker.com

AQUA DUAL
230V, 380V, 480V, 3 PHASE
ELECTRICAL SCHEMATICS

SIZE D | DWG NO 0901104E | REV A
SCALE NONE | 2 OF 6



For 230V, 3ph, 50hz:
Booster Pump - 1.5HP, 5.2Amps
High Press. Pump - 5HP, 16.2Amps

For 230V, 3ph, 60hz:
Booster Pump - 2HP, 5.8Amps
High Press. Pump - 5HP, 13.4Amps

For 230V, 3ph, 50/60hz:
Use assembly 0901104-A
BP Contactor - 18A
HP Contactor - 18A
BP Overload - 1.6-8A
HP Overload - 12-18A

For 380V, 3ph, 50hz:
Booster Pump - 1.5HP, 2.6Amps
High Press. Pump - 5HP, 7.8Amps

For 460V, 3ph, 60hz for 1800GPD:
Booster Pump - 2HP, 2.9Amps
High Press. Pump - 5HP, 6.7Amps

For 460V, 3ph, 60hz for 2600 and 3400GPD:
Booster Pump - 2HP, 2.9Amps
High Press. Pump - 9.5HP, 9.1Amps

For 380V, 3ph, 50hz and 480V, 3ph, 60hz:
Use assembly 0901004-B
BP Contactor - 18A
HP Contactor - 18A
BP Overload - 1.6-8A
HP Overload - 1.6-8A

KEY

— · — · —	CUSTOMER INSTALLED WIRING
— — — —	SEA RECOVERY INSTALLED WIRING

DIMENSIONAL TOLERANCES - UNLESS OTHERWISE SPECIFIED			
MACHINED			WELDMENT
FRACTION	±1/32"		± 1/16"
X	-	± 4mm	± 1/8"
.X	± .1"	± 2mm	± 1/16"
.XX	± .01"	± .25mm	± 1/32"
.XXX	± .005"	± .025mm	-
ANGULAR ± 1'			
125 UNLESS OTHERWISE SPECIFIED			

CUSTOMER - --
PROJECT - --
DRAWN - JPD DATE - 19-DEC-2017
CHECKED - -- DATE - --
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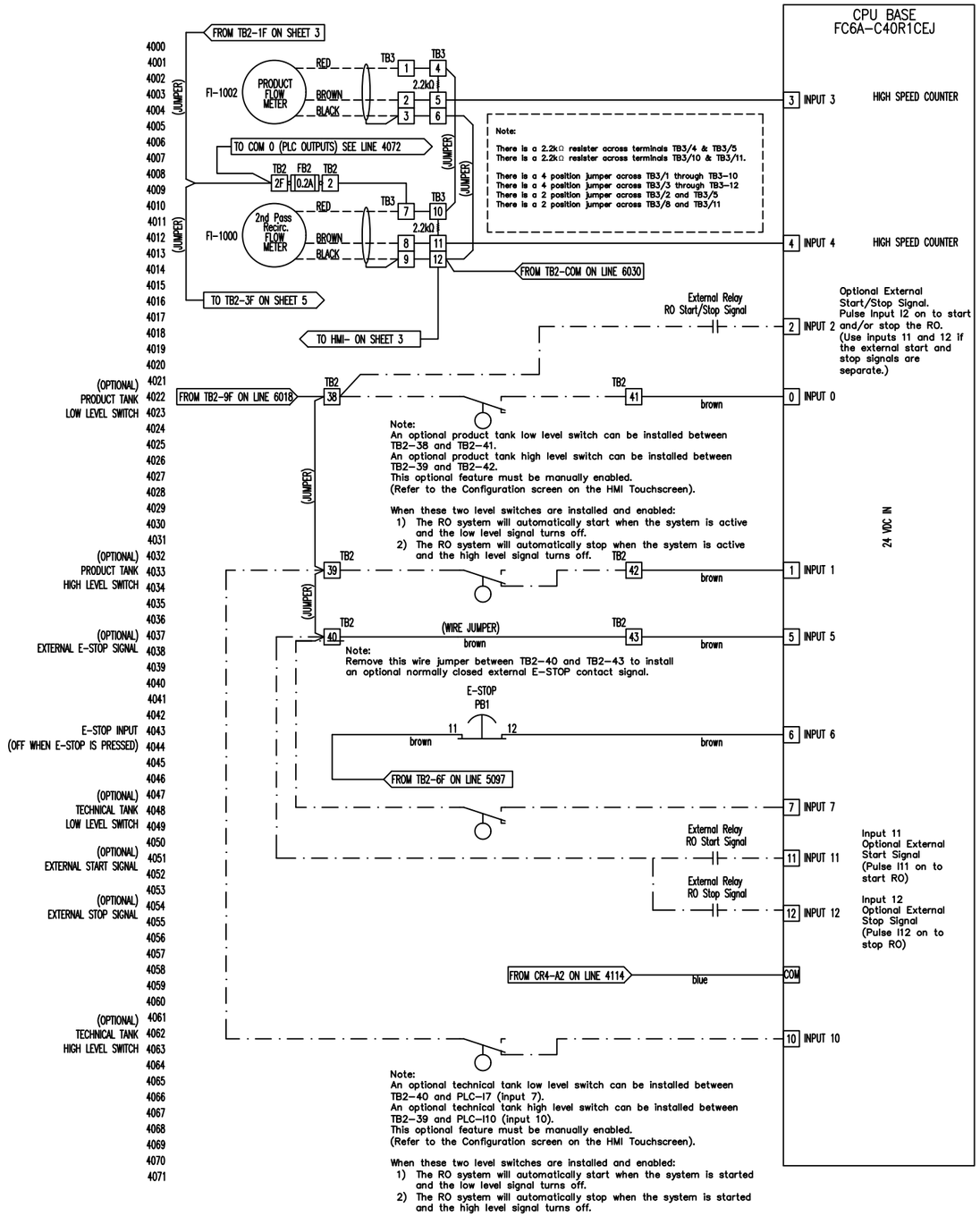
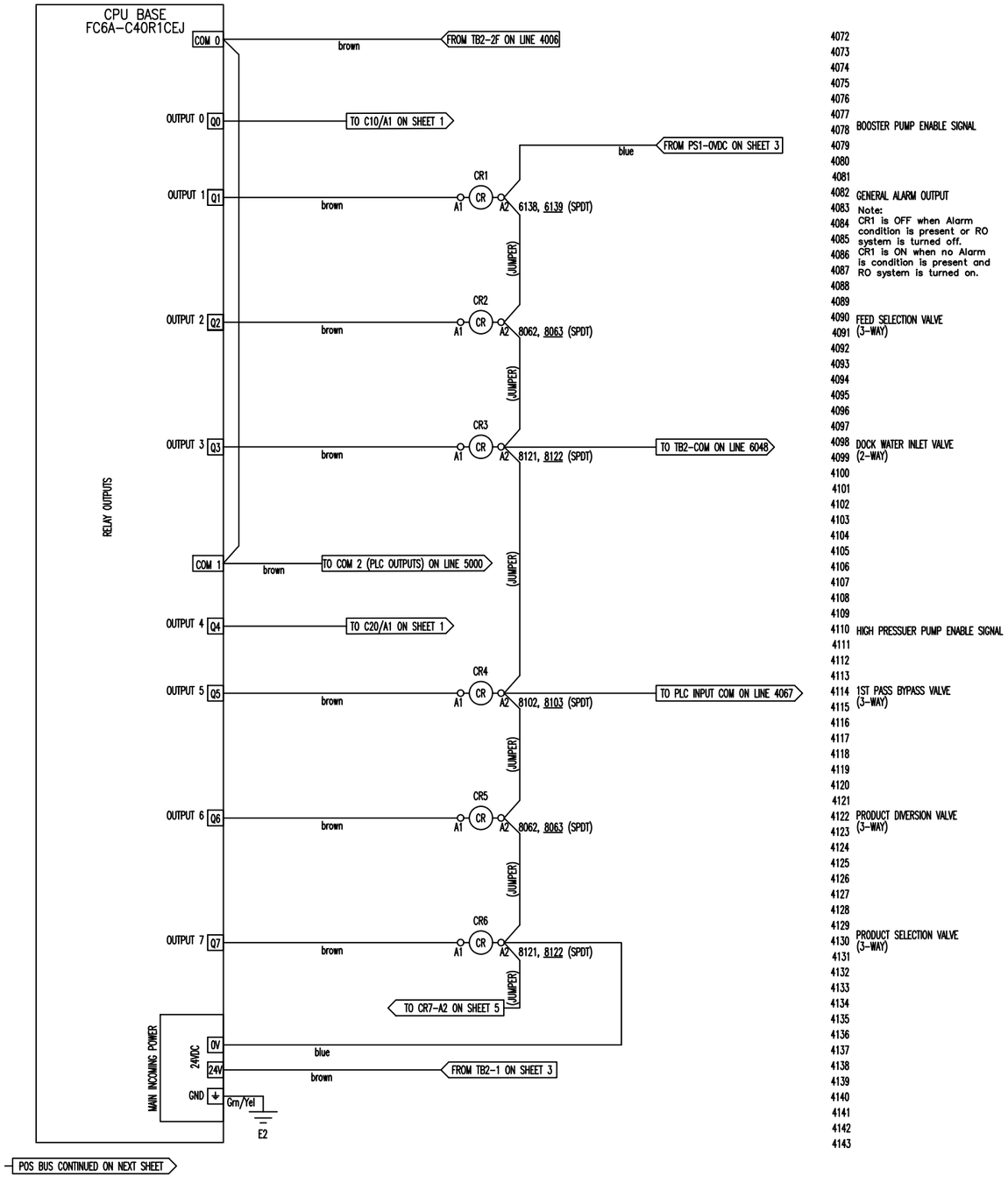
AQUA DUAL
230V, 380V, 480V, 3 PHASE
ELECTRICAL SCHEMATICS

SIZE D | DWG NO 0901104E | REV A
SCALE NONE | 3 OF 6





POS BUS CONTINUED ON NEXT SHEET

KEY

— · — · —	CUSTOMER INSTALLED WIRING
— — — —	SEA RECOVERY INSTALLED WIRING

DIMENSIONAL TOLERANCES - UNLESS OTHERWISE SPECIFIED			
MACHINED			WELDMENT
FRACTION	±1/32"		± 1/16"
X	-	± 4mm	± 1/8"
.X	± .1"	± 2mm	± 1/16"
.XX	± .01"	± .25mm	± 1/32"
.XXX	± .005"	± .025mm	-
ANGULAR ± 1°			

125 UNLESS OTHERWISE SPECIFIED

CUSTOMER - --
PROJECT - --
DRAWN - JPD DATE - 19-DEC-2017
CHECKED - -- DATE - --
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WET WT:
CONTRACT NO

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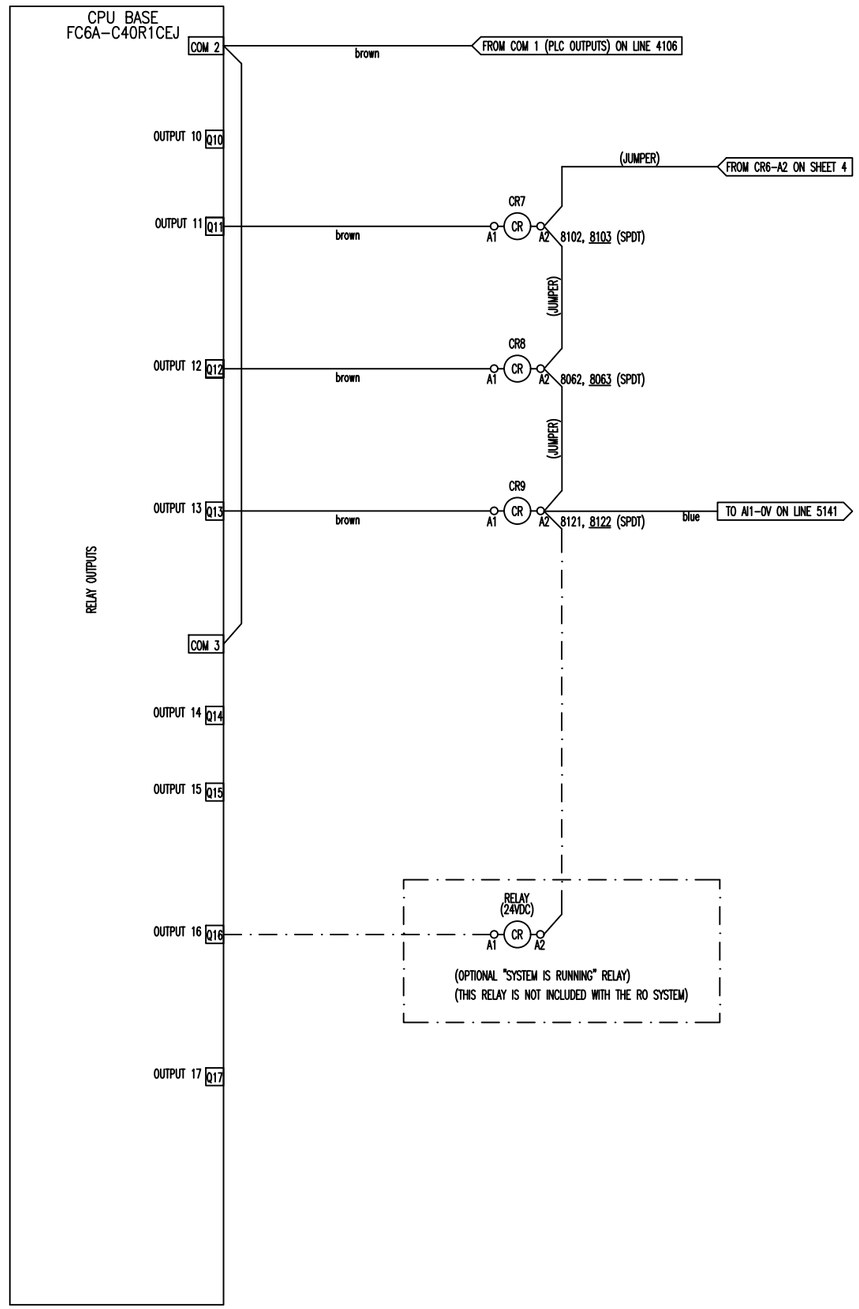
www.parker.com

AQUA DUAL
230V, 1 PHASE
ELECTRICAL SCHEMATICS

SIZE D | DWG NO 0901103E | REV A
SCALE NONE | 4 OF 6



TB4, COM BUS CONTINUED FROM PREV SHEET

5000
5001
5002
5003
5004
5005 SPARE
5006
5007
5008
5009
5010 2ND PASS SELECTION VALVE
5011 (3-WAY)
5012
5013
5014
5015
5016
5017
5018 BACK PRESSURE REGULATOR VALVE
5019 ENABLE SIGNAL
5020
5021
5022
5023
5024
5025
5026 BACK PRESSURE DIRECTION
5027
5028
5029
5030
5031
5032
5033
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5035
5036
5037
5038
5039
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5041
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5044
5045
5046
5047
5048
5049
5050 PLC OUTPUT Q16
5051 (OPTIONAL "SYSTEM IS RUNNING"
5052 OUTPUT SIGNAL)
5053
5054
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5072
5073
5074
5075
5076 PRESSURE TRANSMITTER
5077 20 MICRON PREFILTER INLET
5078
5079
5080
5081
5082
5083 PRESSURE TRANSMITTER
5084 5 MICRON PREFILTER OUTLET
5085
5086
5087
5088
5089
5090
5091 PRESSURE TRANSMITTER
5092 HIGH PRESSURE PUMP OUTLET
5093
5094
5095
5096
5097
5098 PRESSURE TRANSMITTER
5099 1ST PASS PRODUCT OUTLET PRESSURE
5100
5101
5102
5103
5104
5105
5106
5107
5108
5109 SALINITY VALUE
5110
5111
5112
5113
5114
5115
5116
5117 TEMPERATURE VALUE
5118
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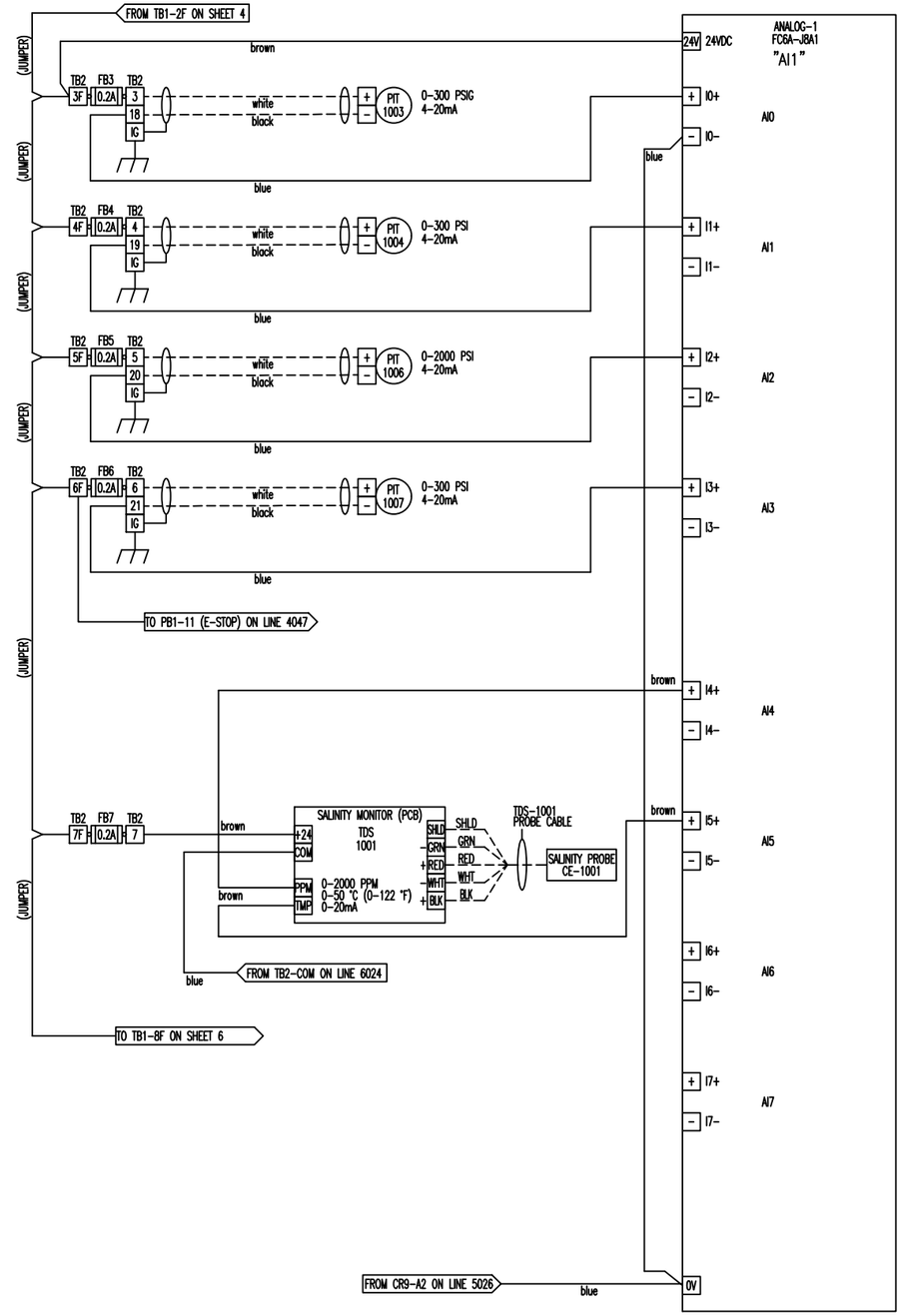

DIMENSIONAL TOLERANCES - UNLESS OTHERWISE SPECIFIED			
MACHINED			WELDMENT
FRACTION	±1/32"		± 1/16"
X	-	± 4mm	± 1/8"
.X	± .1"	± 2mm	± 1/16"
.XX	± .01"	± .25mm	± 1/32"
.XXX	± .005"	± .025mm	-
ANGULAR ± 1'			
125 UNLESS OTHERWISE SPECIFIED			

CUSTOMER - --
PROJECT - --
DRAWN - JPD DATE - 19-DEC-2017
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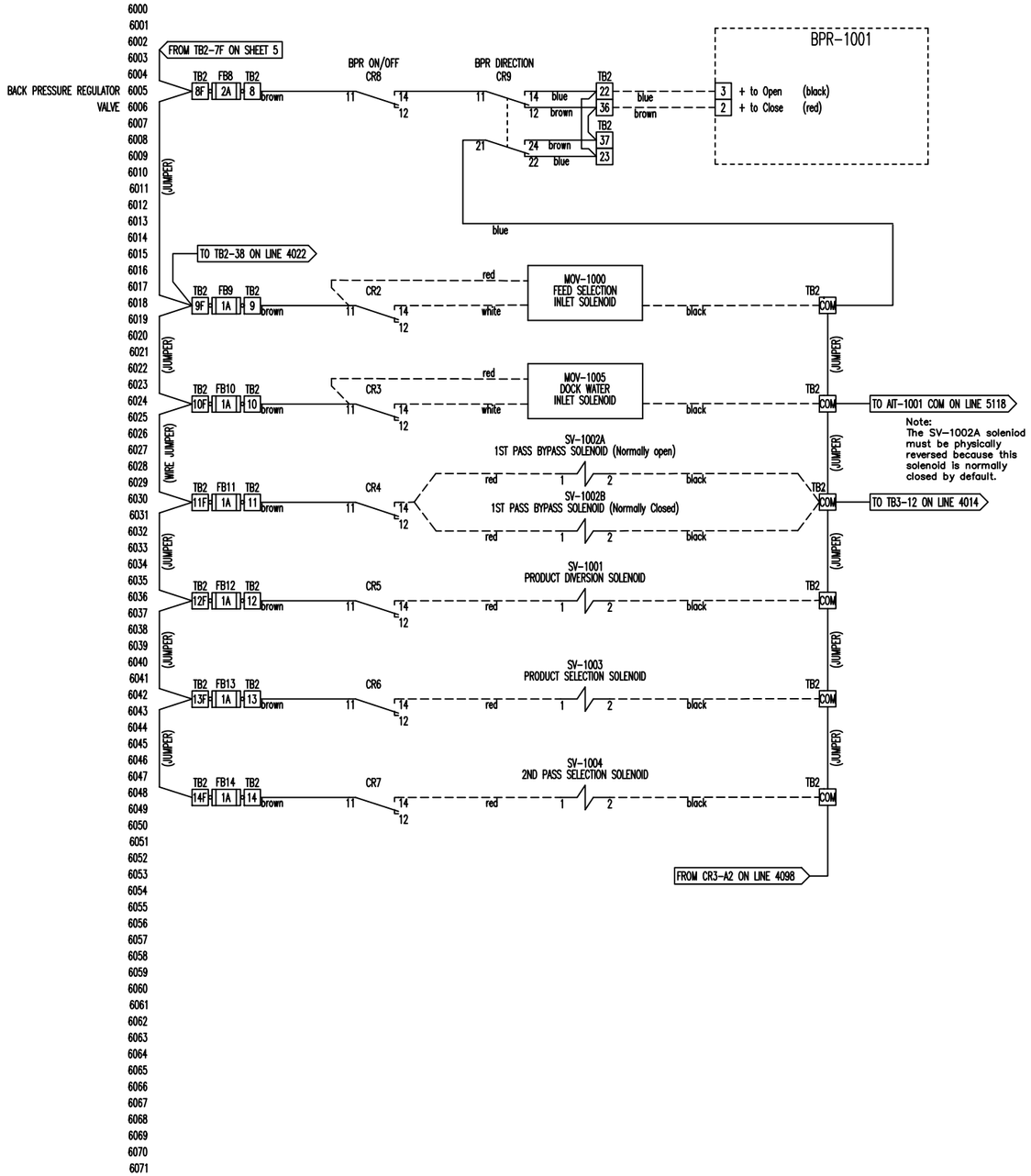
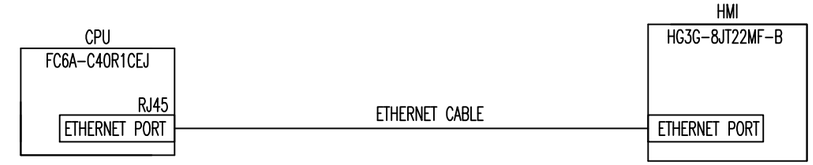
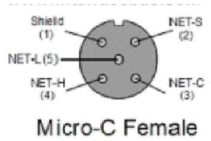
AQUA DUAL
230V, 380V, 480V, 3 PHASE
ELECTRICAL SCHEMATICS

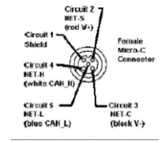
SIZE D | DWG NO 0901104E | REV A
SCALE NONE | 5 OF 6

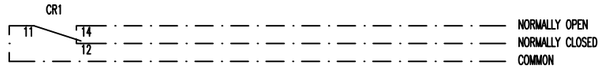


HMI COMMUNICATIONS WIRING









COMMON ALARM (RELAY IS OFF WHEN ALARM IS ACTIVE)

DIMENSIONAL TOLERANCES - UNLESS OTHERWISE SPECIFIED			
MACHINED			WELDMENT
FRACTION	±1/32"		± 1/16"
X	-	± 4mm	± 1/8"
.X	± .1"	± 2mm	± 1/16"
.XX	± .01"	± .25mm	± 1/32"
.XXX	± .005"	± .025mm	-
ANGULAR ± 1'			
125 UNLESS OTHERWISE SPECIFIED			

CUSTOMER - --
PROJECT - --
DRAWN - JPD DATE - 19-DEC-2017
CHECKED - -- DATE - --
APPROVED - -- DATE - --
DRY WT:
WET WT:
CONTRACT NO

Parker Hannifin Corporation
Filtration Group / Water Purification
2630 E. El Presidio Street
Carson, CA 90810
Contact
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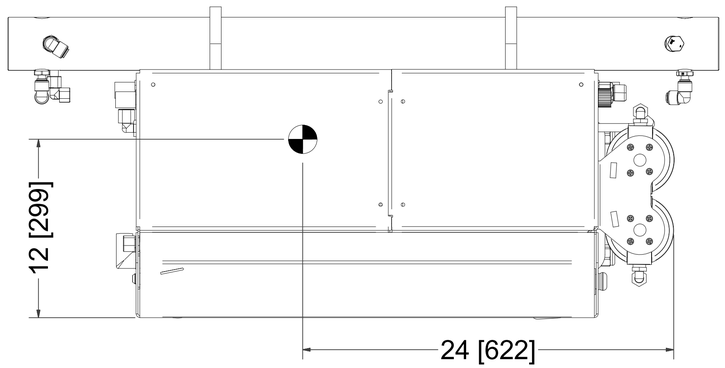
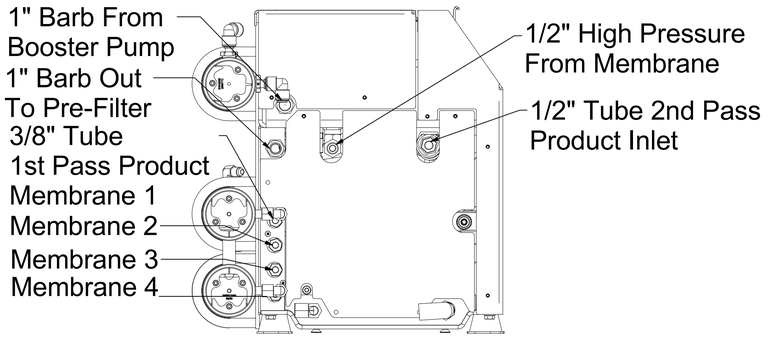
Fax: 310-608-5692
www.parker.com

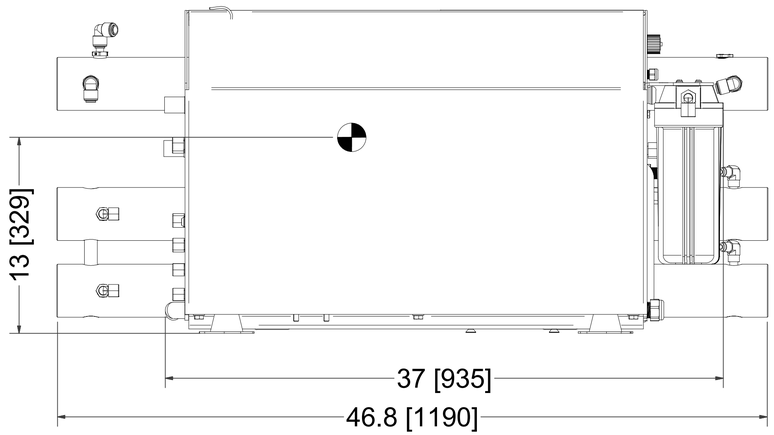
AQUA DUAL
230V, 380V, 480V, 3 PHASE
ELECTRICAL SCHEMATICS

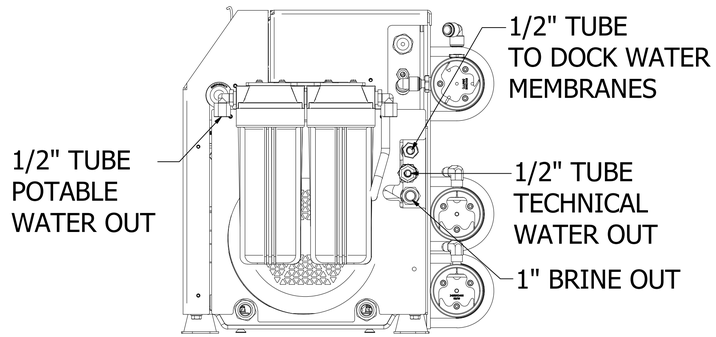
SIZE	DWG NO	REV
D	0901104E	A
SCALE NONE		6 OF 6

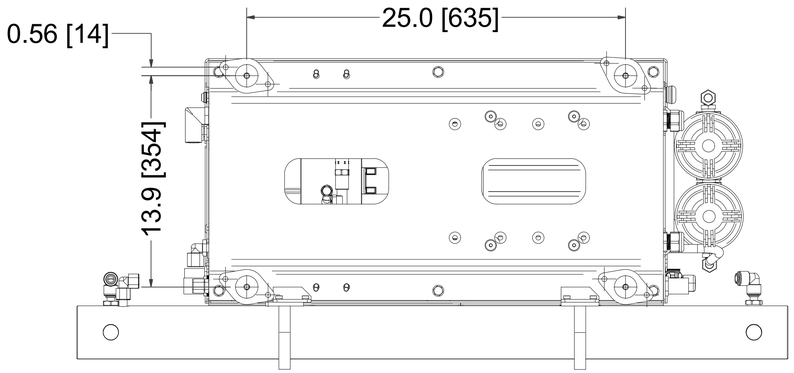
GENERAL ARRANGEMENT











ELECTRICAL OPTIONS
220 VOLT/1 PHASE/50-60Hz
220-380-440 VOLT/3 PHASE/ 50-60 Hz
MOTOR&PUMP SIZE
5HP/7.6 GPM (1800-3400GPD)
SEA WATER MEMBRANE OPTIONS
1800-2
2600-3
3400-4
FRESH WATER MEMBRANE OPTIONS
1400GPD
2200GPD
2900GPD

1. ENG MUST APPROVE ANY DEVIATIONS
NOTES: UNLESS OTHERWISE SPECIFIED

DIMENSIONAL TOLERANCES - UNLESS OTHERWISE SPECIFIED			
MACHINED			WELDMENT
FRACTION	±1/32"		± 1/16"
X	-	± 4mm	± 1/8"
.X	± .1"	± 2mm	± 1/16"
.XX	± .01"	± .25mm	± 1/32"
.XXX	± .005"	± .025mm	-
ANGULAR ± 1˚			
125 UNLESS OTHERWISE SPECIFIED			

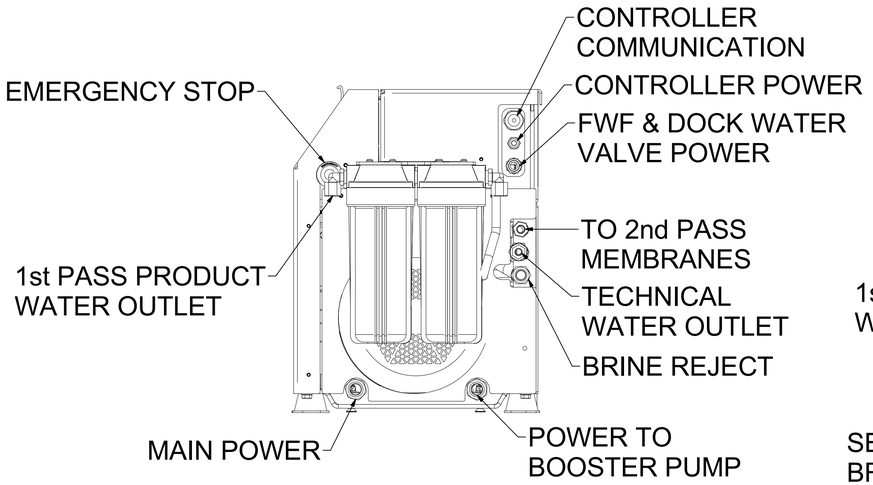
CUSTOMER -
PROJECT -
DRAWN - 515746 DATE - 4/4/2017
CHECKED - DATE -
APPROVED - DATE -
DRY WT: N/A
WET WT:
CONTRACT NO

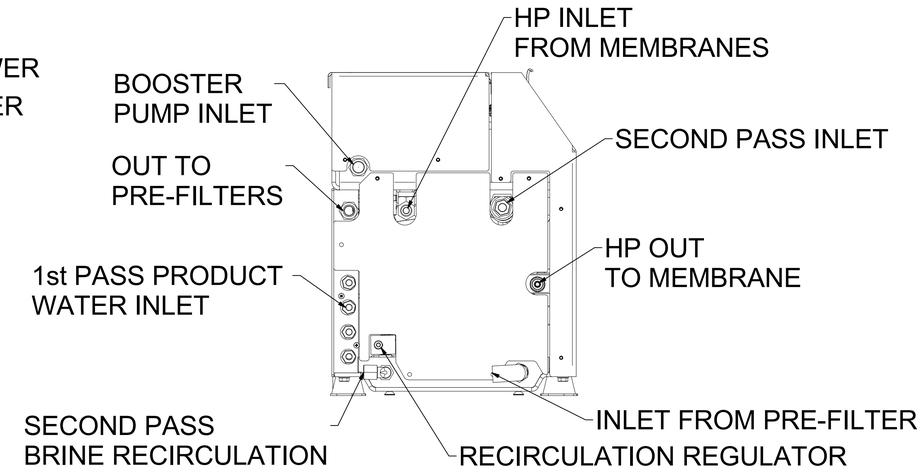
Parker Sea Recovery
Parker Hannifin Corporation
Filtration Group / Water Purification
2630 E. El Presidio Street
Carson, CA 90810
Contact
Office: 310-608-5600
Fax: 310-608-5692
www.parker.com

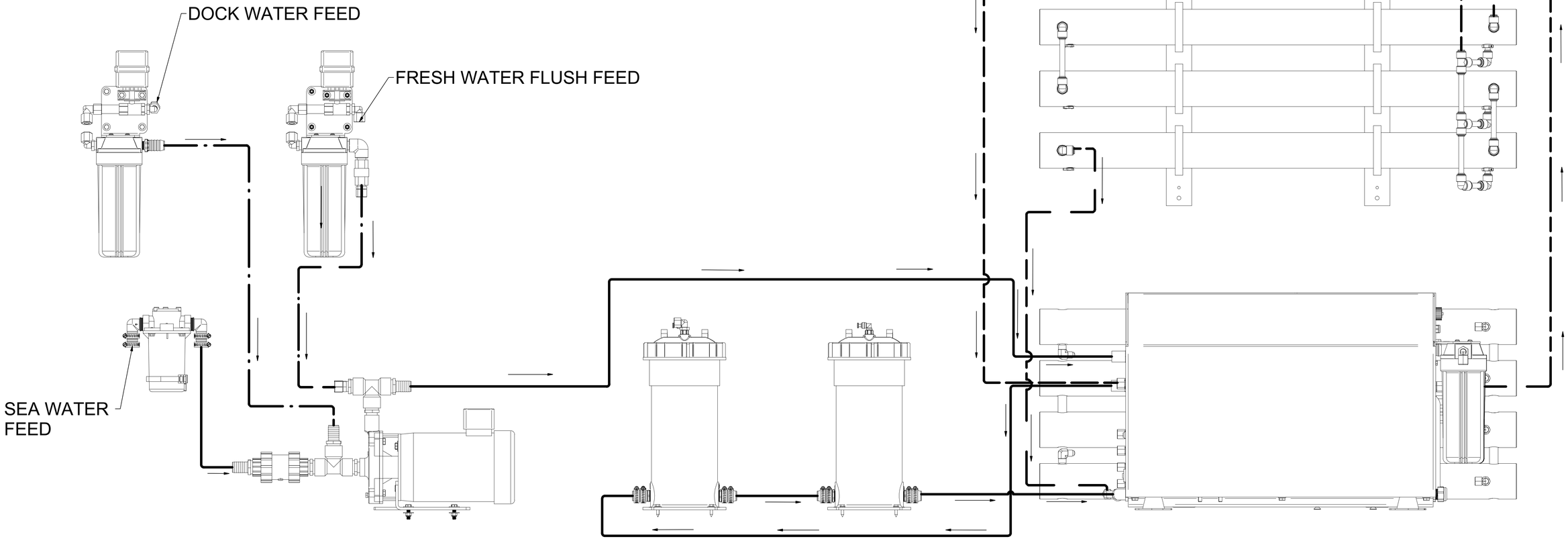
AQUA DUAL COMPACT

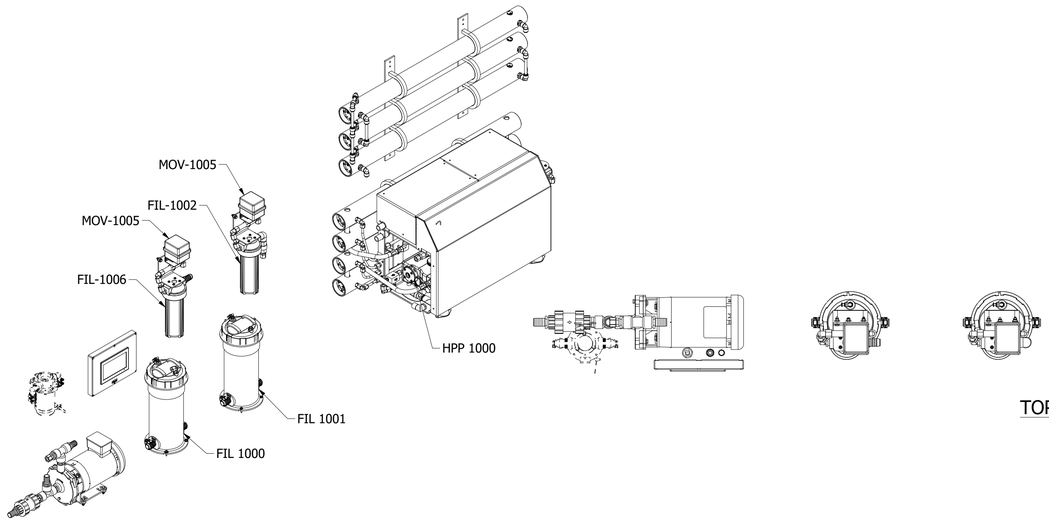
SIZE D | DWG NO A400C | REV -
SCALE | 1 OF 1

DWG NO A400C
SH 1
REV A

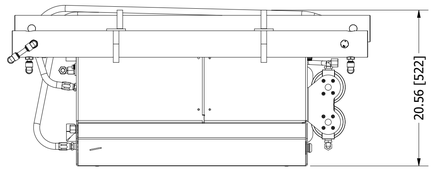

CONTROLLER COMMUNICATION
CONTROLLER POWER
EMERGENCY STOP
FWF & DOCK WATER VALVE POWER
TO 2nd PASS MEMBRANES
1st PASS PRODUCT WATER OUTLET
TECHNICAL WATER OUTLET
BRINE REJECT
MAIN POWER
POWER TO BOOSTER PUMP


HP INLET FROM MEMBRANES
BOOSTER PUMP INLET
SECOND PASS INLET
OUT TO PRE-FILTERS
HP OUT TO MEMBRANE
1st PASS PRODUCT WATER INLET
SECOND PASS BRINE RECIRCULATION
INLET FROM PRE-FILTER
RECIRCULATION REGULATOR

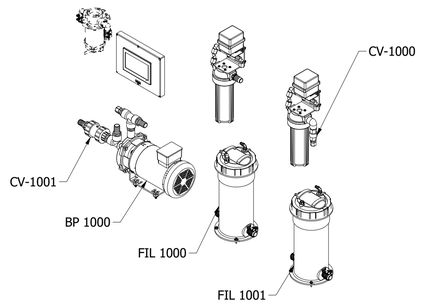

DOCK WATER FEED
FRESH WATER FLUSH FEED
SEA WATER FEED

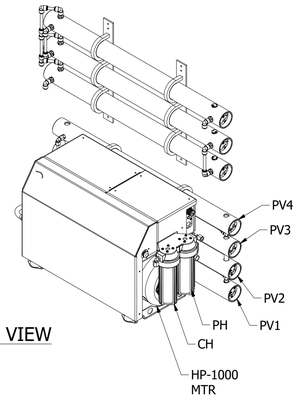


LEFT SIDE ISO VIEW

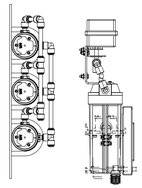


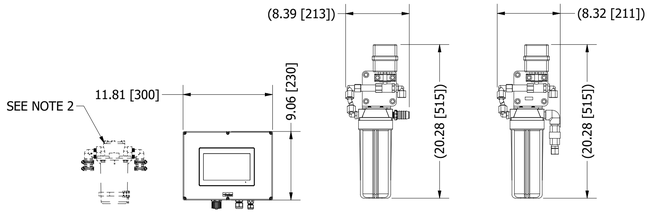
TOP VIEW

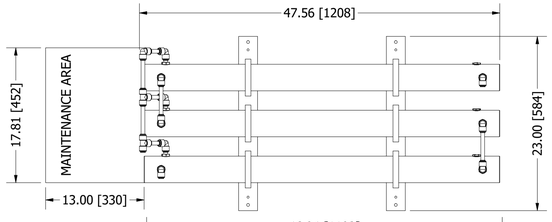


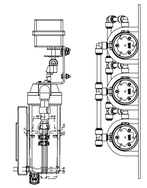


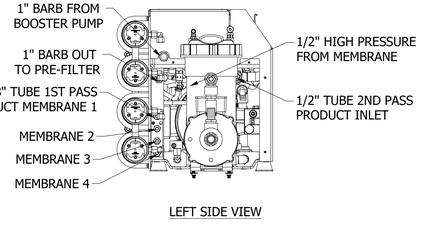
RIGHT SIDE ISO VIEW



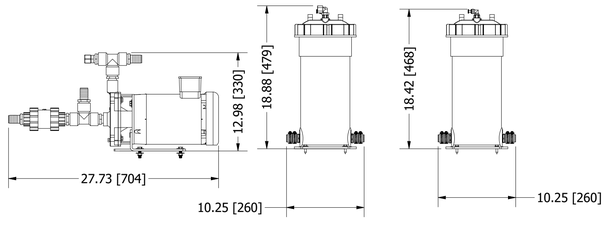




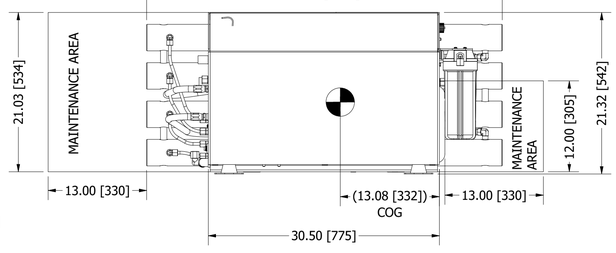


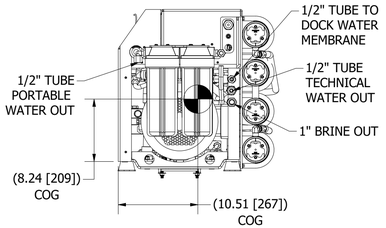


LEFT SIDE VIEW

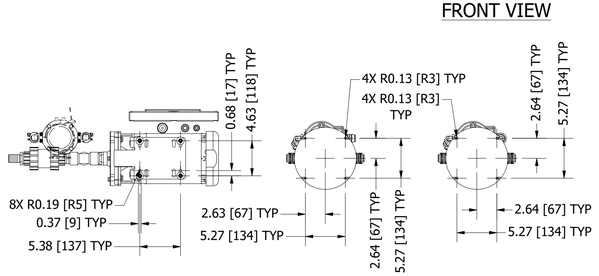


FRONT VIEW

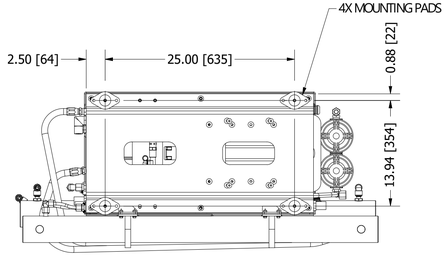




RIGHT SIDE VIEW



BOTTOM VIEW



6. REFERENCE WP-FAT SHAREDRIVE, A400C-TP FOR TEST PROCEDURE
5. REFERENCE A400C-PID FOR PROCESS & INSTRUMENTATION DIAGRAM.
4. ITEM 41 (2408132500-02) VESSEL ASSYS USES ONE ELEMENT (2724011433) (ITEMS ARE PROCURED SEPERATELY).FOR INSTALLATION REF TO TECH MANUAL
3. ITEM 22 (50012017) VESSEL ASSYS USES ONE ELEMENT (33-3040) (ITEMS ARE PROCURED SEPERATELY). FOR INSTALLATION REF TO TECH MANUAL
2. SEA STRAINER IS FOR REFERENCE ONLY AS IT IS PART OFTHE INSTALLATION KIT.
1. ENG MUST APPROVE ANY DEVIATIONS

NOTES: UNLESS OTHERWISE SPECIFIED

DIMENSIONAL TOLERANCES - UNLESS OTHERWISE SPECIFIED			
MACHINED			WELDMENT
FRACTION	±1/32"		± 1/16"
X	-	± 4mm	± 1/8"
.X	± .1"	± 2mm	± 1/16"
.XX	± .01"	± .25mm	± 1/32"
.XXX	± .005"	± .025mm	± 1/32"
ANGULAR ± 1'			

125 UNLESS OTHERWISE SPECIFIED

CUSTOMER -

PROJECT -

DRAWN - KR DATE - 4/28/2020

CHECKED - SY DATE - 4/28/2020

APPROVED - BB DATE - 4/28/2020

DRY WT: SEE TABLE — SEE TABLE

WET WT: SEE TABLE

CONTRACT NO

Parker Hannifin Corporation
Filtration Group / Water Purification
2630 E. El Presidio Street
Carson, CA 90810

Contact
Office: 310-608-5600
Fax: 310-608-5692
www.parker.com

CUSTOMER DWG

AQUA DUAL COMPACT AMDP

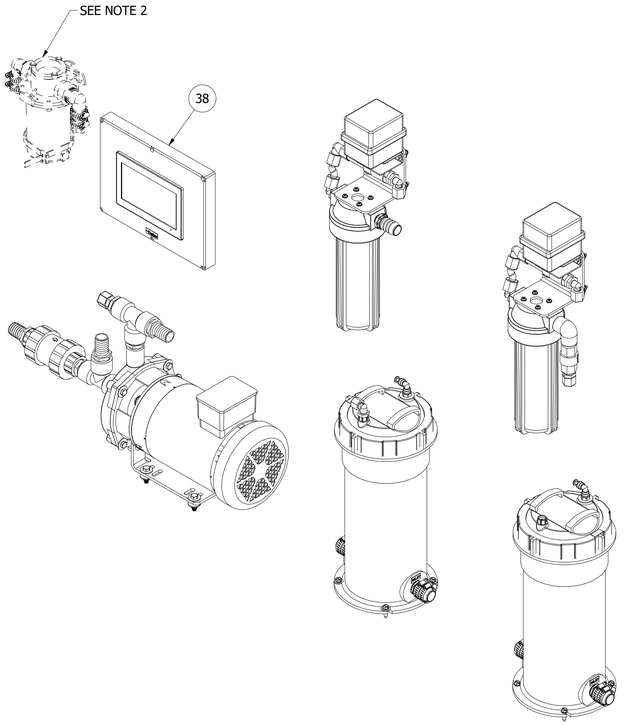
SIZE D | DWG NO A400C-TM | REV -

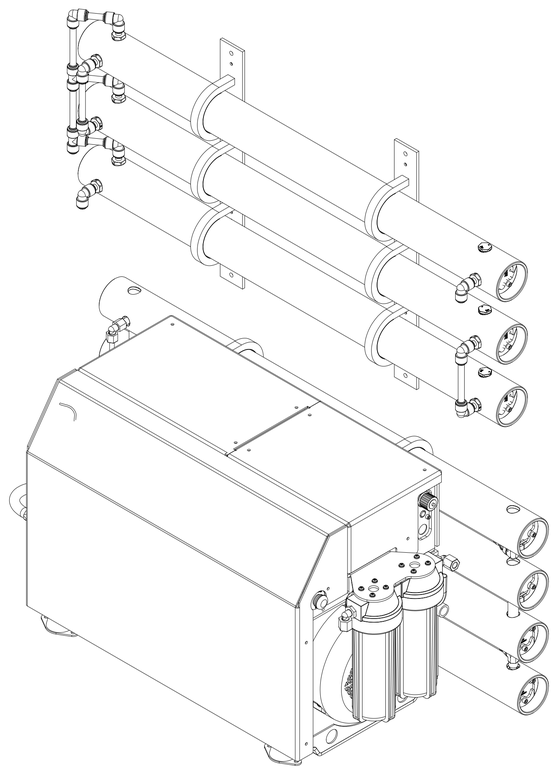
SCALE NTS | 1 OF 3

DWG NO A400C-0103

SH 1

REV A





PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	0821009	VALVE-PLUMB,CONTRL,ASSY,AQUA,DUAL
2	1	0901104-B	AGUA DULCE,380-480VAC,3PH
3	1	11012101	FRAME,ASSY,AL, AQUA DUAL
5	14	05202401GR	BRACKET,MVA U-CLAMP,3 IN
6	1	11012100	BASE, PUMP,AL, AQUA DUAL
7	1	11012102	BRACKET, PUMP, AL,AQUA PRO
8	1	11012106	COVER,ELECT,ENCL,AQUA DUAL
9	1	11012107	COVER,PLUMB,ENCL,AQUA DUAL
10	1	11012108	COVER, SOUND, FRONT,AQUA DUAL
11	2	11012171	BRACKET, MEMBRANE, AL,AQMDP
13	2	0520052000	PLATE,SUPPORT,3 VESSEL,3 IN,6061-T6,23.00x2.50x0.25TH
15	2	2020040006	BRACKET,FWF,FILTER,CARBON
16	3	2417430800	INTERCONNECT MVA SS
19	1	20200402101	DUAL BRACKET PREFILTER-CHRCL-PLNKTN
22	3	SEE TABLE	KIT,VESSEL ASSY,3040,FRP,600PS
23	1	20-0683	BELL HOUSING,3.5 GPM PLGR PUMP
24	1	SEE TABLE	PUMP,708-5, 5 PLGR, 8GPM
28	1	SEE TABLE	BOOSTER PUMP HEAD HP75 SS
29	1	1544182210	MOTOR,2HP,460-60-3,1.5HP,380-50-3
30	1	SEE TABLE	MTR 7.5-5HP,230-460,190-380,3PH,60-50HZ
31	3	SEE TABLE	ELEMENT,BW-3040
32	2	07620310WA	FILTER HOUSING 32.5 SQFT
33	1	08020723KD	ELEMENT OWSE 32.5 SQFT
34	4	0713020873	FILTER HOUSING .50 X 10
35	1	0801063357	ELEMENT CPFE 5 MIC 32.5 SQFT
36	4	0803004773	ELEMENT,CHARCOAL,2.5 x10.0
37	4	SEE TABLE	MEMBRANE 900GPD AW W SEAL 3
38	1	0901428	HMI PANEL ASSY,7IN,AQUA DUAL
39	1	90012047	PUSHBUTTON,ESTOP,16mm, MUSH, HEAD
40	1	313110009DK	CONN MOD JACK PLUG RJ45
41	4	SEE TABLE	VESSEL HIGH PRESSURE 900GPD
43	1	14012117Ar	VALVE CHECK .50 FPT WITH VITO
44	2	1401105698	KZ VALVE FWF 0.50
45	1	1401271942	VALVE,CHECK,TU,PVC,1.00

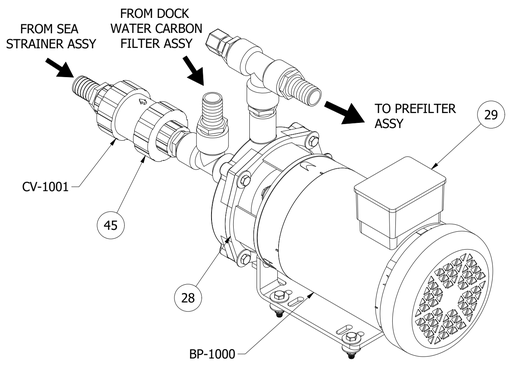
A400C-0103-TM SHOWN. SEE TABLE FOR OTHER VARIATIONS.

TABLE												
PART NUMBER	VOLTAGE	CAPACITY (M3/DAY)	PERMEATE GPD	HP MOTOR	HP PUMP	BOOSTER PUMP	FIRST PASS MEMBERANE VESSEL	FIRST PASS MEMBERANE ELEMENT	SECOND PASS MEMBERANE VESSEL	SECOND PASS MEMBERANE ELEMENT	DRY WT lbs	WET WT lbs
A400C-0101-TM	208-230/3/50-60	6.8	1800	1569263200	70-6178C1	1217514772	QTY 2 2408132500-02	2724011433	QTY 1 50012017	33-3040	451 (204)	512 (232)
A400C-0102-TM	380-460/3/50-60	9.8	2600	1569263200	70-6178C1	1217514772	QTY 3 2408132500-02	2724011433	QTY 2 50012017	33-3040	497 (225)	568 (258)
A400C-0103-TM	230/1/50	12.9	3400	1569263200	70-6178C1	1217514772	QTY 4 2408132500-02	2724011433	QTY 3 50012017	33-3040	345 (156)	629 (285)

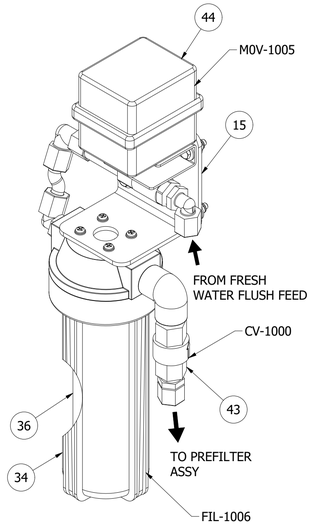
DWG NO A400C-0103

SH 2

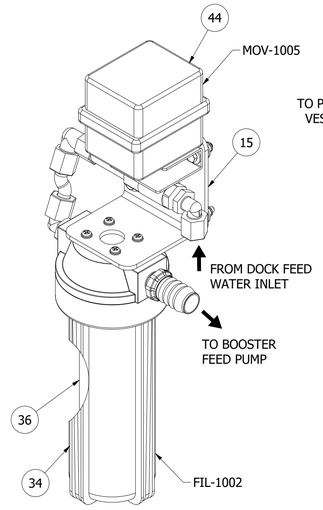
SIZE	DWG NO	REV
D	A400C-TM	-
SCALE NTS	2 OF 3	



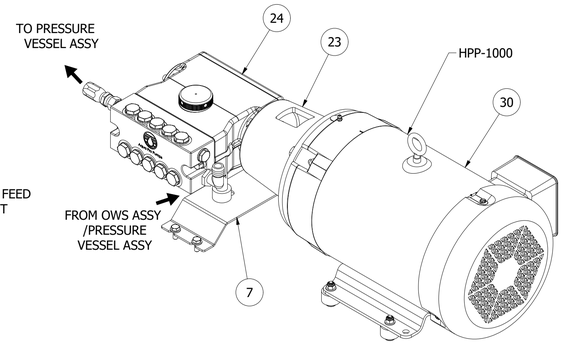
BOOSTER PUMP ASSY



FRESH WATER FILTER ASSY

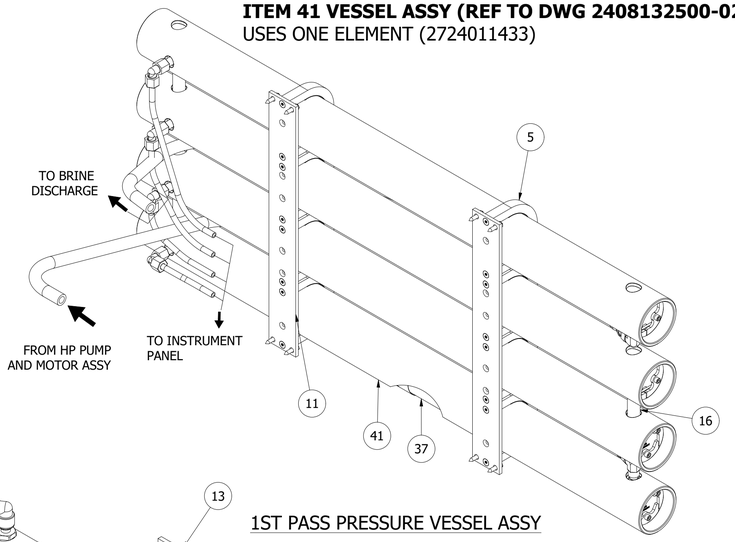


DOCK WATER CARBON FILTER ASSY

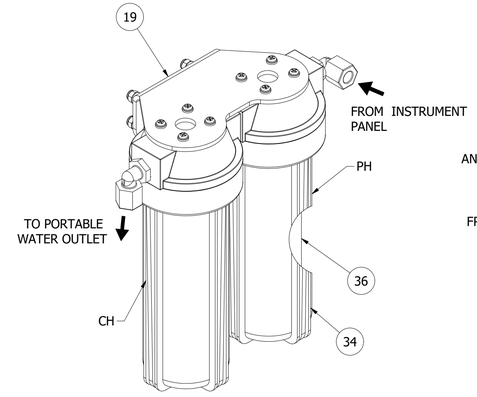


HP PUMP AND MOTOR ASSY

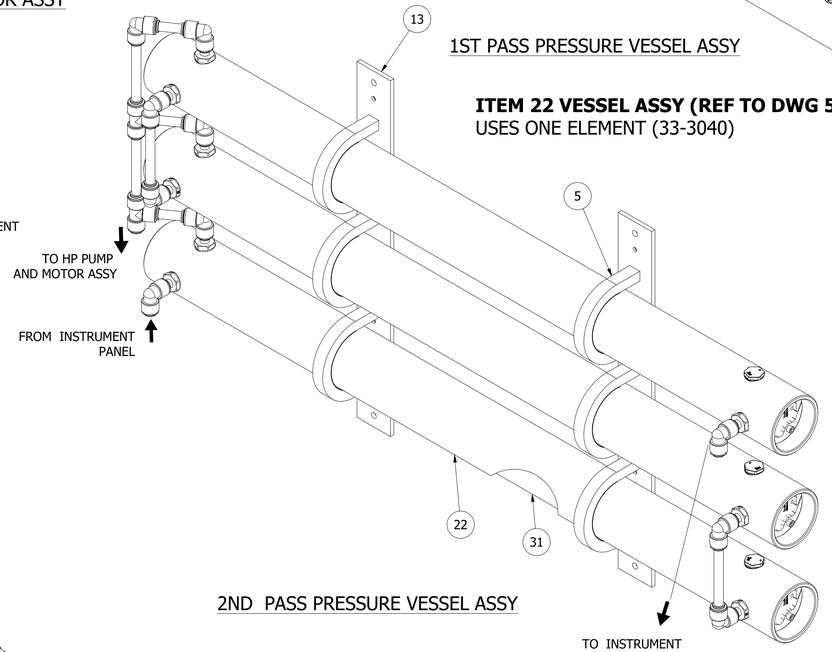
ITEM 41 VESSEL ASSY (REF TO DWG 2408132500-02)
USES ONE ELEMENT (2724011433)



1ST PASS PRESSURE VESSEL ASSY

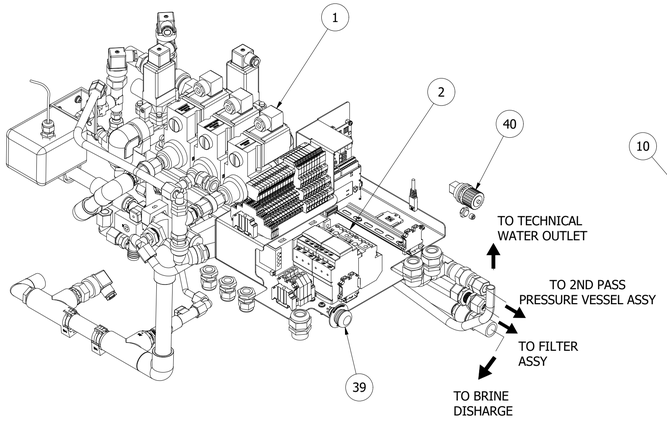


FILTER ASSY

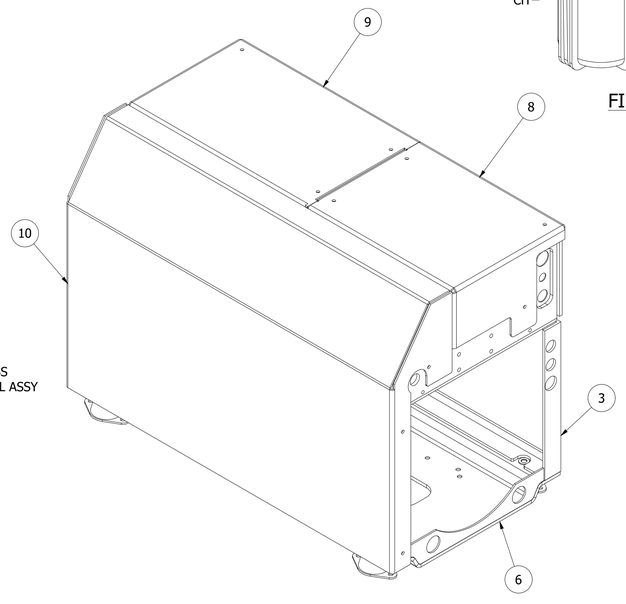


ITEM 22 VESSEL ASSY (REF TO DWG 50012017)
USES ONE ELEMENT (33-3040)

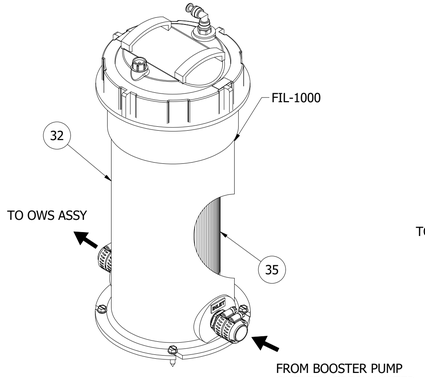
2ND PASS PRESSURE VESSEL ASSY



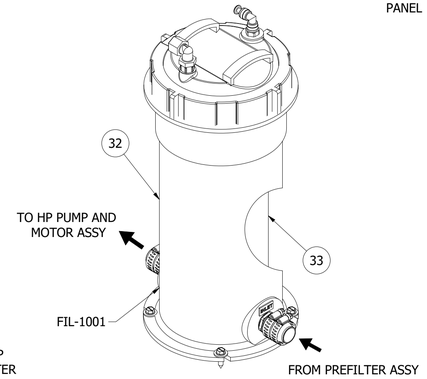
INSTRUMENT PANEL



FRAME ASSY



PREFILTER ASSY

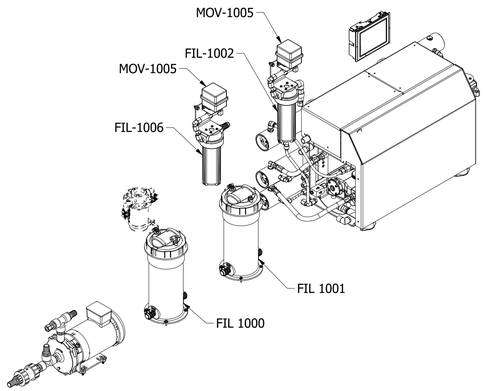


OWS ASSY

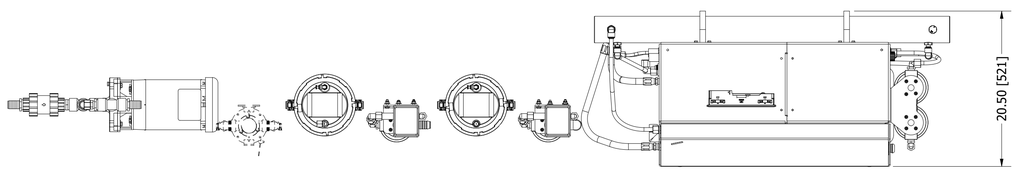
DWG NO A400C-0103

SIZE	DWG NO	REV
D	A400C-TM	-
SCALE NTS	3 OF 3	

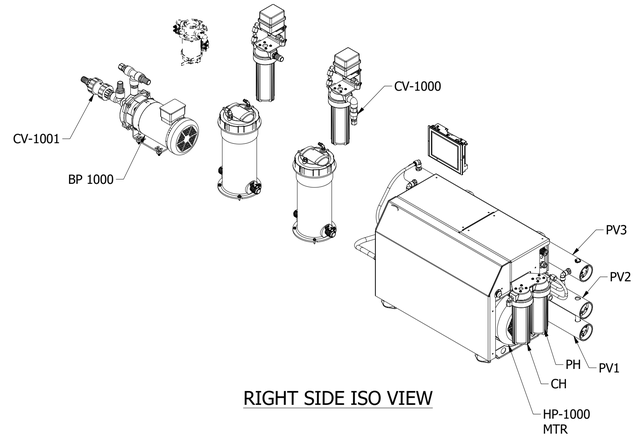
SH 3



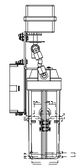
LEFT SIDE ISO VIEW

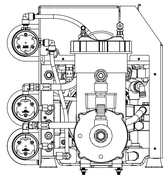


TOP VIEW

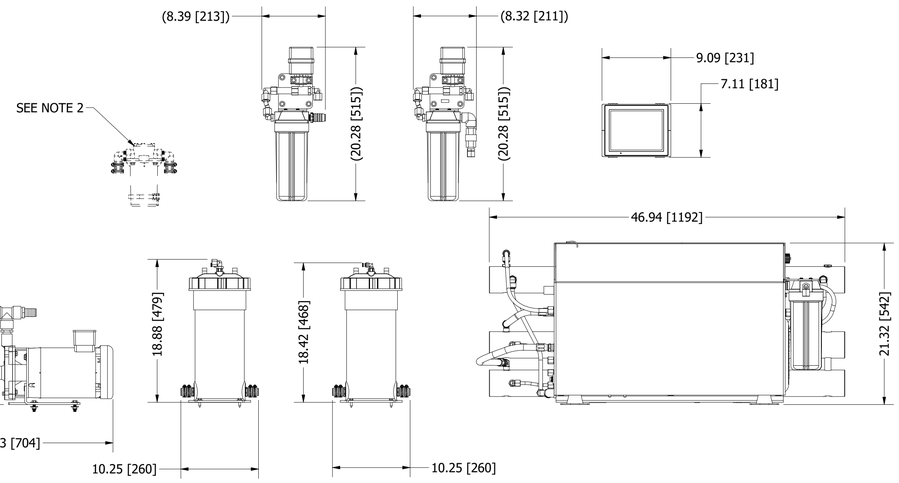


RIGHT SIDE ISO VIEW

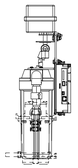


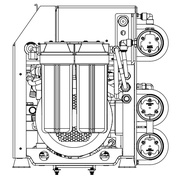


LEFT SIDE VIEW

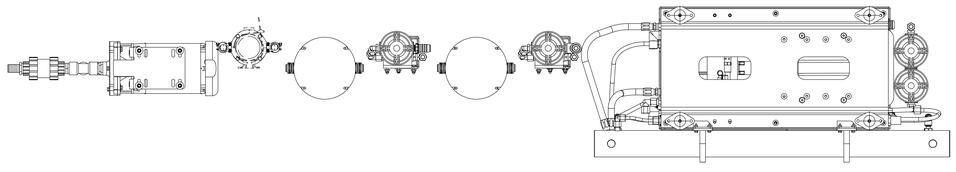


FRONT VIEW





RIGHT SIDE VIEW



BOTTOM VIEW

2. SEA STRAINER IS FOR REFERENCE ONLY AS IT IS PART OFTHE INSTALLATION KIT.
1. ENG MUST APPROVE ANY DEVIATIONS

NOTES: UNLESS OTHERWISE SPECIFIED

DIMENSIONAL TOLERANCES - UNLESS OTHERWISE SPECIFIED			
MACHINED			WELDMENT
FRACTION	±1/32"		± 1/16"
X	-	± 4mm	± 1/8"
.X	± .1"	± 2mm	± 1/16"
.XX	± .01"	± .25mm	± 1/32"
.XXX	± .005"	± .025mm	± 1/32"
ANGULAR ± 1'			

125 UNLESS OTHERWISE SPECIFIED

CUSTOMER -

PROJECT -

DRAWN - KR DATE - 4/6/2020

CHECKED - SY DATE - 4/6/2020

APPROVED - BB DATE - 4/6/2020

DRY WT: 447 lbs 203 kg

WET WT: 512 lbs (232 kg)

CONTRACT NO

Parker Sea Recovery
Parker Hannifin Corporation
Filtration Group / Water Purification
2630 E. El Presidio Street
Carson, CA 90810
Contact
Office: 310-608-5600
Fax: 310-608-5692
www.parker.com

AQUA DUAL COMPACT AMDP,1800GPD SW/1400GPD TW,236

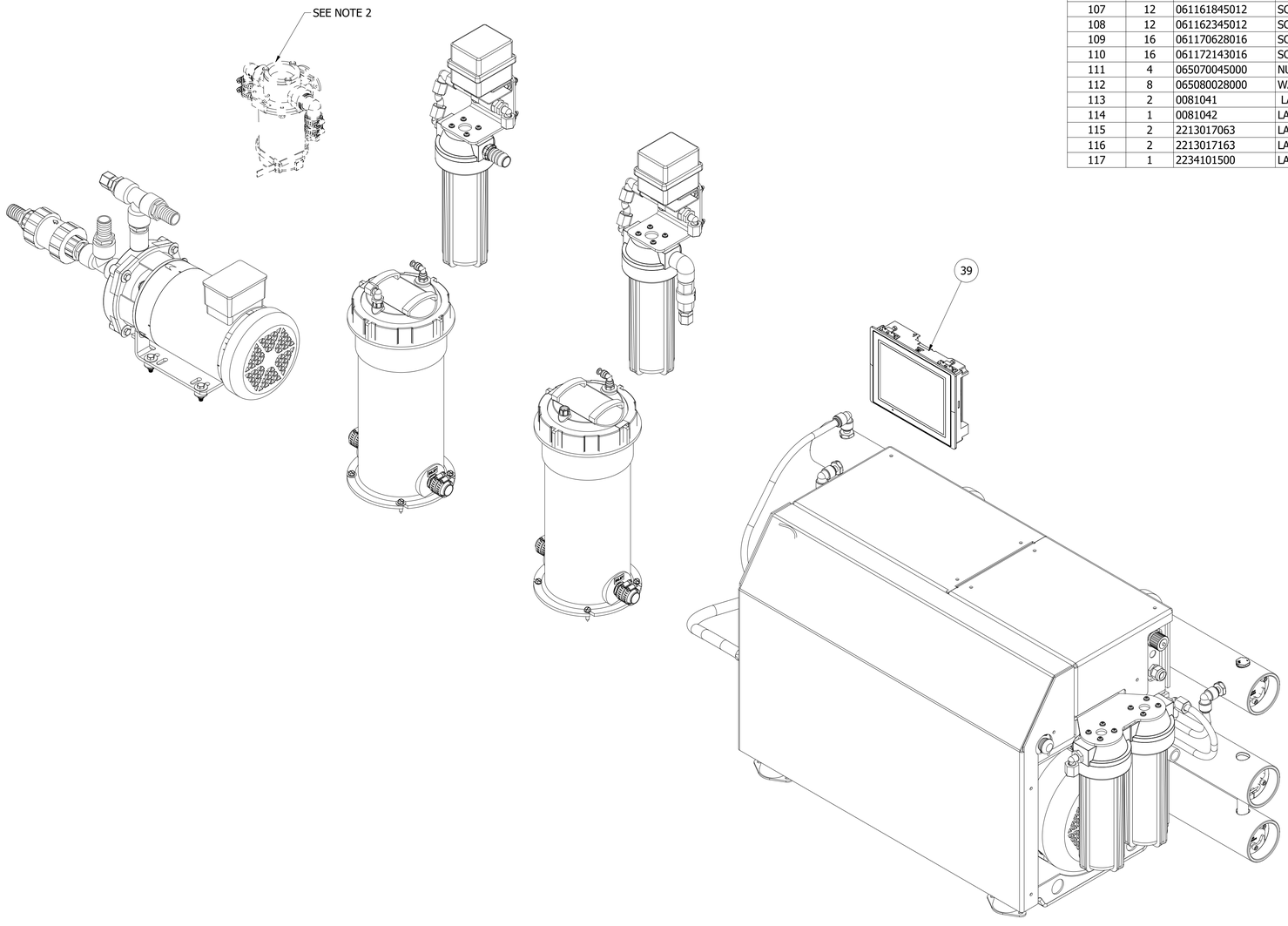
SIZE D | DWG NO A400C-0101 | REV -

SCALE NTS | 1 OF 6

DWG NO A400C-0101

SH 1

REV A



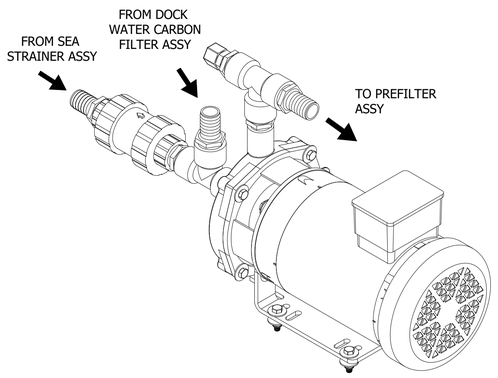
PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
86	6	2132021600	RUBBER MOUNT GROMMET 1 1-4 OD_1.50
87	8	2614017900	O-RING 115 INTERCONNECT AW
88	2	2614018969	O-RING 034 COMMERICAL PREFILTER SEAL
89	2	3901040100	ADAPTER SPACER RING, COMMERCIAL FILTERS
90	10	061060045000	NUT HEX .25-20 W-INSERT SS
91	8	061060050000	NUT HEX .31-18 W-INSERT SS
92	20	061080028000	WASHER FLAT #10 SS
93	8	061080049000	WASHER,FLAT,5-16 IN,SS
94	12	061080056000	WASHER,FLAT,3/8",SS
95	4	061080066000	WASHER,FLAT,1/2",SS
96	28	061100043000	WASHER FLAT OS .25 SS
97	8	061100049000	WASHER,FLAT,OS,5/16",SS
98	2	061100056000	WASHER,FLAT,OS,3/8",SS
99	4	061120066000	WASHER,LOCK,1/2",SS
100	14	061142145016	SCREW,HEX HEAD,.25-20x1",SS
101	4	061142150012	SCREW,HEX HEAD,.31-18x0.75,SS
102	4	061142150020	BOLT HEX .31-18 X 1.25 SS
103	2	061142157016	SCREW,HEX HEAD,3/8-16x1",SS
104	2	061142157020	SCREW,HEX HEAD,3/8-16x1-1/4",SS
105	4	061142167024	SCREW,HEX HEAD,1/2-13x1 1/2",SS
106	4	061161802800	SC ALLEN FLT .313-18X1.75
107	12	061161845012	SC ALLEN FLAT .25-20 X .75 SS
108	12	061162345012	SC SOC CAP .25-20 X .75 SS
109	16	061170628016	SC PHIL PAN A #10 X 1 SS
110	16	061172143016	SCREX,HEX A,.25x1.00,SS
111	4	065070045000	NUT HEX .25-20 FLANGED
112	8	065080028000	WASHER FLAT #10 NYLON
113	2	0081041	LABEL SRC COMM PREFILTER
114	1	0081042	LABEL,OIL WATER, SEPARATOR
115	2	2213017063	LABEL INLET (WHITE BACKGROUND)
116	2	2213017163	LABEL OUTLET (WHITE BACKGROUND)
117	1	2234101500	LABEL FRESH WATER FLUSH

PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	0821009	VALVE-PLUMB,CONTRL,ASSY,AQUA,DUAL
2	1	0901104-B	AGUA DULCE,380-480VAC,3PH
3	1	11012101	FRAME,ASSY,AL, AQUA DUAL
4	6	05202401GR	BRACKET,MVA U-CLAMP,3 IN
5	1	11012100	BASE, PUMP,AL, AQUA DUAL
6	1	11012102	BRACKET, PUMP, AL,AQUA PRO
7	1	11012106	COVER,ELECT,ENCL,AQUA DUAL
8	1	11012107	COVER,PLUMB,ENCL,AQUA DUAL
9	1	11012108	COVER, SOUND, FRONT,AQUA DUAL
10	2	11012171	BRACKET, MEMBRANE, AL,AQMDP
11	2	0117410800	HP NIPPLE 0.25 MPT
12	4	0520210600	RETAINER PORT MVA
13	2	2020040006	BRACKET,FWF,FILTER,CARBON - PR
14	1	2417430800	INTERCONNECT MVA SS
15	2	2453502402	PLUG END, SRC DUAL 3X3.35 IN
16	2	2453502403	PLUG END, SNGL, 3X3.35 IN
17	1	20200402101	DUAL BRACKET PREFILTER-CHRCL-PLNKTN
18	4	20201030000	SEGMENT RING (SET)
19	1	50012017	KIT,VESSEL ASSY,3040,FRP,600PS
20	1	20-0683	BELL HOUSING,3.5 GPM PLGR PUMP
21	1	70-6178C1	PUMP,708-5, 5 PLGR, 8GPM
22	1	72012009	COUPLING, JAW, ML-099 X 1-3/8"
23	1	72012011	INSERT, SPIDER, URETHANE, ML-099
24	1	72012014	COUPLING,JAW,ML-099 X 0.9375IN
25	1	1217514772	BOOSTER PUMP HEAD HP75 SS
26	1	1544182210	MOTOR,2HP,460-60-3,1.5HP,380-50-3
27	1	1569263200	MTR 7.5-5HP,230-460,190-380,3PH,60-50HZ
28	1	33-3040	ELEMENT,BW-3040
29	2	07620310WA	FILTER HOUSING 32.5 SQFT
30	1	08020723KD	ELEMENT OWSE 32.5 SQFT
31	4	0713020873	FILTER HOUSING .50 X 10
32	1	0801063357	ELEMENT CPFE 5 MIC 32.5 SQFT
33	4	0803004773	ELEMENT,CHARCOAL,2.5 x10.0
34	2	2724011433	MEMBRANE 900GPD AW W SEAL 3
35	1	90012047	PUSHBUTTON,ESTOP,16mm, MUSH, HEAD
36	1	313110009DK	CONN MOD JACK PLUG RJ45
37	2	2408132500-02	VESSEL HIGH PRESSURE 900GPD
38	6	2615180100	FELT ADHESIVE 0.125 X 0.75 STRIP
39	1	3131701447-V1.03	TOUCHSCREEN,8.4IN,COLOR,MULTI
40	1	14012117Ar	VALVE CHECK .50 FPT WITH VITO
41	2	1401105698	KZ VALVE FWF 0.50
42	1	1401271942	VALVE,CHECK,TU,PVC,1.00
43	3	30-0056	BUSHING, NYL, 1"M X 3/4"F THD
44	1	30-0059	NIPPLE, NYL, 1" NPT X CLOSE W HEX
45	1	30-0441	ELBOW, NYL, 3/4" MNPT X 3/4" HOSE BARB
46	3	30-0615	ADPTR, NYL, 1" MNPT X 1" HOSE BARB
47	2	30-0673	TEE, NYL, 1" FNPT
48	1	70-3052	PLUG, MS18229-08
49	2	01013725CL	NIPPLE 0.50 NPT x CL
50	2	01123737DG	NIP 0.75 NPT X 0.75 NPT NYLON
51	1	21012091	FITTING,HOSE,3-4-16 37DEG
52	3	23012002	ELB90,TRUE SEAL,ACETAL,SWIVEL,0.50MTx0.50TUBE
53	1	0101012583	ELB90 0.50 FPT x FPT
54	1	0101342583	PLUG 0.50 MT
55	2	0101370815	NIPPLE 0.25 NPT x 1.50
56	2	0101372530	NIPPLE 0.50 NPT x 3.00
57	1	0101652783	ADAPTER 0.50 MPT x 1.00 BARB
58	4	0101653883	ADAPTER 0.75 MPT x 1.00 BARB
59	1	0117343769	PLUG 0.75 MT SS316L
60	2	0204011769	ELBOW,PP,3/8 ODx1/4 FT
61	2	0204012569	ELBOW,PP,1/2 ODx1/2 FT
62	1	0204020869	ELBOW,PP,1/4 ODx1/4 MT
63	6	0204022569	ELBOW,PP,1/2 ODx1/2 MT
64	1	0204092569	FITTING,PP,1/2 ODx1/2 MT
65	1	0204092669	FITTING,PP,1-2 ODx3-4 MT
66	2	1317012469	ELB90 -8 FLARE x 0.25 MT SS
67	4	1317482369	FITTING,HOSE,-8 SWIVEL,SS
68	3	1904010243	STRAIN RELIEF 3222 .75 BLK
69	5	1904011800	STRAIN RELIEF 3 HOLE X 6MM
70	8	2614010100	O-RING 116 PRODUCT AS-AW
71	8	2614014900	O-RING 230 BRINE 3.0 END PLUG
72	1	11012211	BRACKET,MOUNT,BP MTR,AL
73	1	30012030	HOSE,HP,-8,.50,3000-PSI,BLK,9.00L
74	1	30012030	HOSE,HP,-8,.50,3000-PSI,BLK,21.00L
75	1	0312123569	TUBING,PARAFLEX,BLACK,0.38 x 6.00L
76	1	0312123569	TUBING,PARAFLEX,BLACK,0.38 x 6.50L
77	2	0312124269	TUBING,PARAFLEX,BLACK,0.50 x 10.00L
78	1	0312124269	TUBING,PARAFLEX,BLACK,0.50 x 13.00L
79	1	0312124269	TUBING,PARAFLEX,BLACK,0.50 x 15.5.00L
80	1	0312124269	TUBING,PARAFLEX,BLACK,0.50 x 20.00L
81	1	0312124269	TUBE,IP,PV,IP,0.50 x 10.00,A400C-0101
82	4	20-2449	ISOLATION MOUNT,.38-16UNC THD NEOPRENE,50 DURO
83	8	05181435AA	CLAMP,HOSE,SS,1"
84	2	0204020100	ELB90 1/4 MPT X 1/4 TU JG PLASTIC
85	2	0204990300	PLUG .25 JQ

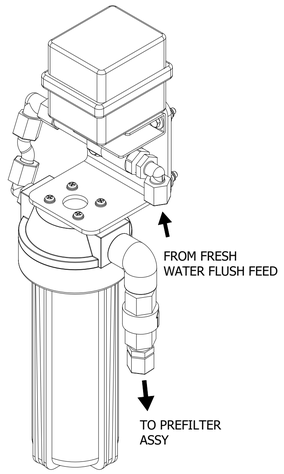
DWG NO A400C-0101

SH 2

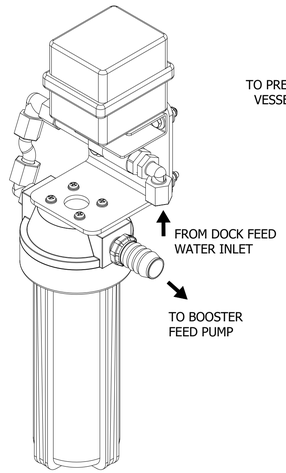
SIZE	DWG NO	REV
D	A400C-0101	-
SCALE NTS	2 OF 6	



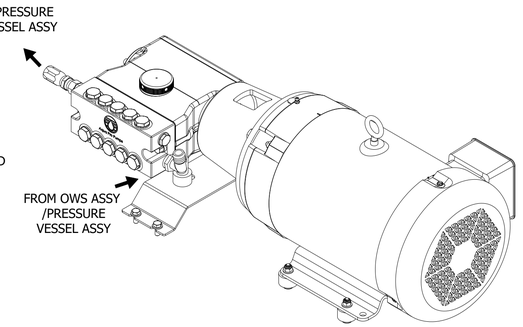
BOOSTER PUMP ASSY



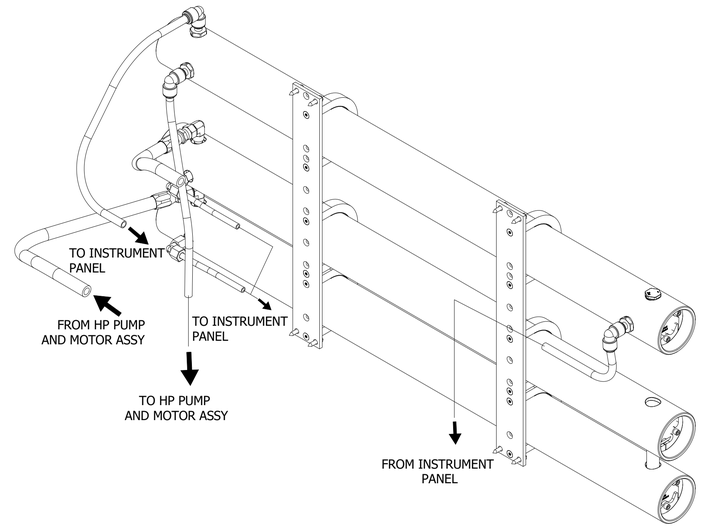
FRESH WATER FILTER ASSY



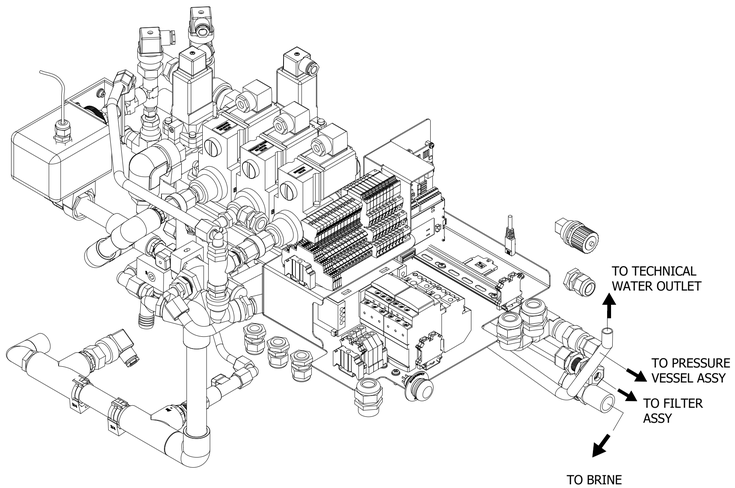
DOCK WATER CARBON FILTER ASSY



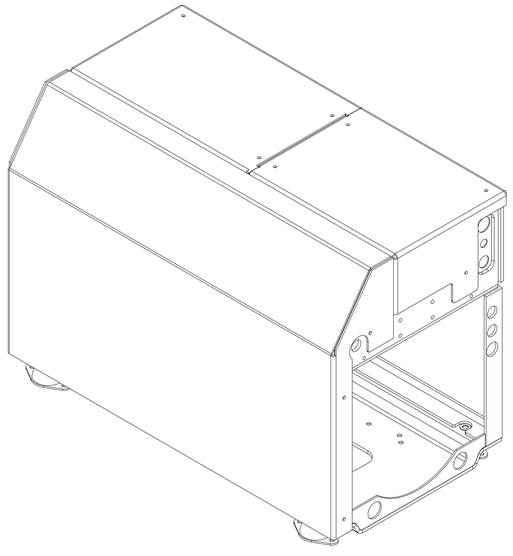
HP PUMP AND MOTOR ASSY



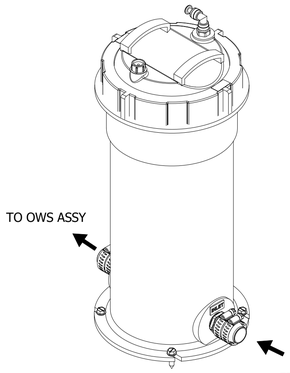
PRESSURE VESSEL ASSY



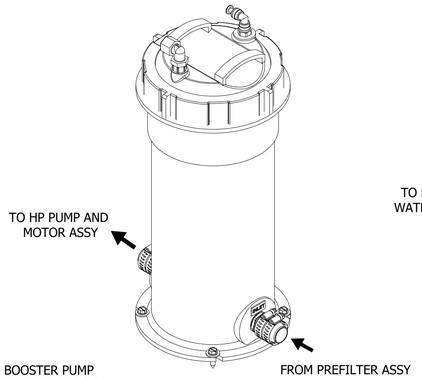
INSTRUMENT PANEL



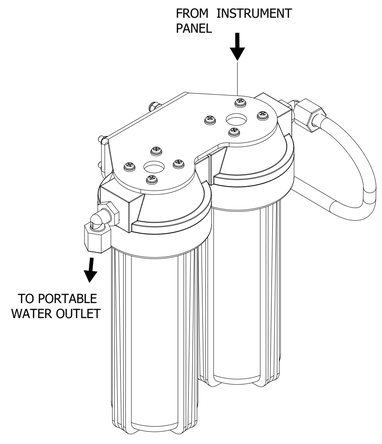
FRAME ASSY



PREFILTER ASSY



OWS ASSY

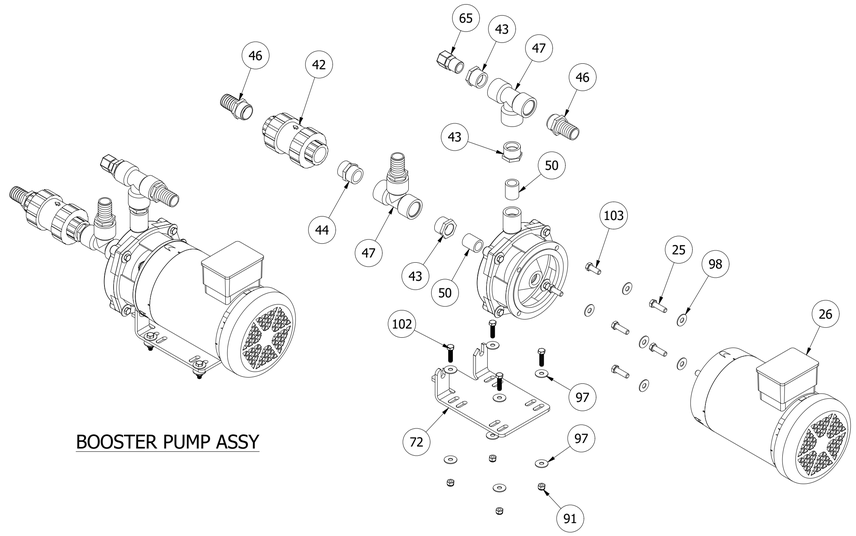


FILTER ASSY

SIZE	DWG NO	REV
D	A400C-0101	-
SCALE NTS	3 OF 6	

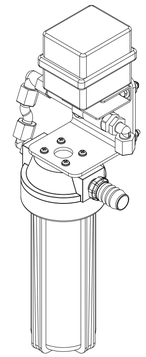
DWG NO A400C-0101

SH 3

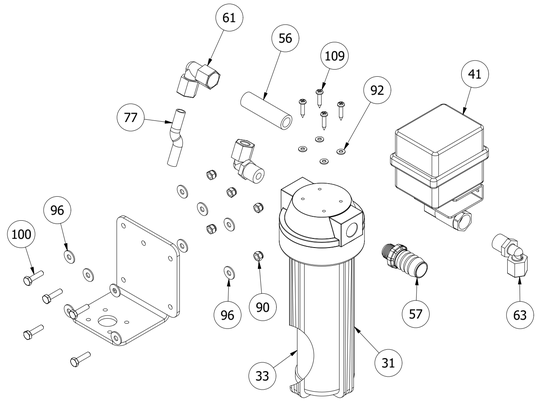


BOOSTER PUMP ASSY

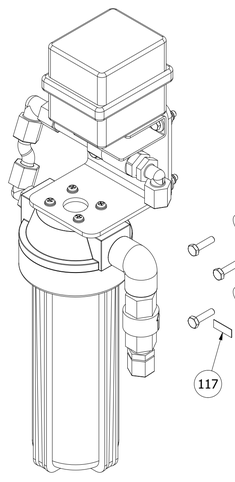
BOOSTER PUMP ASSY - EXPLODED



DOCK WATER CARBON FILTER ASSY

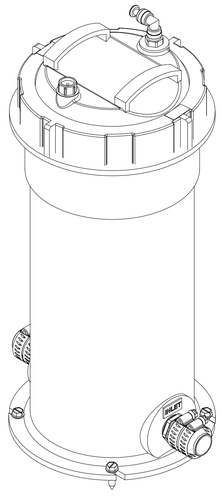


DOCK WATER CARBON FILTER ASSY - EXPLODED

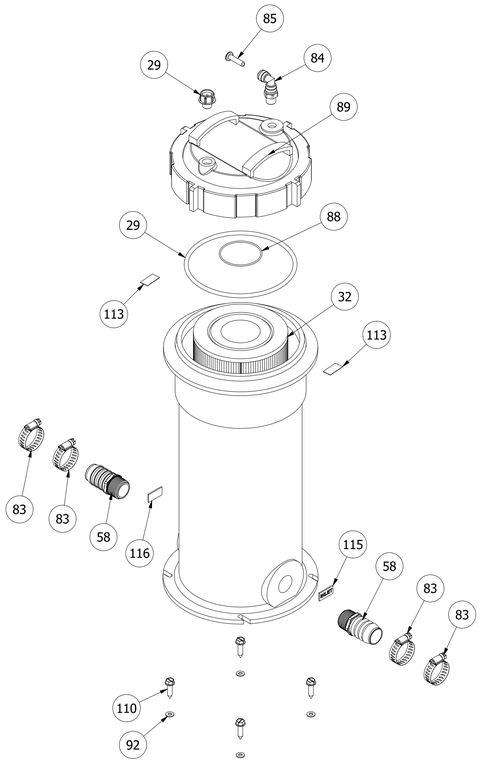


FRESH WATER FILTER ASSY

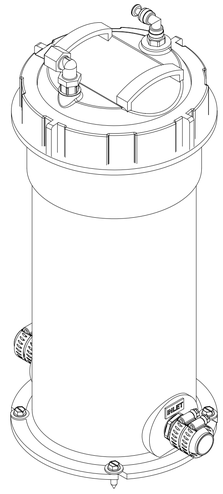
FRESH WATER FILTER ASSY - EXPLODED



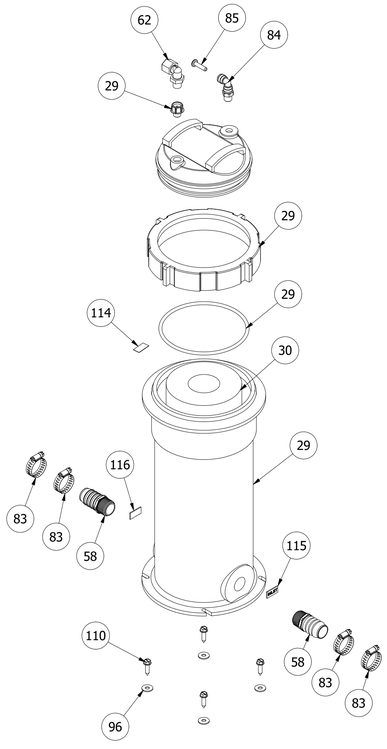
PREFILTER ASSY



PREFILTER ASSY - EXPLODED



OWS ASSY

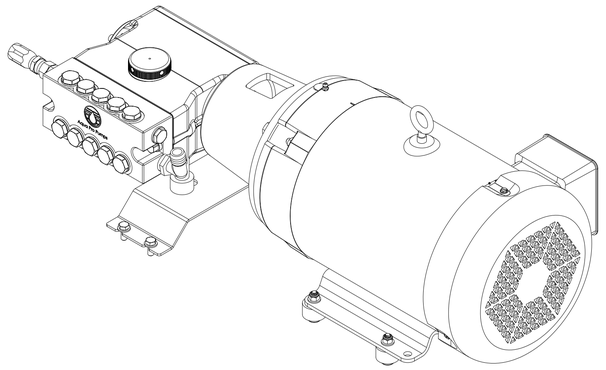


OWS ASSY - EXPLODED

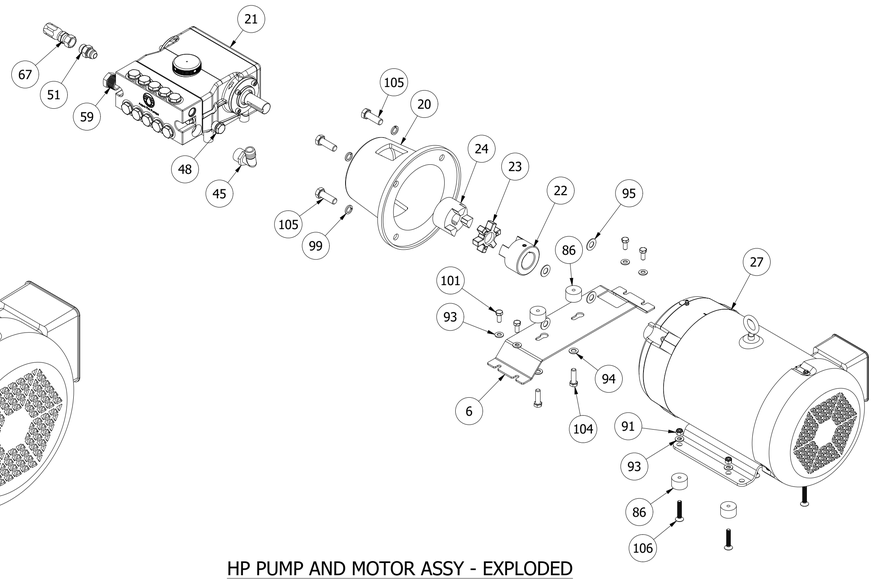
SIZE	DWG NO	REV
D	A400C-0101	-
SCALE NTS	4 OF 6	

DWG NO A400C-0101

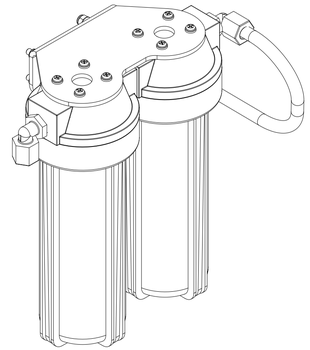
SH 4



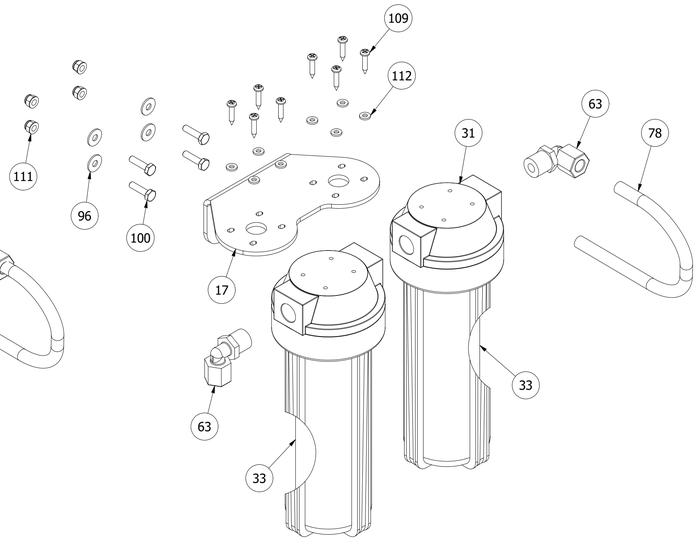
HP PUMP AND MOTOR ASSY



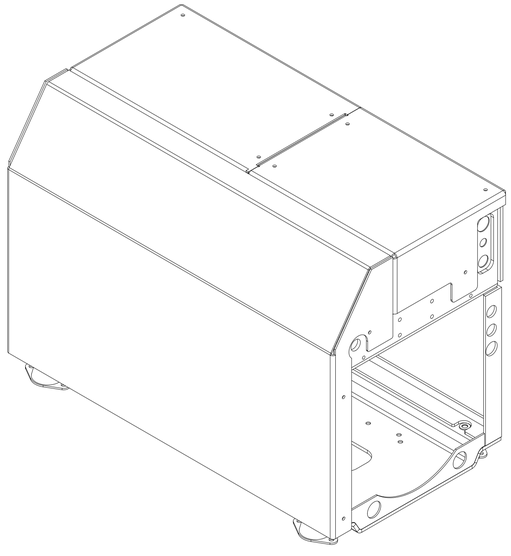
HP PUMP AND MOTOR ASSY - EXPLODED



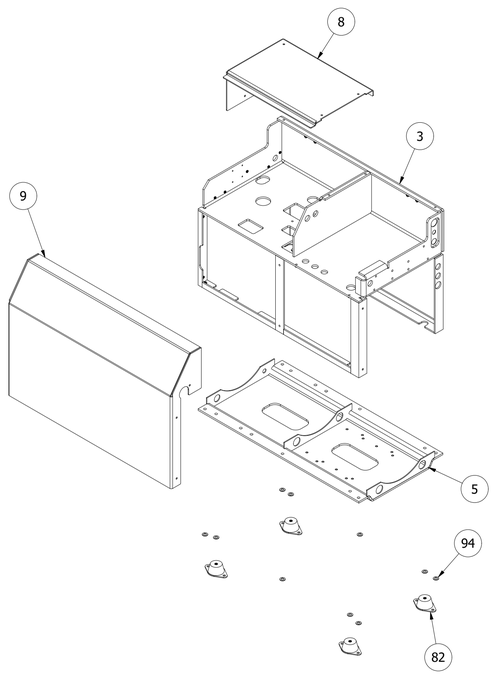
FILTERS ASSY



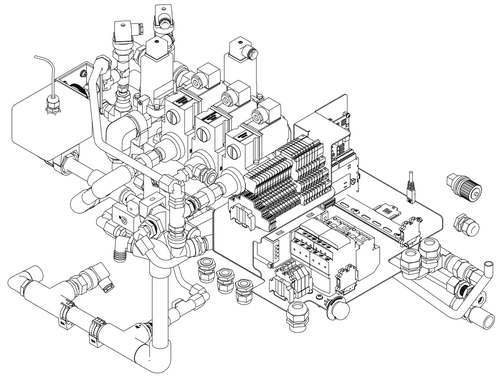
FILTERS ASSY - EXPLODED



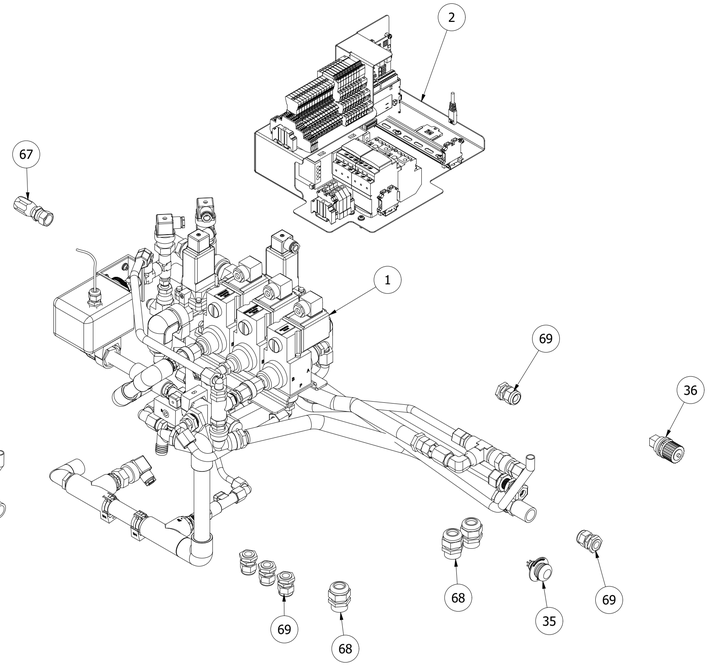
FRAME ASSY



FRAME ASSY - EXPLODED



INTRUMENT PANEL

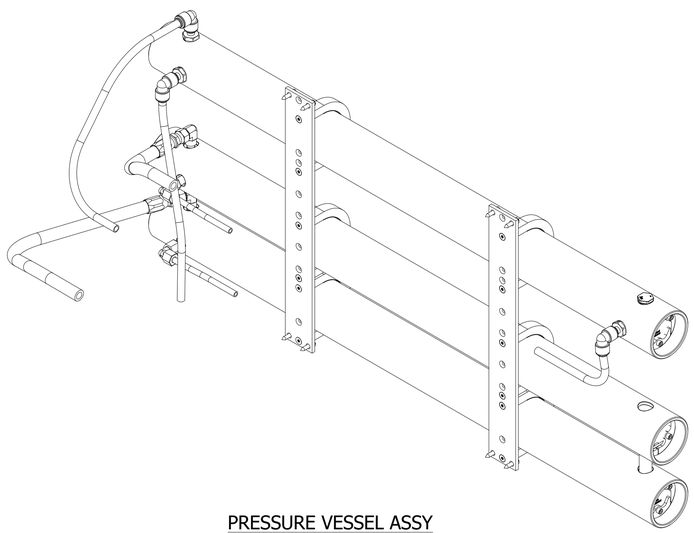


INTRUMENT PANEL - EXPLODED

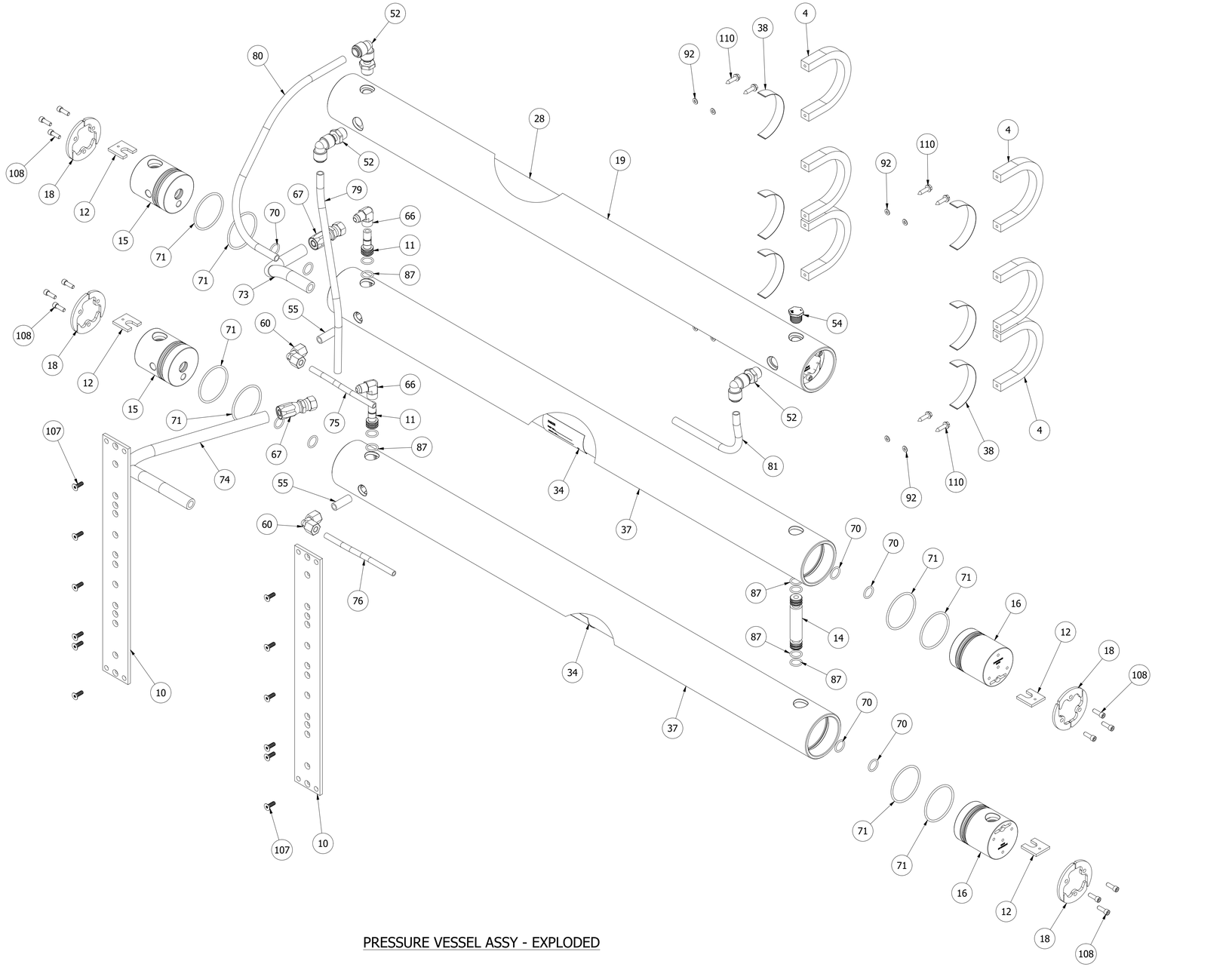
SIZE	DWG NO	REV
D	A400C-0101	-
SCALE NTS		5 OF 6

DWG NO A400C-0101

SH 5



PRESSURE VESSEL ASSY



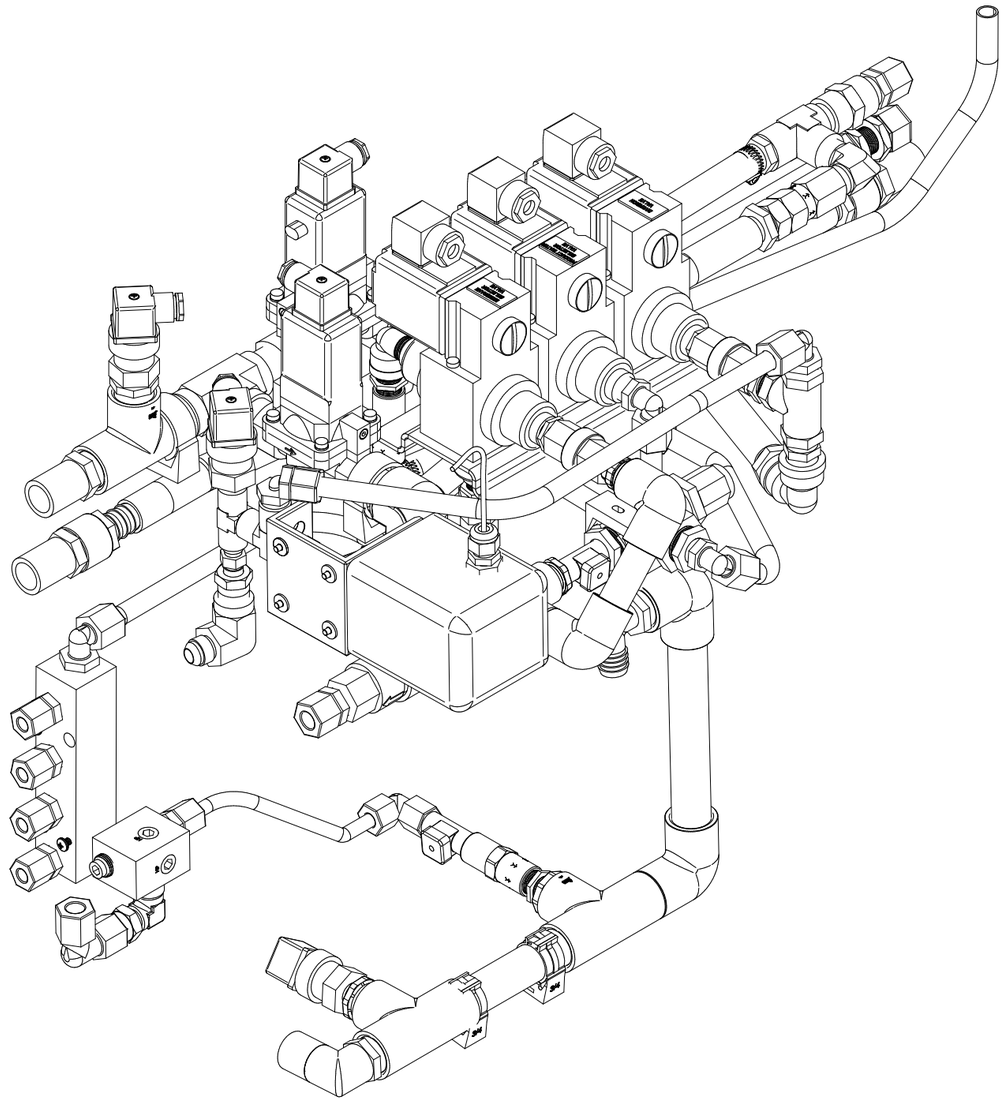
PRESSURE VESSEL ASSY - EXPLODED

SIZE	DWG NO	REV
D	A400C-0101	-
SCALE NTS	6 OF 6	

DWG NO A400C-0101

SH 6

REVISION HISTORY				
DATE	DESCRIPTION	DESIGNER	CHECKED	APPROVED
05/18/2022	UPDTAED MEMBRANE SELECTOR VALVE PLUMBING TO PRT NUMS: 0112071900, 328065066, 30-0453, 30-0333	OM	SY	BB



0821009 VALVE-PLUMB,CONTRL,ASSY,AQUA,DUAL

PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
54	1	0117230869	ELB90 ST 0.25 MPT x 0.25 FPT SS
55	2	0117233769	ELB90 ST 0.75 MPT X 0.75 FPT SS316
56	2	0117292387	RB 0.50 MT x 0.25 FT SS
57	2	0117340800	PLUG SOC ,0.25 MT SS316L
58	1	0117380869	NIPPLE 0.25 NPT X 1.50 SS316L
59	1	0117423769	TEE .75 FT X .75 FT X .75 FT SS
60	1	0117492569	TEE ST .50 FT X .50 MT X .50 FT SS
61	1	0117520869	TEE,BRANCH,.25 FT x .25 MT x .25 FT SS
62	1	0204011869	ELBOW,PP,3/8 ODx3/8 FT
63	1	0204012569	ELBOW,PP,1/2 ODx1/2 FT
64	1	0204021769	ELB90 1/4MPTX3/8TU PLASTIC
65	6	0204022469	ELBOW,PP,1/2 ODx3/8 MT
66	3	0204022569	ELBOW,PP,1/2 ODx1/2 MT
67	1	0204091769	CONN 1/4MPTX3/8TU PLASTIC
68	4	0204091869	FITTING,PP,3/8 ODx3/8 MT
69	2	0204092569	FITTING,PP,1/2 ODx1/2 MT
70	1	0204272569	UNION BULKHD 0.50 TU PLASTIC
71	5 FT	0312124269	TUBE 1/2 BLK
72	1.5 FT	0328065066	HOSE PVC BRAID GRAY (TECH WATER TO MANIFOLD) 0.50 x 17.00L
73	2	30-0333	CLAMP,HOSE,SS,3/8"
74	6	30-0578	NIPPLE,NYL, 3-8 NPT x CLOSE W HEX
75	9	21010110MC	BUSHING,RUBBER,STD,BLUE,0.189IDx0.500ODx0.175TH
76	5	0501164200	PIPE SUPPORT 1.125
77	2	0501164900	SUPPORT,PIPE,0.75
78	13	061080028000	WASHER FLAT #10 SS
79	2	061160630012	SC PHIL PAN 10-24 X .75 SS
80	5	061160631008	SC PHIL PAN #10-32 x .50 SS
81	4	061160631012	SC PHIL PAN #10-32 x 0.75 SS
82	4	061162826010	SC,SHLDR,PHIL,#8-32,0.188Dx0.375L,SS
83	2	061222345006	SC ALLEN .25-20 x .375LG
84	.5 FT	0301094100	PIPE PVC SCH 80 .375 IN x 2.5
85	2 FT	0301096600	PIPE 3/4 PVC80
86	1 FT	0301098800	PIPE 1/2 PVC80

PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	3 FT	30-0262	HOSE,.75,PVC WITH BRAID,GRAY
2	1	11012103	BRACKET,VALVES,AL AQUA DUAL
3	1	14012008	MANIFOLD, AQMXL PROD, PVC, PRESS, LOW,1.5X1.5X6.25
4	1	2020043900	BRACKET,MTG,BPR -AQM
5	1	3421020100	COUPLER BACK PRESSURE REG-AQM
6	1	20-4096	PROBE, CONDUCTIVITY, 5-WIRE, 5 LONG CABLE
7	1	11026820AO	FLOW METER IN-LINE 0.26-4.0GPM
8	1	11026920AO	FLOWMETER IN-LINE .53-7.9GPM
9	1	27012007	VALVE,NEEDLE,ANGL,.25FNPT,316
10	3	2317100601	TRANSDUCER,PRESSURE,LOW,0-300 PSI
11	1	2317102001	TRANSDUCER,PRESSURE,HIGH,0-2000 PSI
12	2	3131680298	PLUG CONNECTOR DIN 3-PIN
13	1	B079400004	BRP GEAR ASSY
14	1	60-0226	VALVE,CHECK,0.50 FNPT,316SS
15	1	60-4547	VALVE,REGULATOR,COMPACT
16	1	14012117Ar	VALVE CHECK .50 FPT WITH VITO
17	1	75012111	VALVE,SOL,DIAGHRAM,2-WAY,0.75 NPT,SS
18	1	75012111A	VALVE,SOL,DIAGHRAM,2-WAY,0.75 NPT,SS
19	2	75012112	VALVE,CHECK,0.375 FNPT,316SS
20	2	76012080	VALVE,CHECK,3/8FPT W/VITO PVC
21	3	1413091200-04	SOLENOID VALVE, 3-WAY, 3/8"
22	1	30-0061	TEE, NYL, 3/4" FNPT
23	1	30-0062	NIPPLE, NYL, 1/2" NPT X CLOSE
24	1	30-0092	COUPLING,.50 FNPT,316SS
25	1	30-0277	ELBOW, NYL, 3/4"MNPT X 1" HB
26	3	30-0441	ELBOW, NYL, 3/4" MNPT X 3/4" HOSE BARB
27	1	30-0453	ADAPTER, 1/2" MNPT X 1/2" HOSE BARB
28	3	30-0506	ADPTR, NYL, 3/4" MNPT X 1" HOSE BARB
29	2	30-0674	TEE, NYL, 1/2" FNPT
30	2	30-0689	ADAPTER 0.75 FPT x BARB
31	2	30-1544	BUSHING, NYL, 3-4M X 3-8F
32	1	01120125DG	ELB90 1-2FPTX1-2FPT NYL
33	1	01122923DG	RB 0.50 MPT x 0.25 FT NYL
34	1	01122934DG	RB .75 MPT X .25 FNPT NYLON
35	1	01124237DG	TEE 0.75 FPT X FPT X FPT NYLON
36	2	01126526DG	ADAP 0.50 MPT x 0.75 BARB NYLON
37	3	01173737CL	NIPPLE 0.75 NPT x CL SS
38	1	26012023	NIPPLE,0.25 MNPT x CL,S40,SS316
39	1	26012094	ELB90 -8 FLARE x 0.50 FT SS
40	1	28012047	ELB90,STREET,NYLON,3-8 FNPT x 3-8 MNPT
41	2	28012127	RB,NYL,0.50 MPT x 0.38 FPT
42	2	0101052583	ELB90 0.50 SL x SL
43	2	0101053783	ELB90 0.75 SL x SL
44	1	0101312483	RB 0.50 SL x 0.38 FPT
45	1	0101313583	RB 0.75 SL x 0.38 FT
46	1	0101322483	RB 0.50 SL x 0.38 SL
47	1	0101323483	RB 0.75 SL x 0.25 FT
48	1	0101372540	NIPPLE 0.50 NPT x 4.00
49	1	0101423783	TEE 0.75 FT x FT x FT
50	1	0101462583	TEE 0.50 FT x FT x FT
51	1	0101463783	TEE 0.75 SL x SL x SL
52	1	0112071900	ELB90 .375 MPT x .50 BARB NYLON
53	1	0117022569	ELB90 0.50 MPT x 0.50 MPT SS316

1. ENG MUST APPROVE ANY DEVIATIONS
NOTES: UNLESS OTHERWISE SPECIFIED

DIMENSIONAL TOLERANCES - UNLESS OTHERWISE SPECIFIED			
MACHINED			WELDMENT
FRACTION	±1/32"		± 1/16"
X	-	± 4mm	± 1/8"
.X	± .1"	± 2mm	± 1/16"
.XX	± .01"	± .25mm	± 1/32"
.XXX	± .005"	± .025mm	-
ANGULAR ± 1'			
125 UNLESS OTHERWISE SPECIFIED			

CUSTOMER -

PROJECT -

DRAWN - RD DATE - 06/20/2017

CHECKED - JB DATE - 06/20/2017

APPROVED - SY DATE - 06/20/2017

DRY WT: 34.627 lbmass

WET WT:

CONTRACT NO

Parker Sea Recovery
Parker Hannifin Corporation
Filtration Group / Water Purification
2630 E. El Presidio Street
Carson, CA 90810
Contact
Office: 310-608-5600
Fax: 310-608-5692
www.parker.com

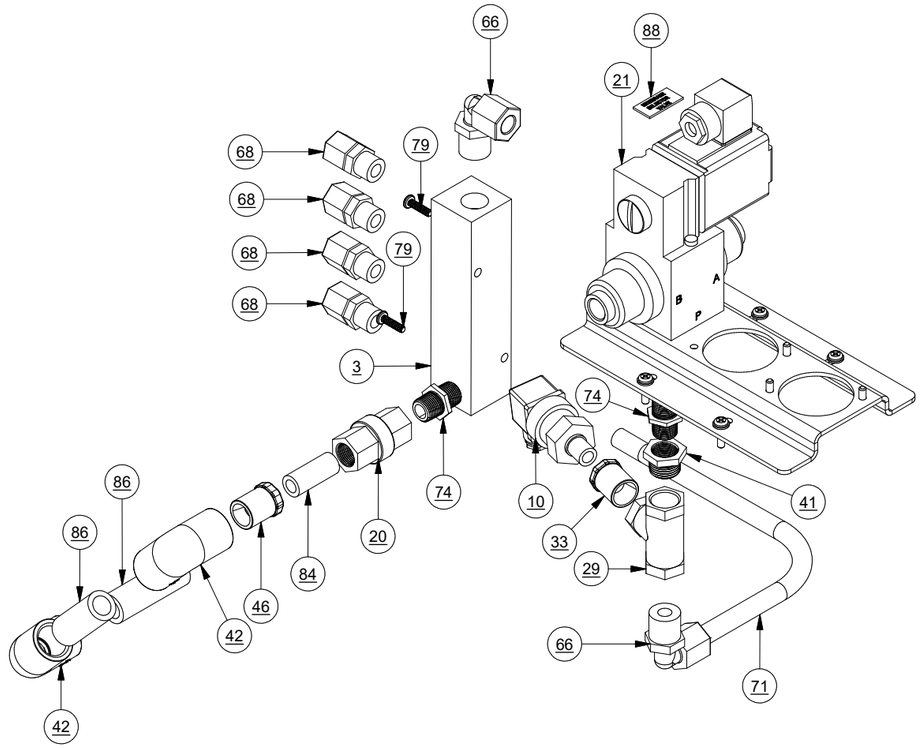
VALVE-PLUMB,CONTRL,ASSY,AQUA,DUAL

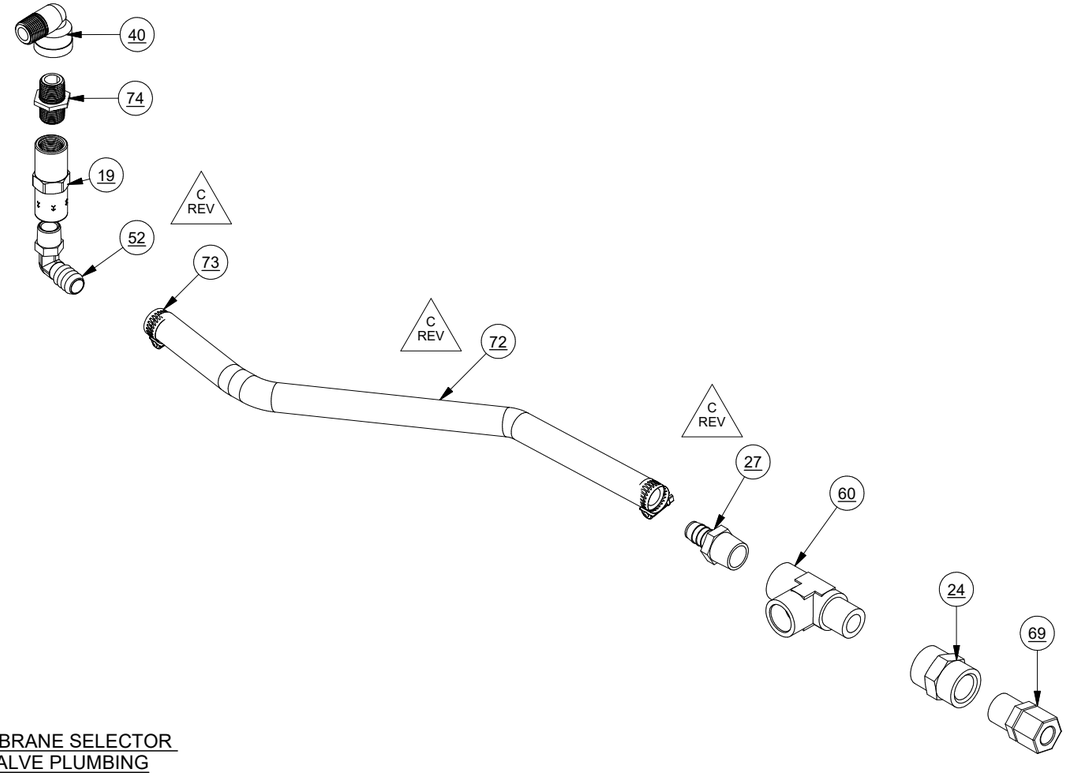
SIZE D | DWG NO 0821009 | REV C

SCALE | 1 OF 6

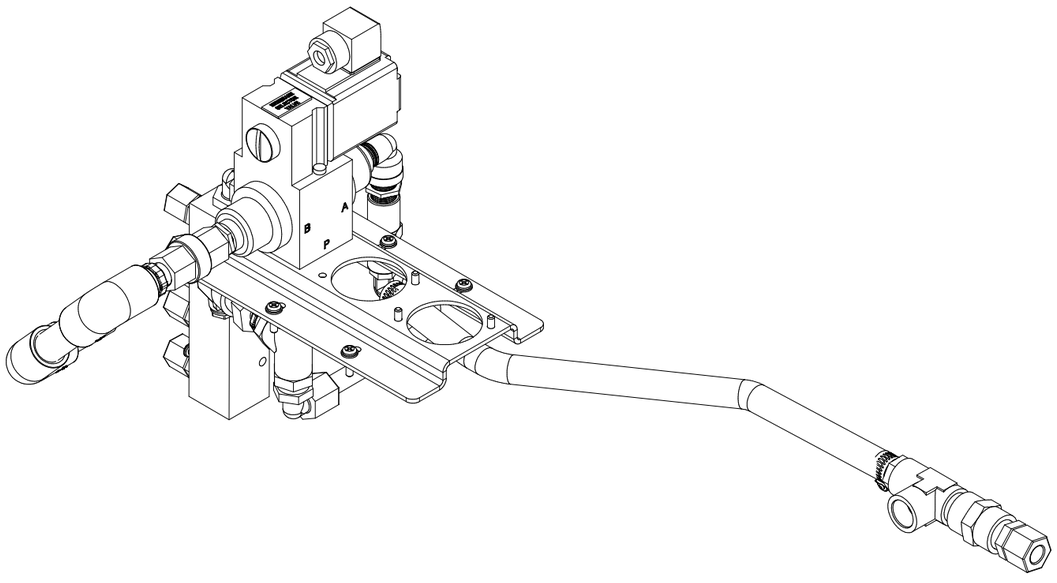
DWG NO 0821009

SH 1





MEMBRANE SELECTOR
VALVE PLUMBING
SV-1004 WITH PT-1007
EXPLODED VIEW

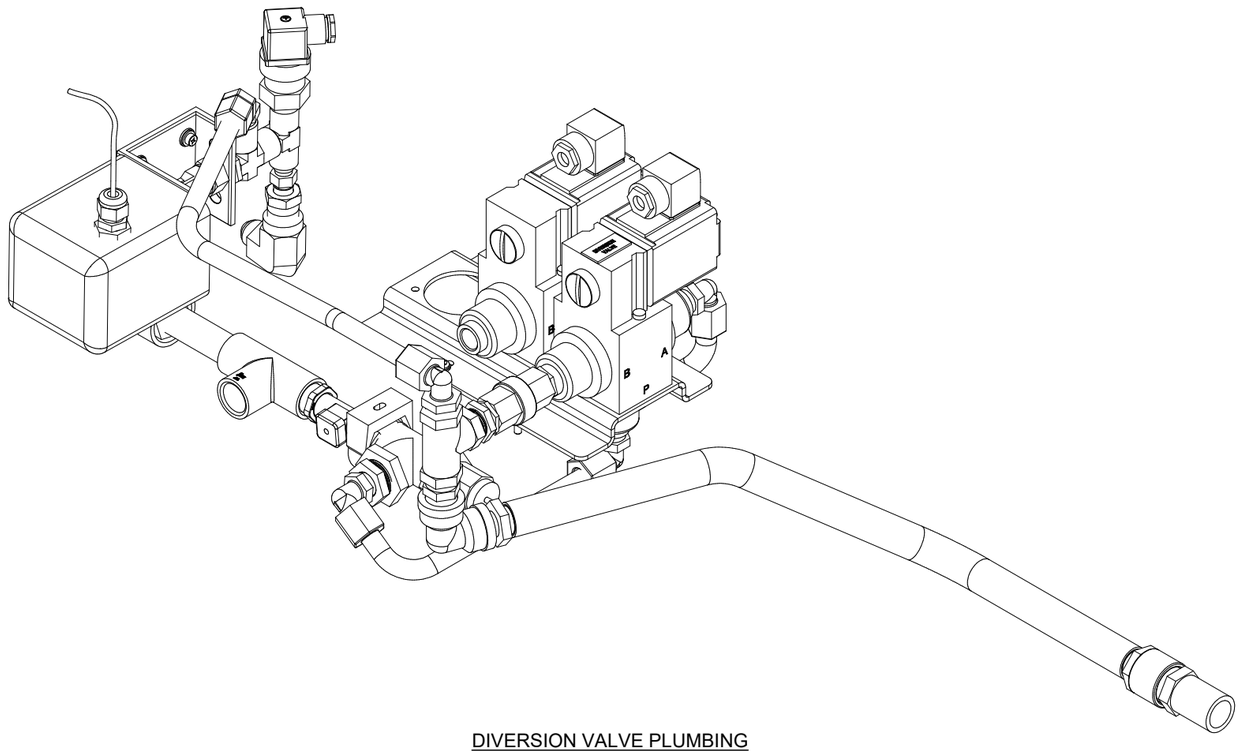


MEMBRANE SELECTOR
VALVE PLUMBING
SV-1004 WITH PT-1007

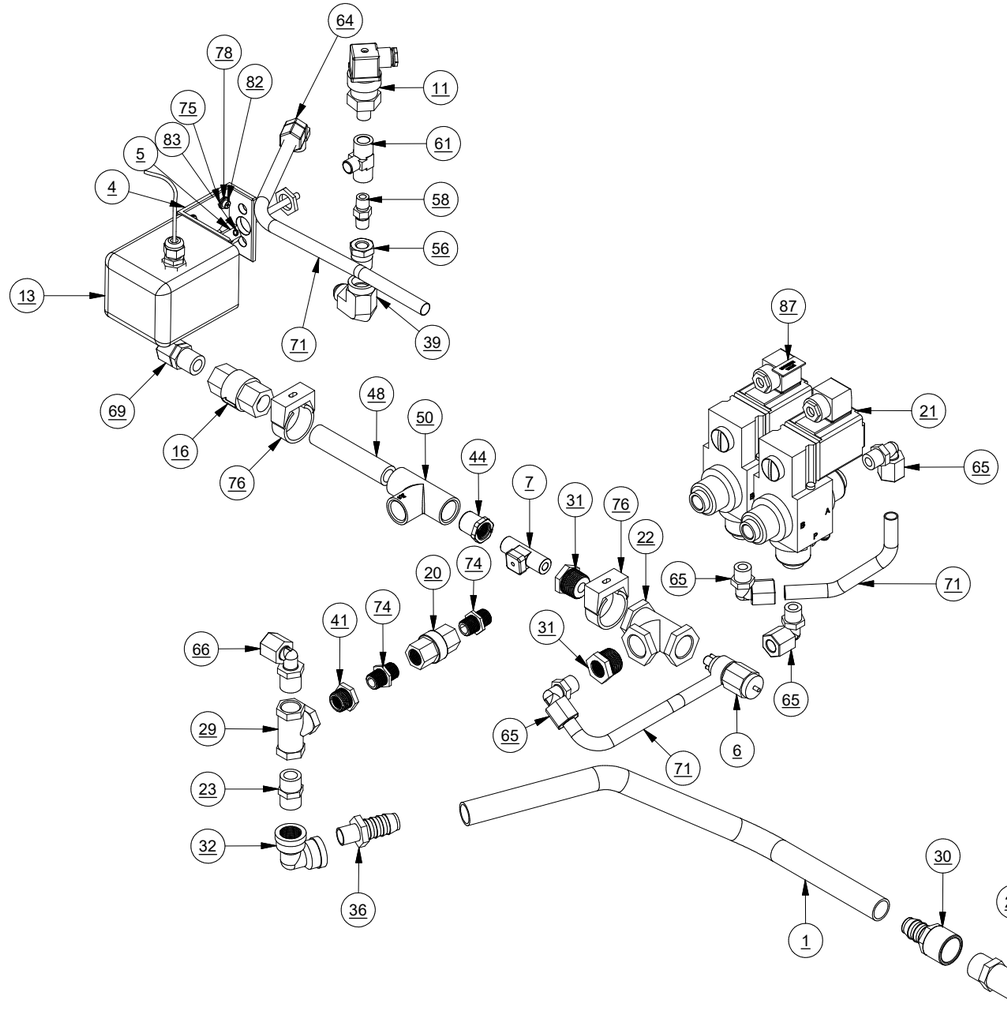
SIZE	DWG NO	REV
D	0821009	C
SCALE NTS	2 OF 6	

DWG NO 0821009

SH 2



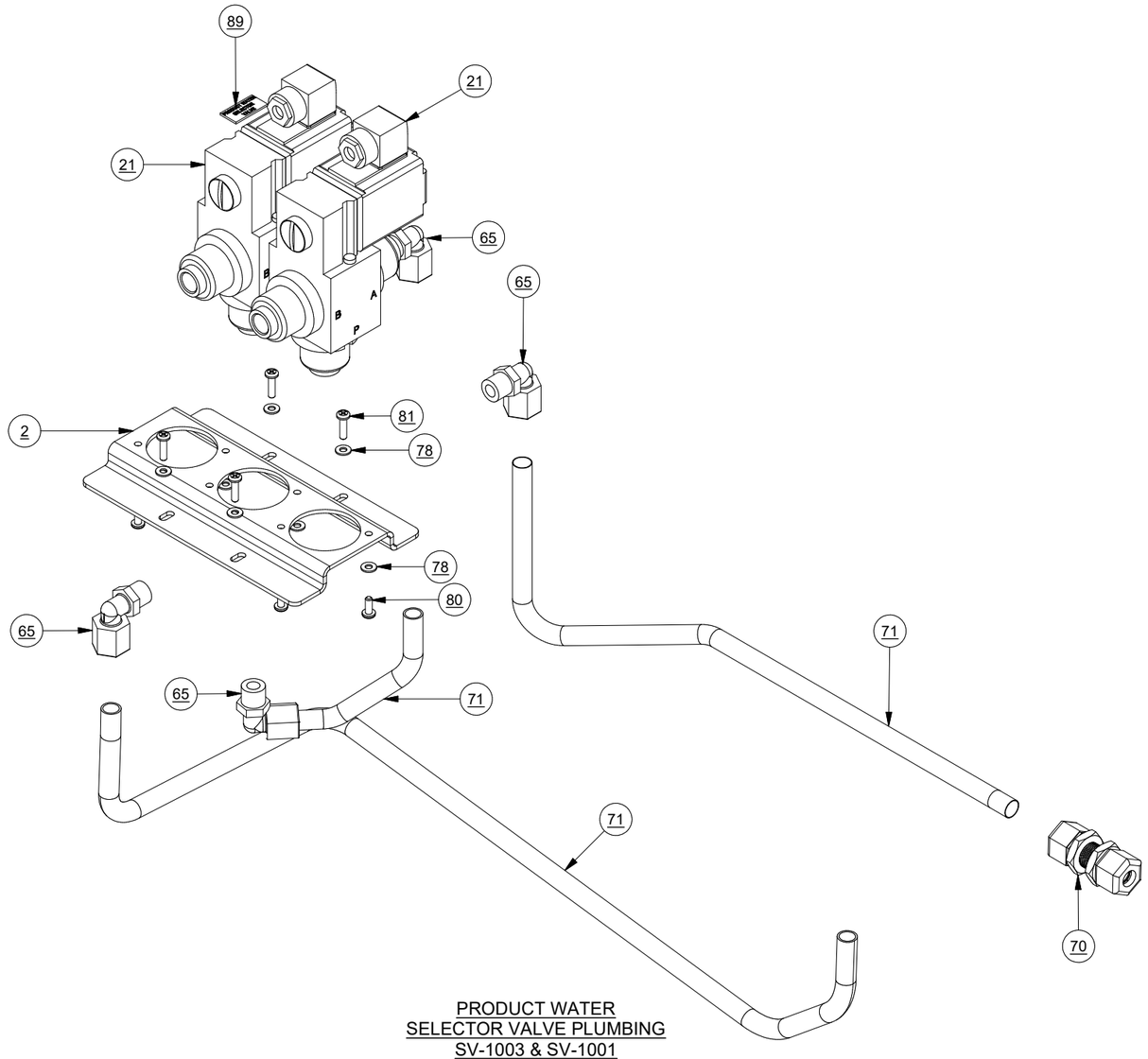
DIVERSION VALVE PLUMBING
SV-1001 & BPR-1001 WITH PT-1006, TDS-1001, & FE-1002



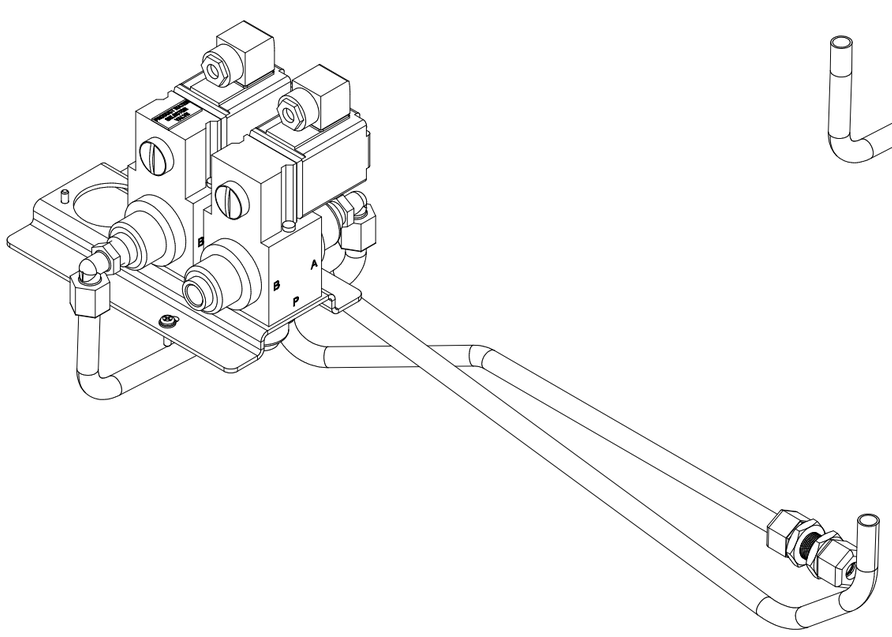
DIVERSION VALVE PLUMBING
SV-1001 & BPR-1001 WITH PT-1006, TDS-1001, & FE-1002
EXPLODED VIEW

SIZE	DWG NO	REV
D	0821009	C
SCALE NTS	3 OF 6	

DWG NO 0821009
SH 3



PRODUCT WATER
SELECTOR VALVE PLUMBING
SV-1003 & SV-1001
EXPLODED VIEW

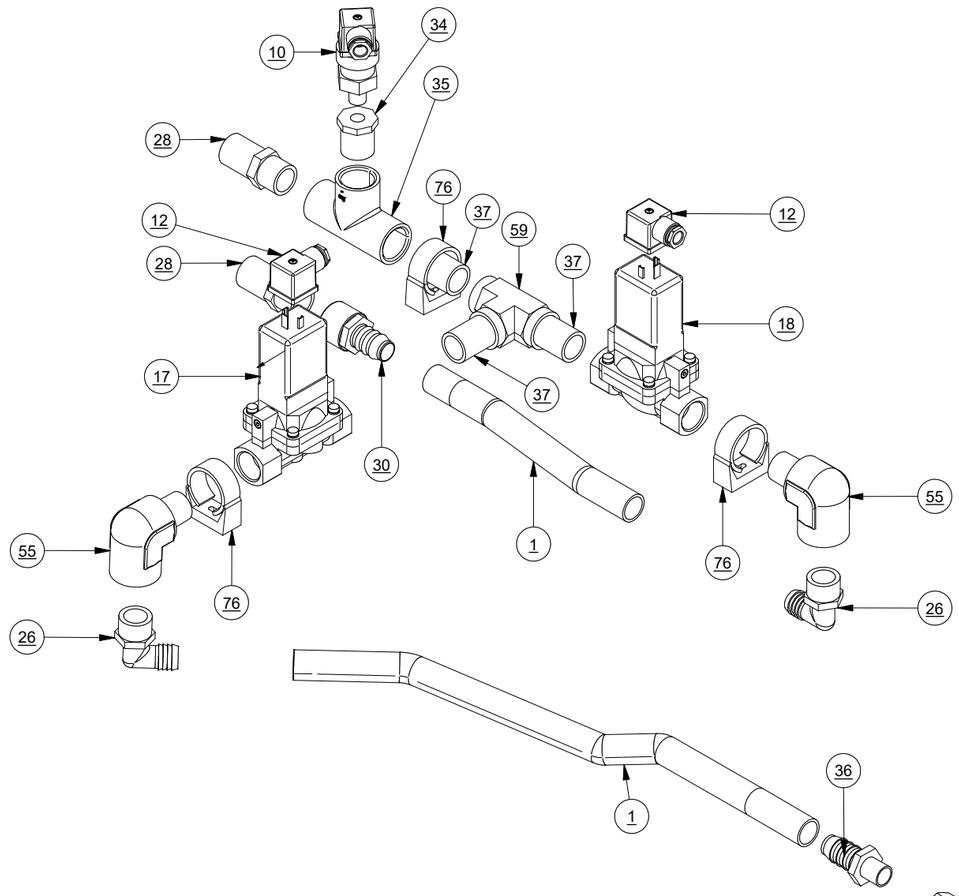


PRODUCT WATER
SELECTOR VALVE PLUMBING
SV-1003 & SV-1001

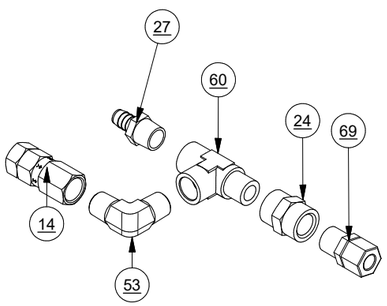
SIZE	DWG NO	REV
D	0821009	C
SCALE NTS	4 OF 6	

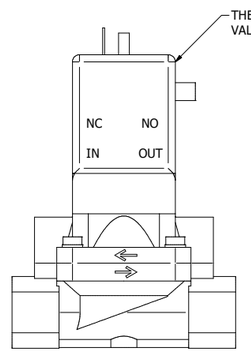
DWG NO 0821009

SH 4

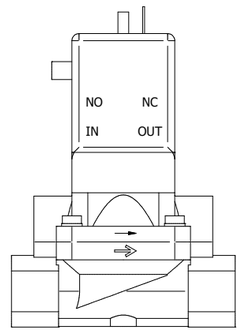


LP SELECTOR
VALVE PLUMBING
SV-1002-A & B
EXPLODED VIEW

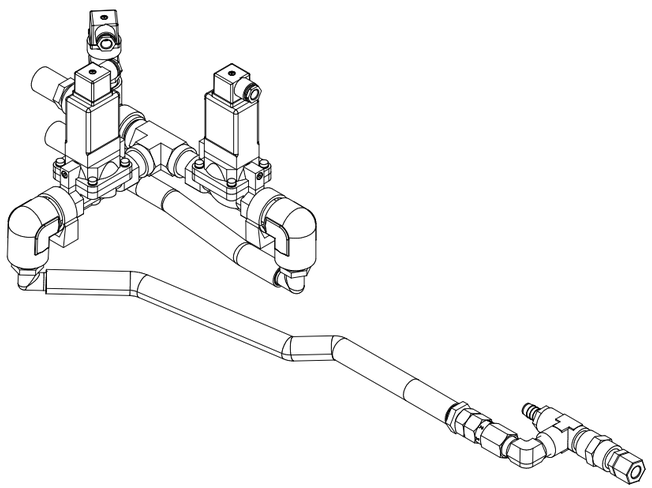




SV 1002 A



SV 1002 B

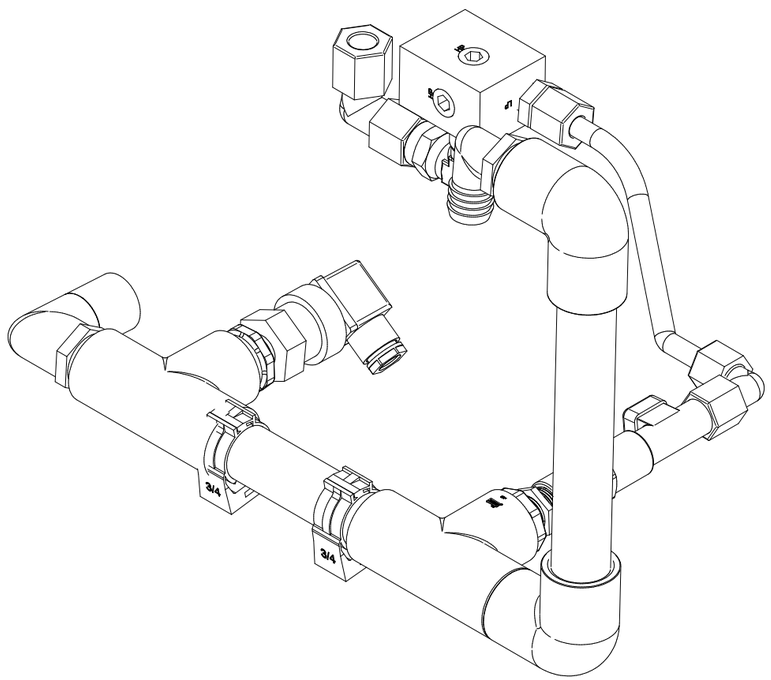


LP SELECTOR
VALVE PLUMBING
SV-1002-A & B

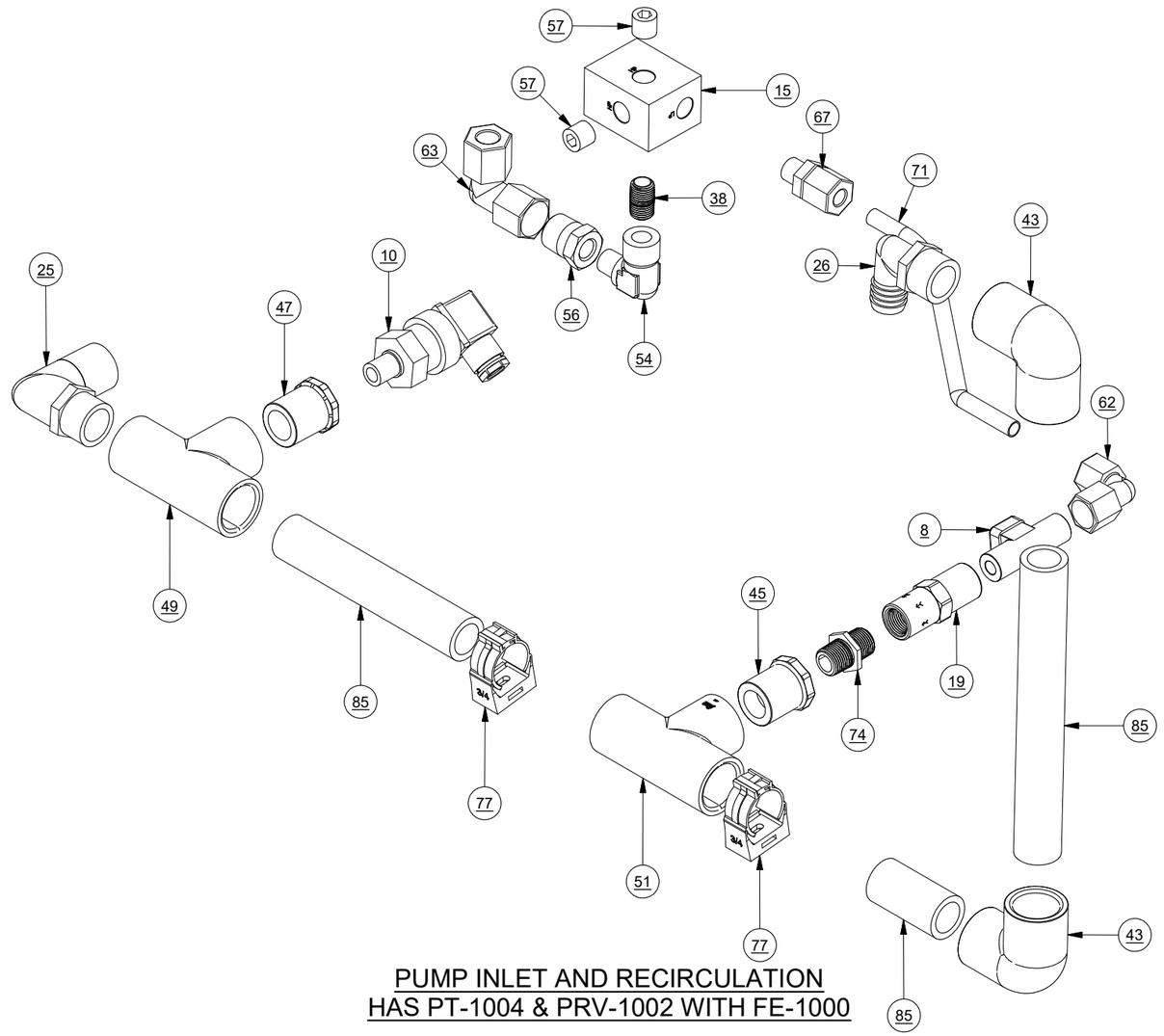
SIZE	DWG NO	REV
D	0821009	C
SCALE NTS	5 OF 6	

DWG NO 0821009

SH 5



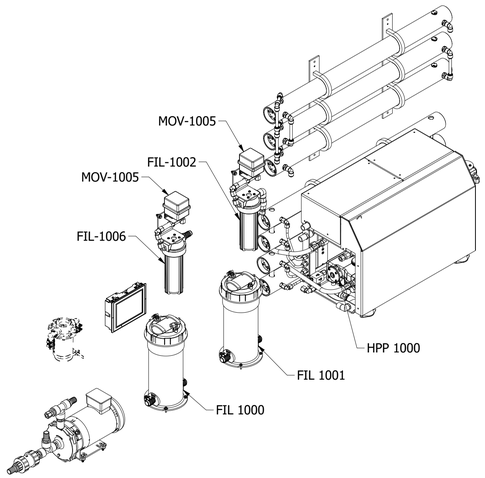
PUMP INLET AND RECIRCULATION
PT-1004 & PRV-1002 WITH FE-1000



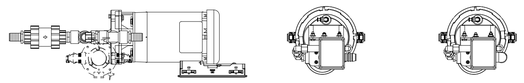
PUMP INLET AND RECIRCULATION
HAS PT-1004 & PRV-1002 WITH FE-1000

SIZE	DWG NO	REV
D	0821009	C
SCALE NTS	6 OF 6	

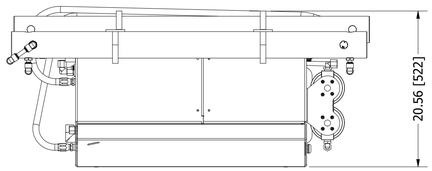
DWG NO 0821009

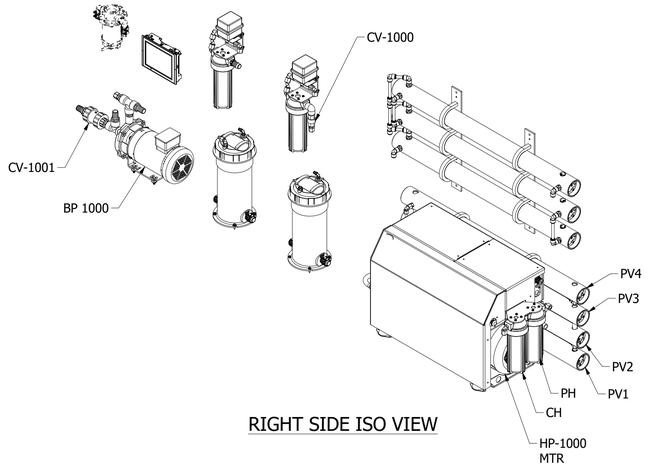


LEFT SIDE ISO VIEW

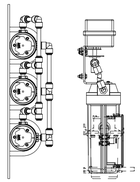


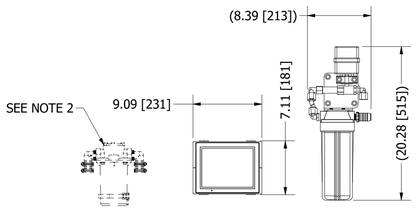
TOP VIEW

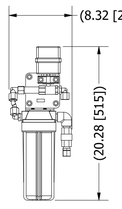


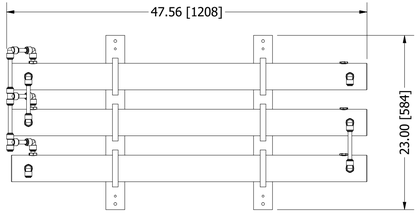


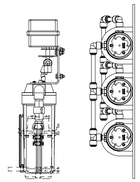
RIGHT SIDE ISO VIEW

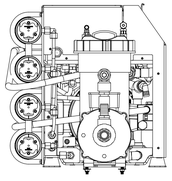




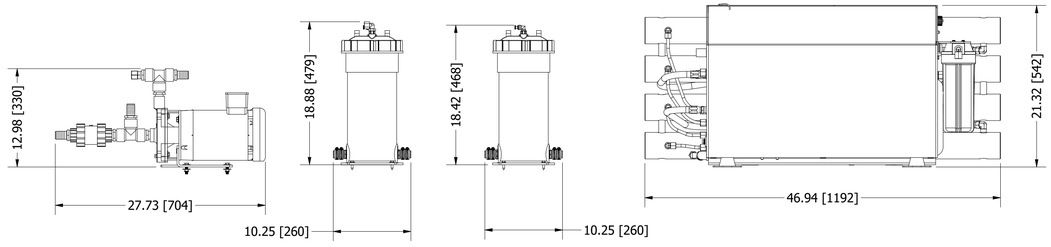




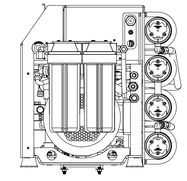




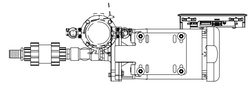
LEFT SIDE VIEW

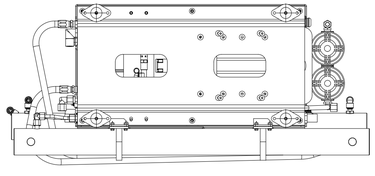


FRONT VIEW



RIGHT SIDE VIEW





BOTTOM VIEW

2. SEA STRAINER IS FOR REFERENCE ONLY AS IT IS PART OF THE INSTALLATION KIT.
1. ENG MUST APPROVE ANY DEVIATIONS

NOTES: UNLESS OTHERWISE SPECIFIED

DIMENSIONAL TOLERANCES - UNLESS OTHERWISE SPECIFIED			
MACHINED			WELDMENT
FRACTION	±1/32"		± 1/16"
X	-	± 4mm	± 1/8"
.X	± .1"	± 2mm	± 1/16"
.XX	± .01"	± .25mm	± 1/32"
.XXX	± .005"	± .025mm	± 1/32"
ANGULAR ± 1'			

125 UNLESS OTHERWISE SPECIFIED

CUSTOMER -

PROJECT -

DRAWN - KR DATE - 4/29/2020

CHECKED - SY DATE - 4/29/2020

APPROVED - BB DATE - 4/29/2020

DRY WT: 537 lbs 244 kg

WET WT: 629 lbs (285 kg)

CONTRACT NO

Parker Sea Recovery
Parker Hannifin Corporation
Filtration Group / Water Purification
2630 E. El Presidio Street
Carson, CA 90810
Contact
Office: 310-608-5600
Fax: 310-608-5692
www.parker.com

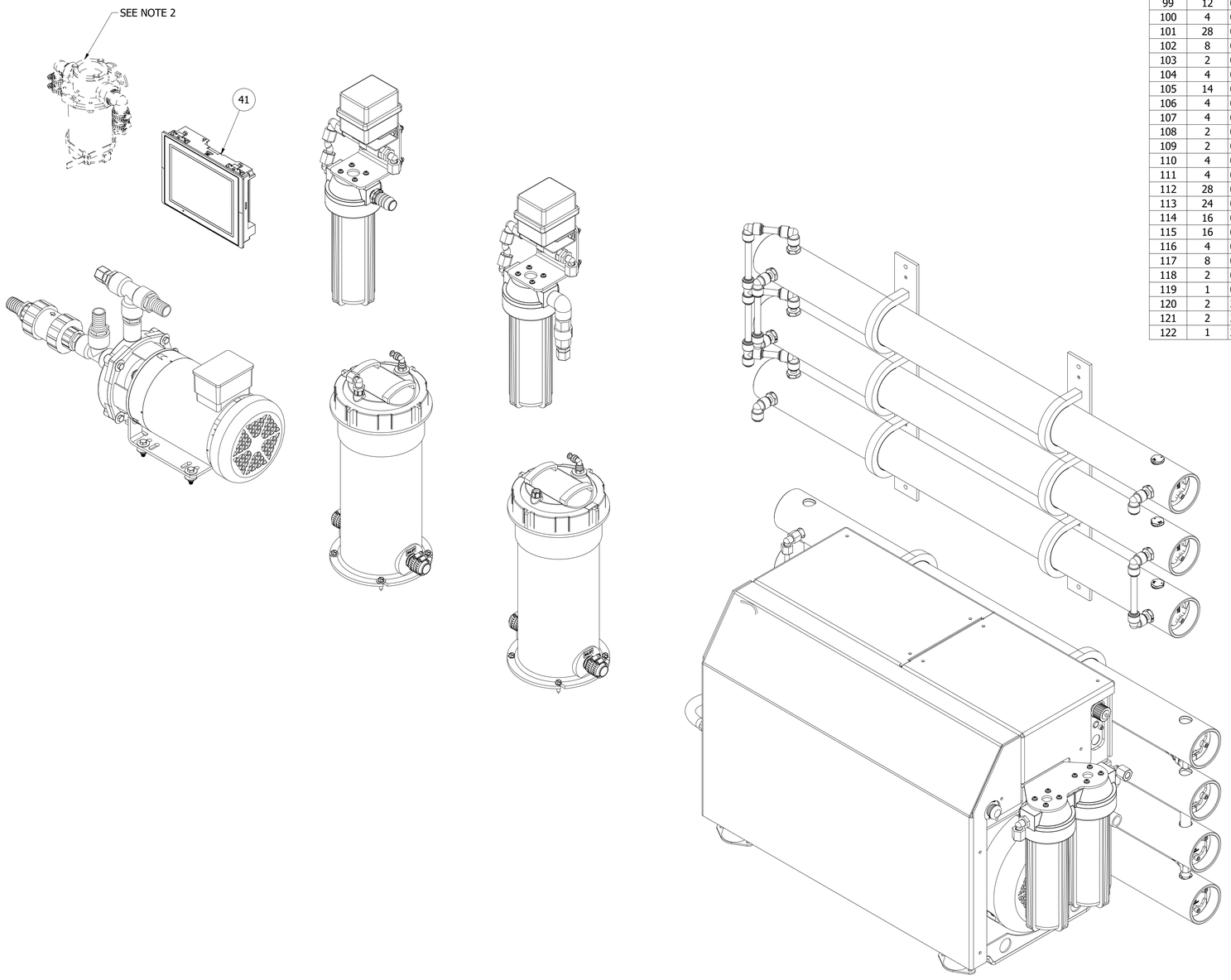
AQUA DUAL COMPACT AMDP,3400GPD SW/2900GPD TW, 230VAC/1PH/50Hz

SIZE D | DWG NO A400C-0103 | REV -

SCALE NTS | 1 OF 6

DWG NO A400C-0103

SH 1

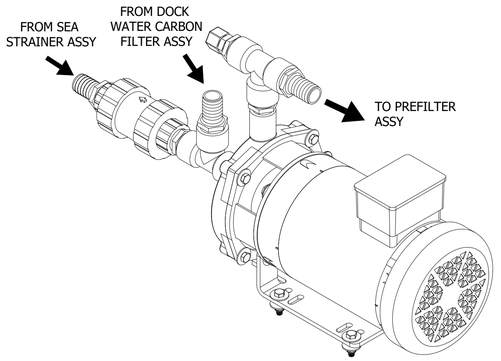


PARTS LIST				PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION	ITEM	QTY	PART NUMBER	DESCRIPTION
86	2	0312124269	TUBING,PARAFLEX,BLACK,0.50 x 10.00L	1	1	0821009	VALVE-PLUMB,CONTRL,ASSY,AQUA,DUAL
87	4	20-2449	ISOLATION MOUNT,.38-16UNC THD NEOPRENE,50 DURO	2	1	0901104-B	AGUA DULCE,380-480VAC,3PH
88	8	05181435AA	CLAMP,HOSE,SS,1"	3	1	11012101	FRAME,ASSY,AL, AQUA DUAL
89	2	0204020100	ELB90 1/4 MPT X 1/4 TU JG PLASTIC	4	14	05202401GR	BRACKET,MVA U-CLAMP,3 IN
90	2	0204990300	PLUG .25 JQ	5	1	11012100	BASE, PUMP,AL, AQUA DUAL
91	6	2132021600	RUBBER MOUNT GROMMET 1 1-4 OD_1.50	6	1	11012102	BRACKET, PUMP, AL,AQUA PRO
92	16	2614017900	O-RING 115 INTERCONNECT AW	7	1	11012106	COVER,ELECT,ENCL,AQUA DUAL
93	2	2614018969	O-RING 034 COMMERICAL PREFILTER SEAL	8	1	11012107	COVER,PLUMB,ENCL,AQUA DUAL
94	2	3901040100	ADAPTER SPACER RING, COMMERCIAL FILTERS	9	1	11012108	COVER, SOUND, FRONT,AQUA DUAL
95	10	061060045000	NUT HEX .25-20 W-INSERT SS	10	2	11012171	BRACKET, MEMBRANE, AL,AQMDP
96	8	061060050000	NUT HEX .31-18 W-INSERT SS	11	2	0117410800	HP NIPPLE 0.25 MPT
97	20	061080028000	WASHER FLAT #10 SS	12	2	0520052000	PLATE,SUPPORT,3 VESSEL,3 IN,6061-T6,23.00x2.50x0.25TH
98	8	061080049000	WASHER,FLAT,5-16 IN,SS	13	8	0520210600	RETAINER PORT MVA
99	12	061080056000	WASHER,FLAT,3/8",SS	14	2	2020040006	BRACKET,FWF,FILTER,CARBON - PR
100	4	061080066000	WASHER,FLAT,1/2",SS	15	3	2417430800	INTERCONNECT MVA SS
101	28	061100043000	WASHER FLAT OS .25 SS	16	2	2453502402	PLUG END, SRC DUAL 3X3.35 IN
102	8	061100049000	WASHER,FLAT,OS,5/16",SS	17	4	2453502403	PLUG END, SNGL, 3X3.35 IN
103	2	061100056000	WASHER,FLAT,OS,3/8",SS	18	1	20200402101	DUAL BRACKET PREFILTER-CHRCL-PLNKTN
104	4	061120066000	WASHER,LOCK,1/2",SS	19	8	20201030000	SEGMENT RING (SET)
105	14	061142145016	SCREW,HEX HEAD,.25-20x1",SS	20	2	H36160522402	PLUG END, HRO DUAL 3X3.35 IN
106	4	061142150012	SCREW,HEX HEAD,.31-18x0.75,SS	21	3	50012017	KIT,VESSEL ASSY,3040,FRP,600PS
107	4	061142150020	BOLT HEX .31-18 X 1.25 SS	22	1	20-0683	BELL HOUSING,3.5 GPM PLGR PUMP
108	2	061142157016	SCREW,HEX HEAD,3/8-16x1",SS	23	1	70-6178C1	PUMP,708-5, 5 PLGR, 8GPM
109	2	061142157020	SCREW,HEX HEAD,3/8-16x1-1/4",SS	24	1	72012009	COUPLING, JAW, ML-099 X 1-3/8"
110	4	061142167024	SCREW,HEX HEAD,1/2-13x1 1/2",SS	25	1	72012011	INSERT, SPIDER, URETHANE, ML-099
111	4	061161802800	SC ALLEN FLT .313-18X1.75	26	1	72012014	COUPLING,JAW,ML-099 X 0.9375IN
112	28	061161845012	SC ALLEN FLAT .25-20 X .75 SS	27	1	1217514772	BOOSTER PUMP HEAD HP75 SS
113	24	061162345012	SC SOC CAP .25-20 X .75 SS	28	1	1544182210	MOTOR,2HP,460-60-3,1.5HP,380-50-3
114	16	061170628016	SC PHIL PAN A #10 X 1 SS	29	1	1569263200	MTR 7.5-5HP,230-460,190-380,3PH,60-50HZ
115	16	061172143016	SCREX,HEX A,.25x1.00,SS	30	3	33-3040	ELEMENT,BW-3040
116	4	065070045000	NUT HEX .25-20 FLANGED	31	2	07620310WA	FILTER HOUSING 32.5 SQFT
117	8	065080028000	WASHER FLAT #10 NYLON	32	1	08020723KD	ELEMENT OWSE 32.5 SQFT
118	2	0081041	LABEL SRC COMM PREFILTER	33	4	0713020873	FILTER HOUSING .50 X 10
119	1	0081042	LABEL,OIL WATER, SEPARATOR	34	1	0801063357	ELEMENT CPFE 5 MIC 32.5 SQFT
120	2	2213017063	LABEL INLET (WHITE BACKGROUND)	35	4	0803004773	ELEMENT,CHARCOAL,2.5 x10.0
121	2	2213017163	LABEL OUTLET (WHITE BACKGROUND)	36	4	2724011433	MEMBRANE 900GPD AW W SEAL 3
122	1	2234101500	LABEL FRESH WATER FLUSH	37	1	90012047	PUSHBUTTON,ESTOP,16mm, MUSH, HEAD
				38	1	313110009DK	CONN MOD JACK PLUG RJ45
				39	4	2408132500-02	VESSEL HIGH PRESSURE 900GPD
				40	14	2615180100	FELT ADHESIVE 0.125 X 0.75 STRIP
				41	1	3131701447-V1.03	TOUCHSCREEN,8.4IN,COLOR,MULTI
				42	1	14012117Ar	VALVE CHECK .50 FPT WITH VITO
				43	2	1401105698	KZ VALVE FWF 0.50
				44	1	1401271942	VALVE,CHECK,TU,PVC,1.00
				45	3	30-0056	BUSHING, NYL, 1"M X 3/4"F THD
				46	1	30-0059	NIPPLE, NYL, 1" NPT X CLOSE W HEX
				47	1	30-0441	ELBOW, NYL, 3/4" MNPT X 3/4" HOSE BARB
				48	3	30-0615	ADPTR, NYL, 1" MNPT X 1" HOSE BARB
				49	2	30-0673	TEE, NYL, 1" FNPT
				50	1	30-1082	ADPTR, TI, 916-18 PUMP OUTLET
				51	1	70-3052	PLUG, MS18229-08
				52	2	01013725CL	NIPPLE 0.50 NPT x CL
				53	2	01123737DG	NIP 0.75 NPT X 0.75 NPT NYLON
				54	9	23012002	ELB90,TRUE SEAL,ACETAL,SWIVEL,0.50MTx0.50TUBE
				55	2	23012004	TEE,TRUE SEAL,ACETAL,0.50 TUBE
				56	1	23012015	ELB90,TRUE SEAL,ACETAL,0.50 TUBE x 0.50 TUBE
				57	1	0101012583	ELB90 0.50 FPT x FPT
				58	3	0101342583	PLUG 0.50 MT
				59	4	0101370815	NIPPLE 0.25 NPT x 1.50
				60	2	0101372530	NIPPLE 0.50 NPT x 3.00
				61	1	0101652783	ADAPTER 0.50 MPT x 1.00 BARB
				62	4	0101653883	ADAPTER 0.75 MPT x 1.00 BARB
				63	1	0117343769	PLUG 0.75 MT SS316L
				64	4	0204011769	ELBOW,PP,3/8 ODx1/4 FT
				65	2	0204012569	ELBOW,PP,1/2 ODx1/2 FT
				66	1	0204020869	ELBOW,PP,1/4 ODx1/4 MT
				67	6	0204022569	ELBOW,PP,1/2 ODx1/2 MT
				68	1	0204092569	FITTING,PP,1/2 ODx1/2 MT
				69	1	0204092669	FITTING,PP,1-2 ODx3-4 MT
				70	2	1317012469	ELB90 -8 FLARE x 0.25 MT SS
				71	4	1317482369	FITTING,HOSE,-8 SWIVEL,SS
				72	3	1904010243	STRAIN RELIEF 3222 .75 BLK
				73	1	1904010643	CORDGRIP,LT,14IN,BLK
				74	4	1904011800	STRAIN RELIEF 3 HOLE X 6MM
				75	16	2614010100	O-RING 116 PRODUCT AS-AW
				76	16	2614014900	O-RING 230 BRINE 3.0 END PLUG
				77	1	11012211	BRACKET,MOUNT,BP MTR,AL
				78	1	30012030	HOSE,HP,-8,.50,3000-PSI,BLK,53.00L
				79	1	30012030	HOSE,HP,-8,.50,3000-PSI,BLK,57.00L
				80	1	0312123569	TUBING,PARAFLEX,BLACK,0.38 x 5.60L
				81	1	0312123569	TUBING,PARAFLEX,BLACK,0.38 x 8.00L
				82	1	0312123569	TUBING,PARAFLEX,BLACK,0.38 x 10.50L
				83	1	0312123569	TUBING,PARAFLEX,BLACK,0.38 x 13.20L
				84	3	0312124269	TUBE,BLK,NYL,0.50 OD x 3.00L
				85	4	0312124269	TUBE,BLK,NYL,0.50 OD x 5.40L

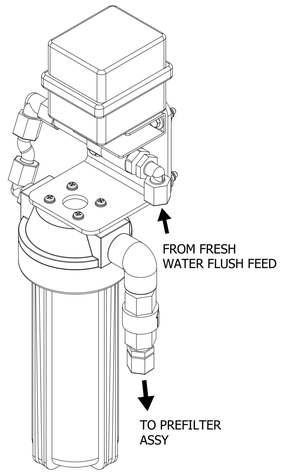
SIZE	DWG NO	REV
D	A400C-0103	-
SCALE NTS	2 OF 6	

DWG NO A400C-0103

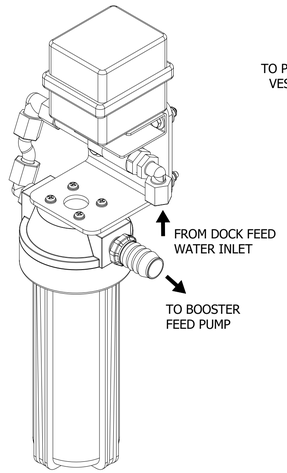
SH 2



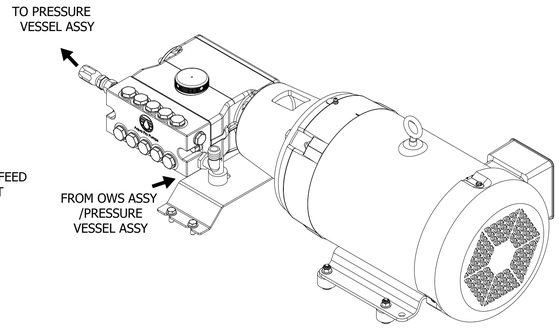
BOOSTER PUMP ASSY



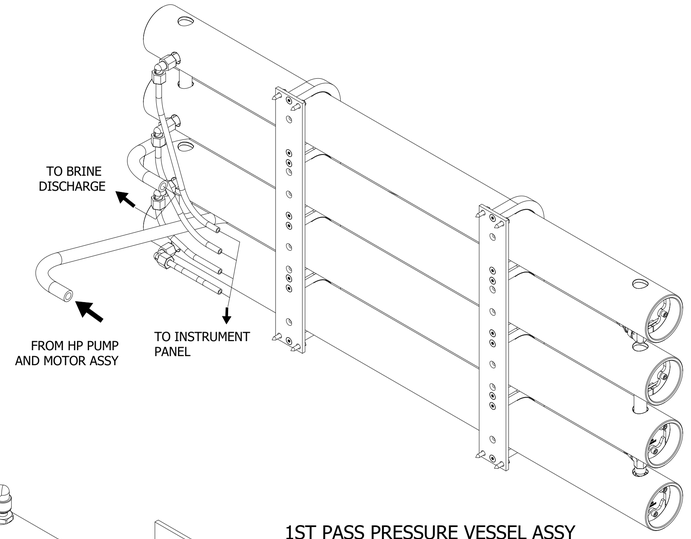
FRESH WATER FILTER ASSY



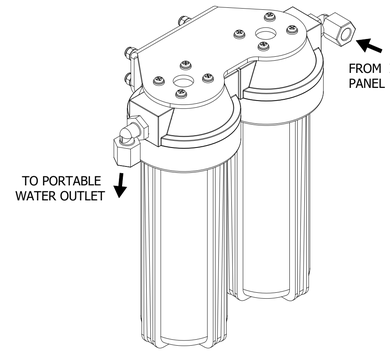
DOCK WATER CARBON FILTER ASSY



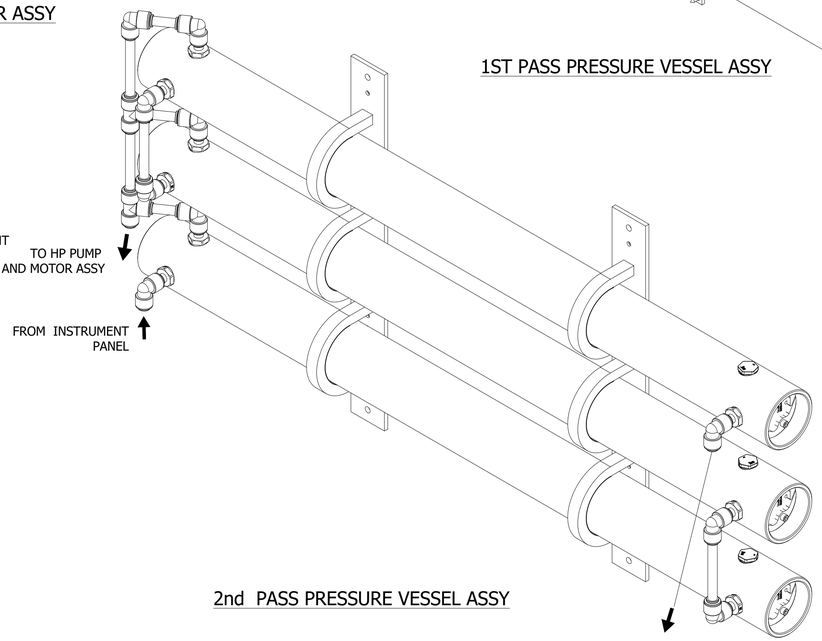
HP PUMP AND MOTOR ASSY



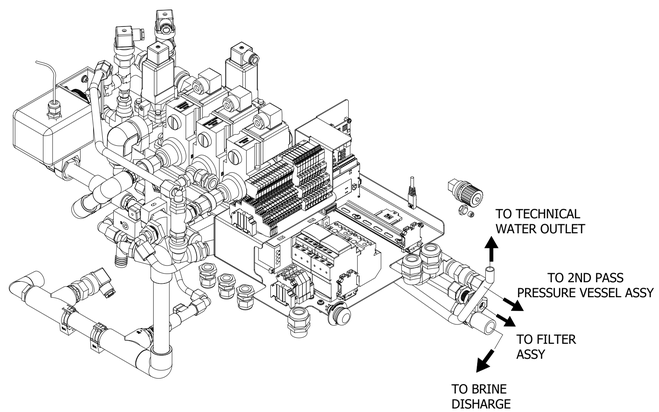
1ST PASS PRESSURE VESSEL ASSY



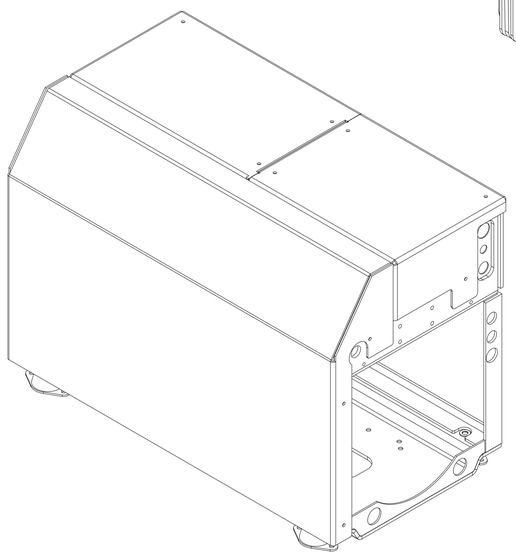
FILTER ASSY



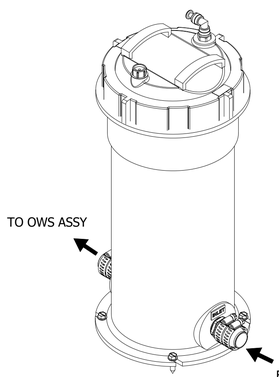
2nd PASS PRESSURE VESSEL ASSY



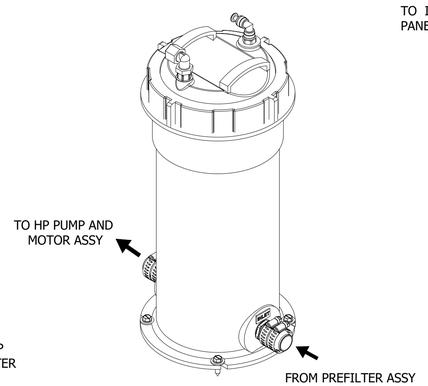
INSTRUMENT PANEL



FRAME ASSY



PREFILTER ASSY



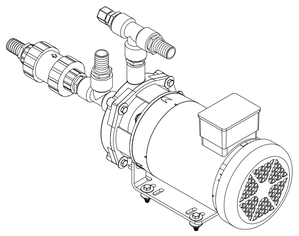
OWS ASSY

SIZE	DWG NO	REV
D	A400C-0103	-
SCALE NTS	3 OF 6	

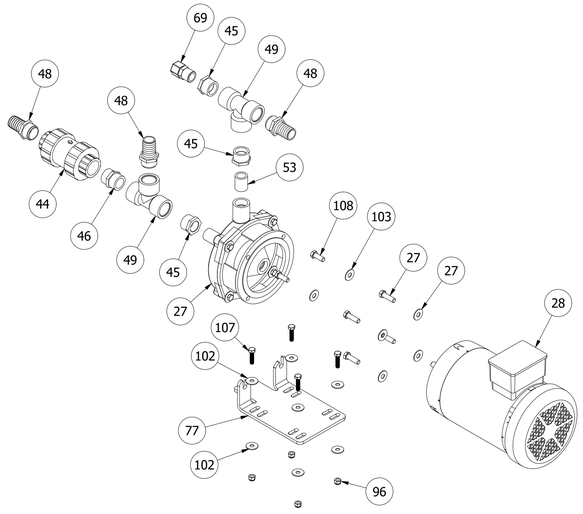
DWG NO A400C-0103

SH 3

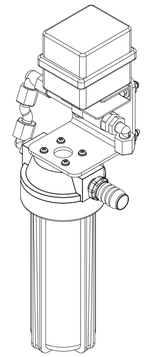
A



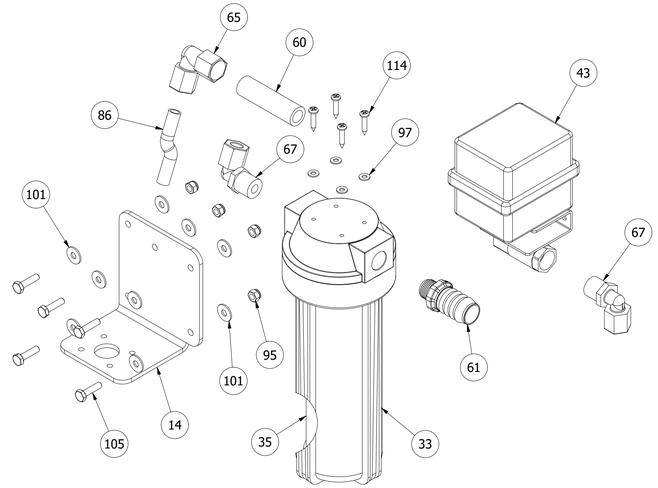
BOOSTER PUMP ASSY



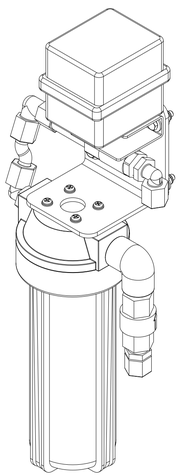
BOOSTER PUMP ASSY - EXPLODED



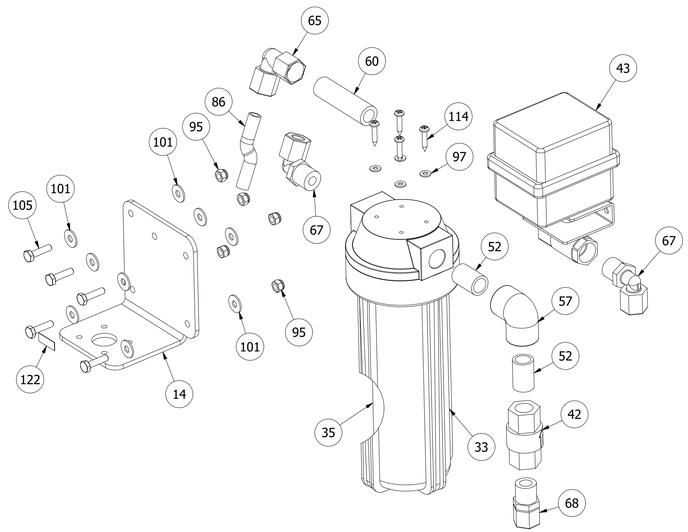
DOCK WATER CARBON FILTER ASSY



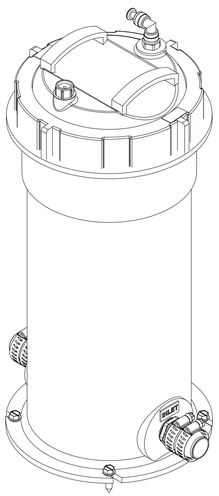
DOCK WATER CARBON FILTER ASSY - EXPLODED



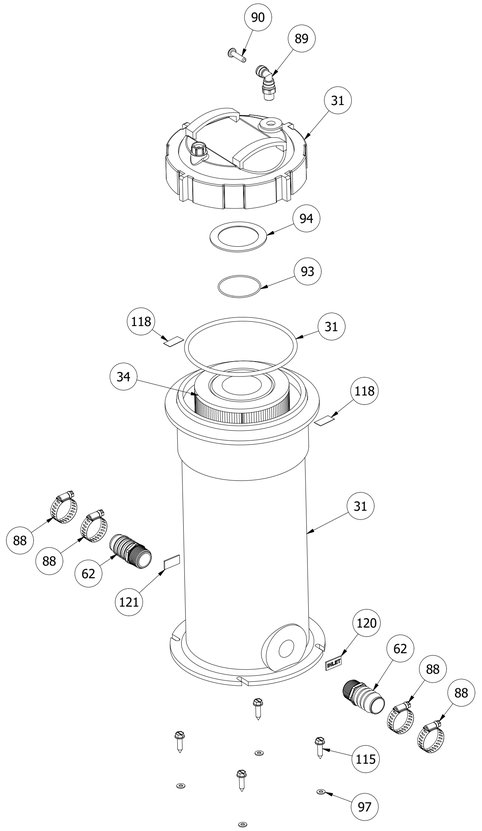
FRESH WATER ASSY



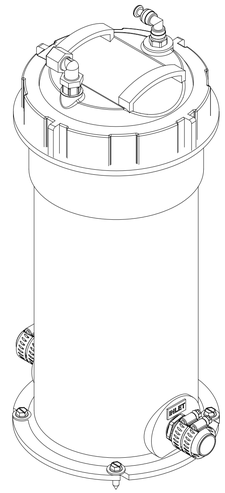
FRESH WATER ASSY - EXPLODED



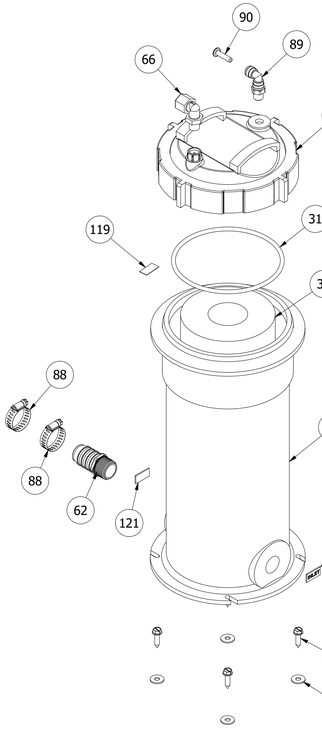
PREFILTER ASSY



PREFILTER ASSY - EXPLODED



OWS ASSY

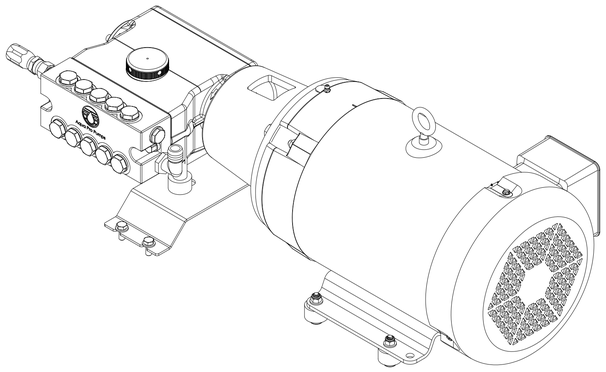


OWS ASSY - EXPLODED

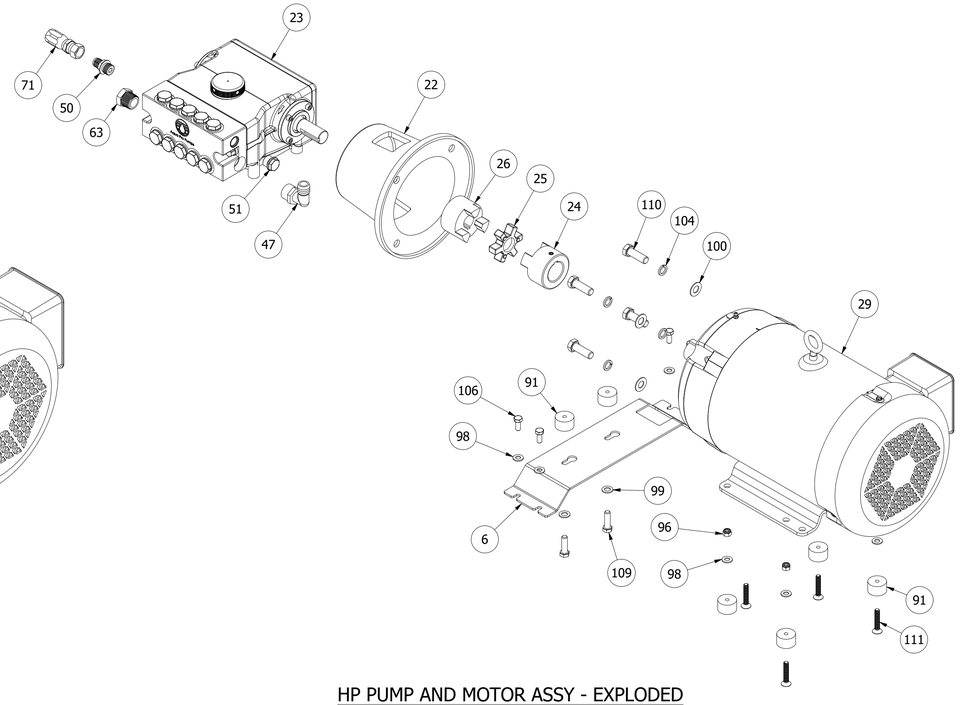
DWG NO A400C-0103

SH 4

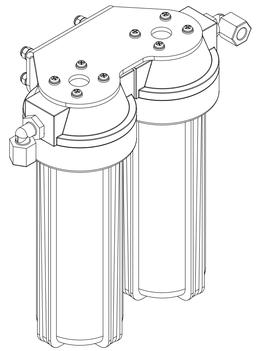
SIZE	DWG NO	REV
D	A400C-0103	-
SCALE NTS	4 OF 6	



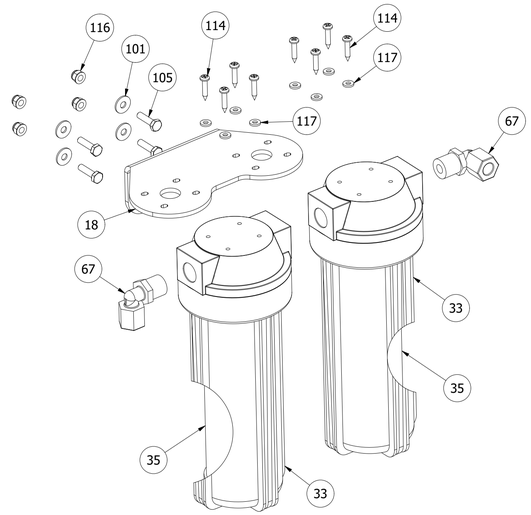
HP PUMP AND MOTOR ASSY



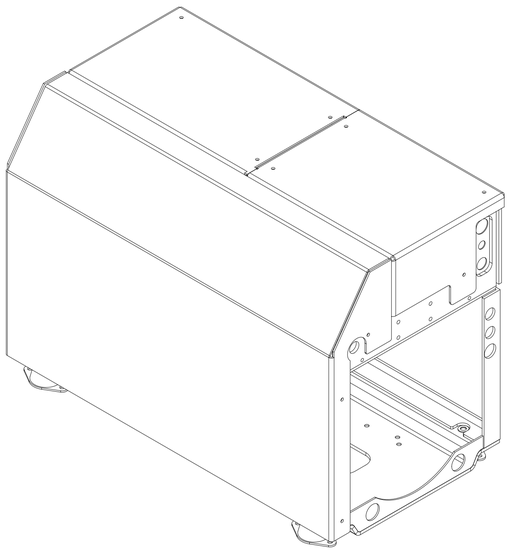
HP PUMP AND MOTOR ASSY - EXPLODED



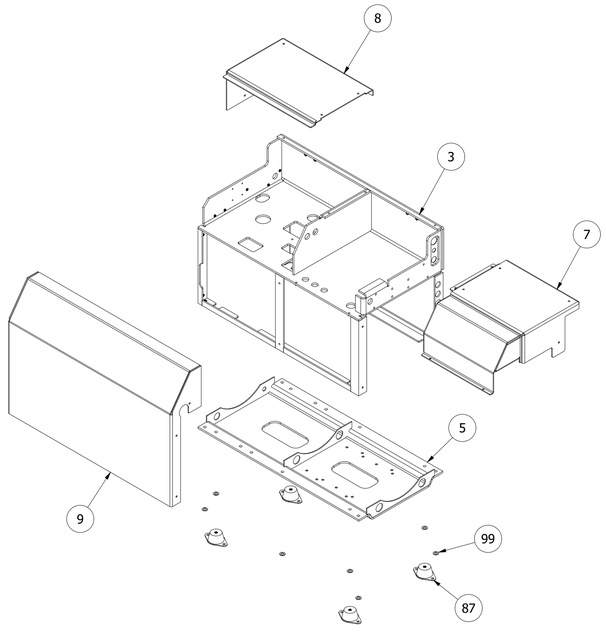
FILTERS ASSY



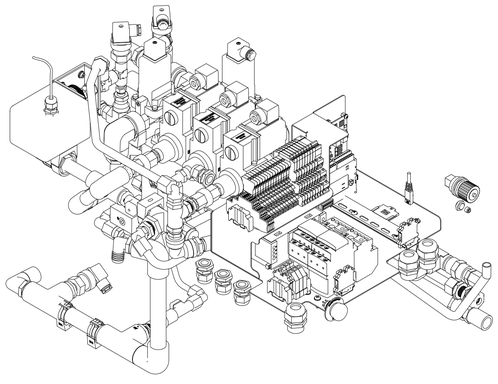
FILTERS ASSY - EXPLODED



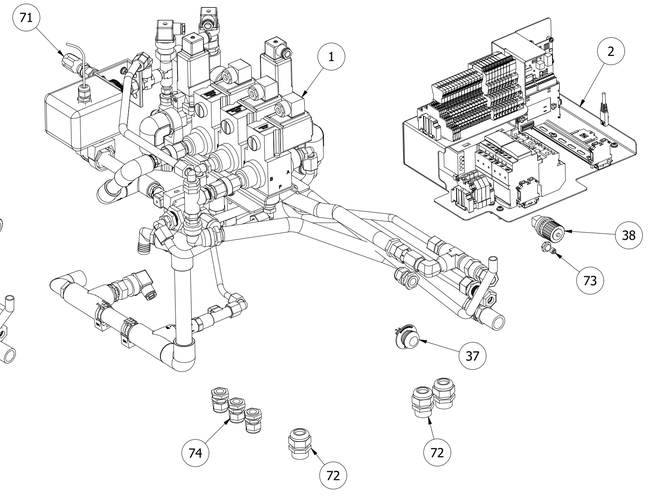
FRAME ASSY



FRAME ASSY - EXPLODED



INTRUMENT PANEL

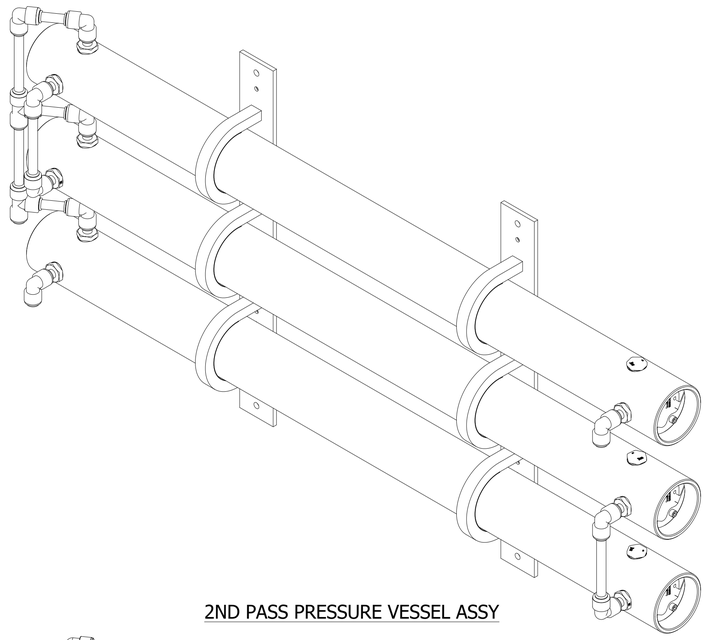


INTRUMENT PANEL - EXPLODED

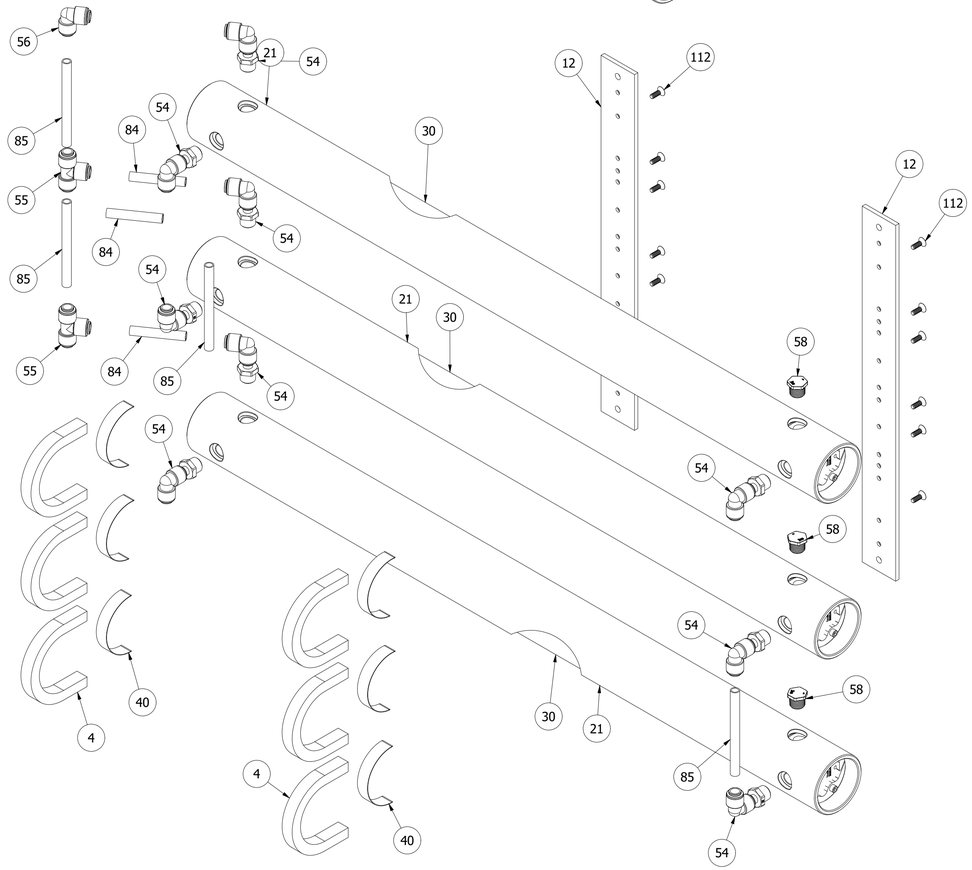
SIZE	DWG NO	REV
D	A400C-0103	-
SCALE NTS	5 OF 6	

DWG NO A400C-0103

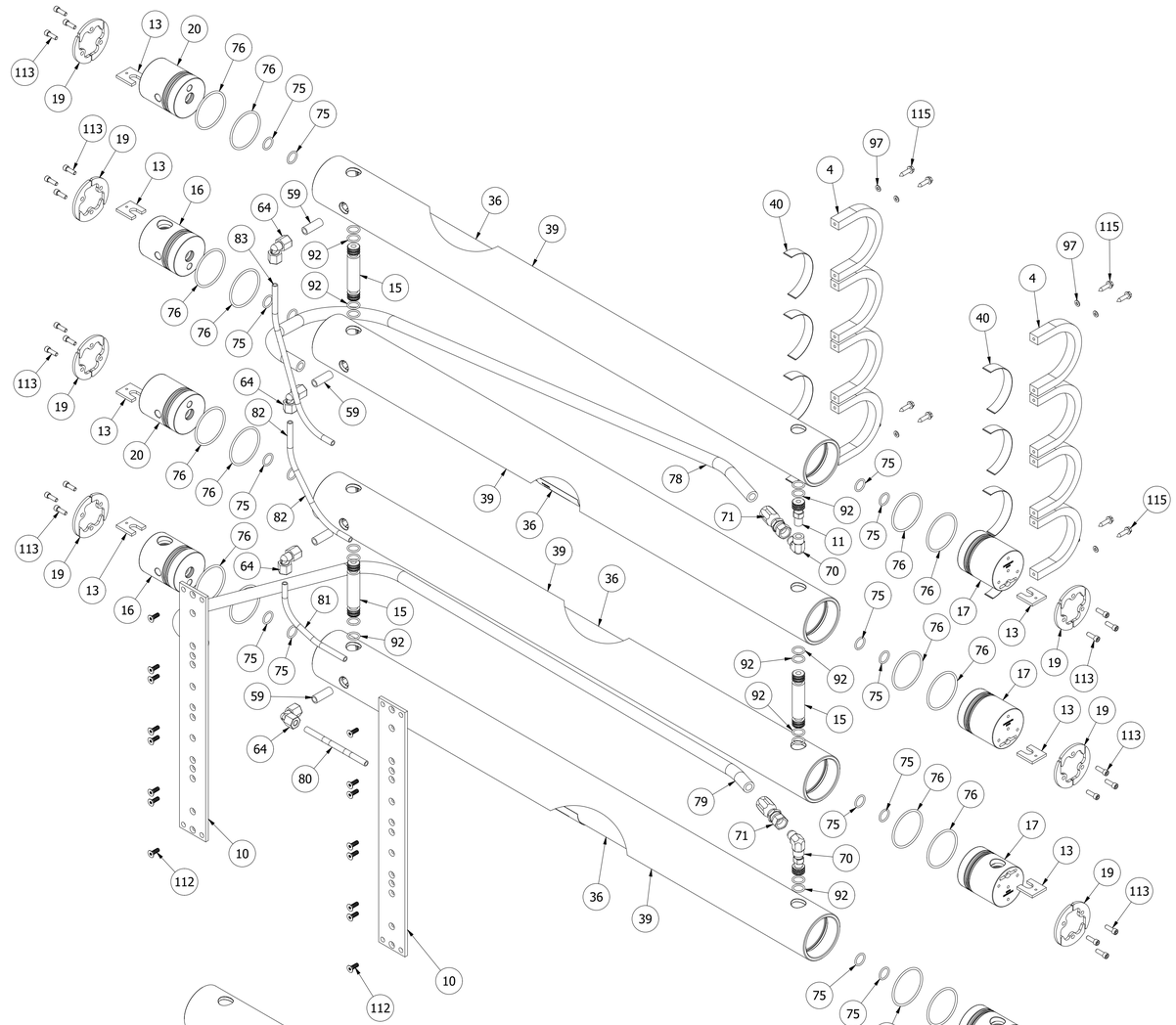
SH 5



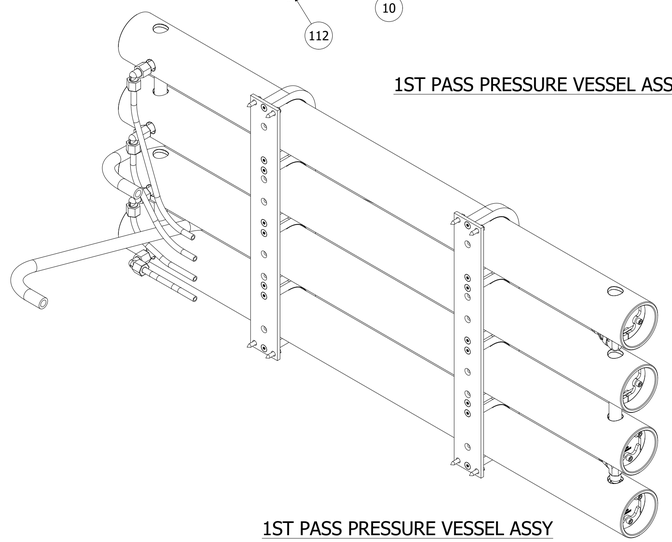
2ND PASS PRESSURE VESSEL ASSY



2ND PASS PRESSURE VESSEL ASSY - EXPLODED



1ST PASS PRESSURE VESSEL ASSY - EXPLODED



1ST PASS PRESSURE VESSEL ASSY

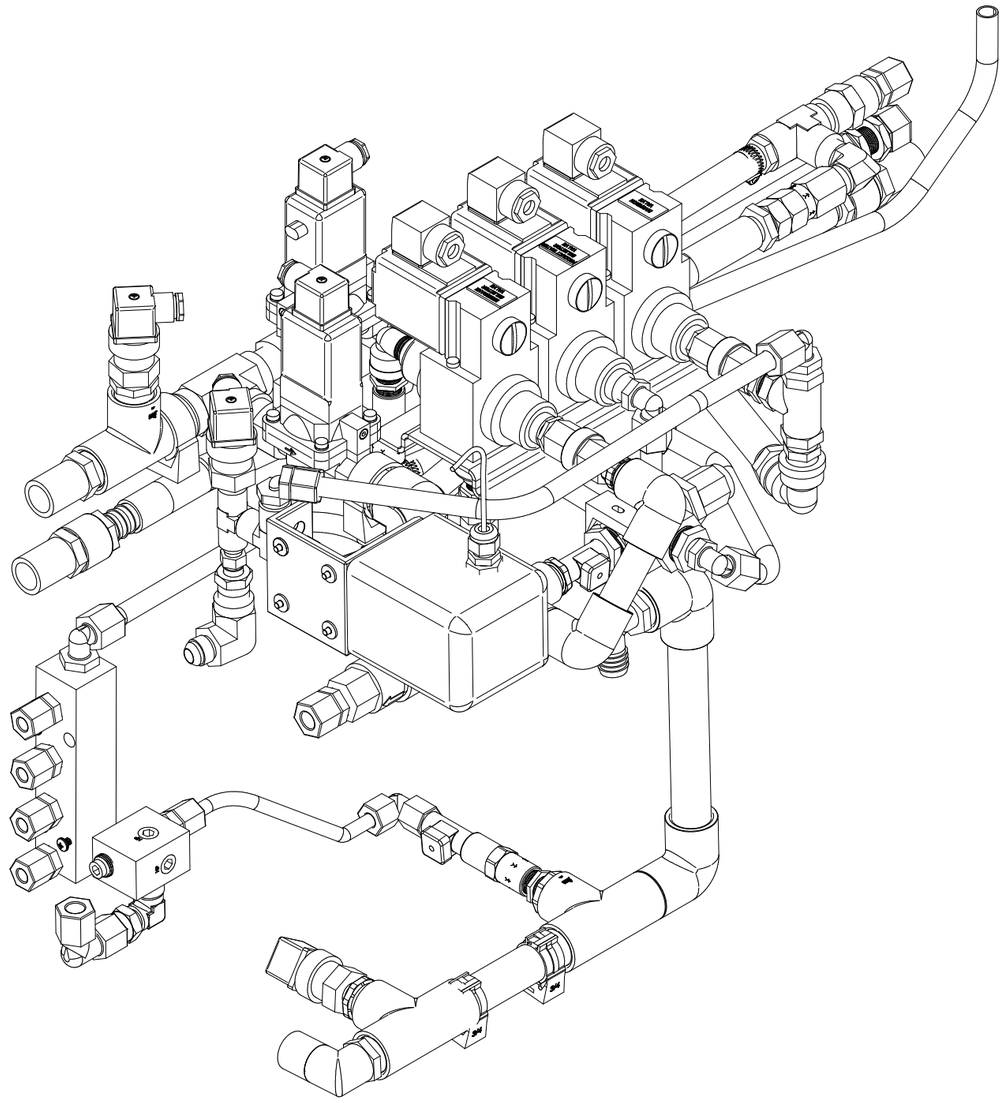
SIZE	DWG NO	REV
D	A400C-0103	-
SCALE NTS	6 OF 6	

DWG NO A400C-0103

SH 6

A

REVISION HISTORY				
DATE	DESCRIPTION	DESIGNER	CHECKED	APPROVED
05/18/2022	UPDTAED MEMBRANE SELECTOR VALVE PLUMBING TO PRT NUMS: 0112071900, 328065066, 30-0453, 30-0333	OM	SY	BB



0821009 VALVE-PLUMB,CONTRL,ASSY,AQUA,DUAL

PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
54	1	0117230869	ELB90 ST 0.25 MPT x 0.25 FPT SS
55	2	0117233769	ELB90 ST 0.75 MPT X 0.75 FPT SS316
56	2	0117292387	RB 0.50 MT x 0.25 FT SS
57	2	0117340800	PLUG SOC ,0.25 MT SS316L
58	1	0117380869	NIPPLE 0.25 NPT X 1.50 SS316L
59	1	0117423769	TEE .75 FT X .75 FT X .75 FT SS
60	1	0117492569	TEE ST .50 FT X .50 MT X .50 FT SS
61	1	0117520869	TEE,BRANCH,.25 FT x .25 MT x .25 FT SS
62	1	0204011869	ELBOW,PP,3/8 ODx3/8 FT
63	1	0204012569	ELBOW,PP,1/2 ODx1/2 FT
64	1	0204021769	ELB90 1/4MPTX3/8TU PLASTIC
65	6	0204022469	ELBOW,PP,1/2 ODx3/8 MT
66	3	0204022569	ELBOW,PP,1/2 ODx1/2 MT
67	1	0204091769	CONN 1/4MPTX3/8TU PLASTIC
68	4	0204091869	FITTING,PP,3/8 ODx3/8 MT
69	2	0204092569	FITTING,PP,1/2 ODx1/2 MT
70	1	0204272569	UNION BULKHD 0.50 TU PLASTIC
71	5 FT	0312124269	TUBE 1/2 BLK
72	1.5 FT	0328065066	HOSE PVC BRAID GRAY (TECH WATER TO MANIFOLD) 0.50 x 17.00L
73	2	30-0333	CLAMP,HOSE,SS,3/8"
74	6	30-0578	NIPPLE,NYL, 3-8 NPT x CLOSE W HEX
75	9	21010110MC	BUSHING,RUBBER,STD,BLUE,0.189IDx0.500ODx0.175TH
76	5	0501164200	PIPE SUPPORT 1.125
77	2	0501164900	SUPPORT,PIPE,0.75
78	13	061080028000	WASHER FLAT #10 SS
79	2	061160630012	SC PHIL PAN 10-24 X .75 SS
80	5	061160631008	SC PHIL PAN #10-32 x .50 SS
81	4	061160631012	SC PHIL PAN #10-32 x 0.75 SS
82	4	061162826010	SC,SHLDR,PHIL,#8-32,0.188Dx0.375L,SS
83	2	061222345006	SC ALLEN .25-20 x .375LG
84	.5 FT	0301094100	PIPE PVC SCH 80 .375 IN x 2.5
85	2 FT	0301096600	PIPE 3/4 PVC80
86	1 FT	0301098800	PIPE 1/2 PVC80

PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	3 FT	30-0262	HOSE,.75,PVC WITH BRAID,GRAY
2	1	11012103	BRACKET,VALVES,AL AQUA DUAL
3	1	14012008	MANIFOLD, AQMXL PROD, PVC, PRESS, LOW,1.5X1.5X6.25
4	1	2020043900	BRACKET,MTG,BPR -AQM
5	1	3421020100	COUPLER BACK PRESSURE REG-AQM
6	1	20-4096	PROBE, CONDUCTIVITY, 5-WIRE, 5 LONG CABLE
7	1	11026820AO	FLOW METER IN-LINE 0.26-4.0GPM
8	1	11026920AO	FLOWMETER IN-LINE .53-7.9GPM
9	1	27012007	VALVE,NEEDLE,ANGL,.25FNPT,316
10	3	2317100601	TRANSDUCER,PRESSURE,LOW,0-300 PSI
11	1	2317102001	TRANSDUCER,PRESSURE,HIGH,0-2000 PSI
12	2	3131680298	PLUG CONNECTOR DIN 3-PIN
13	1	B079400004	BRP GEAR ASSY
14	1	60-0226	VALVE,CHECK,0.50 FNPT,316SS
15	1	60-4547	VALVE,REGULATOR,COMPACT
16	1	14012117Ar	VALVE CHECK .50 FPT WITH VITO
17	1	75012111	VALVE,SOL,DIAGHRAM,2-WAY,0.75 NPT,SS
18	1	75012111A	VALVE,SOL,DIAGHRAM,2-WAY,0.75 NPT,SS
19	2	75012112	VALVE,CHECK,0.375 FNPT,316SS
20	2	76012080	VALVE,CHECK,3/8FPT W/VITO PVC
21	3	1413091200-04	SOLENOID VALVE, 3-WAY, 3/8"
22	1	30-0061	TEE, NYL, 3/4" FNPT
23	1	30-0062	NIPPLE, NYL, 1/2" NPT X CLOSE
24	1	30-0092	COUPLING,.50 FNPT,316SS
25	1	30-0277	ELBOW, NYL, 3/4"MNPT X 1" HB
26	3	30-0441	ELBOW, NYL, 3/4" MNPT X 3/4" HOSE BARB
27	1	30-0453	ADAPTER, 1/2" MNPT X 1/2" HOSE BARB
28	3	30-0506	ADPTR, NYL, 3/4" MNPT X 1" HOSE BARB
29	2	30-0674	TEE, NYL, 1/2" FNPT
30	2	30-0689	ADAPTER 0.75 FPT x BARB
31	2	30-1544	BUSHING, NYL, 3-4M X 3-8F
32	1	01120125DG	ELB90 1-2FPTX1-2FPT NYL
33	1	01122923DG	RB 0.50 MPT x 0.25 FT NYL
34	1	01122934DG	RB .75 MPT X .25 FNPT NYLON
35	1	01124237DG	TEE 0.75 FPT X FPT X FPT NYLON
36	2	01126526DG	ADAP 0.50 MPT x 0.75 BARB NYLON
37	3	01173737CL	NIPPLE 0.75 NPT x CL SS
38	1	26012023	NIPPLE,0.25 MNPT x CL,S40,SS316
39	1	26012094	ELB90 -8 FLARE x 0.50 FT SS
40	1	28012047	ELB90,STREET,NYLON,3-8 FNPT x 3-8 MNPT
41	2	28012127	RB,NYL,0.50 MPT x 0.38 FPT
42	2	0101052583	ELB90 0.50 SL x SL
43	2	0101053783	ELB90 0.75 SL x SL
44	1	0101312483	RB 0.50 SL x 0.38 FPT
45	1	0101313583	RB 0.75 SL x 0.38 FT
46	1	0101322483	RB 0.50 SL x 0.38 SL
47	1	0101323483	RB 0.75 SL x 0.25 FT
48	1	0101372540	NIPPLE 0.50 NPT x 4.00
49	1	0101423783	TEE 0.75 FT x FT x FT
50	1	0101462583	TEE 0.50 FT x FT x FT
51	1	0101463783	TEE 0.75 SL x SL x SL
52	1	0112071900	ELB90 .375 MPT x .50 BARB NYLON
53	1	0117022569	ELB90 0.50 MPT x 0.50 MPT SS316

1. ENG MUST APPROVE ANY DEVIATIONS
NOTES: UNLESS OTHERWISE SPECIFIED

DIMENSIONAL TOLERANCES - UNLESS OTHERWISE SPECIFIED			
MACHINED			WELDMENT
FRACTION	±1/32"		± 1/16"
X	-	± 4mm	± 1/8"
.X	± .1"	± 2mm	± 1/16"
.XX	± .01"	± .25mm	± 1/32"
.XXX	± .005"	± .025mm	-
ANGULAR ± 1'			
125 UNLESS OTHERWISE SPECIFIED			

CUSTOMER -

PROJECT -

DRAWN - RD DATE - 06/20/2017

CHECKED - JB DATE - 06/20/2017

APPROVED - SY DATE - 06/20/2017

DRY WT: 34.627 lbmass

WET WT:

CONTRACT NO

Parker Sea Recovery
Parker Hannifin Corporation
Filtration Group / Water Purification
2630 E. El Presidio Street
Carson, CA 90810
Contact
Office: 310-608-5600
Fax: 310-608-5692
www.parker.com

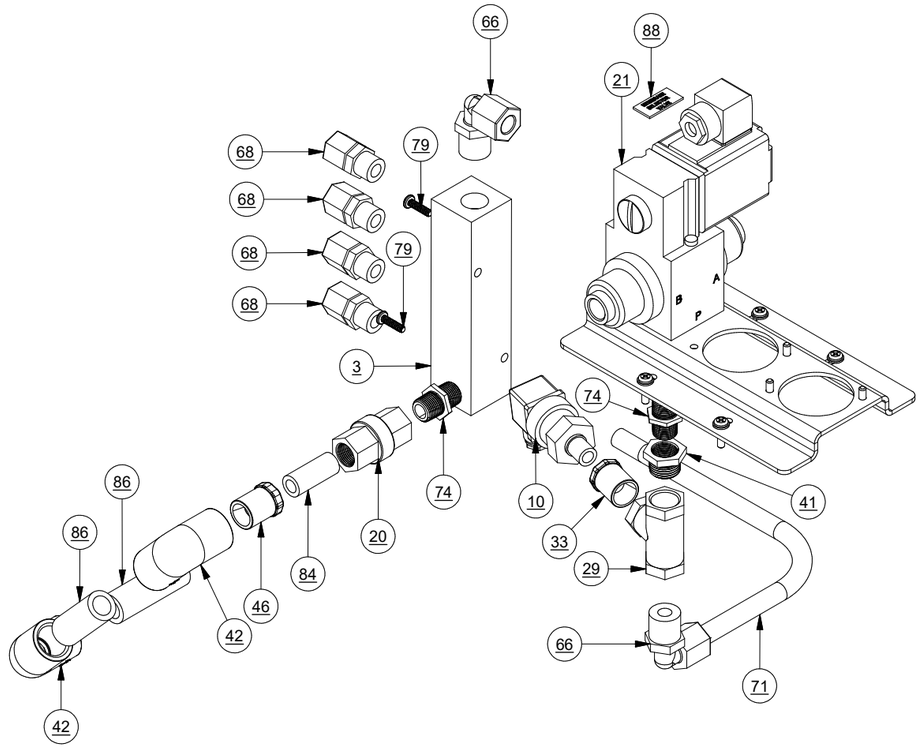
VALVE-PLUMB,CONTRL,ASSY,AQUA,DUAL

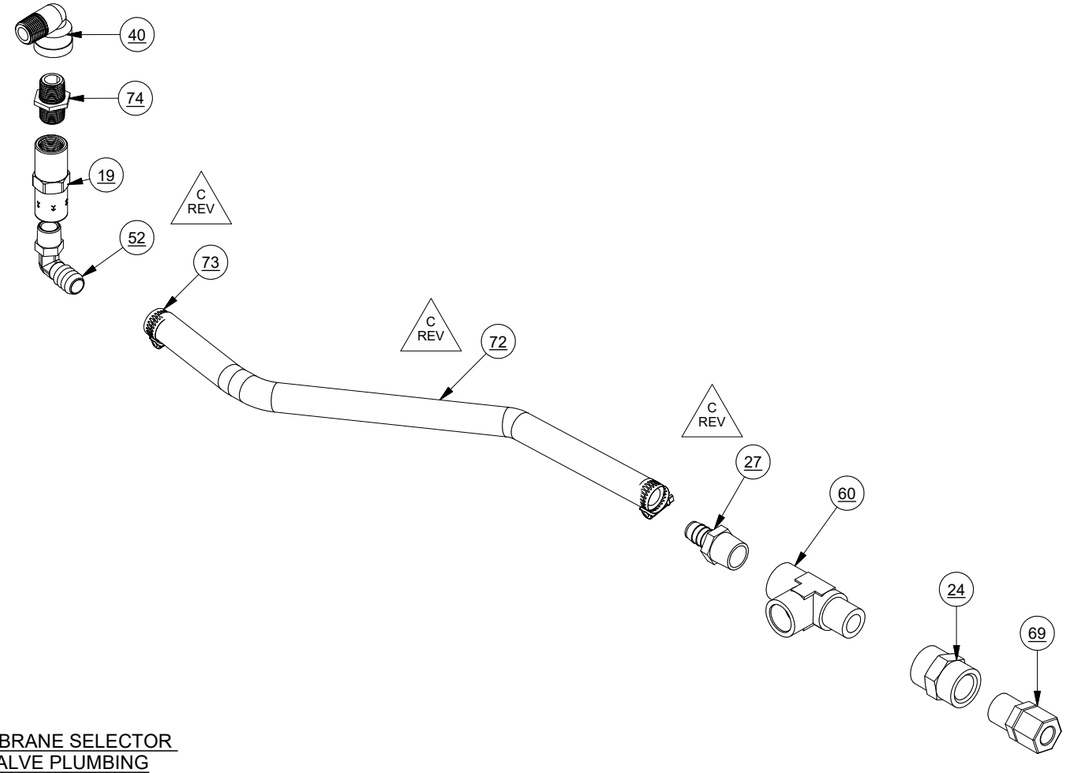
SIZE D | DWG NO 0821009 | REV C

SCALE | 1 OF 6

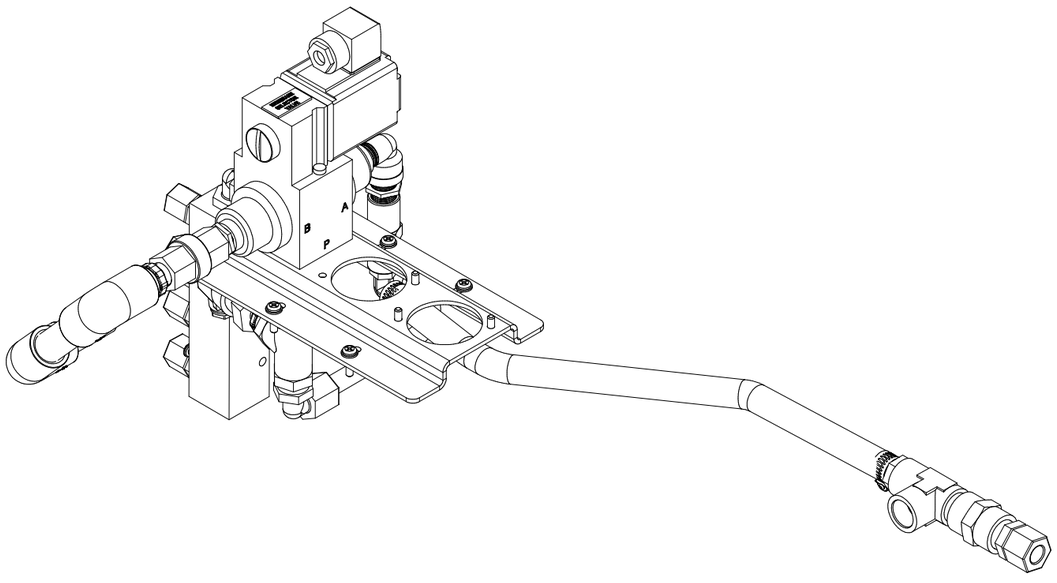
DWG NO 0821009

SH 1





MEMBRANE SELECTOR
VALVE PLUMBING
SV-1004 WITH PT-1007
EXPLODED VIEW

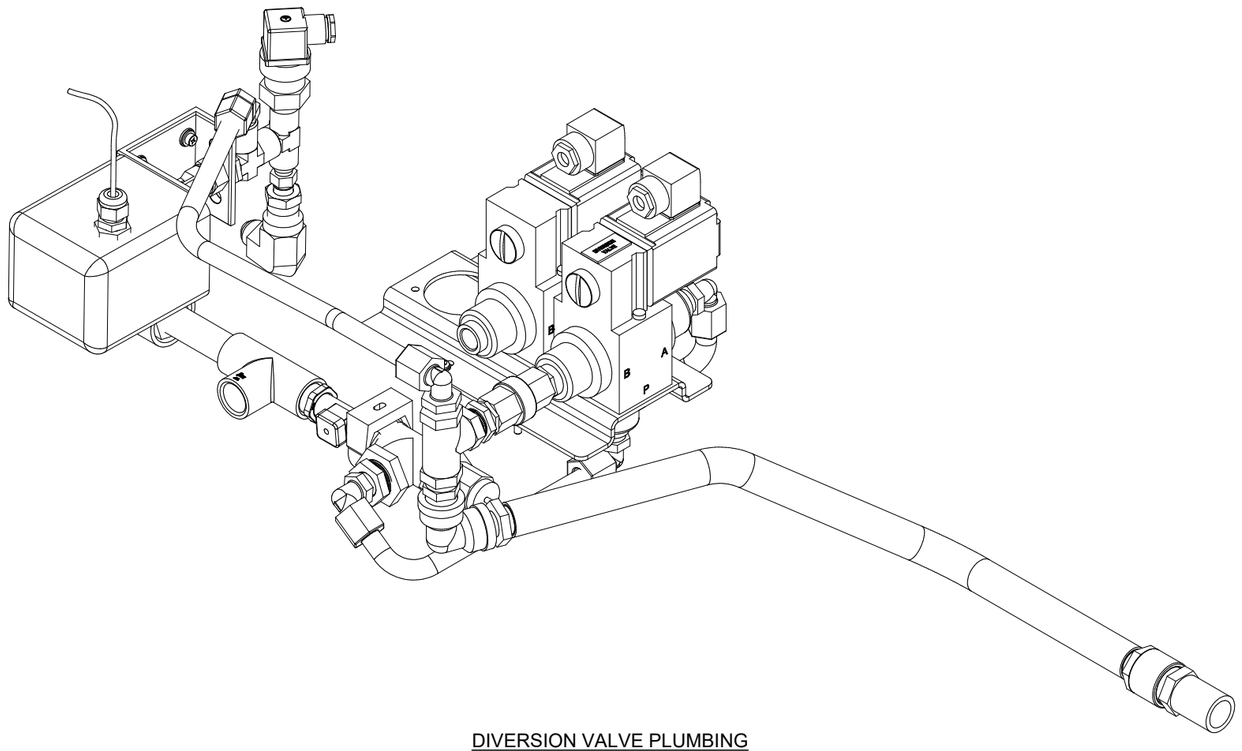


MEMBRANE SELECTOR
VALVE PLUMBING
SV-1004 WITH PT-1007

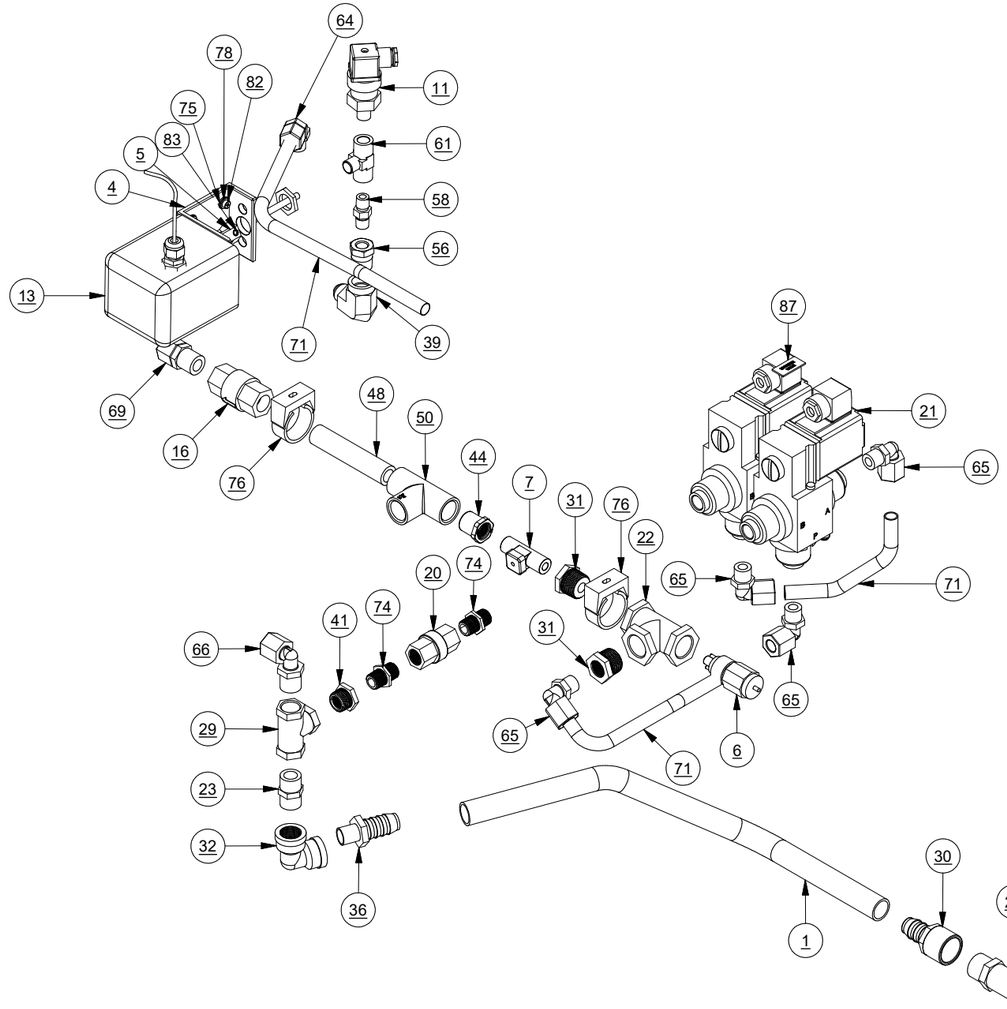
SIZE	DWG NO	REV
D	0821009	C
SCALE NTS	2 OF 6	

DWG NO 0821009

SH 2



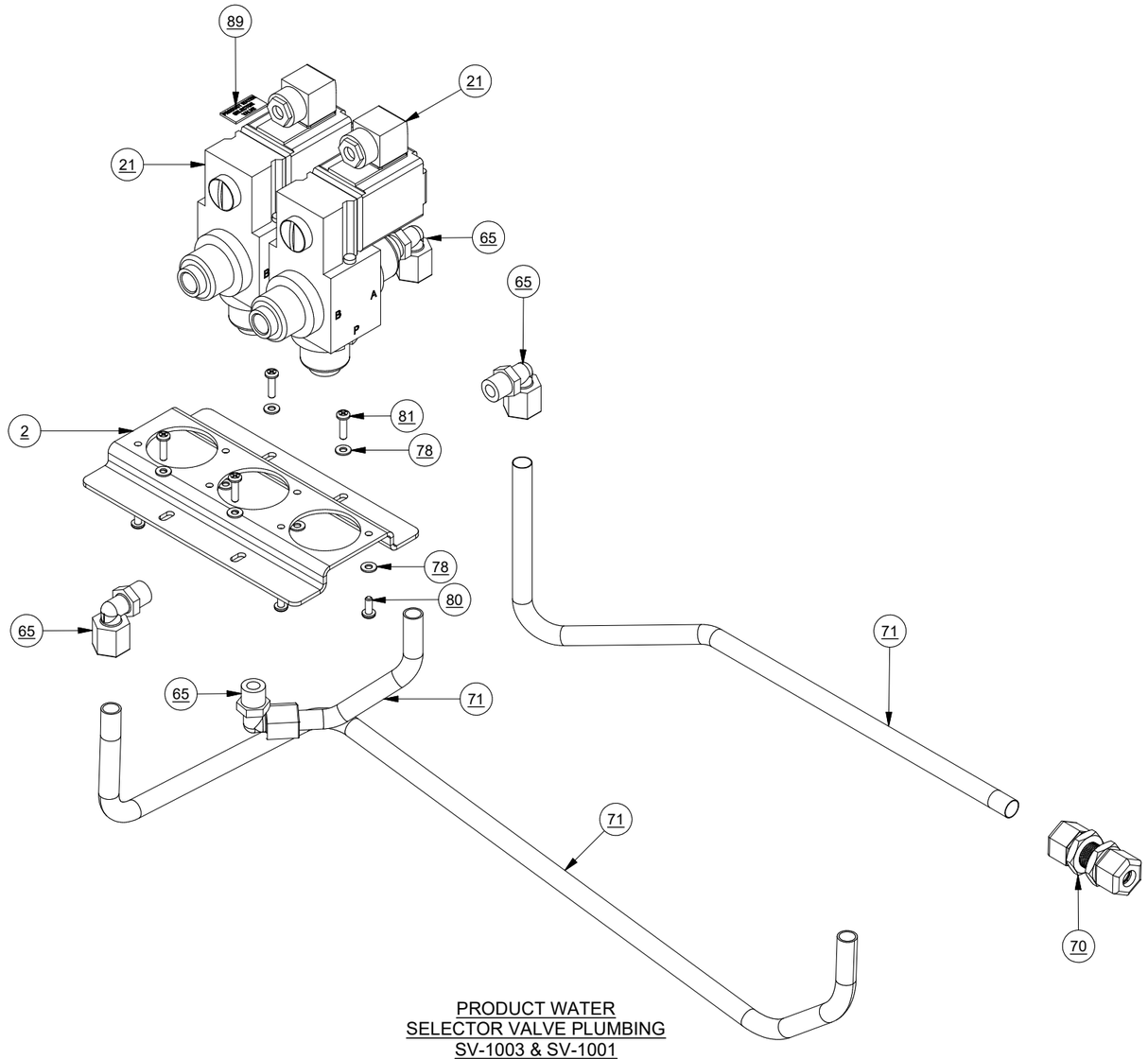
DIVERSION VALVE PLUMBING
SV-1001 & BPR-1001 WITH PT-1006, TDS-1001, & FE-1002



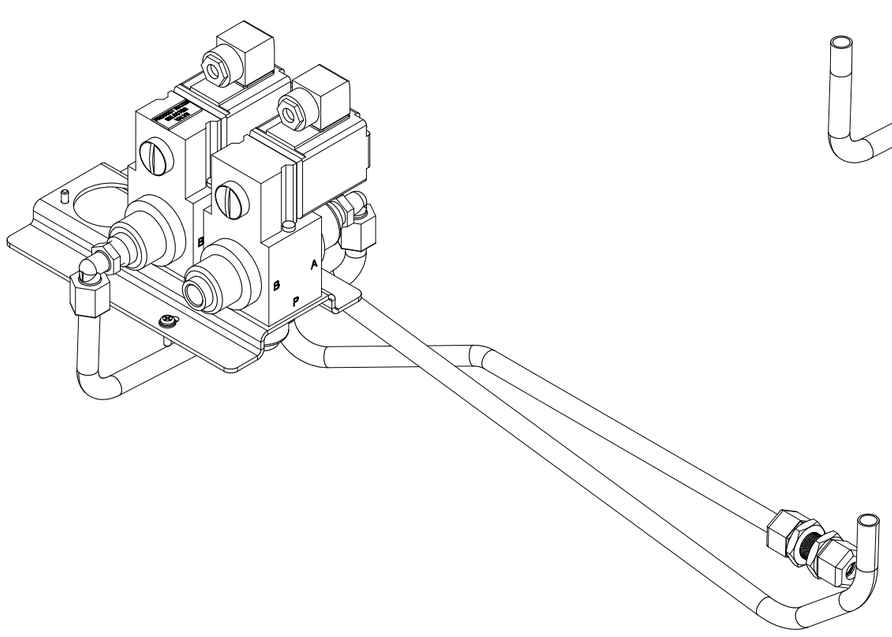
DIVERSION VALVE PLUMBING
SV-1001 & BPR-1001 WITH PT-1006, TDS-1001, & FE-1002
EXPLODED VIEW

SIZE	DWG NO	REV
D	0821009	C
SCALE NTS	3 OF 6	

DWG NO 0821009
SH 3



PRODUCT WATER
SELECTOR VALVE PLUMBING
SV-1003 & SV-1001
EXPLODED VIEW

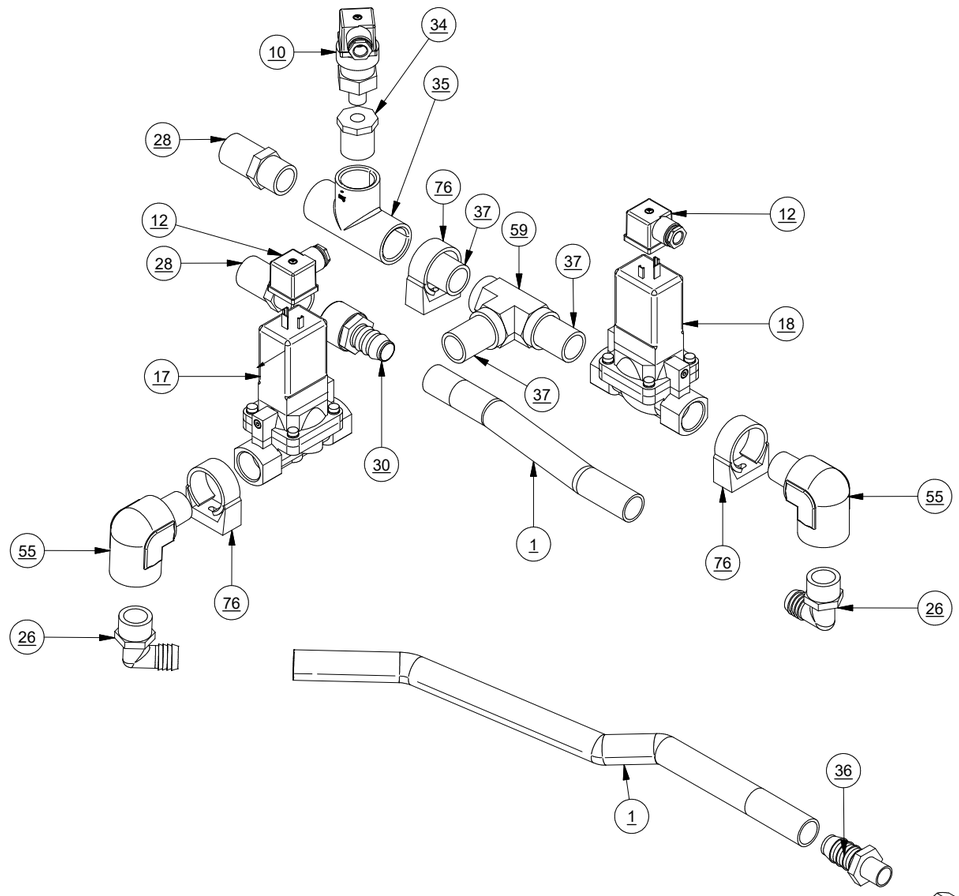


PRODUCT WATER
SELECTOR VALVE PLUMBING
SV-1003 & SV-1001

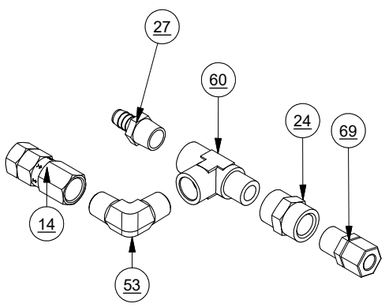
SIZE	DWG NO	REV
D	0821009	C
SCALE NTS	4 OF 6	

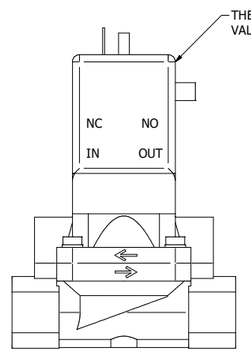
DWG NO 0821009

SH 4

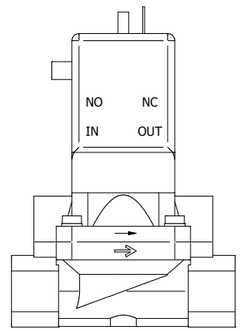


LP SELECTOR
VALVE PLUMBING
SV-1002-A & B
EXPLODED VIEW

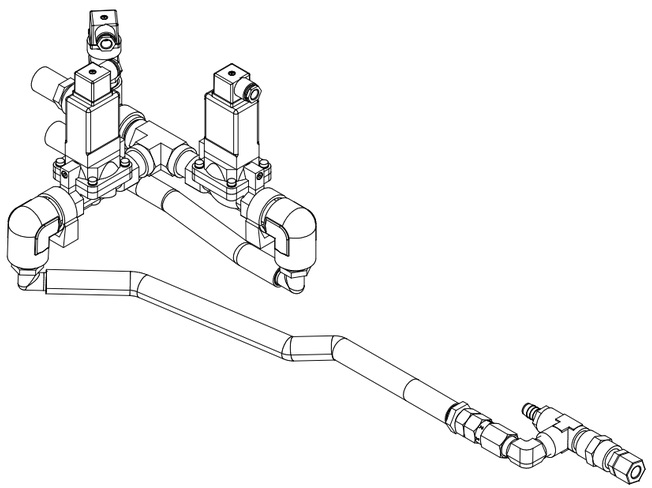




SV 1002 A



SV 1002 B

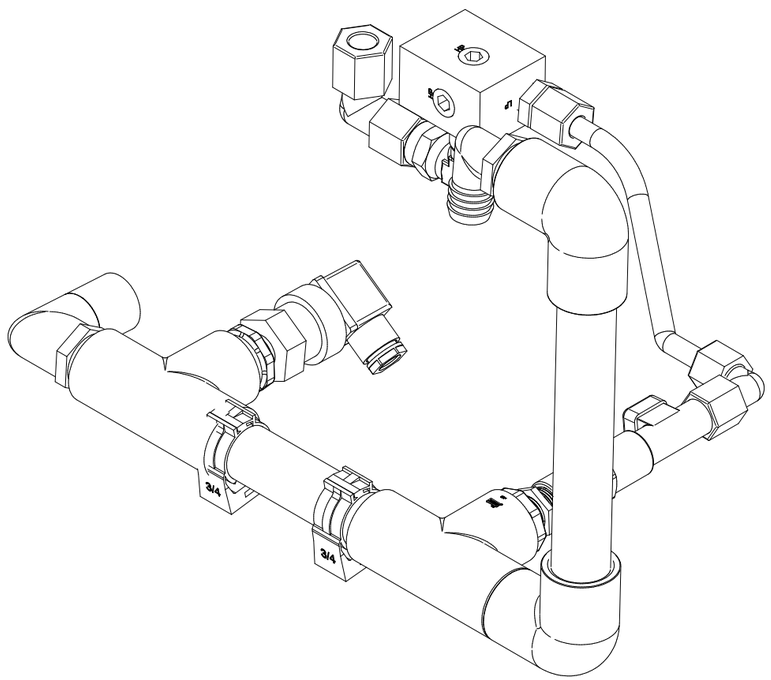


LP SELECTOR
VALVE PLUMBING
SV-1002-A & B

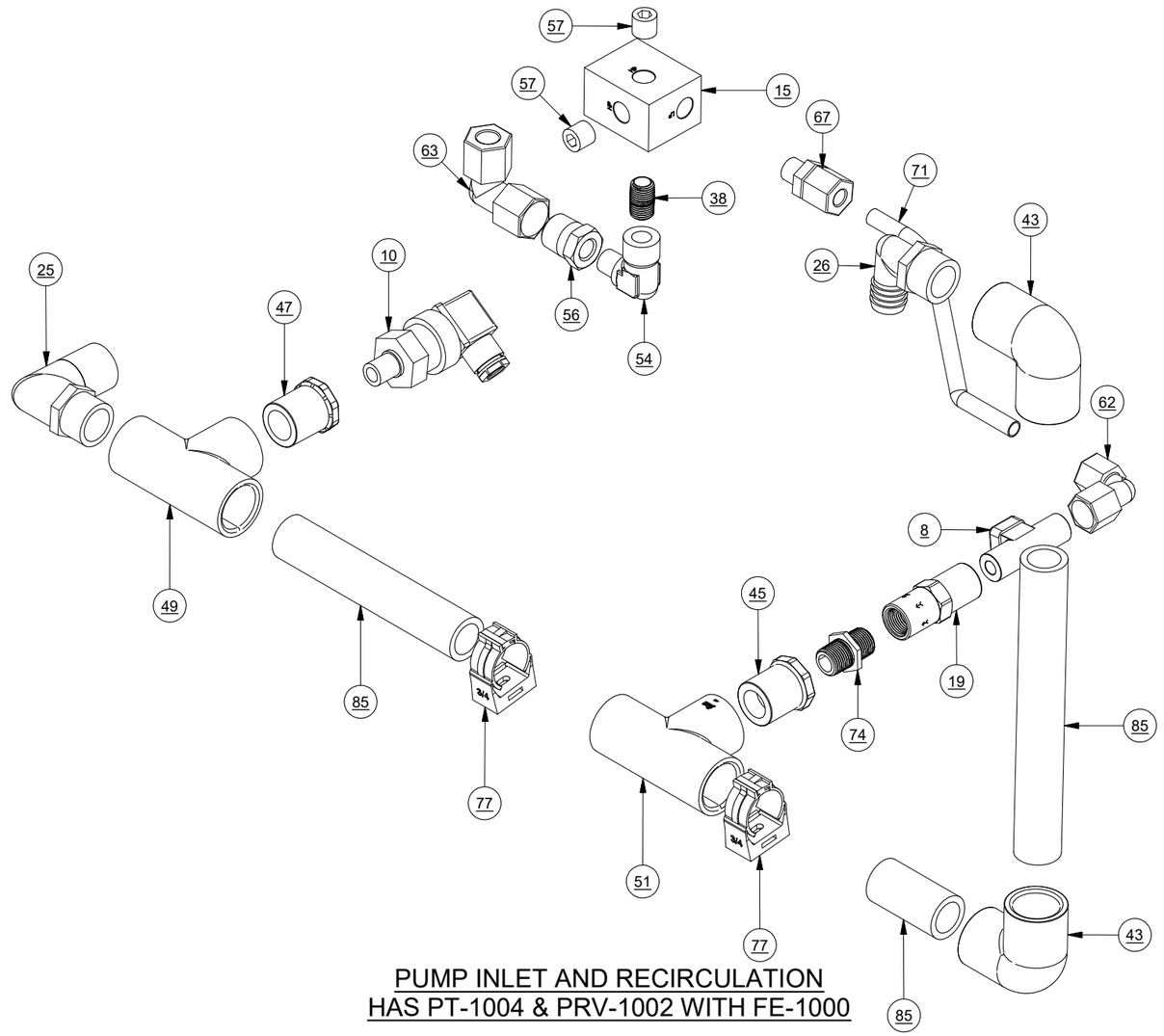
SIZE	DWG NO	REV
D	0821009	C
SCALE NTS	5 OF 6	

DWG NO 0821009

SH 5



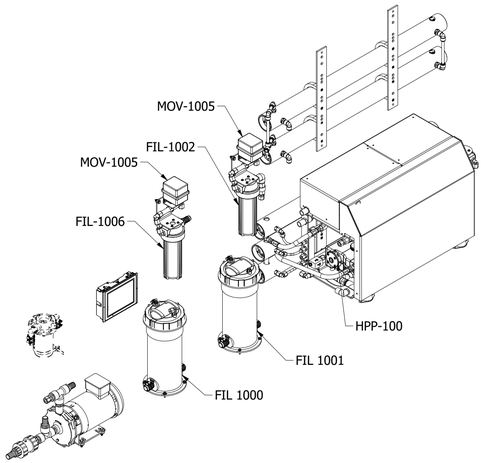
PUMP INLET AND RECIRCULATION
PT-1004 & PRV-1002 WITH FE-1000



PUMP INLET AND RECIRCULATION
HAS PT-1004 & PRV-1002 WITH FE-1000

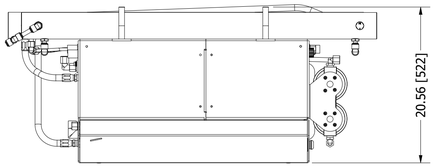
SIZE	DWG NO	REV
D	0821009	C
SCALE NTS	6 OF 6	

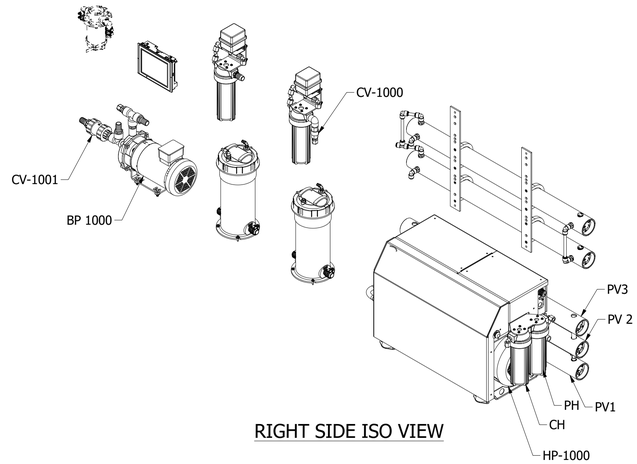
DWG NO 0821009



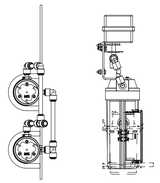
LEFT SIDE ISO VIEW

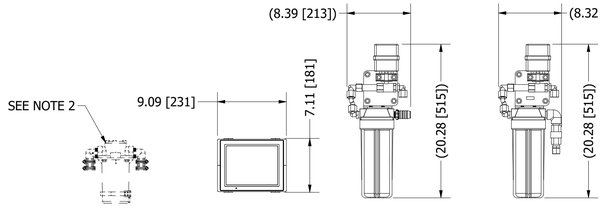
TOP VIEW

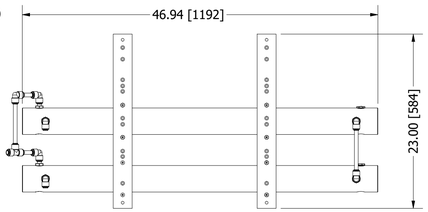


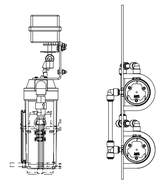


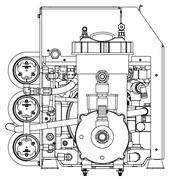
RIGHT SIDE ISO VIEW



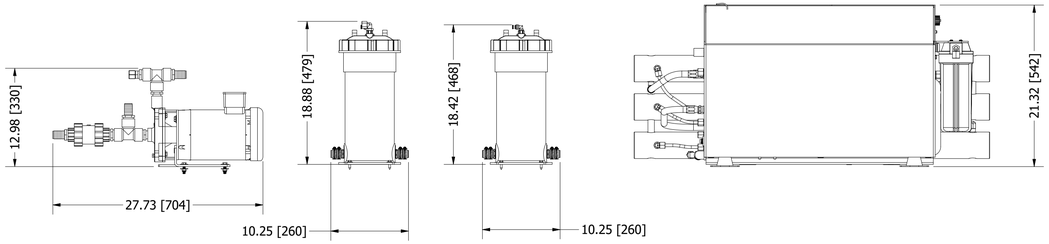




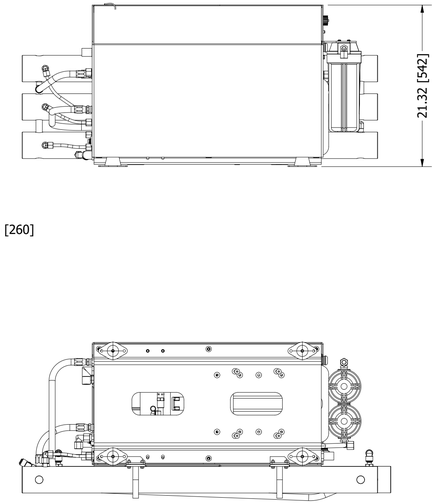


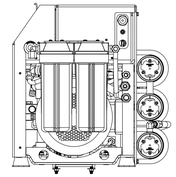


LEFT SIDE VIEW

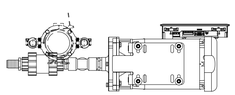


FRONT VIEW





RIGHT SIDE VIEW



BOTTOM VIEW

2. SEA STRAINER IS FOR REFERENCE ONLY AS IT IS PART OF THE INSTALLATION KIT.
1. ENG MUST APPROVE ANY DEVIATIONS

NOTES: UNLESS OTHERWISE SPECIFIED

DIMENSIONAL TOLERANCES - UNLESS OTHERWISE SPECIFIED			
MACHINED			WELDMENT
FRACTION	±1/32"		± 1/16"
X	-	± 4mm	± 1/8"
.X	± .1"	± 2mm	± 1/16"
.XX	± .01"	± .25mm	± 1/32"
.XXX	± .005"	± .025mm	± 1/32"
ANGULAR ± 1'			
125 UNLESS OTHERWISE SPECIFIED			

CUSTOMER -

PROJECT -

DRAWN - KR DATE - 4/23/2020

CHECKED - SY DATE - 4/23/2020

APPROVED - BB DATE - 4/23/2020

DRY WT: 493 lbs 224 kg

WET WT: 568 lbs (258 Kg)

CONTRACT NO

Parker Sea Recovery

Parker Hannifin Corporation
Filtration Group / Water Purification
2630 E. El Presidio Street
Carson, CA 90810

Contact
Office: 310-608-5600
Fax: 310-608-5692
www.parker.com

AQUA DUAL COMPACT AMDP,2600GPD SW/2200GPD TW, 380-460VAC/3PH/50-60Hz

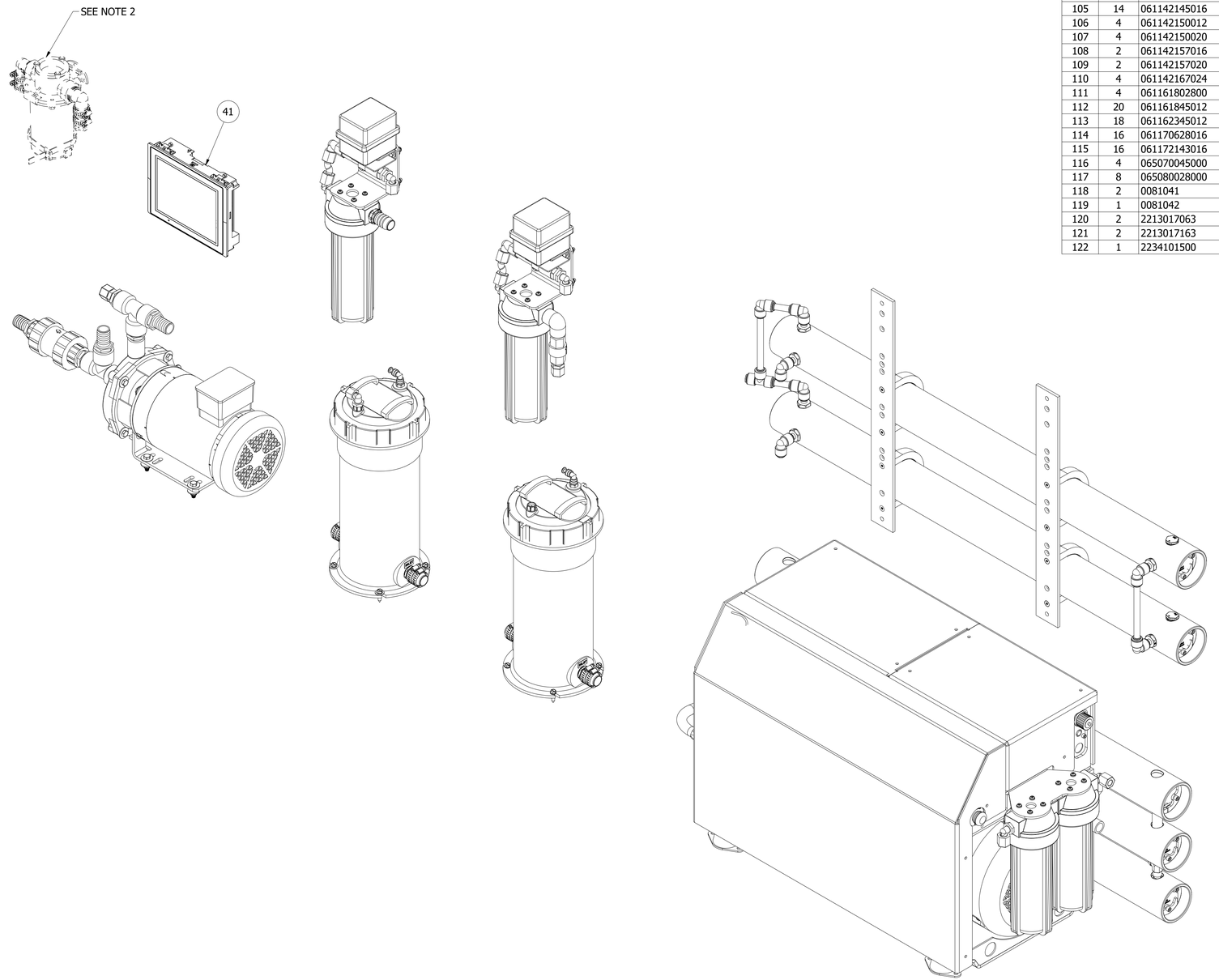
SIZE D | DWG NO A400C-0102 | REV -

SCALE NTS | 1 OF 6

DWG NO A400C-0102

SH 1

A

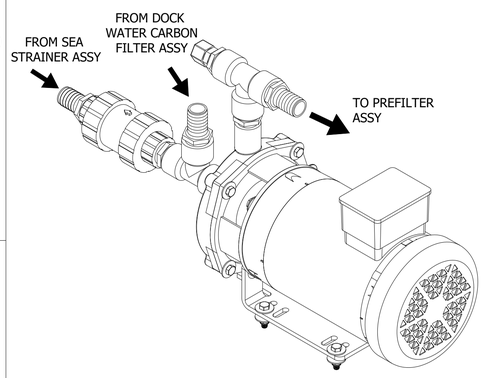


PARTS LIST				PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION	ITEM	QTY	PART NUMBER	DESCRIPTION
86	2	0312124269	TUBING,PARAFLEX,BLACK,0.50 x 10.00L	1	1	0821009	VALVE-PLUMB,CONTRL,ASSY,AQUA,DUAL
87	4	20-2449	ISOLATION MOUNT,.38-16UNC THD NEOPRENE,50 DURO	2	1	0901104-B	AGUA DULCE,380-480VAC,3PH
88	8	05181435AA	CLAMP,HOSE,SS,1"	3	1	11012101	FRAME,ASSY,AL, AQUA DUAL
89	2	0204020100	ELB90 1/4 MPT X 1/4 TU JG PLASTIC	4	10	05202401GR	BRACKET,MVA U-CLAMP,3 IN
90	2	0204990300	PLUG .25 JQ	5	1	11012100	BASE, PUMP,AL, AQUA DUAL
91	6	2132021600	RUBBER MOUNT GROMMET 1 1-4 OD_1.50	6	1	11012102	BRACKET, PUMP, AL,AQUA PRO
92	12	2614017900	O-RING 115 INTERCONNECT AW	7	1	11012106	COVER,ELECT,ENCL,AQUA DUAL
93	2	2614018969	O-RING 034 COMMERICAL PREFILTER SEAL	8	1	11012107	COVER,PLUMB,ENCL,AQUA DUAL
94	2	3901040100	ADAPTER SPACER RING, COMMERCIAL FILTERS	9	1	11012108	COVER, SOUND, FRONT,AQUA DUAL
95	10	061060045000	NUT HEX .25-20 W-INSERT SS	10	2	11012171	BRACKET, MEMBRANE, AL,AQMDP
96	8	061060050000	NUT HEX .31-18 W-INSERT SS	11	2	0117410800	HP NIPPLE 0.25 MPT
97	20	061080028000	WASHER FLAT #10 SS	12	2	0520052000	PLATE,SUPPORT,3 VESSEL,3 IN,6061-T6,23.00x2.50x0.25TH
98	8	061080049000	WASHER,FLAT,5-16 IN,SS	13	6	0520210600	RETAINER PORT MVA
99	12	061080056000	WASHER,FLAT,3/8",SS	14	2	2020040006	BRACKET,FWF,FILTER,CARBON - PR
100	4	061080066000	WASHER,FLAT,1/2",SS	15	2	2417430800	INTERCONNECT MVA SS
101	28	061100043000	WASHER FLAT OS .25 SS	16	1	2453502402	PLUG END, SRC DUAL 3X3.35 IN
102	8	061100049000	WASHER,FLAT,OS,5/16",SS	17	3	2453502403	PLUG END, SNGL, 3X3.35 IN
103	2	061100056000	WASHER,FLAT,OS,3/8",SS	18	1	20200402101	DUAL BRACKET PREFILTER-CHRCL-PLNKTN
104	4	061120066000	WASHER,LOCK,1/2",SS	19	6	20201030000	SEGMENT RING (SET)
105	14	061142145016	SCREW,HEX HEAD,.25-20x1",SS	20	2	H36160522402	PLUG END, HRO DUAL 3X3.35 IN
106	4	061142150012	SCREW,HEX HEAD,.31-18x0.75,SS	21	2	50012017	KIT,VESSEL ASSY,3040,FRP,600PS
107	4	061142150020	BOLT HEX .31-18 X 1.25 SS	22	1	20-0683	BELL HOUSING,3.5 GPM PLGR PUMP
108	2	061142157016	SCREW,HEX HEAD,3/8-16x1",SS	23	1	70-6178C1	PUMP,708-5, 5 PLGR, 8GPM
109	2	061142157020	SCREW,HEX HEAD,3/8-16x1-1/4",SS	24	1	72012009	COUPLING, JAW, ML-099 X 1-3/8"
110	4	061142167024	SCREW,HEX HEAD,1/2-13x1 1/2",SS	25	1	72012011	INSERT, SPIDER, URETHANE, ML-099
111	4	061161802800	SC ALLEN FLT .313-18X1.75	26	1	72012014	COUPLING,JAW,ML-099 X 0.9375IN
112	20	061161845012	SC ALLEN FLAT .25-20 X .75 SS	27	1	1217514772	BOOSTER PUMP HEAD HP75 SS
113	18	061162345012	SC SOC CAP .25-20 X .75 SS	28	1	1544182210	MOTOR,2HP,460-60-3,1.5HP,380-50-3
114	16	061170628016	SC PHIL PAN A #10 X 1 SS	29	1	1569263200	MTR 7.5-5HP,230-460,190-380,3PH,60-50HZ
115	16	061172143016	SCREX,HEX A,.25x1.00,SS	30	2	33-3040	ELEMENT,BW-3040
116	4	065070045000	NUT HEX .25-20 FLANGED	31	2	07620310WA	FILTER HOUSING 32.5 SQFT
117	8	065080028000	WASHER FLAT #10 NYLON	32	1	08020723KD	ELEMENT OWSE 32.5 SQFT
118	2	0081041	LABEL SRC COMM PREFILTER	33	4	0713020873	FILTER HOUSING .50 X 10
119	1	0081042	LABEL,OIL WATER, SEPARATOR	34	1	0801063357	ELEMENT CPFE 5 MIC 32.5 SQFT
120	2	2213017063	LABEL INLET (WHITE BACKGROUND)	35	4	0803004773	ELEMENT,CHARCOAL,2.5 x10.0
121	2	2213017163	LABEL OUTLET (WHITE BACKGROUND)	36	3	2724011433	MEMBRANE 900GPD AW W SEAL 3
122	1	2234101500	LABEL FRESH WATER FLUSH	37	1	90012047	PUSHBUTTON,ESTOP,16mm, MUSH, HEAD
				38	1	313110009DK	CONN MOD JACK PLUG RJ45
				39	3	2408132500-02	VESSEL HIGH PRESSURE 900GPD
				40	10	2615180100	FELT ADHESIVE 0.125 X 0.75 STRIP
				41	1	3131701447-V1.03	TOUCHSCREEN,8.4IN,COLOR,MULTI
				42	1	14012117Ar	VALVE CHECK .50 FPT WITH VITO
				43	2	1401105698	KZ VALVE FWF 0.50
				44	1	1401271942	VALVE,CHECK,TU,PVC,1.00
				45	3	30-0056	BUSHING, NYL, 1"M X 3/4"F THD
				46	1	30-0059	NIPPLE, NYL, 1" NPT X CLOSE W HEX
				47	1	30-0441	ELBOW, NYL, 3/4" MNPT X 3/4" HOSE BARB
				48	3	30-0615	ADPTR, NYL, 1" MNPT X 1" HOSE BARB
				49	2	30-0673	TEE, NYL, 1" FNPT
				50	1	30-1082	ADPTR, TI, 916-18 PUMP OUTLET
				51	1	70-3052	PLUG, MS18229-08
				52	2	01013725CL	NIPPLE 0.50 NPT x CL
				53	2	01123737DG	NIP 0.75 NPT X 0.75 NPT NYLON
				54	6	23012002	ELB90,TRUE SEAL,ACETAL,SWIVEL,0.50MTx0.50TUBE
				55	1	23012004	TEE,TRUE SEAL,ACETAL,0.50 TUBE
				56	1	23012015	ELB90,TRUE SEAL,ACETAL,0.50 TUBE x 0.50 TUBE
				57	1	0101012583	ELB90 0.50 FPT x FPT
				58	2	0101342583	PLUG 0.50 MT
				59	1	0101370815	NIPPLE 0.25 NPT x 1.50
				60	2	0101372530	NIPPLE 0.50 NPT x 3.00
				61	1	0101652783	ADAPTER 0.50 MPT x 1.00 BARB
				62	4	0101653883	ADAPTER 0.75 MPT x 1.00 BARB
				63	1	0117343769	PLUG 0.75 MT SS316L
				64	2	0171370815	NIPPLE 0.25 NPT x 1.50
				65	3	0204011769	ELBOW,PP,3/8 ODx1/4 FT
				66	2	0204012569	ELBOW,PP,1/2 ODx1/2 FT
				67	1	0204020869	ELBOW,PP,1/4 ODx1/4 MT
				68	6	0204022569	ELBOW,PP,1/2 ODx1/2 MT
				69	1	0204092569	FITTING,PP,1/2 ODx1/2 MT
				70	1	0204092669	FITTING,PP,1-2 ODx3-4 MT
				71	2	1317012469	ELB90 -8 FLARE x 0.25 MT SS
				72	4	1317482369	FITTING,HOSE,-8 SWIVEL,SS
				73	3	1904010243	STRAIN RELIEF 3222 .75 BLK
				74	1	1904010643	CORDGRIP,LT,14IN,BLK
				75	4	1904011800	STRAIN RELIEF 3 HOLE X 6MM
				76	12	2614010100	O-RING 116 PRODUCT AS-AW
				77	12	2614014900	O-RING 230 BRINE 3.0 END PLUG
				78	1	11012211	BRACKET,MOUNT,BP MTR,AL
				79	1	30012030	HOSE,HP,-8,.50,3000-PSI,BLK,9.30L
				80	1	30012030	HOSE,HP,-8,.50,3000-PSI,BLK,57.50L
				81	1	0312123569	TUBING,PARAFLEX,BLACK,0.38 x 8.00L
				82	1	0312123569	TUBING,PARAFLEX,BLACK,0.38 x 8.50L
				83	1	0312123569	TUBING,PARAFLEX,BLACK,0.38 x 11.00L
				84	2	0312124269	TUBE,BLK,NYL,0.50 OD x 3.00L
				85	2	0312124269	TUBE,BLK,NYL,0.50 OD x 6.90L

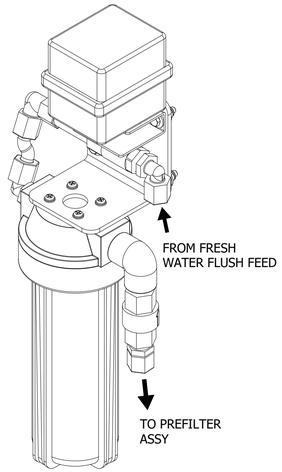
SIZE	DWG NO	REV
D	A400C-0102	-
SCALE NTS	2 OF 6	

DWG NO A400C-0102

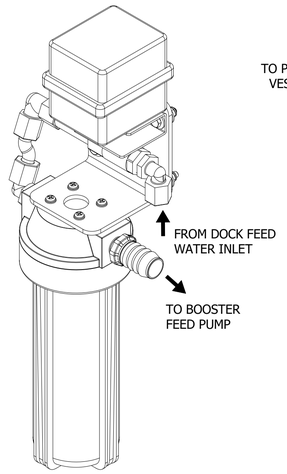
SH 2



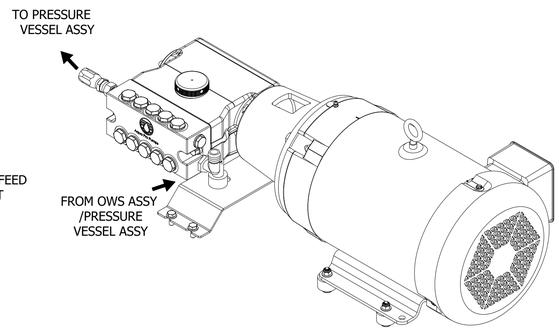
BOOSTER PUMP ASSY



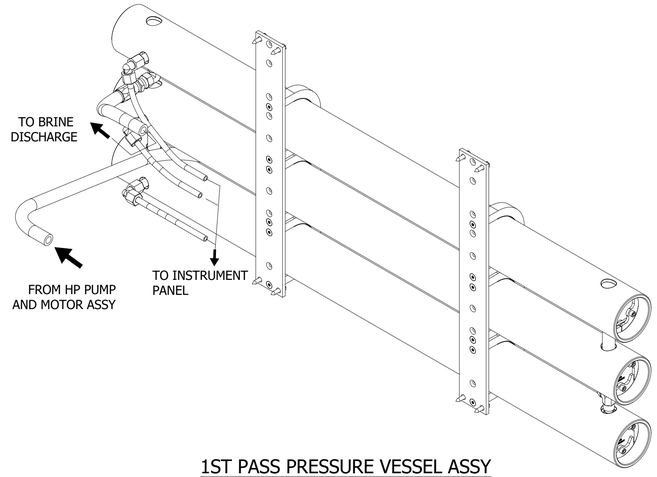
FRESH WATER FILTER ASSY



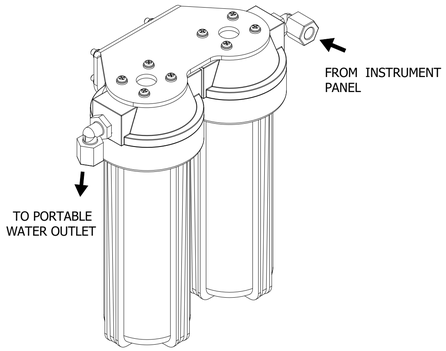
DOCK WATER CARBON FILTER ASSY



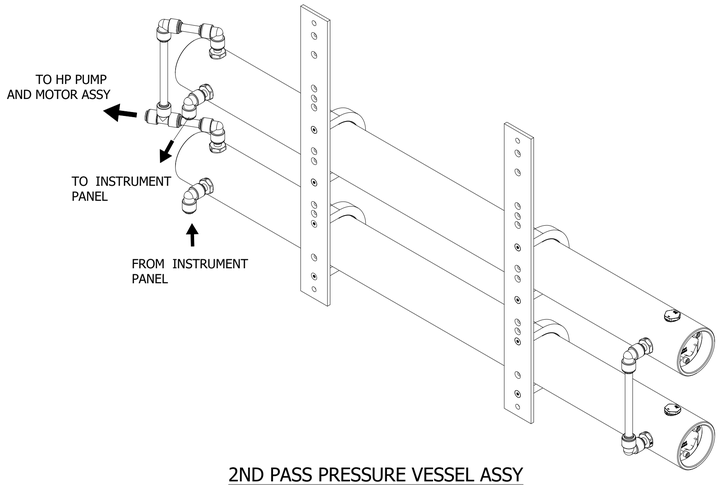
HP PUMP AND MOTOR ASSY



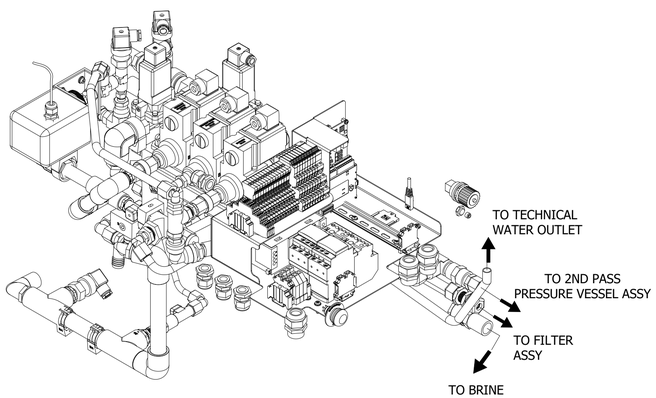
1ST PASS PRESSURE VESSEL ASSY



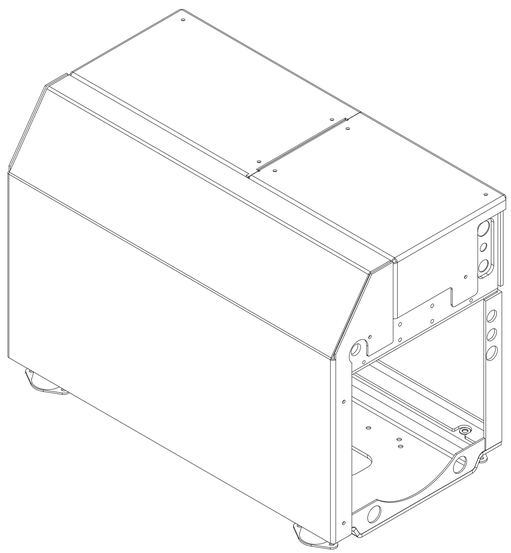
FILTER ASSY



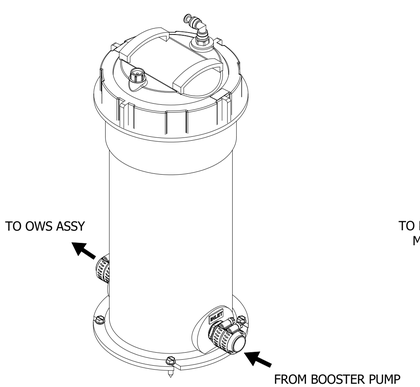
2ND PASS PRESSURE VESSEL ASSY



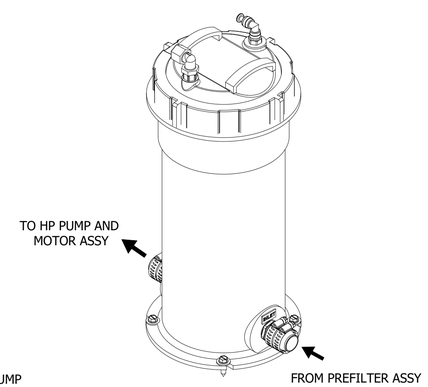
INSTRUMENT PANEL



FRAME ASSY



PREFILTER ASSY

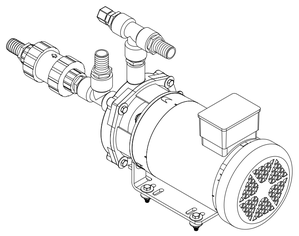


OWS ASSY

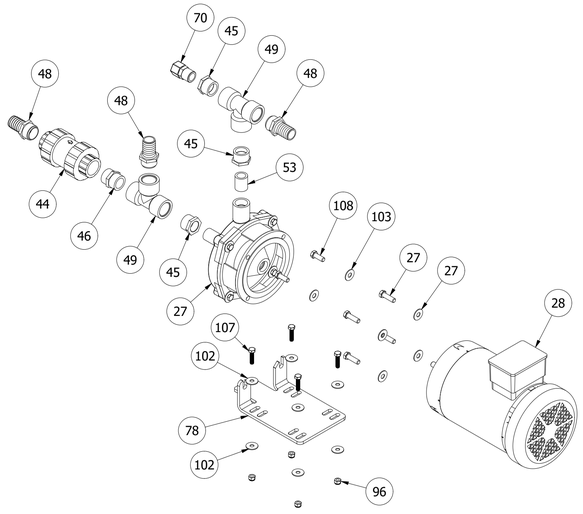
DWG NO A400C-0102

SH 3

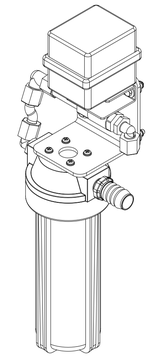
SIZE	DWG NO	REV
D	A400C-0102	-
SCALE NTS	3 OF 6	



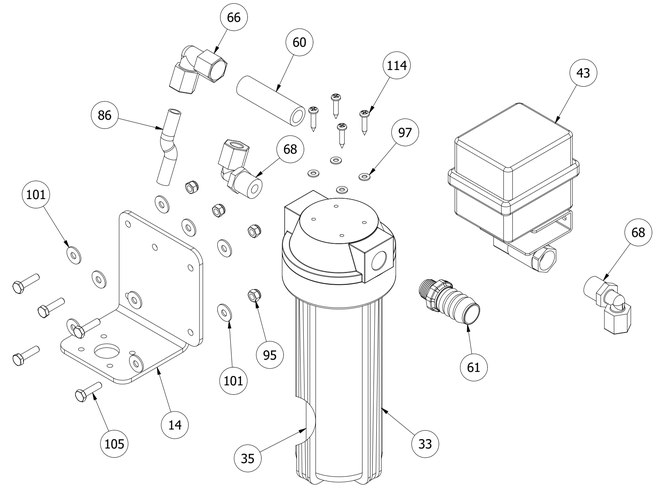
BOOSTER PUMP ASSY



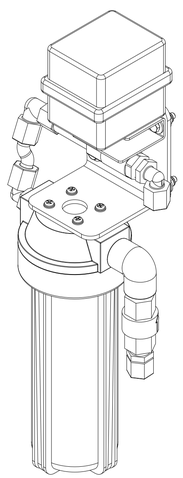
BOOSTER PUMP ASSY - EXPLODED



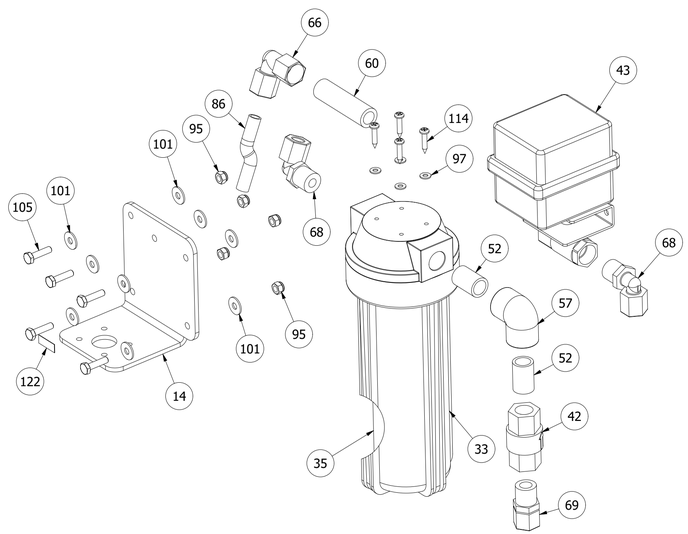
DOCK WATER CARBON FILTER ASSY



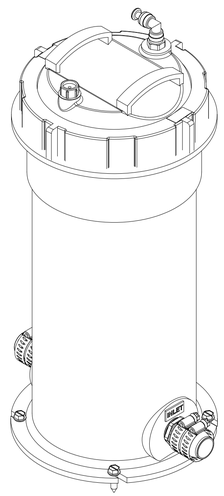
DOCK WATER CARBON FILTER ASSY - EXPLODED



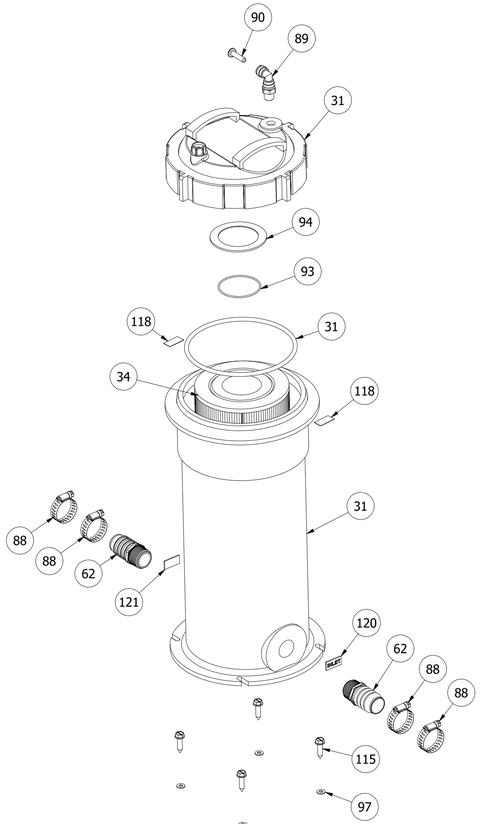
FRESH WATER FILTER ASSY



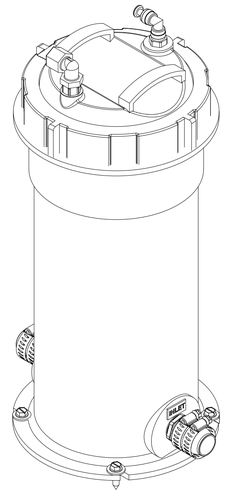
FRESH WATER FILTER ASSY - EXPLODED



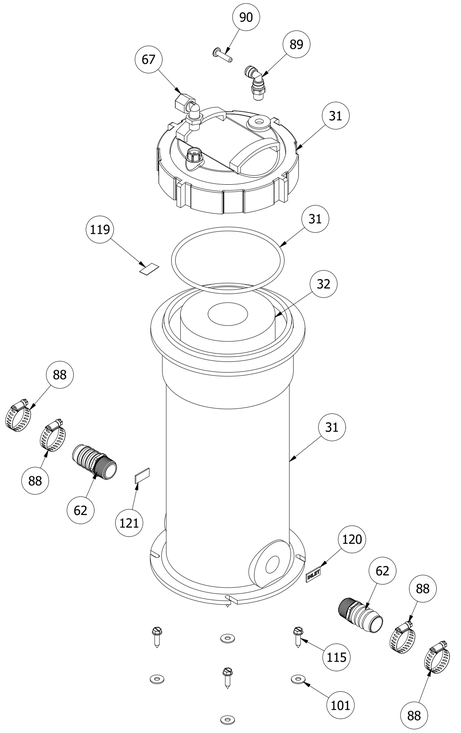
PREFILTER ASSY



PREFILTER ASSY - EXPLODED



OWS ASSY

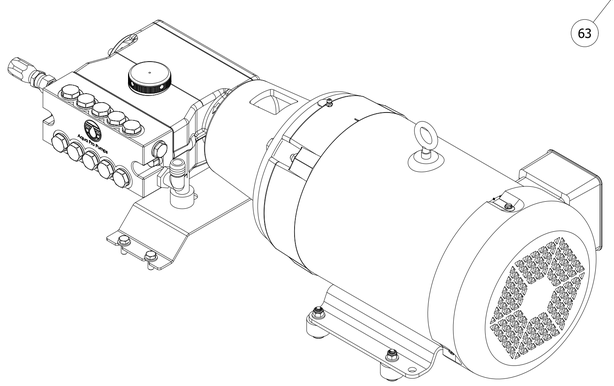


OWS ASSY - EXPLODED

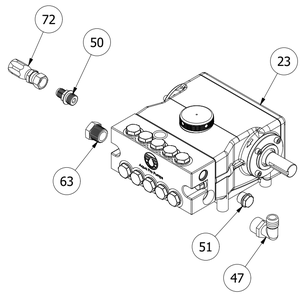
SIZE	DWG NO	REV
D	A400C-0102	-
SCALE NTS	4 OF 6	

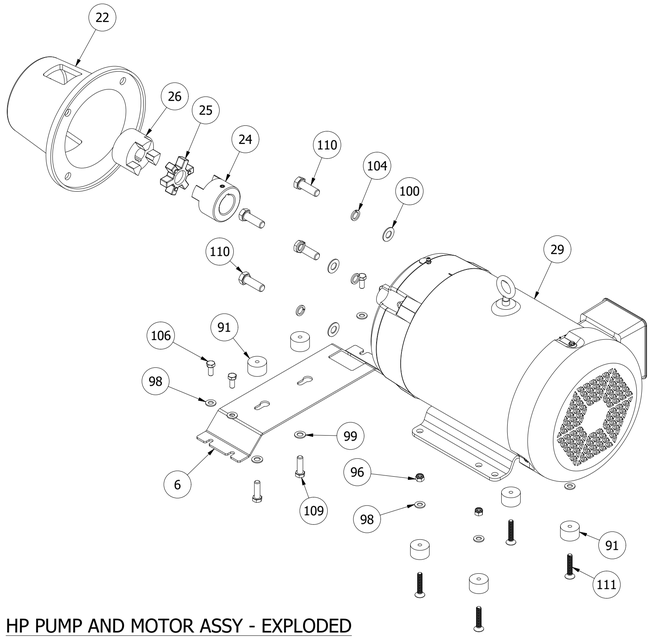
DWG NO A400C-0102

SH 4

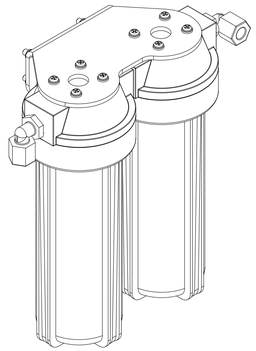


HP PUMP AND MOTOR ASSY

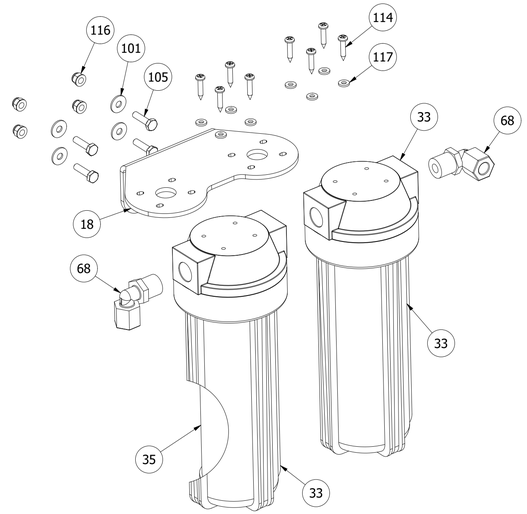




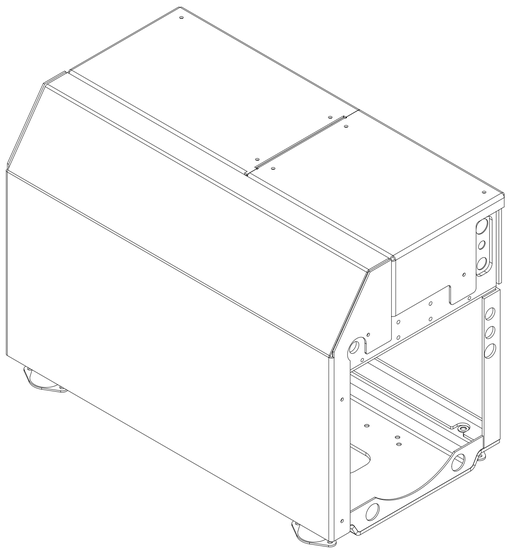
HP PUMP AND MOTOR ASSY - EXPLODED



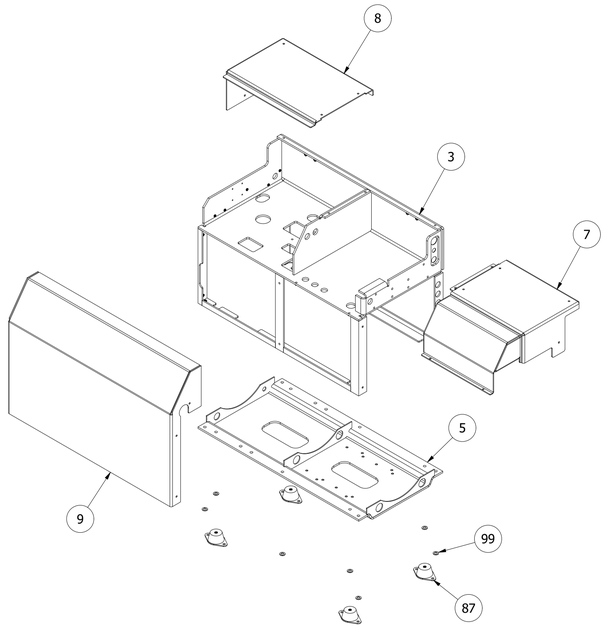
FILTERS ASSY



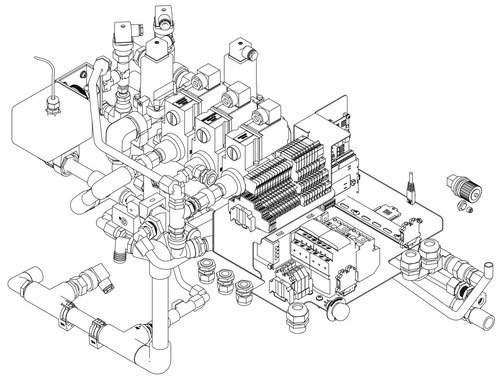
FILTERS ASSY - EXPLODED



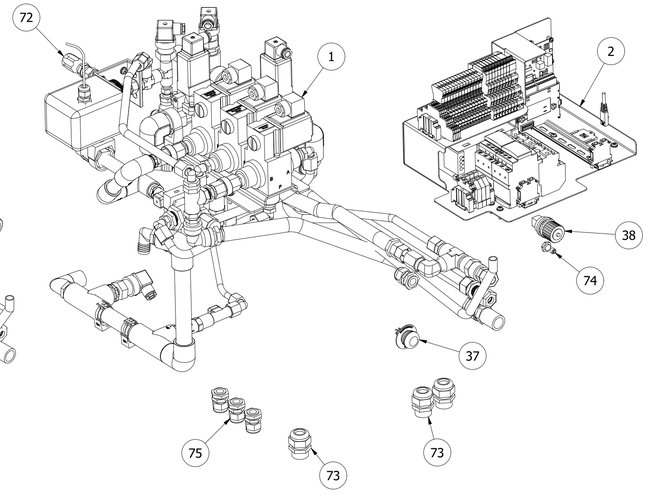
FRAME ASSY



FRAME ASSY - EXPLODED



INTRUMENT PANEL

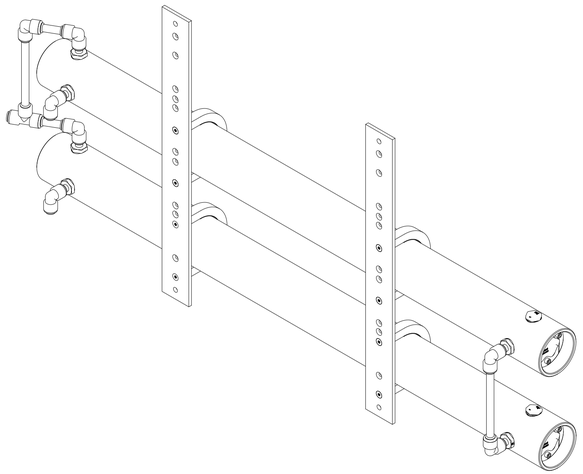


INTRUMENT PANEL - EXPLODED

SIZE	DWG NO	REV
D	A400C-0102	-
SCALE NTS	5 OF 6	

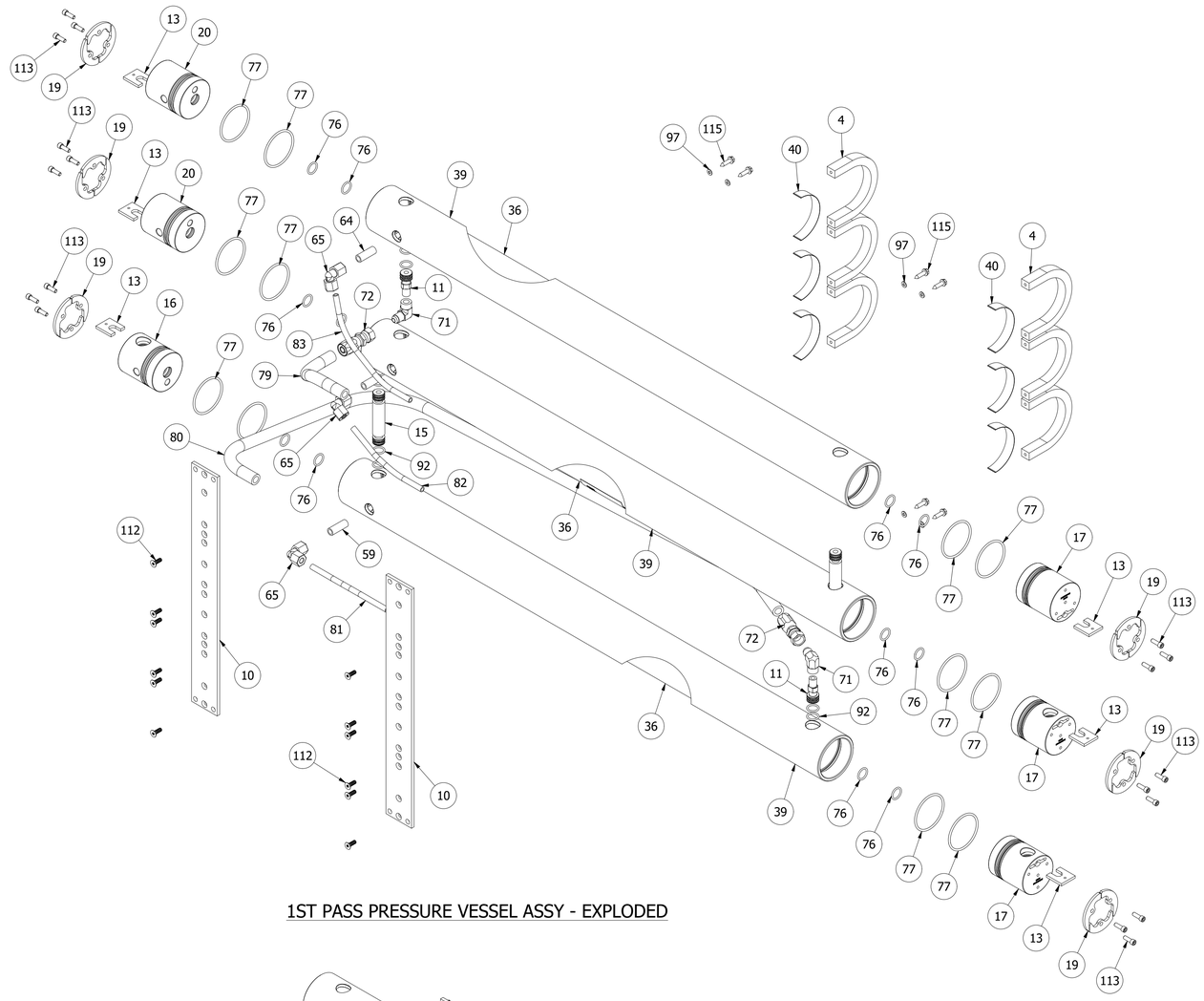
DWG NO A400C-0102

SH 5

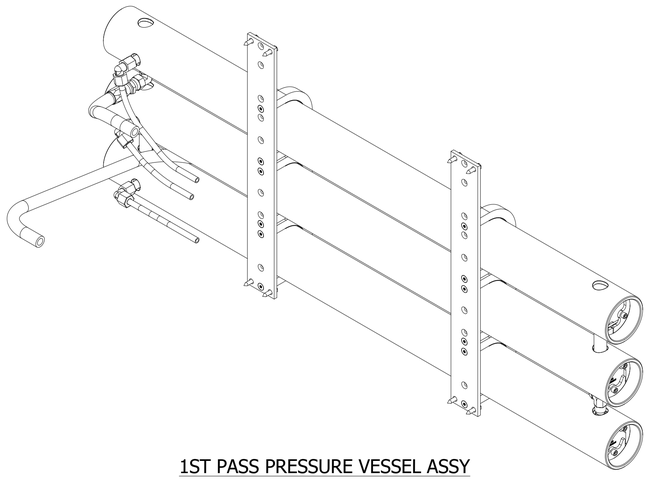


2ND PASS PRESSURE VESSEL ASSY

2ND PASS PRESSURE VESSEL ASSY - EXPLODED



1ST PASS PRESSURE VESSEL ASSY - EXPLODED



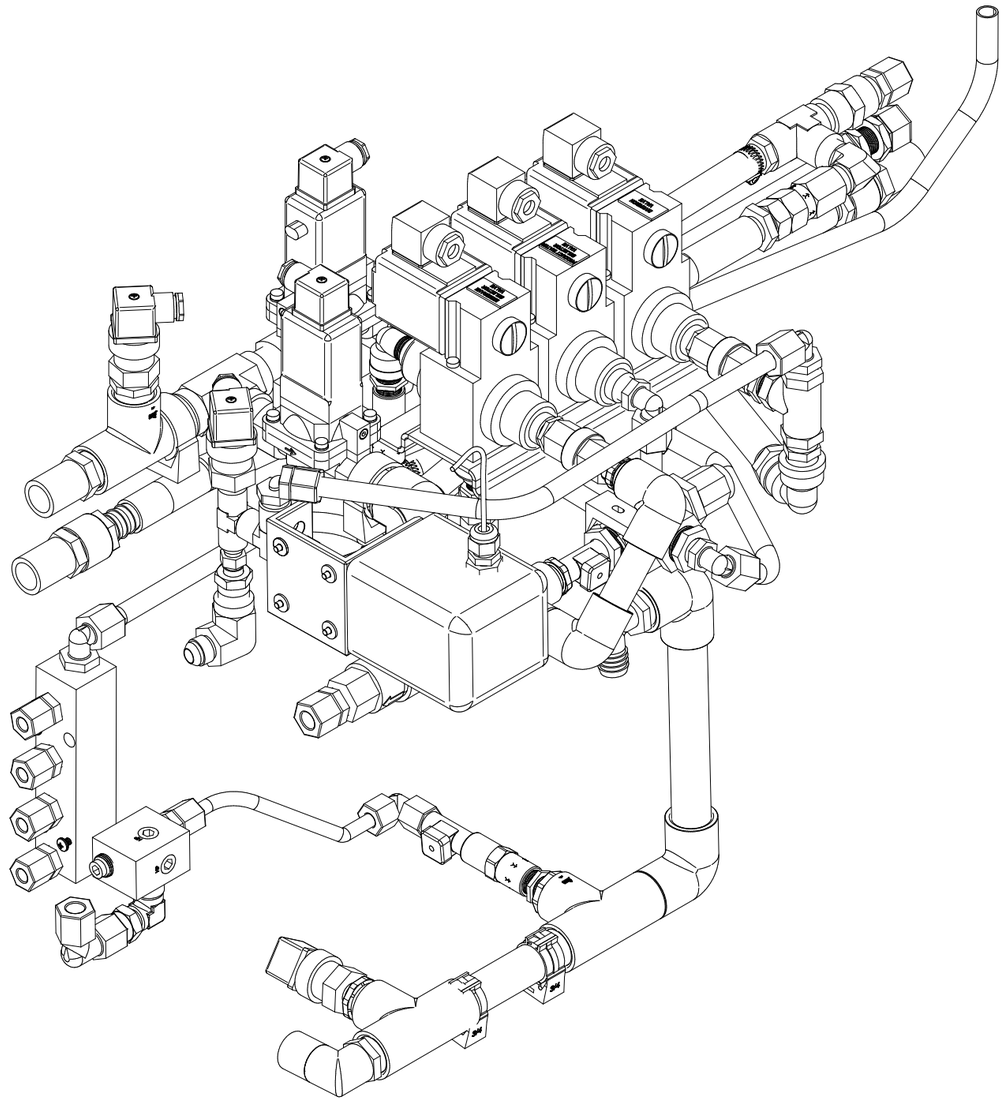
1ST PASS PRESSURE VESSEL ASSY

SIZE D	DWG NO A400C-0102		REV -
SCALE NTS		6 OF 6	

DWG NO A400C-0102

SH 6

REVISION HISTORY				
DATE	DESCRIPTION	DESIGNER	CHECKED	APPROVED
05/18/2022	UPDTAED MEMBRANE SELECTOR VALVE PLUMBING TO PRT NUMS: 0112071900, 328065066, 30-0453, 30-0333	OM	SY	BB



0821009 VALVE-PLUMB,CONTRL,ASSY,AQUA,DUAL

PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
54	1	0117230869	ELB90 ST 0.25 MPT x 0.25 FPT SS
55	2	0117233769	ELB90 ST 0.75 MPT X 0.75 FPT SS316
56	2	0117292387	RB 0.50 MT x 0.25 FT SS
57	2	0117340800	PLUG SOC ,0.25 MT SS316L
58	1	0117380869	NIPPLE 0.25 NPT X 1.50 SS316L
59	1	0117423769	TEE .75 FT X .75 FT X .75 FT SS
60	1	0117492569	TEE ST .50 FT X .50 MT X .50 FT SS
61	1	0117520869	TEE,BRANCH,.25 FT x .25 MT x .25 FT SS
62	1	0204011869	ELBOW,PP,3/8 ODx3/8 FT
63	1	0204012569	ELBOW,PP,1/2 ODx1/2 FT
64	1	0204021769	ELB90 1/4MPTX3/8TU PLASTIC
65	6	0204022469	ELBOW,PP,1/2 ODx3/8 MT
66	3	0204022569	ELBOW,PP,1/2 ODx1/2 MT
67	1	0204091769	CONN 1/4MPTX3/8TU PLASTIC
68	4	0204091869	FITTING,PP,3/8 ODx3/8 MT
69	2	0204092569	FITTING,PP,1/2 ODx1/2 MT
70	1	0204272569	UNION BULKHD 0.50 TU PLASTIC
71	5 FT	0312124269	TUBE 1/2 BLK
72	1.5 FT	0328065066	HOSE PVC BRAID GRAY (TECH WATER TO MANIFOLD) 0.50 x 17.00L
73	2	30-0333	CLAMP,HOSE,SS,3/8"
74	6	30-0578	NIPPLE,NYL, 3-8 NPT x CLOSE W HEX
75	9	21010110MC	BUSHING,RUBBER,STD,BLUE,0.189IDx0.500ODx0.175TH
76	5	0501164200	PIPE SUPPORT 1.125
77	2	0501164900	SUPPORT,PIPE,0.75
78	13	061080028000	WASHER FLAT #10 SS
79	2	061160630012	SC PHIL PAN 10-24 X .75 SS
80	5	061160631008	SC PHIL PAN #10-32 x .50 SS
81	4	061160631012	SC PHIL PAN #10-32 x 0.75 SS
82	4	061162826010	SC,SHLDR,PHIL,#8-32,0.188Dx0.375L,SS
83	2	061222345006	SC ALLEN .25-20 x .375LG
84	.5 FT	0301094100	PIPE PVC SCH 80 .375 IN x 2.5
85	2 FT	0301096600	PIPE 3/4 PVC80
86	1 FT	0301098800	PIPE 1/2 PVC80

PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	3 FT	30-0262	HOSE,.75,PVC WITH BRAID,GRAY
2	1	11012103	BRACKET,VALVES,AL AQUA DUAL
3	1	14012008	MANIFOLD, AQMXL PROD, PVC, PRESS, LOW,1.5X1.5X6.25
4	1	2020043900	BRACKET,MTG,BPR -AQM
5	1	3421020100	COUPLER BACK PRESSURE REG-AQM
6	1	20-4096	PROBE, CONDUCTIVITY, 5-WIRE, 5 LONG CABLE
7	1	11026820AO	FLOW METER IN-LINE 0.26-4.0GPM
8	1	11026920AO	FLOWMETER IN-LINE .53-7.9GPM
9	1	27012007	VALVE,NEEDLE,ANGL,.25FNPT,316
10	3	2317100601	TRANSDUCER,PRESSURE,LOW,0-300 PSI
11	1	2317102001	TRANSDUCER,PRESSURE,HIGH,0-2000 PSI
12	2	3131680298	PLUG CONNECTOR DIN 3-PIN
13	1	B079400004	BRP GEAR ASSY
14	1	60-0226	VALVE,CHECK,0.50 FNPT,316SS
15	1	60-4547	VALVE,REGULATOR,COMPACT
16	1	14012117Ar	VALVE CHECK .50 FPT WITH VITO
17	1	75012111	VALVE,SOL,DIAGHRAM,2-WAY,0.75 NPT,SS
18	1	75012111A	VALVE,SOL,DIAGHRAM,2-WAY,0.75 NPT,SS
19	2	75012112	VALVE,CHECK,0.375 FNPT,316SS
20	2	76012080	VALVE,CHECK,3/8FPT W/VITO PVC
21	3	1413091200-04	SOLENOID VALVE, 3-WAY, 3/8"
22	1	30-0061	TEE, NYL, 3/4" FNPT
23	1	30-0062	NIPPLE, NYL, 1/2" NPT X CLOSE
24	1	30-0092	COUPLING,.50 FNPT,316SS
25	1	30-0277	ELBOW, NYL, 3/4"MNPT X 1" HB
26	3	30-0441	ELBOW, NYL, 3/4" MNPT X 3/4" HOSE BARB
27	1	30-0453	ADAPTER, 1/2" MNPT X 1/2" HOSE BARB
28	3	30-0506	ADPTR, NYL, 3/4" MNPT X 1" HOSE BARB
29	2	30-0674	TEE, NYL, 1/2" FNPT
30	2	30-0689	ADAPTER 0.75 FPT x BARB
31	2	30-1544	BUSHING, NYL, 3-4M X 3-8F
32	1	01120125DG	ELB90 1-2FPTX1-2FPT NYL
33	1	01122923DG	RB 0.50 MPT x 0.25 FT NYL
34	1	01122934DG	RB .75 MPT X .25 FNPT NYLON
35	1	01124237DG	TEE 0.75 FPT X FPT X FPT NYLON
36	2	01126526DG	ADAP 0.50 MPT x 0.75 BARB NYLON
37	3	01173737CL	NIPPLE 0.75 NPT x CL SS
38	1	26012023	NIPPLE,0.25 MNPT x CL,S40,SS316
39	1	26012094	ELB90 -8 FLARE x 0.50 FT SS
40	1	28012047	ELB90,STREET,NYLON,3-8 FNPT x 3-8 MNPT
41	2	28012127	RB,NYL,0.50 MPT x 0.38 FPT
42	2	0101052583	ELB90 0.50 SL x SL
43	2	0101053783	ELB90 0.75 SL x SL
44	1	0101312483	RB 0.50 SL x 0.38 FPT
45	1	0101313583	RB 0.75 SL x 0.38 FT
46	1	0101322483	RB 0.50 SL x 0.38 SL
47	1	0101323483	RB 0.75 SL x 0.25 FT
48	1	0101372540	NIPPLE 0.50 NPT x 4.00
49	1	0101423783	TEE 0.75 FT x FT x FT
50	1	0101462583	TEE 0.50 FT x FT x FT
51	1	0101463783	TEE 0.75 SL x SL x SL
52	1	0112071900	ELB90 .375 MPT x .50 BARB NYLON
53	1	0117022569	ELB90 0.50 MPT x 0.50 MPT SS316

1. ENG MUST APPROVE ANY DEVIATIONS
NOTES: UNLESS OTHERWISE SPECIFIED

DIMENSIONAL TOLERANCES - UNLESS OTHERWISE SPECIFIED			
MACHINED			WELDMENT
FRACTION	±1/32"		± 1/16"
X	-	± 4mm	± 1/8"
.X	± .1"	± 2mm	± 1/16"
.XX	± .01"	± .25mm	± 1/32"
.XXX	± .005"	± .025mm	-
ANGULAR ± 1'			
125 UNLESS OTHERWISE SPECIFIED			

CUSTOMER -

PROJECT -

DRAWN - RD DATE - 06/20/2017

CHECKED - JB DATE - 06/20/2017

APPROVED - SY DATE - 06/20/2017

DRY WT: 34.627 lbmass

WET WT:

CONTRACT NO

Parker Sea Recovery
Parker Hannifin Corporation
Filtration Group / Water Purification
2630 E. El Presidio Street
Carson, CA 90810
Contact
Office: 310-608-5600
Fax: 310-608-5692
www.parker.com

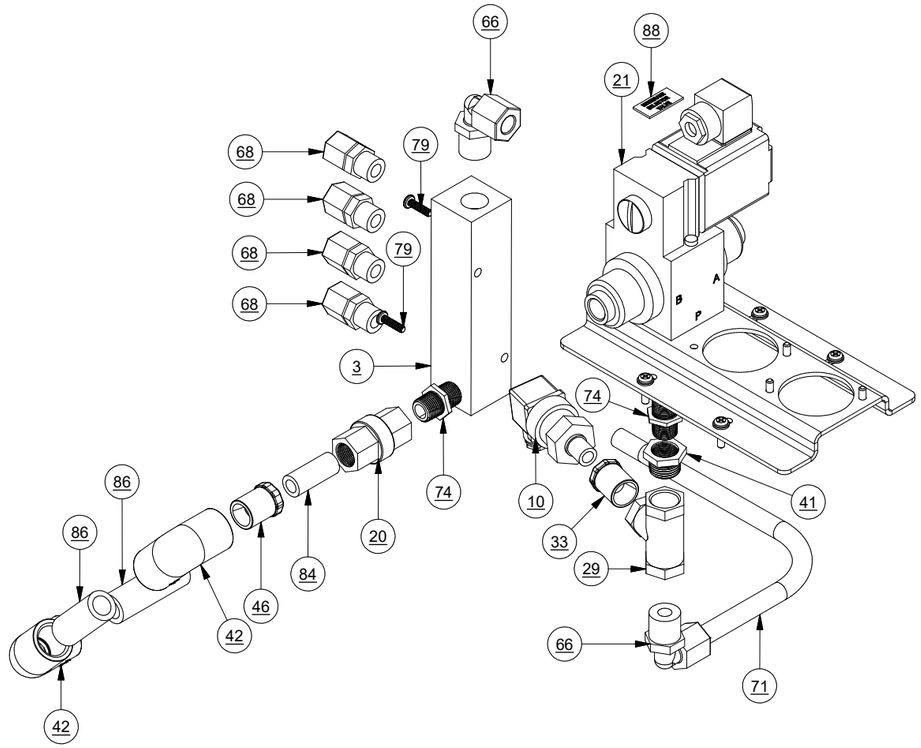
VALVE-PLUMB,CONTRL,ASSY,AQUA,DUAL

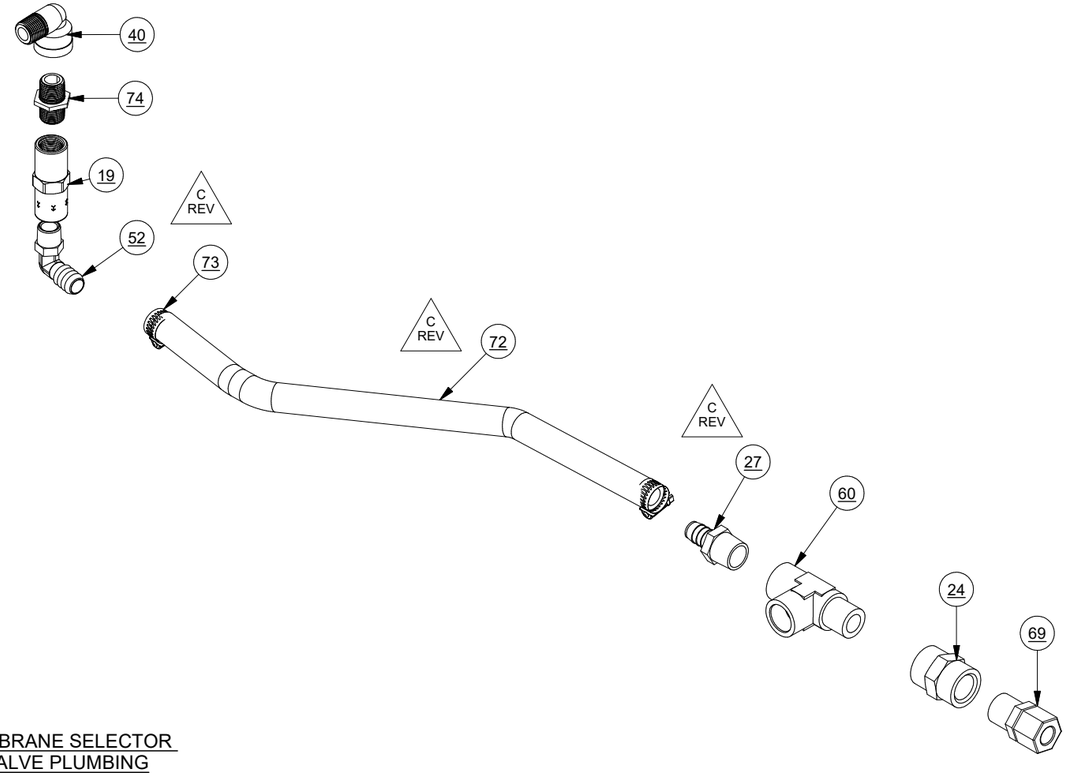
SIZE D | DWG NO 0821009 | REV C

SCALE | 1 OF 6

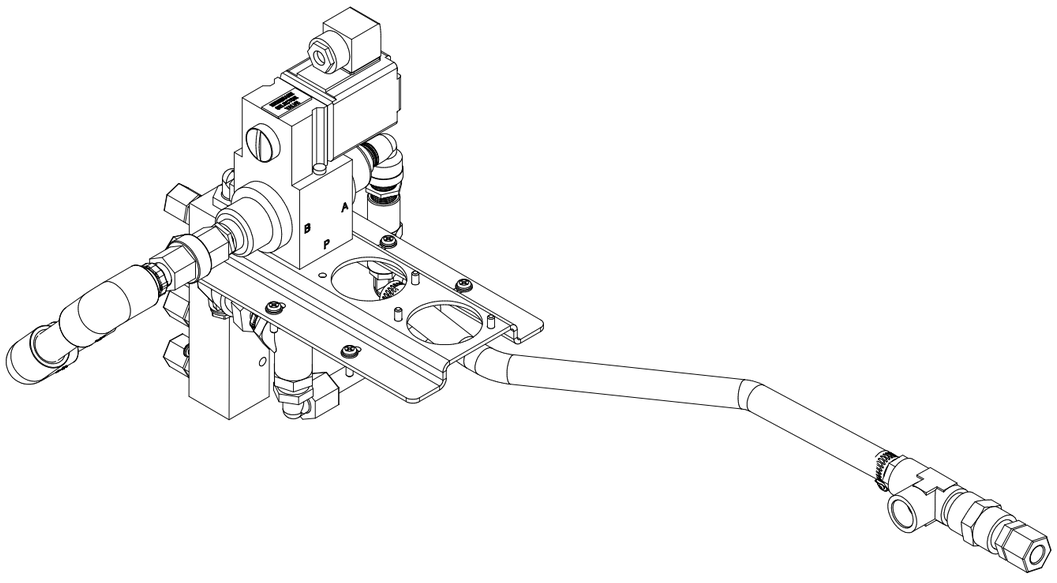
DWG NO 0821009

SH 1





MEMBRANE SELECTOR
VALVE PLUMBING
SV-1004 WITH PT-1007
EXPLODED VIEW

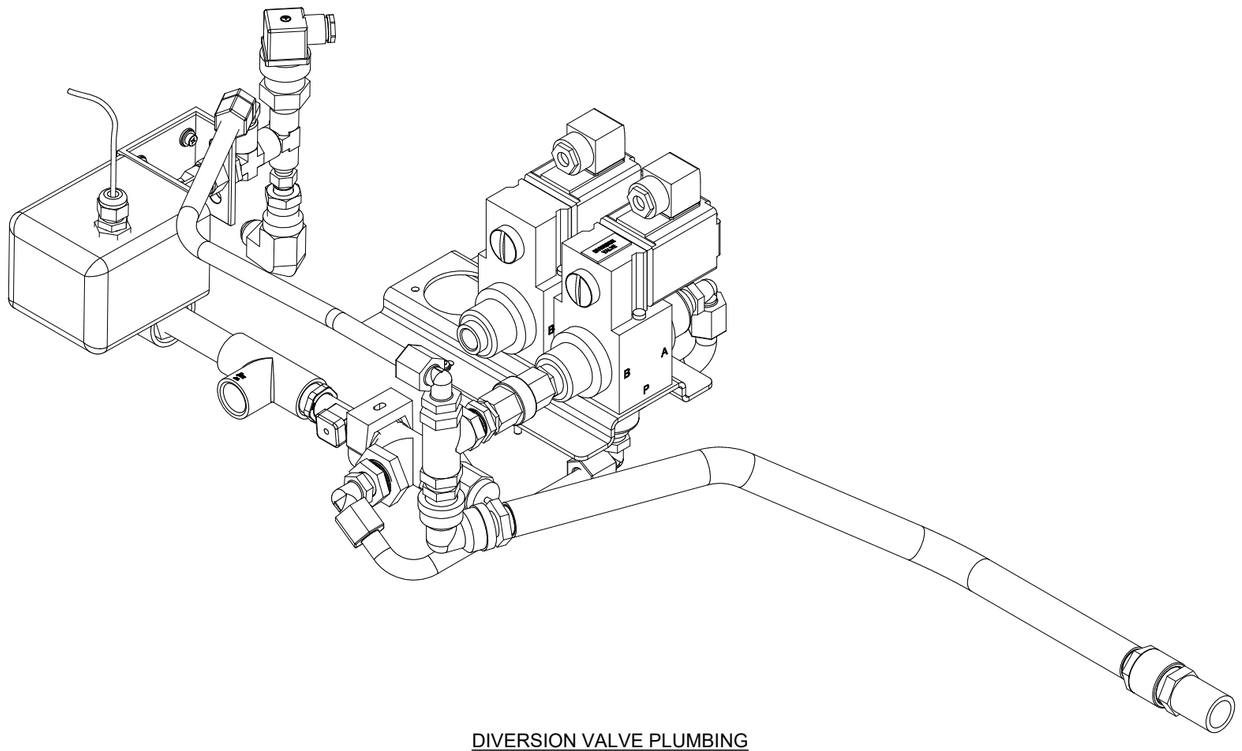


MEMBRANE SELECTOR
VALVE PLUMBING
SV-1004 WITH PT-1007

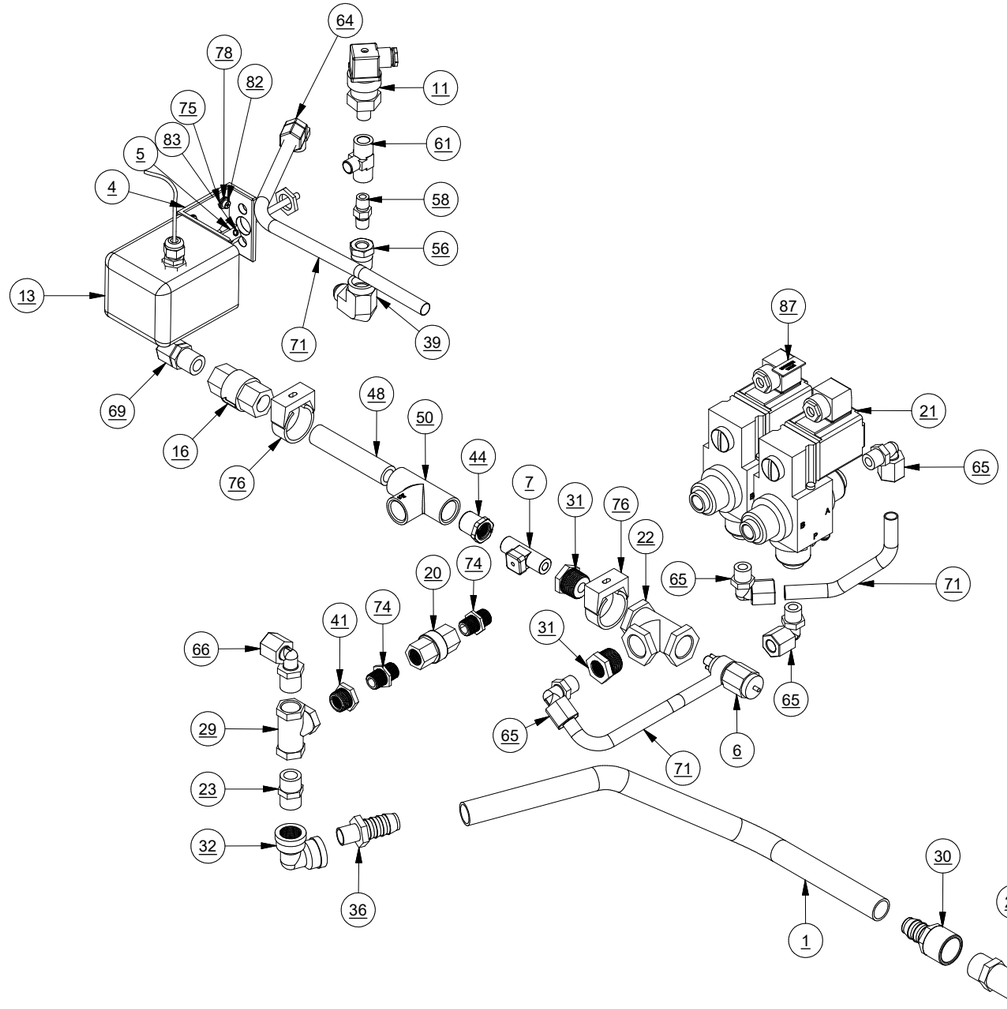
SIZE	DWG NO	REV
D	0821009	C
SCALE NTS	2 OF 6	

DWG NO 0821009

SH 2



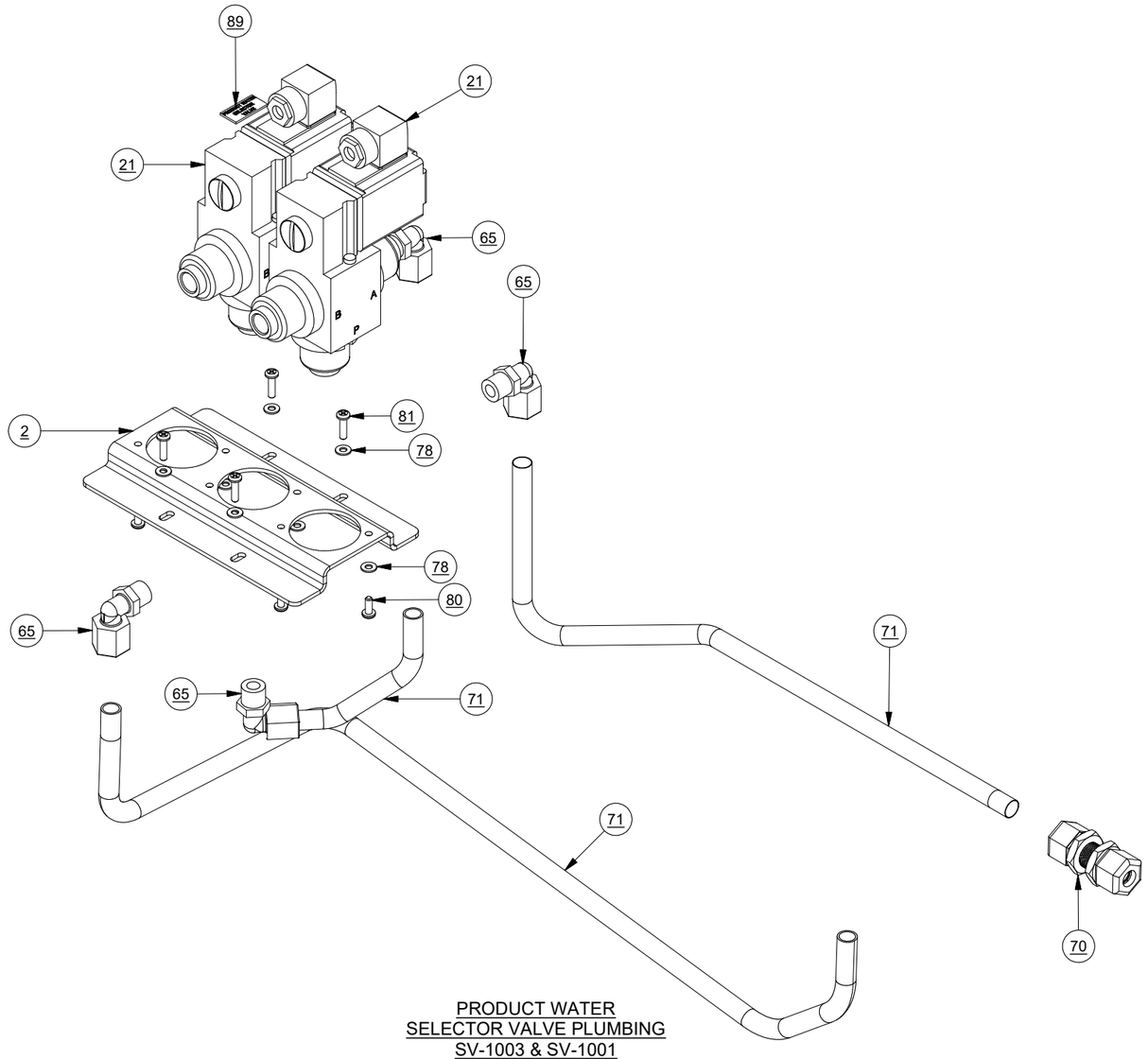
DIVERSION VALVE PLUMBING
SV-1001 & BPR-1001 WITH PT-1006, TDS-1001, & FE-1002



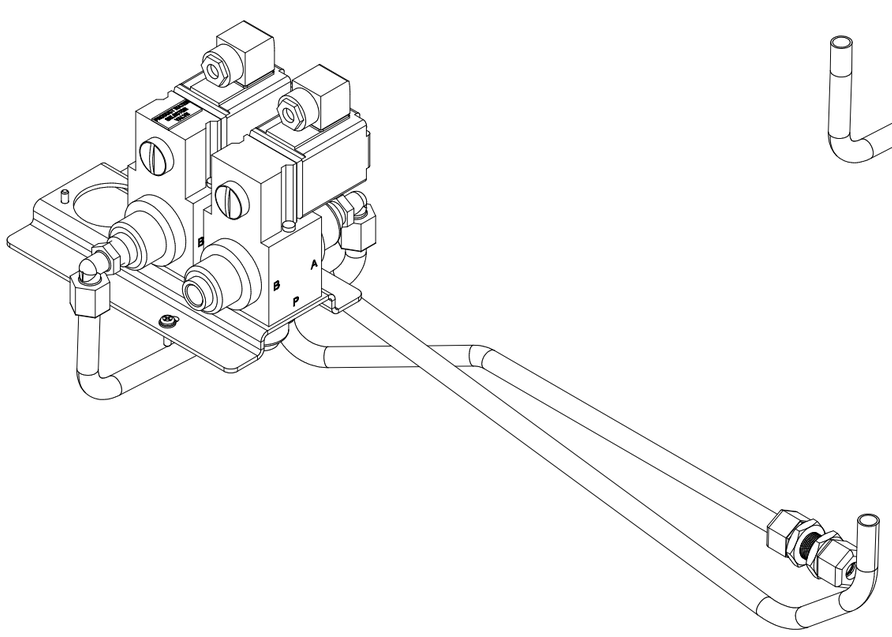
DIVERSION VALVE PLUMBING
SV-1001 & BPR-1001 WITH PT-1006, TDS-1001, & FE-1002
EXPLODED VIEW

SIZE	DWG NO	REV
D	0821009	C
SCALE NTS	3 OF 6	

DWG NO 0821009
SH 3



PRODUCT WATER
SELECTOR VALVE PLUMBING
SV-1003 & SV-1001
EXPLODED VIEW

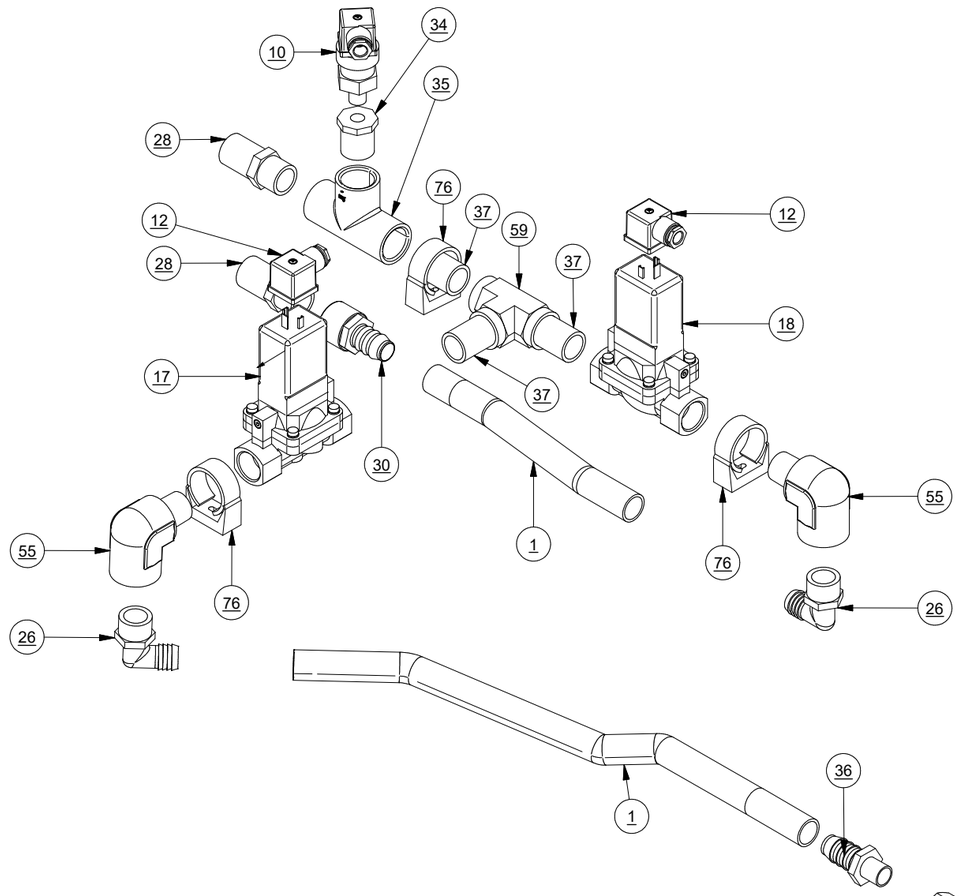


PRODUCT WATER
SELECTOR VALVE PLUMBING
SV-1003 & SV-1001

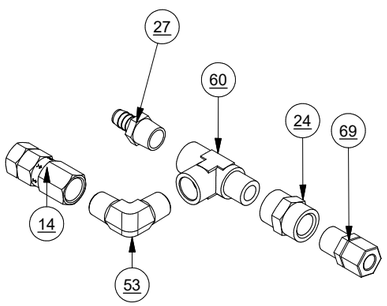
SIZE	DWG NO	REV
D	0821009	C
SCALE NTS	4 OF 6	

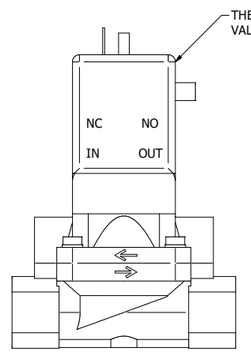
DWG NO 0821009

SH 4

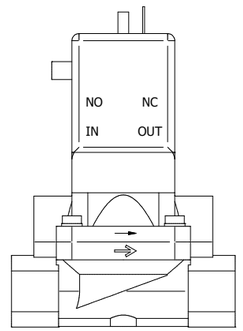


LP SELECTOR
VALVE PLUMBING
SV-1002-A & B
EXPLODED VIEW

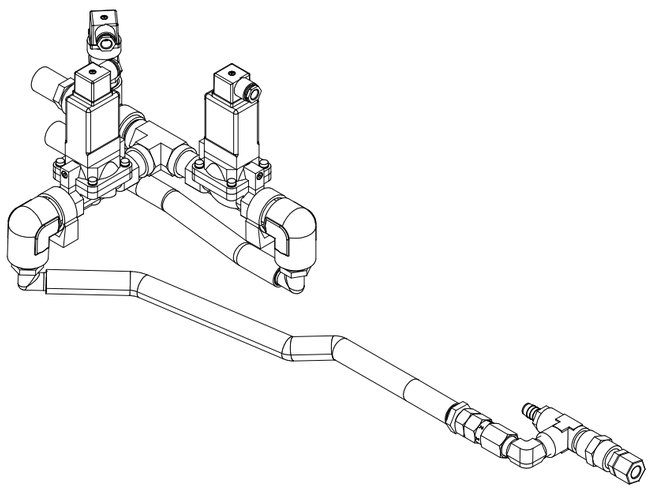




SV 1002 A



SV 1002 B

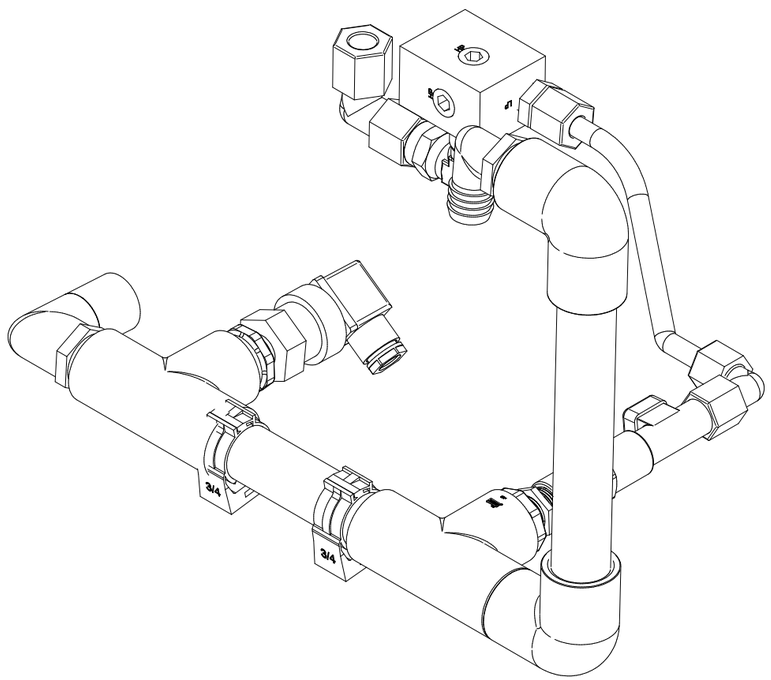


LP SELECTOR
VALVE PLUMBING
SV-1002-A & B

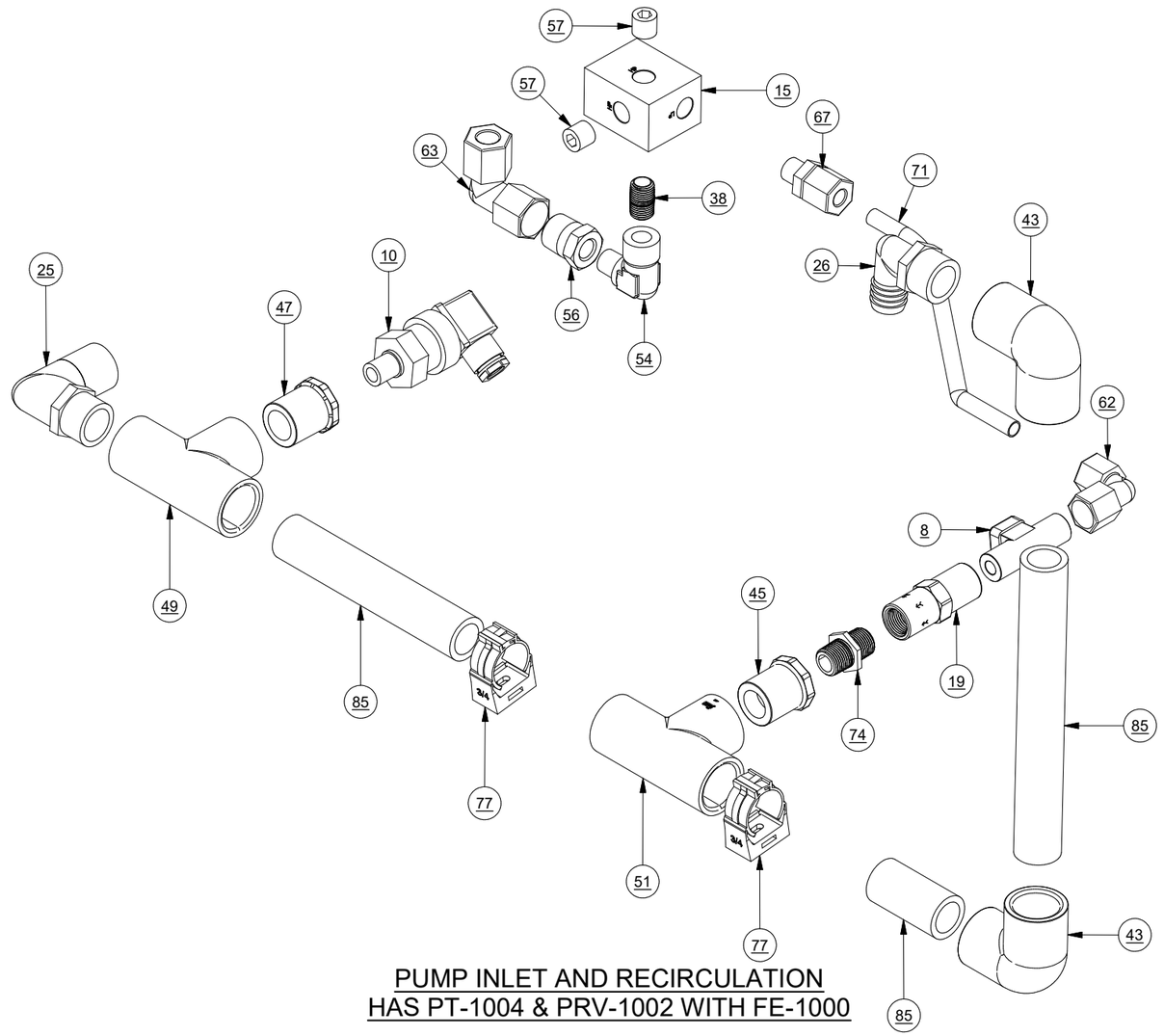
SIZE	DWG NO	REV
D	0821009	C
SCALE NTS	5 OF 6	

DWG NO 0821009

SH 5



PUMP INLET AND RECIRCULATION
PT-1004 & PRV-1002 WITH FE-1000



PUMP INLET AND RECIRCULATION
HAS PT-1004 & PRV-1002 WITH FE-1000

SIZE	DWG NO	REV
D	0821009	C
SCALE NTS	6 OF 6	

DWG NO 0821009