Part Number: TM-UC1200-2400 REV B

ULTROClear

1200-3400 GPD
4.5-12.9 m^3/d

Installation, Operation & Maintenance

aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding

Parker

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Sea Recovery

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REVISION HISTORY

REV	DATE	DESCRIPTION	AUTHOR
A	April 27, 2018	Initial Release	Paul K.
B	August 16, 2019	Miscellaneous Updates	S. Lentz

The following are the types of flags used in this technical manual. They designate safety related items and important operational instructions and should be given special attention when they appear in the text:

WARNING	Text formatted in this manner concerns an operating procedure or practice that, if not strictly observed, can result in injury to personnel or loss of life.
CAUTION	Text formatted in this manner concerns an operating procedure or practice that, if not strictly observed, can result in damage to or destruction of equipment.
NOTE	Text formatted in this manner concerns an operating procedure or condition that warrants special attention.

1.0 SYSTEM DESCRIPTION

The Parker Hannifin UltRO Clear System is a purification system that uses direct feed water from Sea water RO unit or Dock water to produce spot free ultra-pure water. This unit produces UltRO Clear quality water with salt concentrations of <20 PPM TDS ppm by removing approximately 99% of the dissolved salt in potable water.

1.1 SPECIFICATIONS

1.1.1 PERFORMANCE CHARACTERISTICS

Parameter	Specification
Permeate Flow (1): Feed Flow: Concentrate Flow:	4.5 m^3/day. (0.83 GPM) Potable 0.5 m^3/hr. (2.3 GPM) Normal 0.3 m^3/hr. (1.5 GPM)
Permeate Flow (1): Feed Flow: Concentrate Flow:	9.2 m^3/day. (1.7 GPM) Potable 0.5 m^3/hr. (2.3 GPM) Normal 1.3 m^3/hr. (0.6 GPM)
Permeate Flow (1): Feed Flow: Concentrate Flow:	9.2 m^3/day. (1.7 GPM) Potable 0.8 m^3/hr. (3.5 GPM) Normal 0.4 m^3/hr. (1.8 GPM)
Feed water TDS Design water Temperature: Product Pressure: Max. Operating Pressure: Design RO element pressure: Max. feedwater residual chlorine: Membrane type:	Less than 50 ppm TDS 25 °C (77 °F) Production shall not decrease more than 3% for each °C temperature decreasing of sea water feed. 0-2 BAR (0-30 PSI) 14 BAR (200 PSI) 10.5 BAR (150 PSI) <1 ppm Thin Film Composite

(1) Raw water temperatures less than 25°C (77°F) will result in less than rated product water output. Conversely, higher raw water temperatures will result in higher than rated output.

Table 1.0 - Performance Specification

1.1.2 PHYSICAL CHARACTERISTICS

Unit Dimensions – See General Arrangement in Section 8.

Weight	ULTRO CLEAR SYSTEM
1200	81 lbs. / 37 kg
2400	93 lbs. / 42 kg
3400	117 lbs. / 53 kg

Table 1.1 – Unit Weights

1.1.3 UTILITY REQUIREMENTS

See the nameplate attached to top of the unit for power requirements.

Pump Motor	**HP**	**kW**
1200-2400	0.33	0.25
3400	0.5	0.4

Table 1.2 – Pump Horsepower

Utility	**Connection**	**Design Pressure Minimum BAR (psi)**	**Design Pressure Maximum BAR (psi)**
Potable Water Feed	½" Compression Tube	2.1 (30)	4.1 (60)
Concentrate Flow* (Reject Discharge)	½" Compression Tube	0 (0)	2 (30)
Product Water Flow*	½" Compression Tube	0 (0)	2 (30)

* Vacuum condition at shutdown is not acceptable, syphon breaker may be required.

Table 1.3 - Flow Requirements

1.1.4 ENVIRONMENTAL REQUIREMENTS

Parameter	Specification
Ambient temperature: List (permanent): Trim (fore and aft): Pitch: Roll:	1-40°C (33-108°F) 15° +30° ±10° (6 sec. cycle) ±30° (12 sec. cycle)

Table 1.4 - Nominal Operating Conditions

1.2 EQUIPMENT REQUIRED FOR OPERATION

1.2.1 CONSUMABLES

The following is the normal quantity of equipment consumed during six (6) months of standard unit operation:

NOTE

Only Parker approved filters and chemicals should be used.

Description	QTY	Parker Part No.
Pre-Filter Sediment / Carbon	2	0803004773

Table 1.5 - Consumables

1.2.2 TEST EQUIPMENT

The following table lists the basic equipment recommended to perform most types of verification testing and system maintenance. The salinity meter allows the operator to perform routine sampling of the equipment:

Description	Parker Part No.
Meter, TDS, Handheld, Digital	99-1990A

Table 1.6 - Recommended Test Equipment

2.0 PREPARATION FOR USE, INSTALLATION AND INITIAL ADJUSTMENT

2.1 UNPACKING AND HANDLING

Remove unit from shipping crate and inspect for shipping damage.

CAUTION

Do not allow unit or any components to be exposed to freezing temperatures. If it is anticipated that the unit may be exposed to freezing temperature, please contact Parker in advance for technical assistance.

2.2 LOCATION

The RO unit should be installed in a dry, sheltered location protected from direct weather. Some type of drainage should be provided beneath the RO unit to allow standing water to drain when performing maintenance or repair (see system diagram in Section 8.0 for skid size, interface locations and minimum maintenance envelope requirements).
Since every installation is unique, the mounting instructions are provided for guidance only. It is recommended that you use your own discretion as to the exact method of mounting and placement of any mounting bolts.

1) Mount the RO unit securely making sure that the isolation mounts are secure to the base of the unit.

CAUTION

All feed and discharge connections should be dedicated to the system to avoid damage to the equipment.

2) Make the following plumbing connections to the RO unit's piping interfaces (refer to Section 8.0 for the exact piping interface locations):

   a) Connect the inlet water supply either directly from the Sea water RO system or Dock water using a compression tube connection.

   b) Connect the product flow water discharge using a compression tube connection.

   c) Connect the concentrate flow discharge using a compression tube connection to the skid.

CAUTION

Inlet and discharge interconnecting lines should be constructed of a NON-FERROUS material. Examples of some suitable materials are PVC, copper-nickel, 316 stainless steel pipe or a reinforced non-collapsing hose. Ferrous piping produces rust that will irreversibly foul the membrane and void the RO unit warranty.

NOTE

Avoid connecting the inlet piping to any water line that services any other piece of equipment. Air could be drawn through the RO unit causing damage to the RO unit's pumps.

CAUTION

The use of galvanized steel for product piping should be avoided as small amounts of rust may form that can be drawn back into the RO when the system is off.

Exposing the membranes to chlorinated water may cause irreversible damage and will void the RO unit warranty, so use the carbon flush filter supplied.

NOTE

Strictly observe all applicable electrical codes and regulations governing the installation and wiring of electrical equipment. Typical codes specify the type and size of conduit, wire diameter and class of wire insulation depending upon the amperage and environment. The power supply should always be of a greater service rating than the requirements of the RO unit. This will assure proper voltage even if power supply voltage is slightly less than required. Never connect the RO unit to a line that services another electrical device. The RO unit should have its own dedicated power supply and breaker.

WARNING

Disconnect electrical power to RO unit and the power source before connecting to RO unit interface. Failure to do so can cause serious injury or death to personnel.

a) Connect the correct voltage/power supply 115/220VAC, 1 PHASE, 60/50 Hz to the power box. Refer to the name plate for proper voltage.

b) Connect a suitable ground to the RO unit skid (as determined by the specifics of your installation).

3.0 GENERAL THEORY OF OPERATION

3.1 REVERSE OSMOSIS THEORY

Reverse osmosis, like many other practical scientific methods, has been developed from processes first observed in nature. Osmosis is a naturally occurring phenomenon in which a semi-permeable membrane separates a pure and a concentrated solution (a semi-permeable membrane is defined as one that preferentially passes a substance). Every fluid has an inherent potential that is directly related to the type and number of solids in solution. This potential, referred to as osmotic pressure, increases in proportion to relative concentration of a solution. A concentrated solution, therefore, has an osmotic pressure that is higher than that of a pure solution.

In a desalination system, the less concentrated solution will equalize the concentrations of both solutions by migrating across the membrane. When enough pure solution migrates across the membrane such that the inherent potential difference between the solutions is no longer higher than the osmotic pressure of the membrane, the purer solution will stop flowing. If the pressure on the concentrated solution is increased to above the osmotic pressure, fluid flow will be reversed. This condition, called Reverse Osmosis, can be established by artificially pressurizing the more concentrated solution using a high-pressure pump. In this type of system, the concentrated solution (normally referred to as feedwater) will become more concentrated as pure water flows out of solution and across the membrane to the permeate side. Discounting the effects of feedwater temperature and salinity, the operating pressure normally required to produce significant amounts of pure water is at least twice the osmotic pressure of the membrane being used.

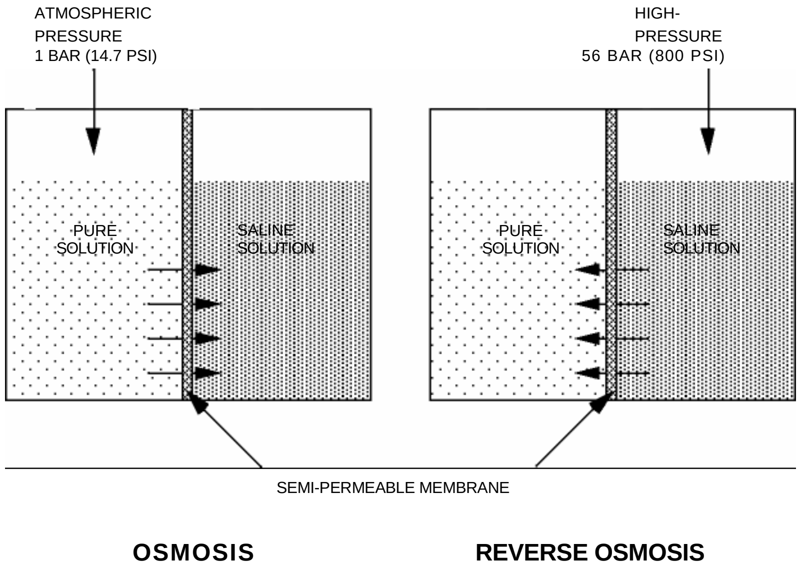


Figure 3.0 - Simple (Reverse) Osmotic System

Potable water contains many kinds of solids dissolved in solution. The most prevalent is common table salt (sodium chloride). Other minerals that may be present in solution are substances that usually contain various compounds of calcium and sulfate. The sum of all the solids dissolved in a sample of water is referred to as *Total Dissolved Solids* or TDS. Potable water normally averages 500 or less ppm (parts per million) TDS although variations of 200 ppm are common. The fundamental goal any desalination process is a significant reduction in the number of dissolved solids in water.

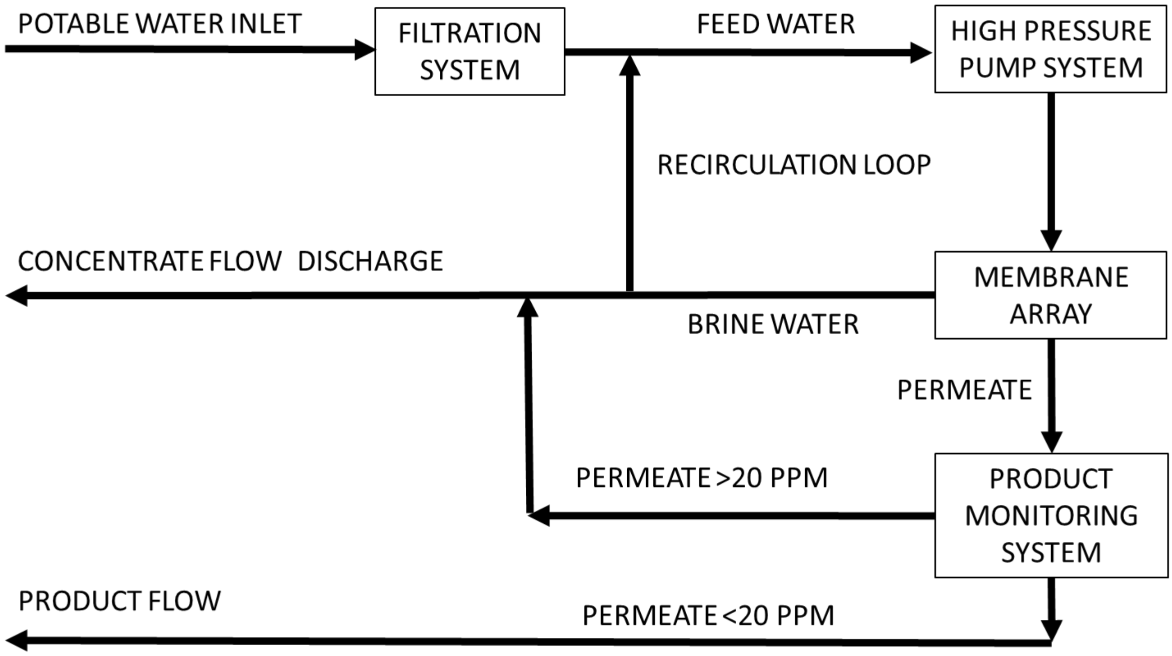


Figure 3.1 - Simplified Schematic of a RO System

It should be noted that no system can remove all the dissolved solids from potable water. The system is designed to reject approximately 99% of the TDS or, in other words, to allow 1% of the 500 ppm TDS in the potable water to pass into the product water. This yields water of less than 20 ppm, the recommended TDS for drinking water. A system such as this is said to have a *salt passage* percentage of 1% or a *salt rejection* of 99%.

3.2 PRODUCT WATER QUALITY STANDARDS

This RO unit will produce permeate (product water) with a quality of < 20 ppm TDS to provide ULTRO CLEAR quality water.

3.3 FACTORS AFFECTING PERMEATE PRODUCTION

3.3.1 VARIATIONS IN TEMPERATURE, PRESSURE AND SALINITY

The following table illustrates how the quality and quantity of permeate produced in by RO system is affected by changes in temperature, salinity and pressure:

With constant....	**And increasing....**	**Permeate**	
		TDS	**Capacity**
Salinity and Pressure	Temperature	Increases	Increases
Temperature and Pressure	Salinity	Increases	Decreases
Temperature and Salinity	Pressure	Decreases	Increases

Table 3.0 - Factors Affecting Permeate Quality

NOTE

If feedwater salt concentration decreases, the product water flow rate should not be allowed to increase more than 20% above rated flow. Reject pressure will need to be lowered to maintain rated flow.

CAUTION

Operating the unit at more than 120% of rated capacity in low salinity water can damage the membranes and will void the RO unit warranty.

3.3.2 TEMPERATURE CORRECTION FACTOR

As previously described, the output capacity of any RO unit is highly dependent on feedwater temperature. To quantify this relationship, theoretical data has been utilized to develop Temperature Correction Factors (TCF) to compensate measured flowrate to calculated flowrate at 25°C/77°F. This allows the operator to establish the baseline flow for a given temperature, allowing more accurate troubleshooting. The procedure for calculating the temperature compensated flow is as follows:

1) Measure raw water temperature and determine the corresponding correction factor from Table 3.2 based on the measured temperature.

2) Note the actual product flow rate at the *Product Flow* meter. Multiply the actual product flow meter flow rate by the correction factor from Table 3.2 to give theoretical temperature compensated flow under standard conditions (25°C).

Example:

Raw water temp:	15°C
TCF:	1.47
Actual product flow:	113.5 (GPH)
Calculation:	113.5 x 1.47 = 167 (GPH)
Temperature Corrected flow:	167 (GPH)

(167 GPH is the normal flow for a PW4000)

°C	Factor	°C	Factor	°F	Factor	°F	Factor
1	3.64	26	0.97	34	3.47	84	0.88
2	3.23	26	0.94	36	3.18	86	0.82
3	3.03	28	0.91	38	3.18	88	0.79
4	2.78	29	0.88	40	2.68	90	0.79
5	2.58	30	0.85	42	2.47	92	0.77
6	2.38	31	0.83	44	2.29	94	0.75
7	2.22	32	0.80	46	2.14	96	0.73
8	2.11	33	0.77	48	2.01	98	0.70
9	2.00	34	0.75	50	1.88	100	0.68
10	1.89	35	0.73	52	1.77	102	0.65
11	1.78	36	0.71	54	1.68	104	0.63
12	1.68	37	0.69	56	1.59	106	0.61
13	1.61	38	0.67	58	1.51	108	0.59
14	1.54	39	0.65	60	1.44	110	0.57
15	1.47	40	0.63	62	1.36	112	0.55
16	1.39	41	0.61	64	1.30	114	0.53
17	1.34	42	0.60	66	1.24	116	0.51
18	1.29	43	0.58	68	1.17	118	0.49
19	1.24	44	0.56	70	1.12	120	0.47
20	1.19	45	0.54	72	1.08	122	0.45
21	1.15	46	0.53	74	1.05		
22	1.11	47	0.51	76	1.02		
23	1.08	48	0.49	78	1.00		
24	1.04	49	0.47	80	0.93		
25	1.00	50	0.46	82	0.90		

Table 3.1 - Temperature Correction Factors (TCF)

3.4 OPERATIONAL DESCRIPTION

3.4.1 ULTRO CLEAR SYSTEM

Potable water supplied to the intake of the Parker RO ULTRO CLEAR unit will initially flow into the system which is protected by the **Relief Valve**. This valve is set at 60 psi (4.15 BAR).

Once through the relief valve, the potable water is supplied to the **Filtration System**. The water then flows into the two **Carbon/Sediment Filters, AC-20A/B,** which is designed to reduce raw water turbidity to a nominal 20 microns in diameter and remove free chlorine that may be present in the water. The inlet pressure is monitored by **Feed Pressure Switch, PS-50** this protects the system from low pressure and will shut down the system. The discharge pressure from the filter housing is monitored by a **Pressure Gauge, PI-20**.

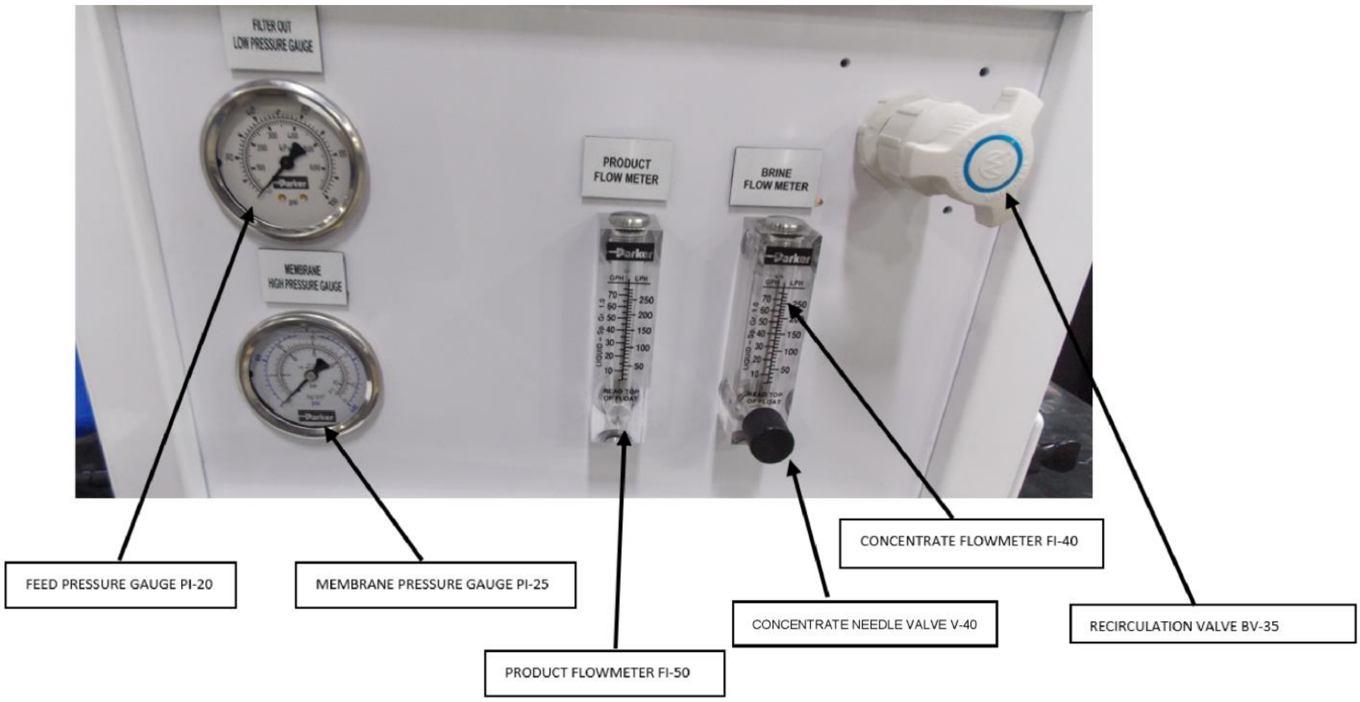


Figure 3.2 – System Front Panel - #1

3.4.2 REVERSE OSMOSIS SYSTEM

The clean and filtered raw water (now referred to as *feedwater)* is supplied to the inlet of the **High-Pressure Pump, P-20.** This pump raises feedwater pressure to 10.5 BAR (150 psi), the nominal pressure required for optimal system recovery. The pressurized feedwater then flows directly into the **Membrane Array.** The membrane array is an arrangement of fiberglass pressure vessels each containing a RO membrane element.

The pressurized feedwater flows along the membrane elements where reverse osmosis takes place (see Section 3.1). The feedwater flow is divided into two streams - the high purity product stream (referred to as the *permeate)* and the increasingly concentrated reject stream (referred to as the *concentrate*, *brine* or *reject).*

After exiting the membrane array, the brine (which contains higher concentrations of salts) flows through the **HP Regulating Valve, V40.** This manually adjustable valve is used to control the back pressure through the membrane array. The regulation systems pressure can be adjusted for small changes using the **Recirculation Valve, BV-35**. The pressure is read on the **Membrane Inlet Pressure Gauge, PI-25.** After passing through the HP regulating valve, the brine flows through the **HP Regulating Valve, V40** it flows through the **Concentrate Flowmeter FI-40** and exits the ULTRO CLEAR unit.

3.4.3 PRODUCT MONITORING SYSTEM (OPTIONAL)

The product water stream (or permeate) flows out to the **Product Flow Meter, FI-50** to the **Conductivity Probe TDS-50**. The water quality is monitored by the battery-operated conductivity monitor. The monitor will alarm when high level TDS is reached.

3.5 CONTROLS AND INSTRUMENTATION

The following table provides a brief description of each individual component along with an explanation of its function. It is intended as a supplement to the more detailed information contained in Section 8.0 – System/Equipment Drawings and Diagrams.

Call Out	Description	Function
AC-20A/B	Carbon / Sediment filter	Filters particles> 5 microns in diameter and removes chlorine from damaging the membranes.
FI-40	Concentrate Water Flow Meter	Indicates the amount of reject water discharged from the RO unit.
FI-50	Product Water Flow Meter	Indicates the amount of permeate produced by the RO unit.
P-20	RO Pump	Pressurizes feed water to supply the membrane array at proper (high) pressure.
PI-20	Feed Pressure Gauge	Indicates filter discharge pressure to high pressure pump.
PI-25	Membrane Inlet Pressure Gauge	Indicates membrane array inlet pressure.
PS-50	Inlet Pressure Switch	Ensures inlet pressure is maintained for RO System.
BV35	Recirculation Valve	Controls amount of recirculation in RO Array.
V40	Concentrate Needle Valve	Controls discharge flow from array.
CK-40	Concentrate Check Valve	Ensure water from backing up into the pressure vessel array.
PRV-10	Relief Valve	Internal pressure relief bypass valve, 60 psi setpoint

Table 3.2 - Instrumentation and Controls

Figure 3.3 - Carbon Filters

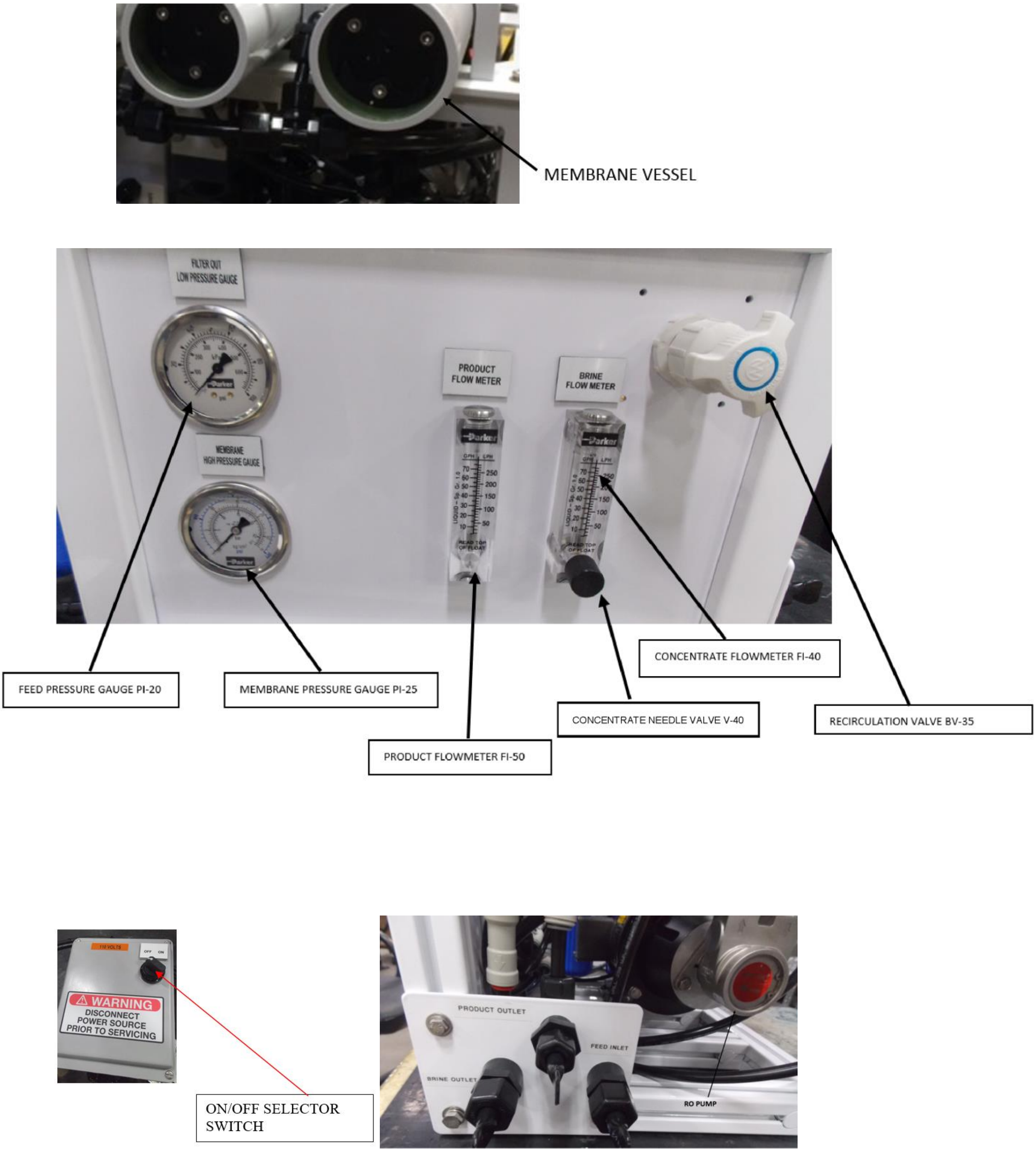


Figure 3.4 – Major Components Location

4.0 OPERATION

4.1 LOAD OUT PROCEDURE

1) Load Carbon / Sediment filters into filter housing. See Section 5.2 for detailed procedure.

2) Load membrane into pressure vessel. See Section 5.3.

4.2 FIRST TIME START- PROCEDURE

1) Check the tightness of all lines and fittings.

2) Place the RO unit's valves and switches in the positions shown in Table 4.0.

ID	Description	Position
BV35	Recirculation Valve	Closed
V40	Concentrate Needle Valve	Full Open
SS1	Main Switch	OFF

Table 4.0 - Valve/Switch Line Up - Initial Start-up

CAUTION

Failure to open the *Concentrate Needle Valve V-40* (which is required to bleed any entrapped air) can result in hydraulic shock to the system.

3) Switch ON the breaker at the main breaker panel to power up the unit.

4) Supply water to system and confirm **PI-20 Feed Pressure Gauge** is above 2.1 BAR (20 psi)**.**

5) Inspect all plumbing connections in the unit for leakage. Temperature variations during shipment may cause plumbing connections to seep when initially started on-site. Secure the power to the unit and repair any leaks prior to proceeding. Once the leaks have been repaired, re-energize system and open the water source.

6) Turn SS1 Main Switch on.

7) Begin closing the Black knob, **Concentrate Needle Valve V-40**, in the *closed* position by slowly turning the handle in the clockwise direction.

While observing the **Membrane Inlet Pressure Gauge PI-25** and the **Concentrate Flowmeter FI-40.** The pressure should rise to about 120psi (8.2 BAR).

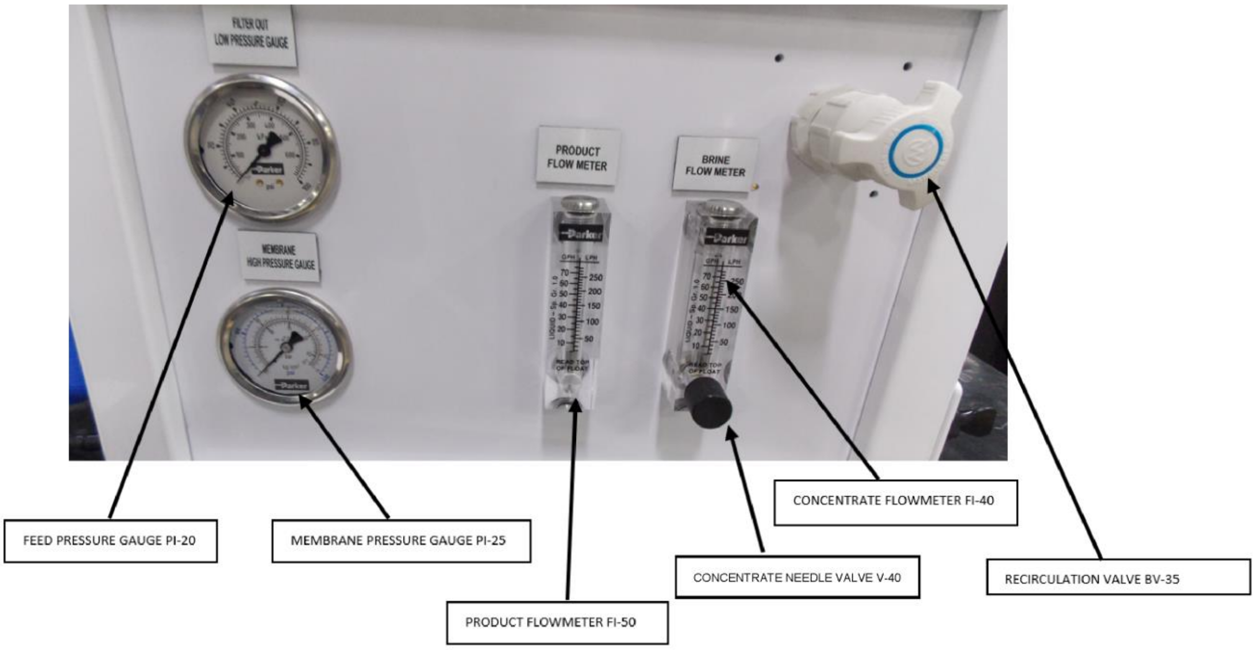


Figure 4.0 – Flowmeter, Needle Valve and Pressure Gauge

WARNING
Pressure, as indicated on the inlet side of the *RO Membrane Array G*auge, should never exceed 200 psi (13.8 BAR).

8) Observe the *Product Flow* meter. This flow meter indicates, in liters per hour (LPH) and gallons per hour (GPH), the product water flow rate. Record the product flow after 5 hours of operation (use the sample Operational Log sheet provided in Figure 5.3).
9) Observe the *Concentrate Flow* meter. This flow meter indicates, in liters per hour (LPH) and gallons per hour (GPH) the reject flow rate from the RO array, see Table 1.0 for flow rates. Record the reject flow after the first 5 hours of operation (use the sample Operational Log sheet provided in Figure 5.3).

10) Press Stop button.

4.3 QUICK START-UP PROCEDURE

1) Switch ON the breaker at the main breaker panel to power up the unit.

2) Place associated main switch to Automatic.

3) Check PI-20 Feed Pressure Gauge is at least 5 psi (0.35 BAR).

4) Begin closing the Black knob, **Concentrate Needle Valve V-40**, by slowly turning the handle in the clockwise direction. While observing the **Membrane Inlet Pressure Gauge PI-25** and the **Concentrate Flowmeter FI-40.** The pressure should rise to about 120 psi (8.32 BAR).

4.4 SHUTDOWN PROCEDURES

4.4.1 SHUTDOWN PROCEDURE (SHORT TERM)

1) Release the pressure from the system by slowly turning the Black knob, **Concentrate Needle Valve V-40**, counter-clockwise.

2) Stop the unit by pressing the Stop button.

3) Secure the feedwater system by closing a feedwater valve upstream of the UltRO Clear System.

4.4.2 SHUTDOWN PROCEDURE (EXTENDED)

Since bacteria and biologic growth increases significantly the longer stagnant water is in contact with the membranes, the fresh flushing procedure should be used whenever the unit will be secured for more than 14 days. Although they do not attack the membranes or other system components directly, high concentrations of biological matter can block enough of the product water channels to cause a reduction of as much as 40% of the total system capacity.

CAUTION
Failure to follow the extended shutdown procedure can result in irreversible fouling to the RO membranes.

Bacterial contamination can be avoided by following the following procedures:

- Flush the system 2 - 4 minutes every two weeks.

5.0 MAINTENANCE INSTRUCTIONS

5.1 GENERAL

The service life of most of the system equipment is directly related to the feed water inlet conditions. Improper maintenance will also significantly reduce the life expectancy of the major unit components (such as the membranes, filters and pumps) as well as the reliability of the unit. Under normal conditions, and with proper maintenance, a reverse osmosis membrane (which is the major consumable item) should have an effective service life somewhere between 1 to 2 years with heavy use.

	Daily	Weekly	Monthly	Quarterly	Semi-Annually	Annually	As Required	Labor Hours (approximate)
Replace filter(s)							•	0.5
Replace membranes							•	2.0

Table 5.0 - Maintenance Task Chart

5.2 FILTER ELEMENT CLEANING OR REPLACEMENT

The filter elements should be replaced when the **Feed Pressure Gauge PI-20** drops below 5 psi.

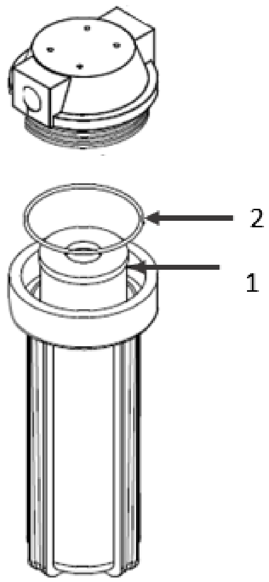


Figure 5.0 – Filter Exploded View

Call Out	Description	Qty	Parker Part #
1	Element Pre- Filter 10-25	2	0803004773
2	O-Ring 237 Blue Housing	2	2614010473

Table 5.1 - Filter Parts List

CAUTION

Parker filter cartridges are specifically designed for RO applications and constructed with a carbon attractive chlorine. Use of non-approved cartridges will void the RO unit warranty.

Replace the filter element(s) using the following procedure:

1) Secure the RO unit. Close the raw water supply (external) to RO unit.

2) Remove bowl from filter housing.

3) Remove the filter element.

4) Replace the filter element and install a new element.

5) Reinstall a new filter element. Inspect O-ring and replace as necessary.

6) Reinstall the filter bowl and tighten.

7) After the filter element has been changed, operate the RO unit and check for leaks.

5.3 MEMBRANE ELEMENT INSTALLATION OR REPLACEMENT

The membrane when the pressure is at maximum and the TDS is unacceptable.

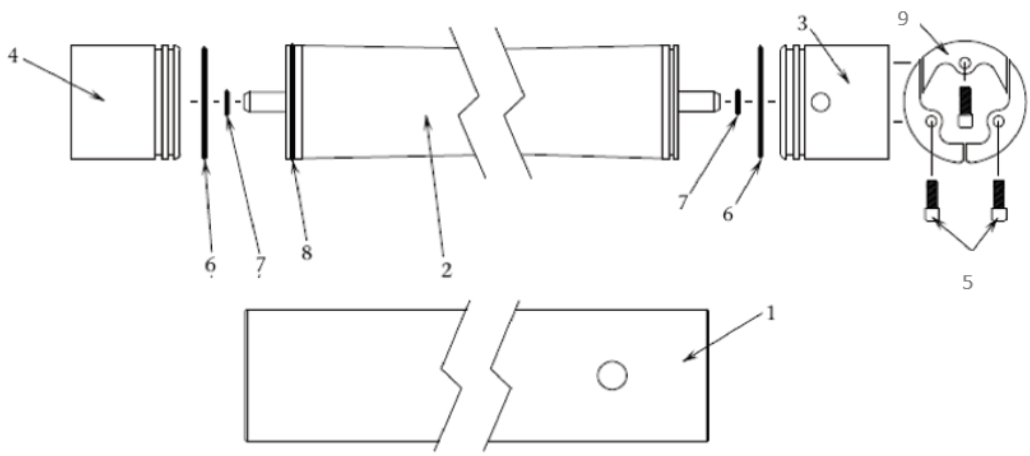


Figure 5.1 – Pressure Vessel Exploded View

Call Out	Description	Qty	Parker Part #
1	Vessel, FRP, 3021,1 KPSI, w/o Endcaps	1	50012002
2	Element, Brackish Water, LE-3021	1	33-0321-X
3	Vessel End Plug, Acetal,3021,1/4 FNPT Ports	1	51012001
4	Vessel End Plug, Acetal,3021,1/4 FNPT Ports	1	51012001
5	SC Soc Cap 1/4-20 X 3/4 SS	6	061162345012
6	O-Ring 230 Brine 3" End Plug	2	2614014900
7	O-Ring 116 Product	4	2614010100
8	Brine Seal (Supplied with Membrane)	1	
9	Segment Ring AW (Set)	2	20201030000

Table 5.2 – Pressure Vessel Parts List.

CAUTION

Membranes are specifically designed for RO applications. Use of non-approved membranes will void the RO unit warranty.

NOTE

It is recommended to 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.

Replace the membrane element(s) using the following procedure:

PRESSURE VESSEL:

a. Disassembly of the RO Membrane and Vessel Assembly:

1. Remove the hoses and fittings from each end of the High-Pressure Vessel Assembly.

2. Remove the fasteners (Item #5) that hold the Segment Rings (Item #9) in place. Located at each end of the Pressure Vessel.

3. Push inward on the End Plug #3 and #4 and remove the three-piece segment ring #9 from one end, repeat for the other end.

4. Insert one fastener (Item #5) finger tight back into the End Plug (Item #3 & #4). This screw is used as a grip to remove the End Plug.

5. Grasp the fastener with a pair of pliers and pull slowly outward to remove the End Plug. There will be some resistance due to the Brine O-Rings.

6. Remove and discard the brine O-Rings (Item #6) from each of the End Plugs (Item #3 and #4).

7. Remove and discard the Product Water O-Rings (Item #7) from each of the End Plugs (Item #3 and #4).

8. Clean the end plugs with a cloth and inspect each for any sign of wear, cracks, or damage.

9. Sparingly, lightly, lubricate NEW Brine O-Rings (Item #6) and new Product Water O-Rings (Item #7) and install.

CAUTION

The surface of the Product Water Tube must be scratch free. Never use pliers or other grabbing tools on the Product Water Tube.

10. The R.O. Membrane Element may also be pushed from the Outlet end of the vessel towards the Inlet end.

NOTE

A R.O. Membrane Element comes complete with a "U" cup Brine Seal (Item #8) at one end of the Element. This Brine Seal must be positioned at the INLET end of the Pressure Vessel. The seal faces the flow.

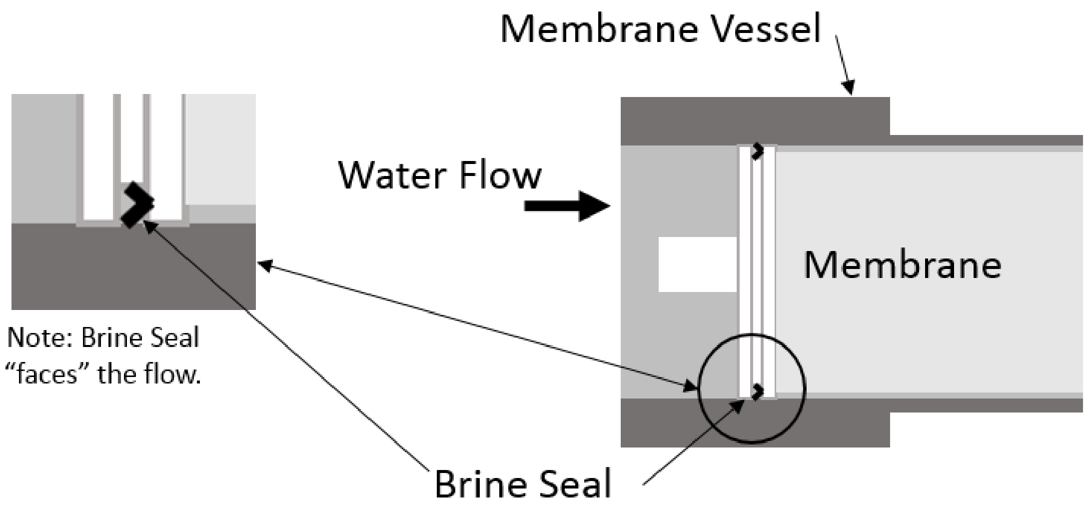


Figure 5.2 – Membrane Vessel Configuration

11. Slide the Membrane Element into the High-Pressure Vessel, past the brine seal, until the Membrane Element product water tube is 10 cm (4 inches) past the end lip of the High-Pressure Vessel.

12. 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.

13. Screw in fitting connectors.

14. 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 fasteners (Item #5). Attach the fasteners (Item #5) and tighten.

15. Reconnect the Hoses to the respective fitting on the Pressure Vessel.

16. After the membrane element has been changed, operate the RO unit and check for leaks.

5.4 INSPECTION LOG

Figure 5.3 depicts a Sample Operational Log for the RO unit. The operator of the RO unit should establish a program for entering the required data on a regular basis. Maintaining accurate operational data is the first, and most important, step in determining preventative maintenance requirements and reducing system downtime. Figure 5.4 depicts a Sample Discrepancy Report that may be used for reporting and tracking problems with the RO unit.

Date	Total Operating Hours	PI-20 Feed Pressure	PI-25 Membrane Inlet Pressure	FI-40 Reject Flow	FI-50 Product Flow	Product Water TDS (ppm)	Water Temp (°C)	Comments

Figure 5.3 - Sample Operational Log

COMMENT/DISCREPANCY REPORT

Parker Hannifin
RO UltRO Clear

Plant No: Date:

Log Task No: Time:

System Affected:

Technician:

Comment / Discrepancy:

Corrective Action:

Action Taken:

Date Completed:

Printed Name:

Signature:

Figure 5.4 - Sample Discrepancy Report

6.0 PRESERVATION FOR STORAGE

When the Parker Hannifin RO unit is to be shut down for an extended period, it is necessary take steps to prevent the growth of biological organisms see Section 4.4 Shut Down Procedure. If the unit will at any time be exposed to air temperatures of 32°F (0°C) or less, the membranes must be removed and the unit fully drained or the unit filled with an anti-freeze solution, such as propylene glycol.

7.0 TROUBLESHOOTING

No amount of trouble shooting advice can replace common sense and direct plant knowledge gained through the operation and maintenance of your unit. However, our experience taking technical calls suggests some points to check.

1. Always verify proper valve configuration for each of the operational modes selected. Verify valve positions for valves within the unit and external valves are open as required.

2. Always check for positive pressure at the HP pump suction. Many problems stem from low or erratic feed water supply. Check filters, inlet piping, etc., to be sure of flooded suction to the RO Pump.

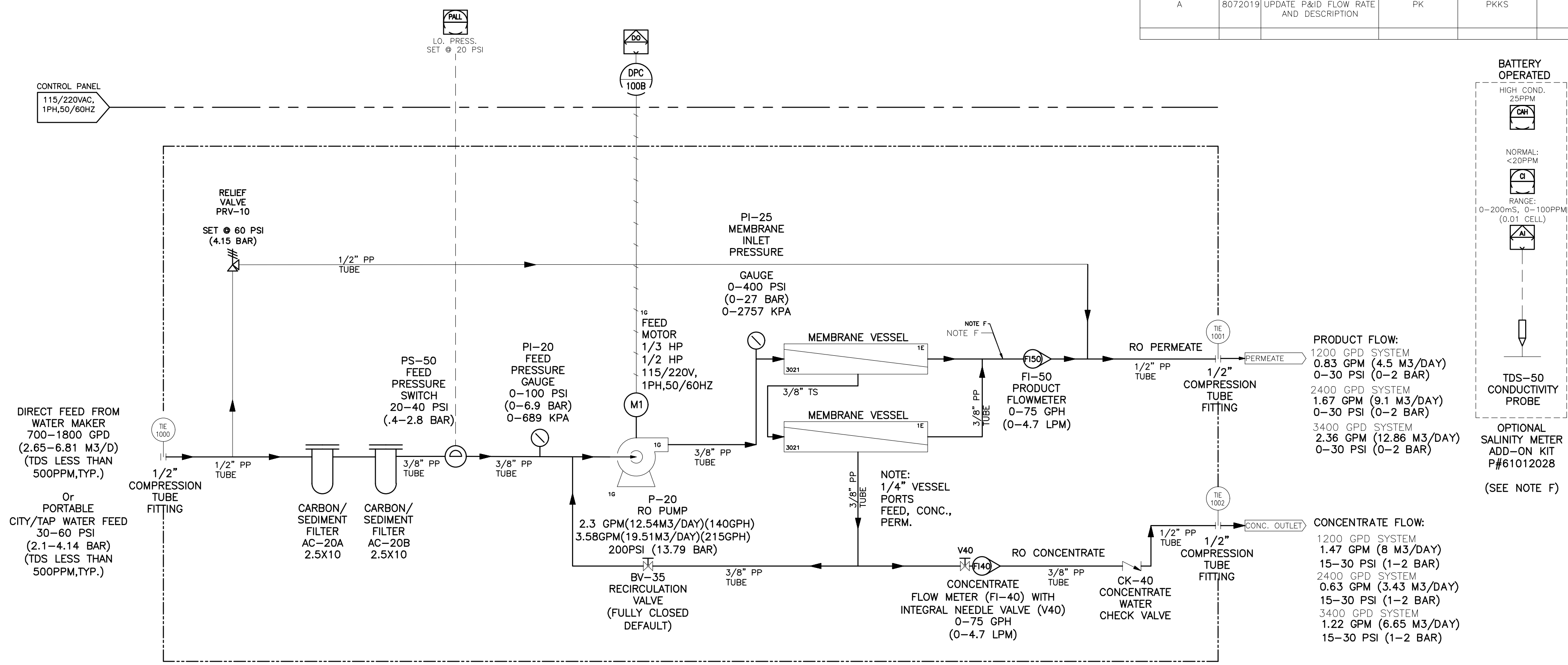
3. Always check for loose connections or broken wires when inspecting electrical parts. Checking for continuity and solid contact can sometimes avoid hours of troubleshooting effort.

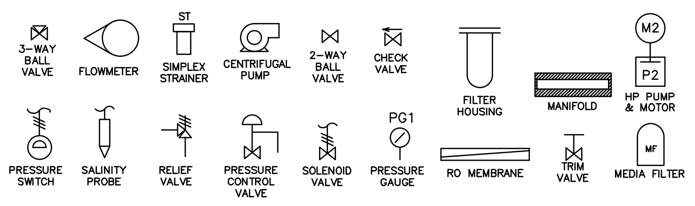
For assistance, call or email Parker for a Technical Service representative.

8.0 SYSTEM DRAWINGS AND DIAGRAMS AND PARTS LIST

REVISION HISTORY

REV	DATE	DESCRIPTION	DESIGNER	CHECKED	APPROVED
A	8072019	UPDATE P&ID FLOW RATE AND DESCRIPTION	PK	PKKS	BB





NOTES:

A. TYPICAL SOURCE WATER IS CITY/ TAP UP TO 1,000 MICROSIEMENS OR FIRST PASS RO PERMEATE UP TO 1000 MICROSIEMENS
B. DECHLORINATION MUST BE PROVIDED IF CHLORINE IS PRESENT, AC FILTER
C. SCALING PRETREATMENT OR ANTI-SCALANT
D. BOOSTER PUMPING IS RECOMMENDED FOR APPLICATIONS WITH LESS THAN 30 PSI OF FEED PRESSURE.
E. LOW PRESSURE PARKER MEMBRANES ARE PROVIDED (DEFAULT) AND 1200 GPD SYSTEM USES SINGLE MEMBRANE, 2400 GPD SYSTEM USES DOUBLE MEMBRANES AND 3400 GPD SYSTEM USES TRIPLE MEMBRANES.
F. OPTIONAL SALINITY METER IS INSTALLED NEAR FI-50 PER TECH BULLETIN TB015.
G. FOR 1200-2400 GPD SYSTEM USE $\frac{1}{3}$ HP MOTOR AND 140LPH PUMP AND FOR 3400 GPD SYSTEM USE $\frac{1}{2}$ HP MOTOR AND 215 GPH (3.58GPM)(19.51M3/DAY) PUMP

INSTRUMENT LINE SYMBOLS

- — — — ELECTRICAL SIGNAL (DISCRETE)
- —/—/— ELECTRICAL POWER (VAC-SINGLE PHASE OR VDC)
- ——— CONNECTION TO PROCESS, OR INSTRUMENT SUPPLY

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 -

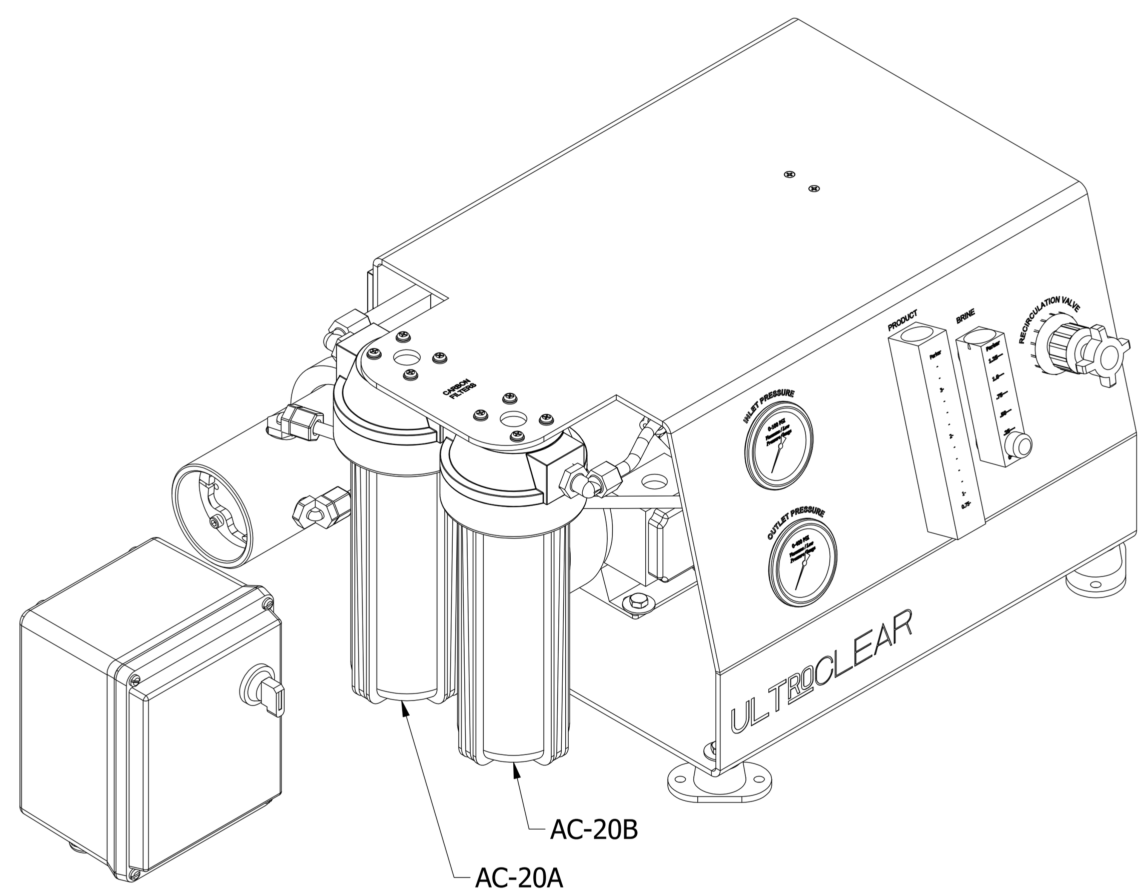
DRAWN - JD	DATE - 03/25/2019	
CHECKED - BW	DATE - 03/25/2019	
APPROVED -PK	DATE - 03/25/2019	
DRY WT: N/A		N/A
WET WT: N/A		
CONTRACT NO		

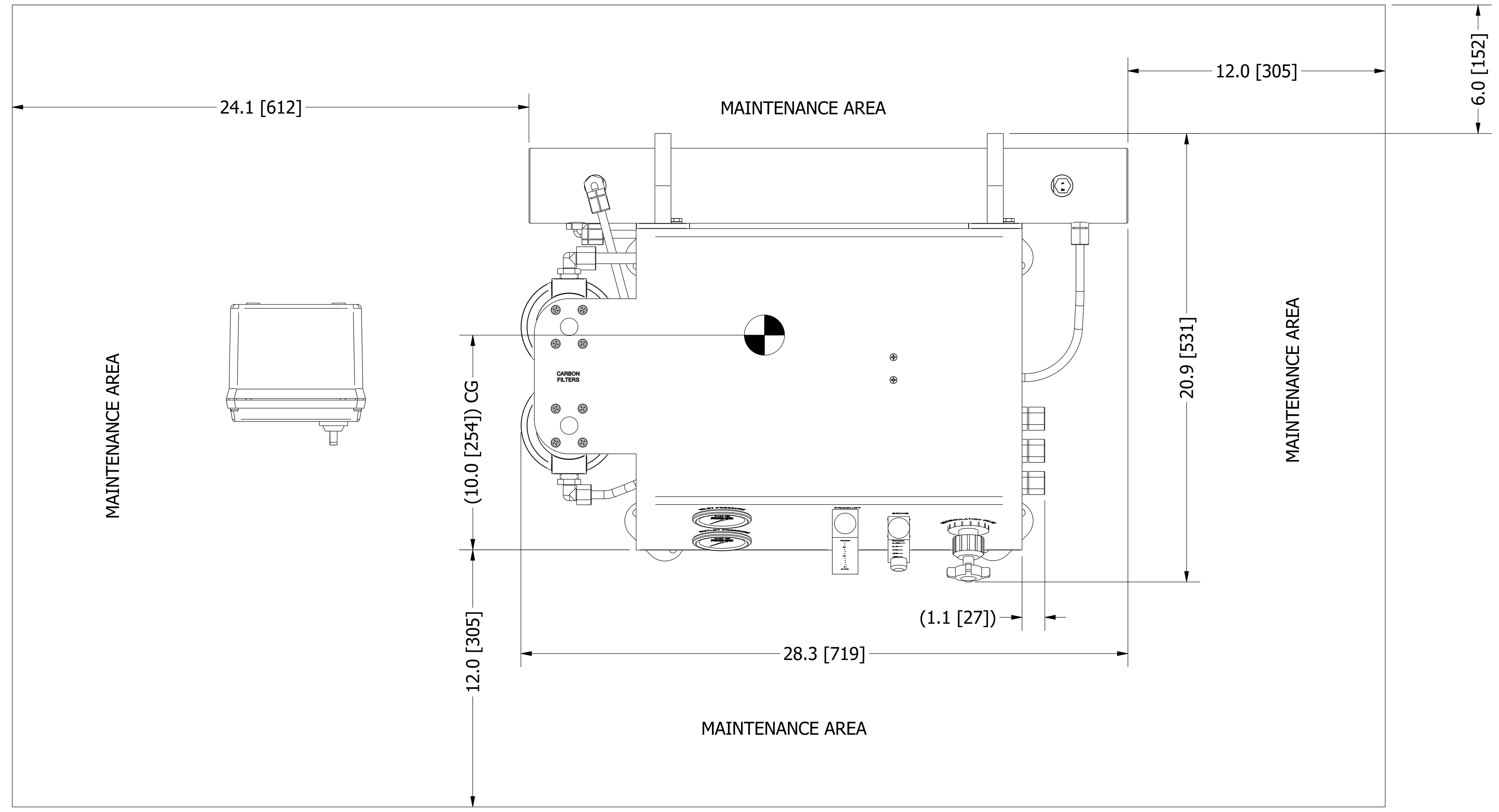
Parker
Parker Hannifin Corporation
Filtration Group / Water Purification
2630 E. El Presidio Street
Carson, CA 90810
Contact
Office: 310-608-5600
Fax: 310-608-5692
www.parker.com

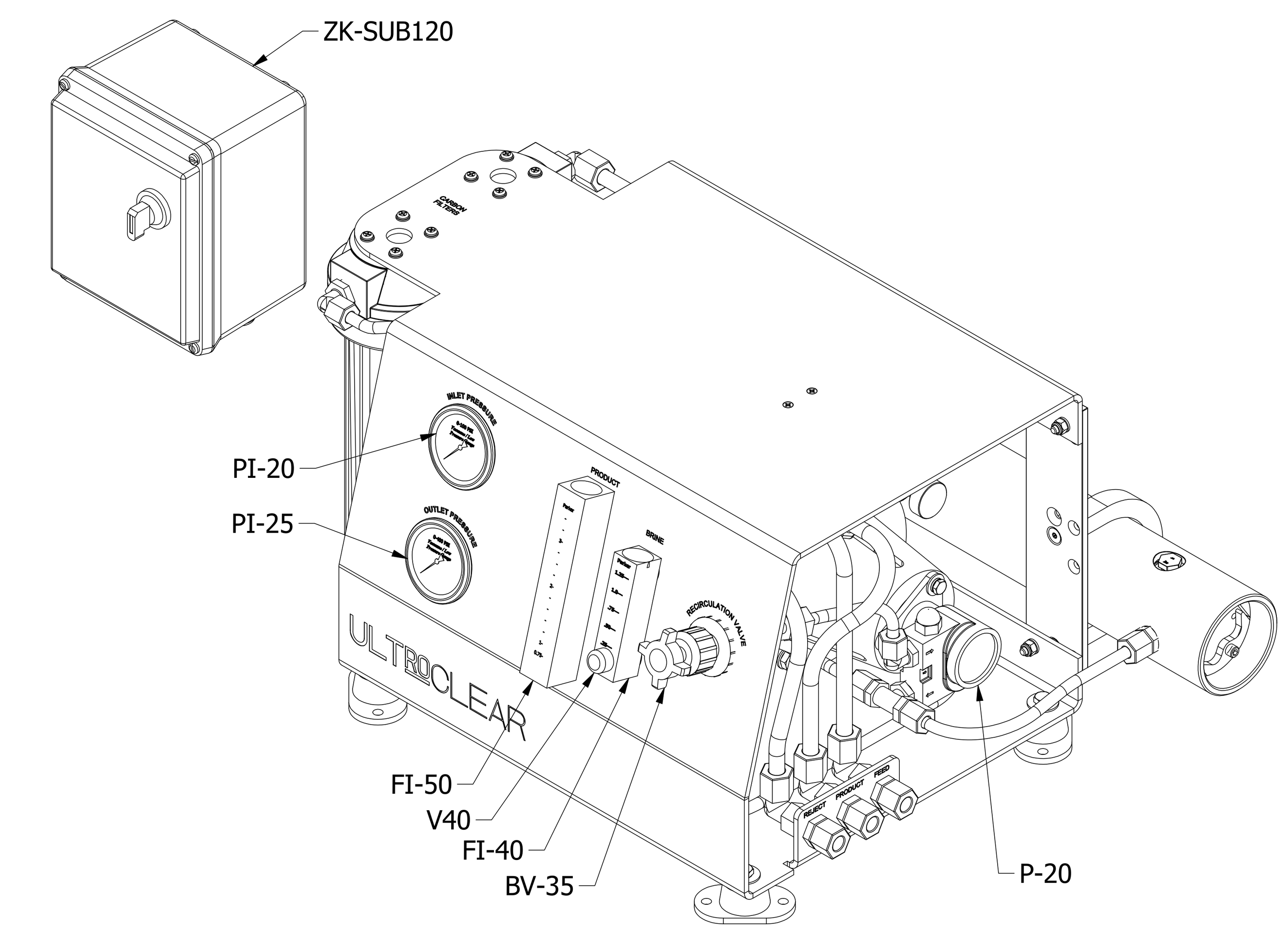
UC SERIES, 115/220V, 50/60HZ, 1PH PROCESS AND INSTRUMENTATION DIAGRAM

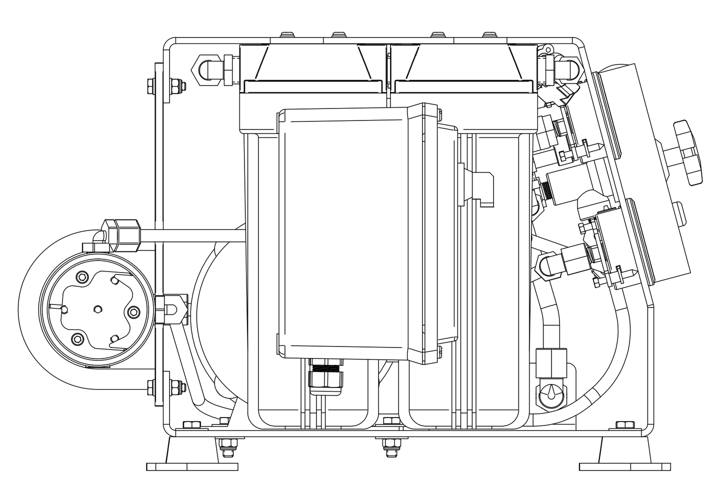
SIZE	CAGE NO	DWG NO	REV
D	62144	UC-PID	A
SCALE NTS		1 OF 1	

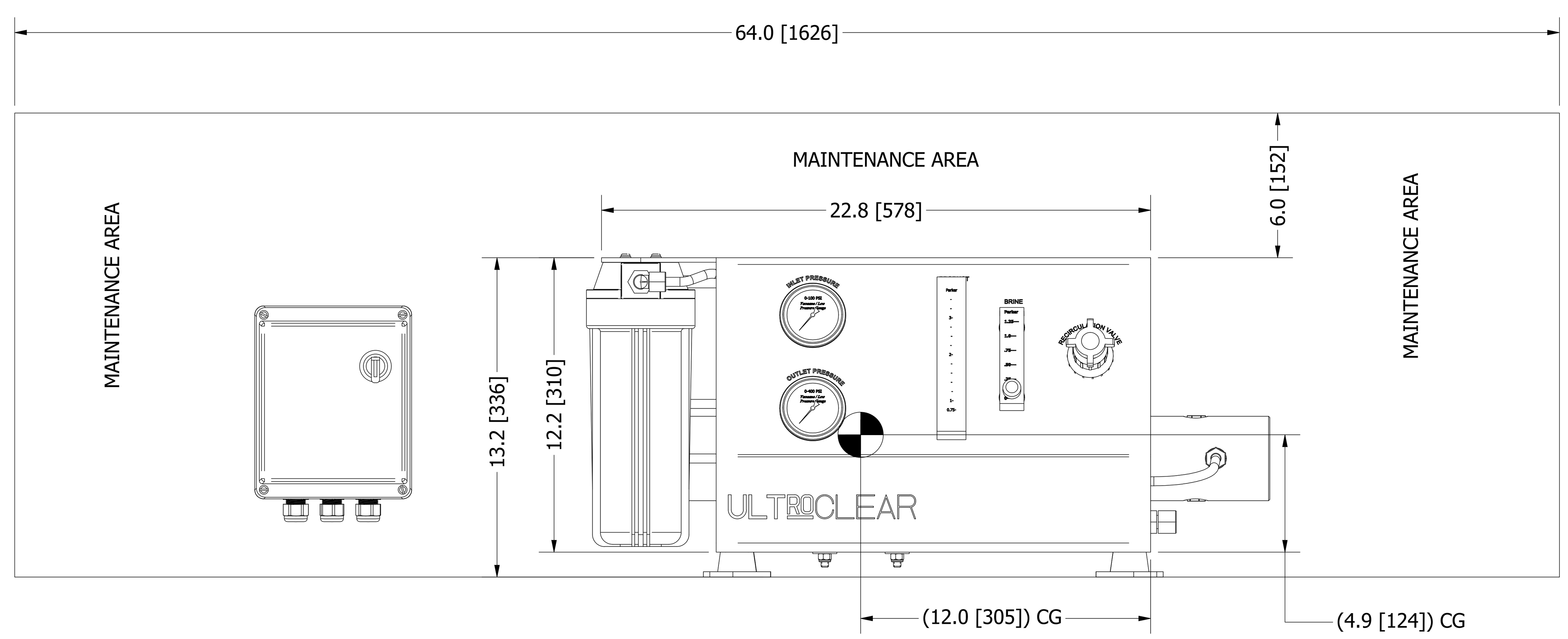
REVISION HISTORY					
REV	DATE	DESCRIPTION	DESIGNER	CHECKED BY	APPROVED
D	4/8/2019	UPDATED PS-50 SWITCH AND SURROUNDING COMPONENTS, ADDED ALL COMPONENT TAGS, CHANGED "PRV ASSY" TO "FEED WATER INLET ASSY", REVISED PLUMBING CONNECTIONS BEHIND EACH FLOW GAUGE	JPD	SY	BB

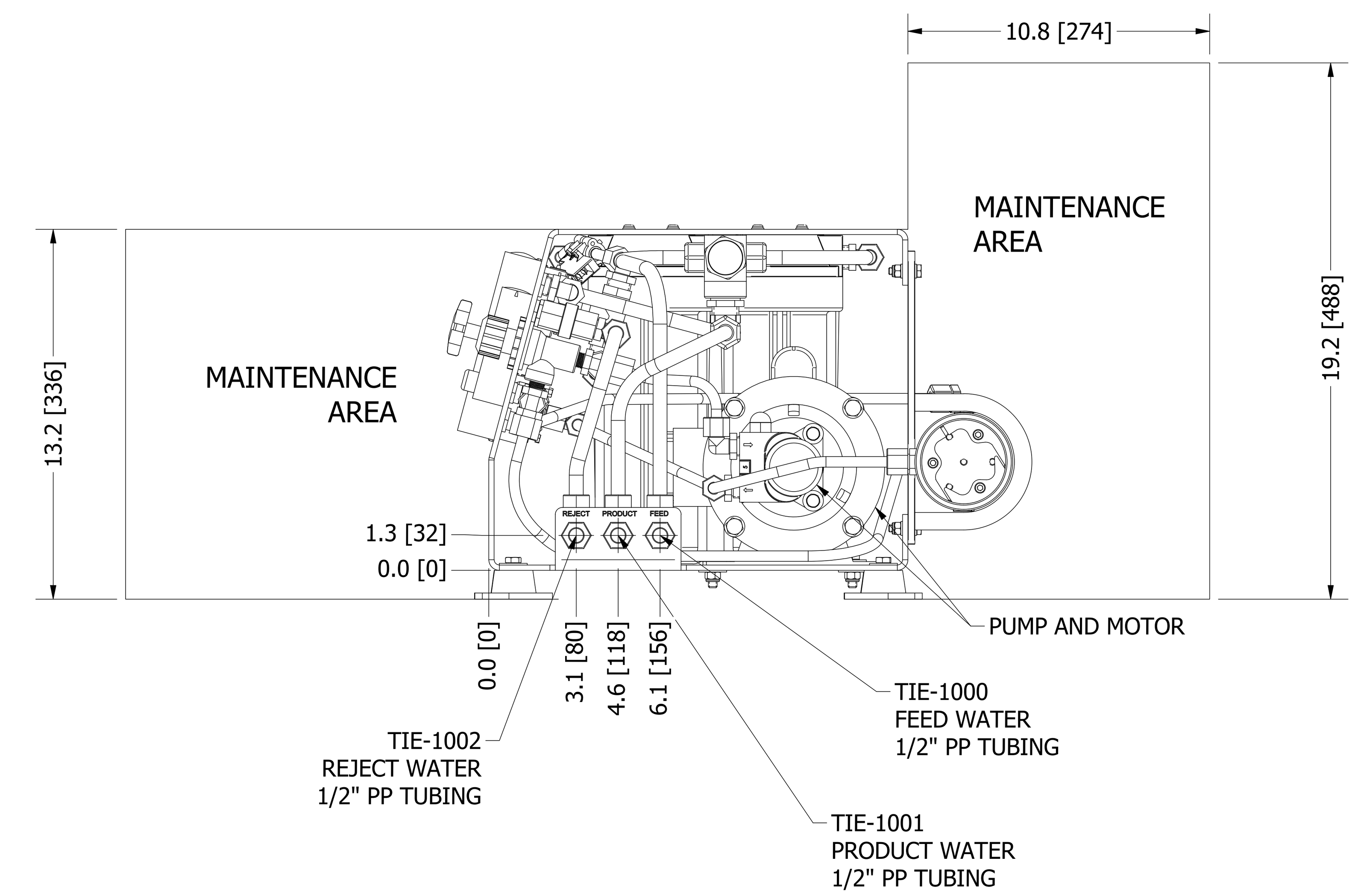


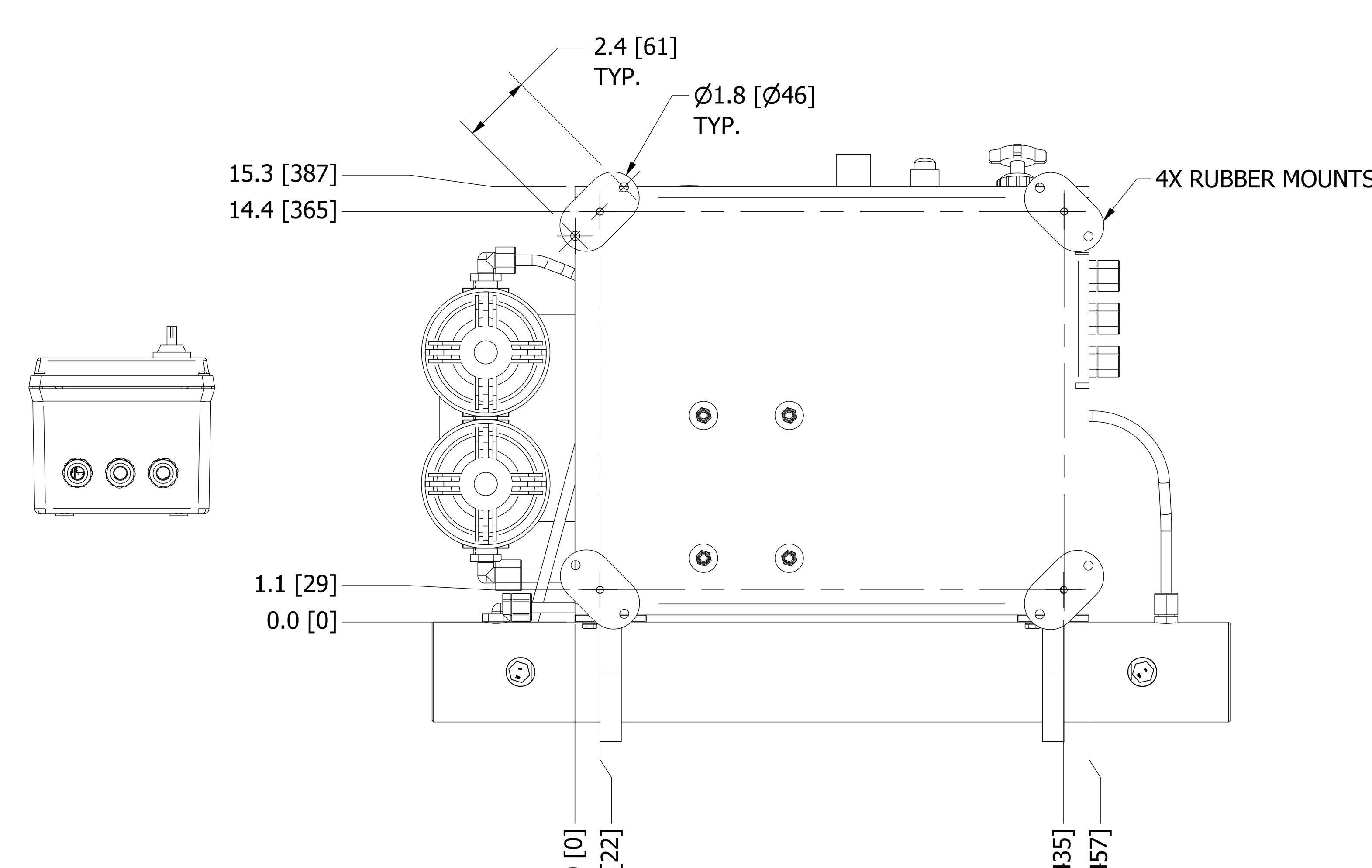












REFERENCE TP-0281

PROPRIETARY STATEMENT

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 - BCW	DATE - 5/1/2018	
CHECKED - PK	DATE - 5/1/2018	
APPROVED - PK	DATE - 5/1/2018	
DRY WT: 81 lbs	37 kg	
WET WT: 93 lbs (42 kgs)		
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

CUSTOMER DWG

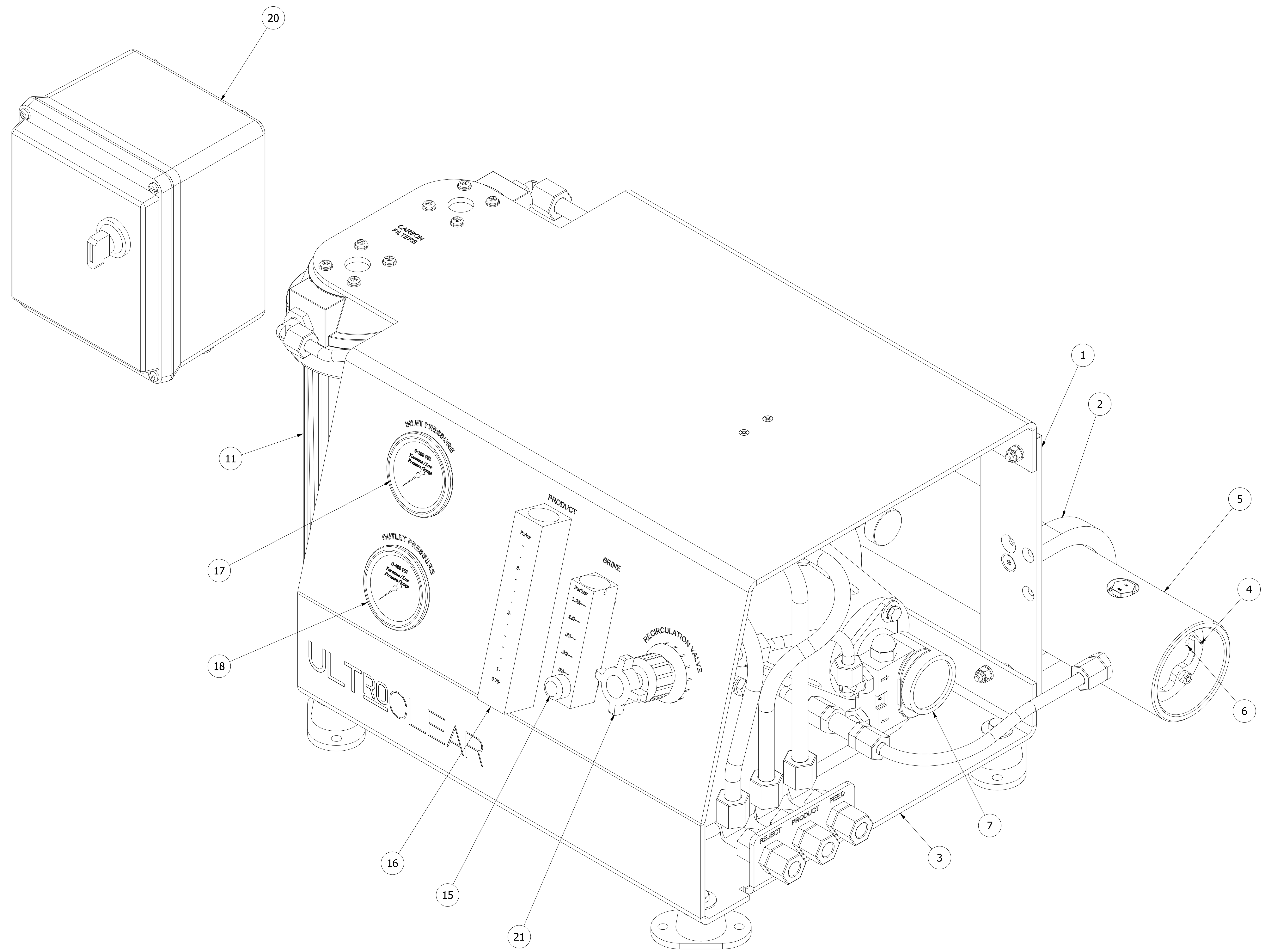
UC,1200GPD,110V,1PH,50-60Hz

SIZE	DWG NO	REV
D	UC1200-116	D

SCALE 1 : 5 | 1 OF 3

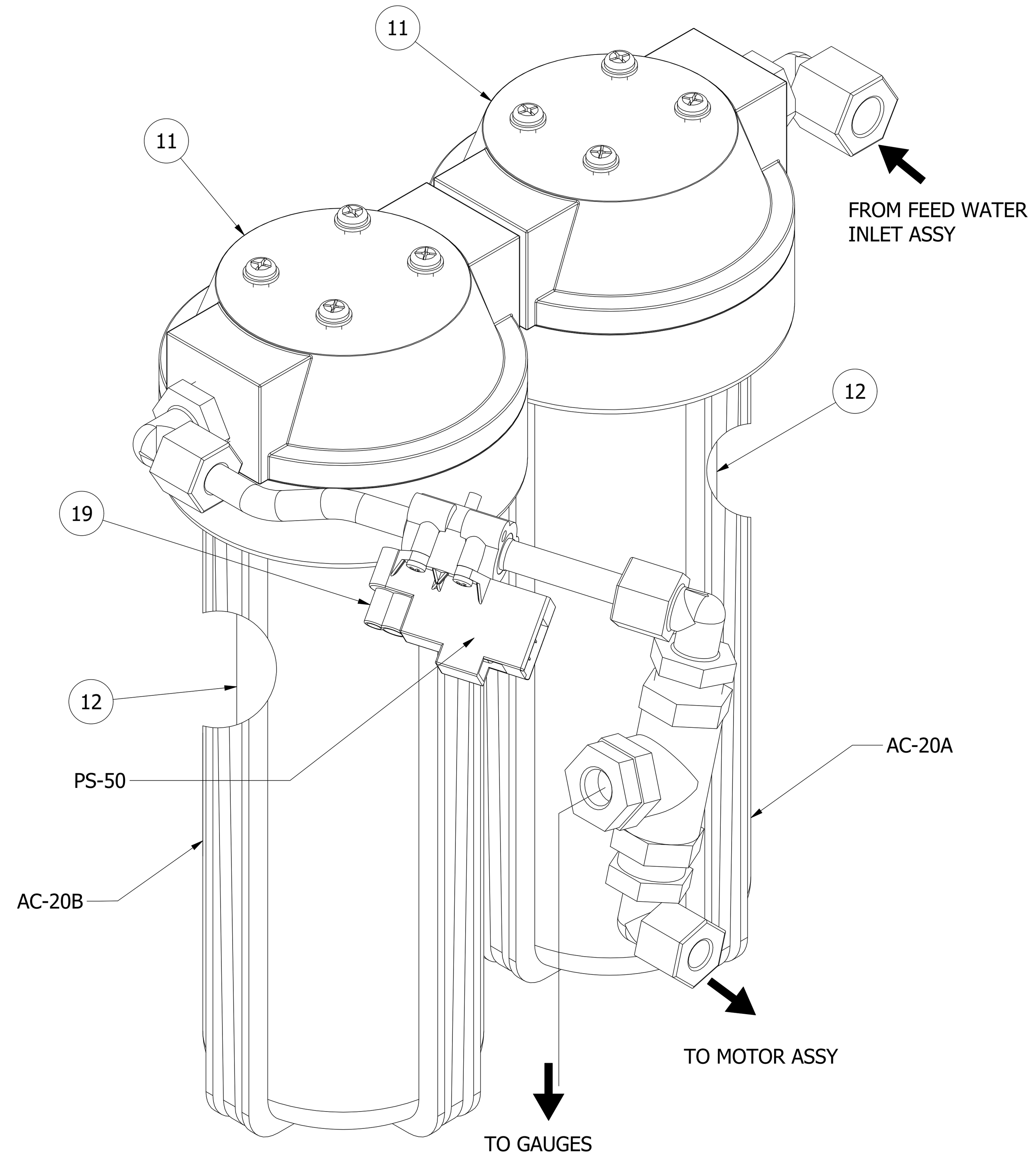
DWG NO UC1200-116 SH 1

PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	0520051800-1	MVA RACK , UWDX BJ
2	2	05202401GR	BRACKET,MVA U-CLAMP,3 IN
3	1	0861044	FRAME,ASSY,ZK SERIES
4	2	20201030000	SEGMENT RING AW (SET)
5	1	50012002	VESSEL, 3021 FRP
6	2	51012001	END PLUG, 3021, 1-4 IN PORTS
7	1	12176402DP	PUMP ROTARY VANE 140 GPH #15
8	1	12227601DP	COUPLING PUMP-MOTOR SHAFT
9	1	12227701DP	ADAPTER PUMP ROTARY VANE
10	1	15AG250912	MOTOR .33 HP 50-60-1
11	2	0713020873	FILTER HOUSING .50 X 10
12	2	0803004773	ELEMENT,CHARCOAL,2.5 x10.0
13	1	33-0321-X	ELEMENT,BRACKISH WTR,XLE-3021
14	2	05180851CC	BRACKET,GAUGE,CBM,SS
15	1	85012008	FLOWMETER,REGULATOR, 75 GPH,ACRYLIC
16	1	85012028	FLOWMETER,3.5 GPM,ACRYLIC
17	1	86012004	GAUGE 0-100PSI,CBM.NPT
18	1	86012005	GAUGE 0-400 CBM.NPT
19	1	86012007	SWITCH,40-20PSI,3/8" TUBE ENDS
20	1	ZK-SUB120	ELECTRICAL PANEL ASSY,120VAC,UltROClear
21	1	60-3406	VALVE,ANGLE,0.25FNPT,NYL
22	1	60-7742	VALVE, RELIEF, NYL, 3-4 FNPT
23	1	76012080	VALVE,CHECK,3/8FPT W/VITO PVC

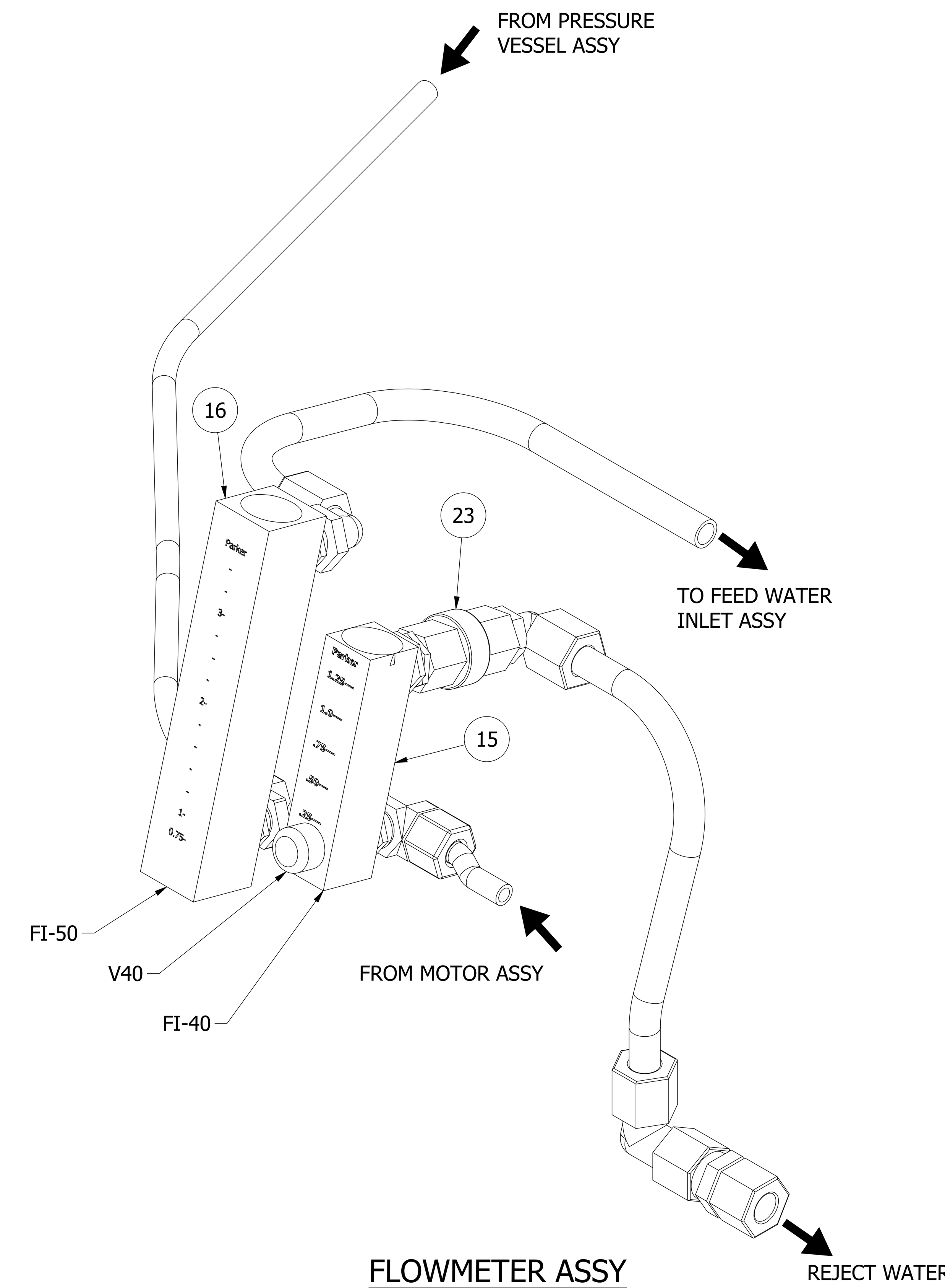


SIZE	DWG NO	REV
D	UC1200-116	D
SCALE	2 OF 3	

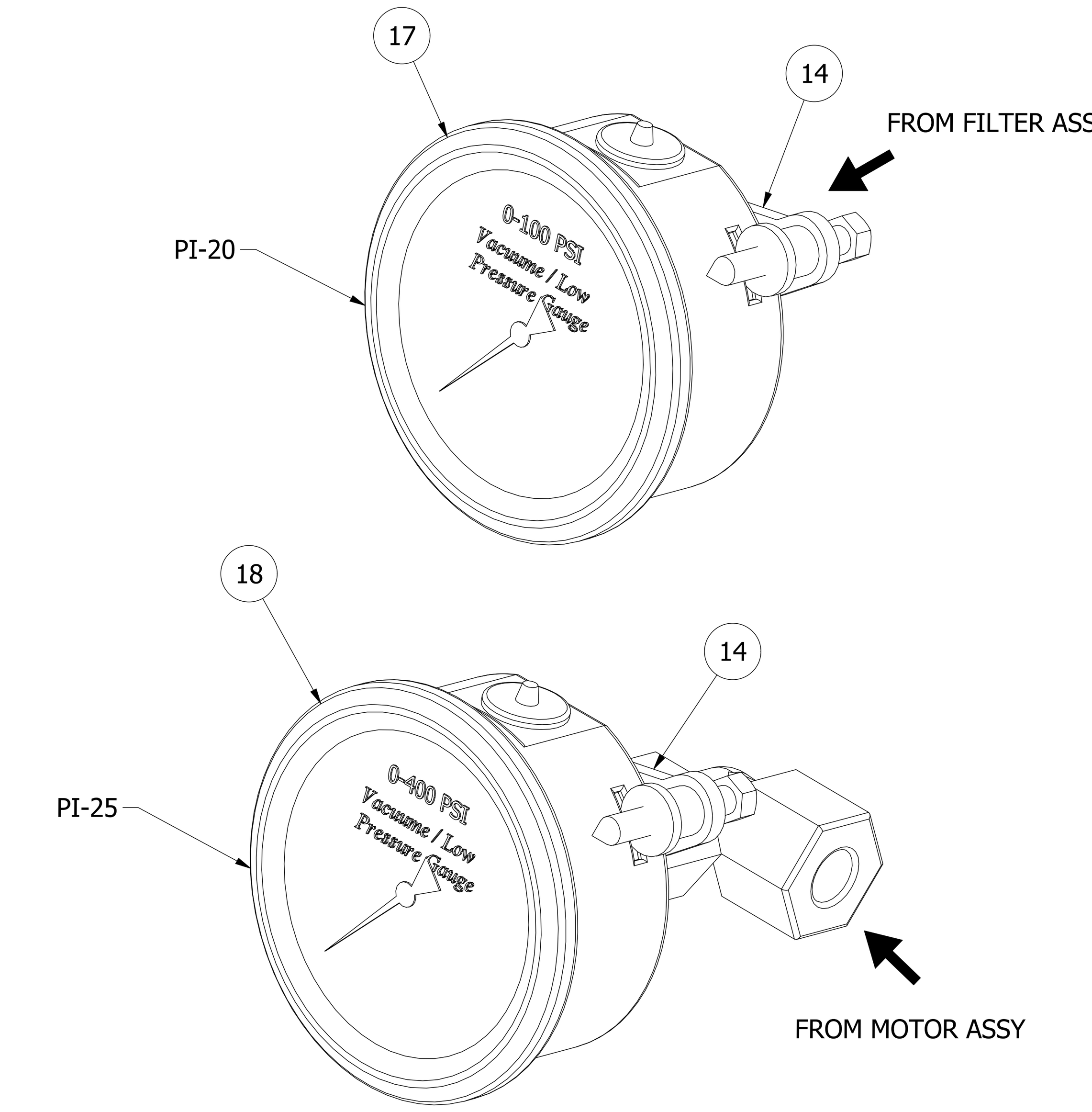
DWG NO UC1200-116 SH 2



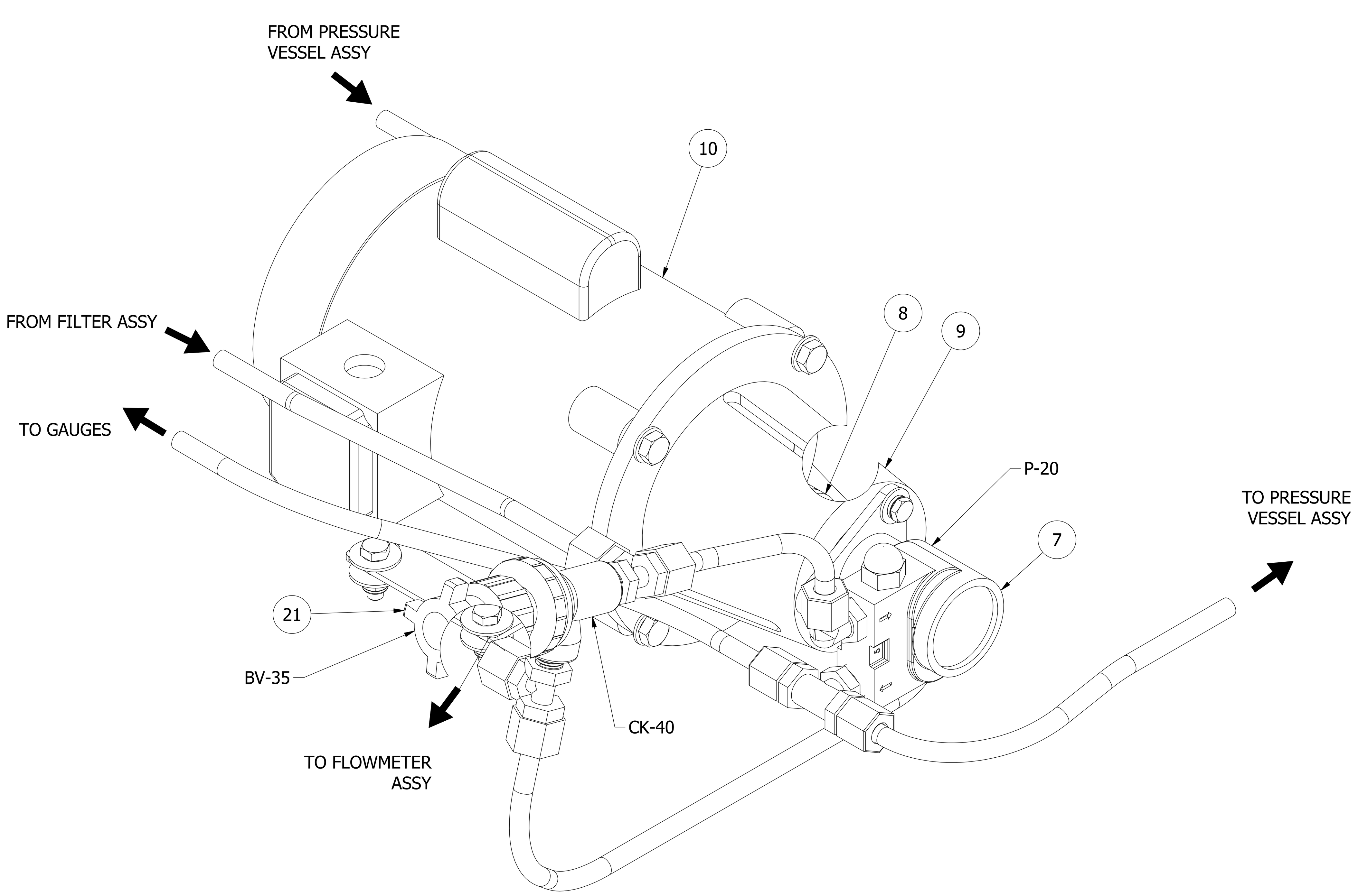
FILTER ASSY



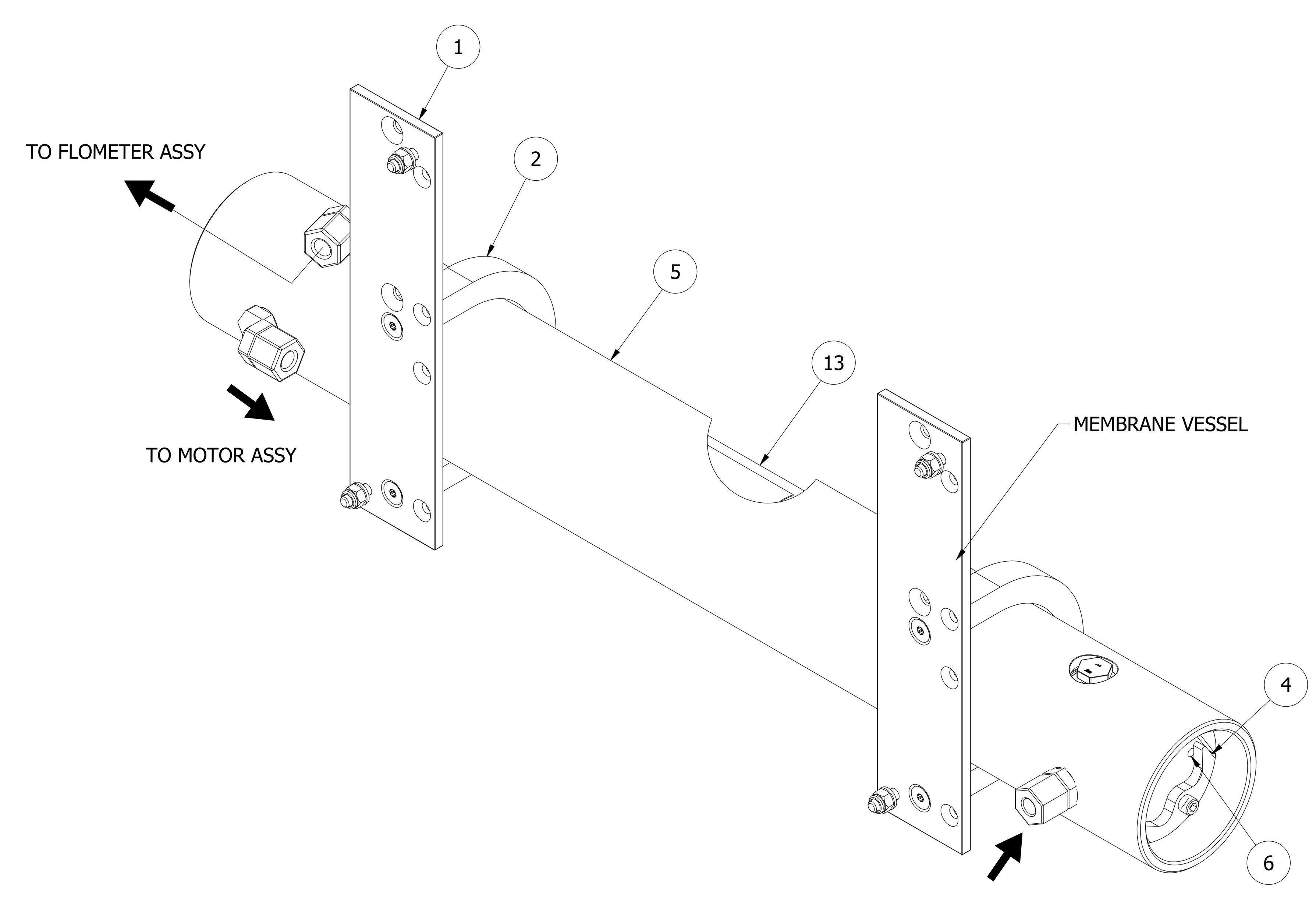
FLOWMETER ASSY



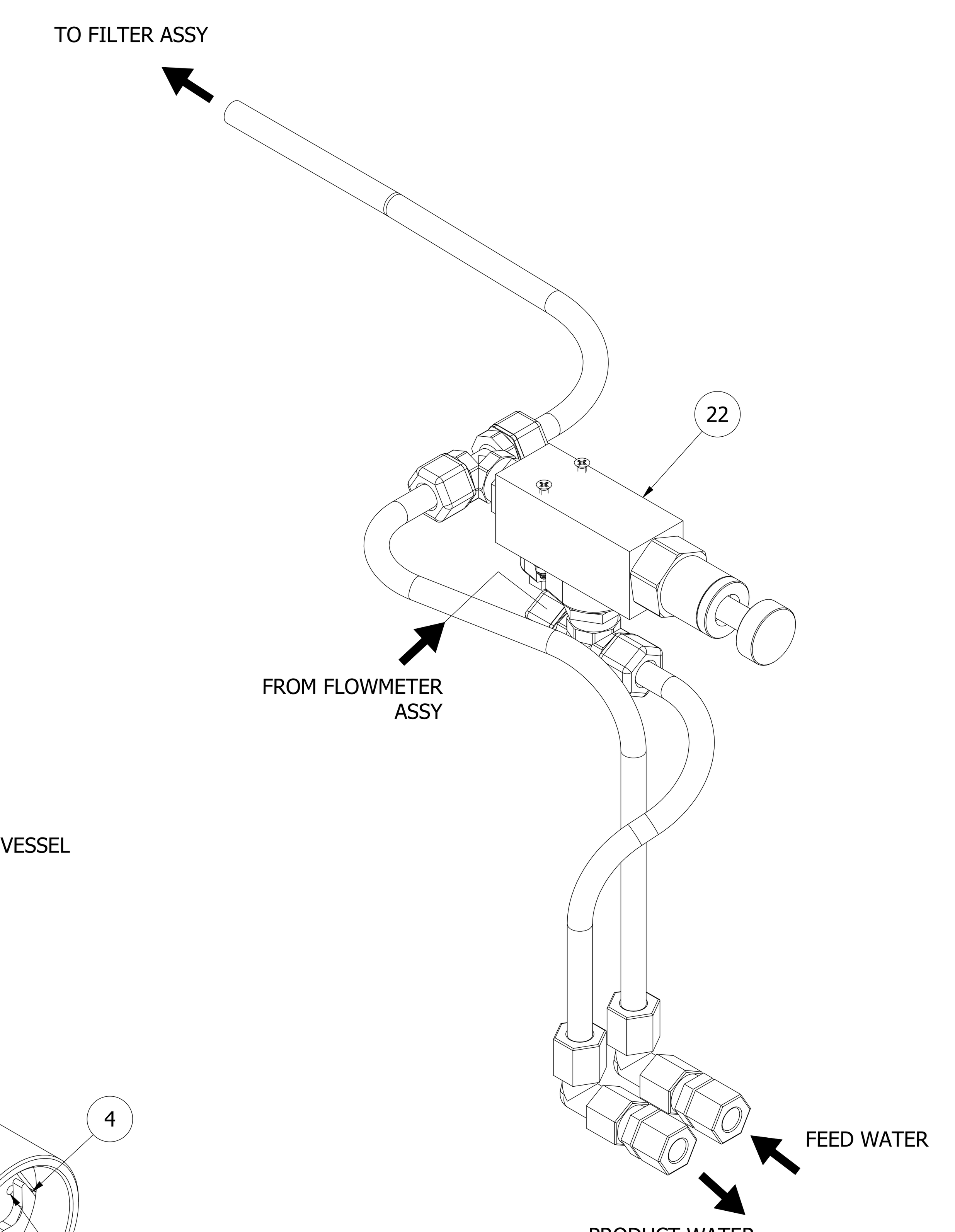
GAUGES



MOTOR ASSY



PRESSURE VESSEL ASSY

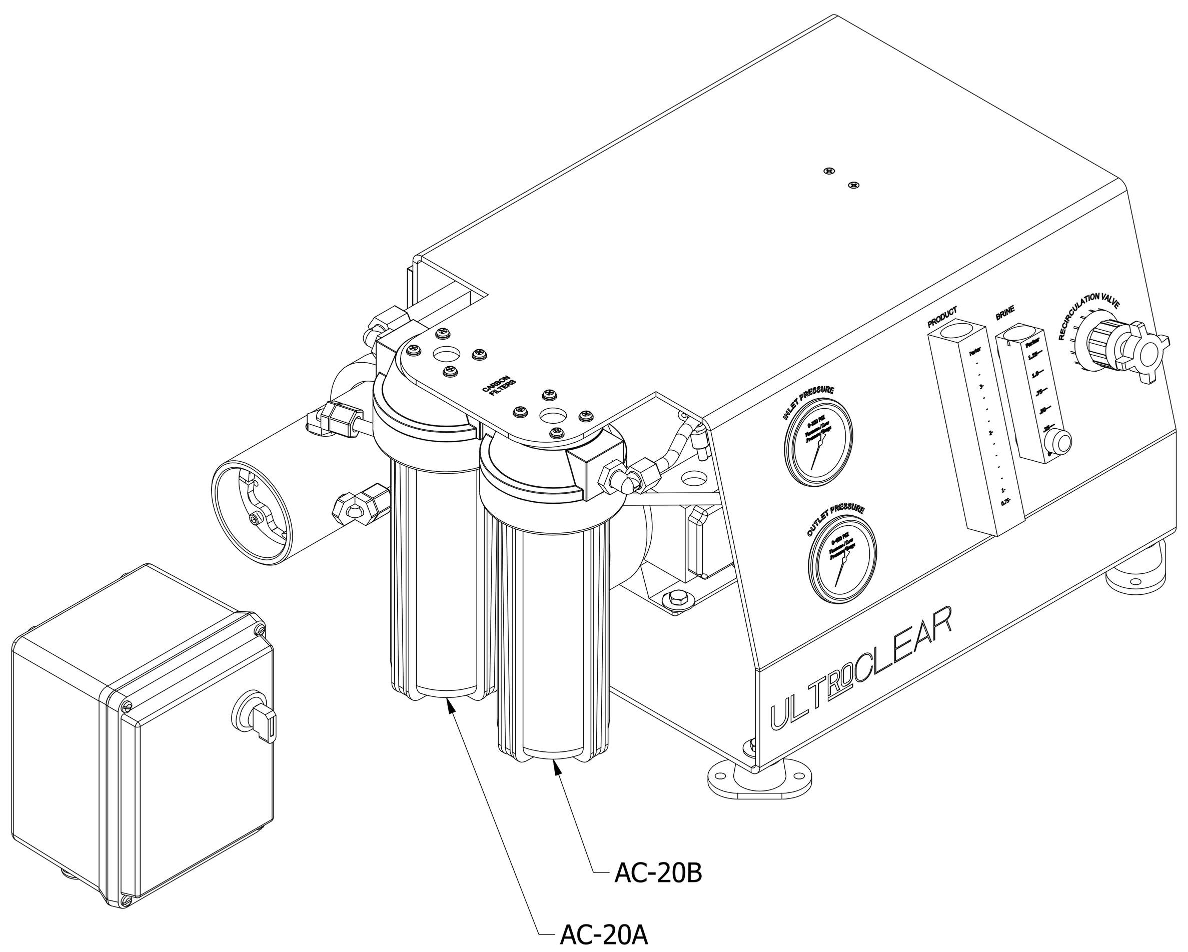


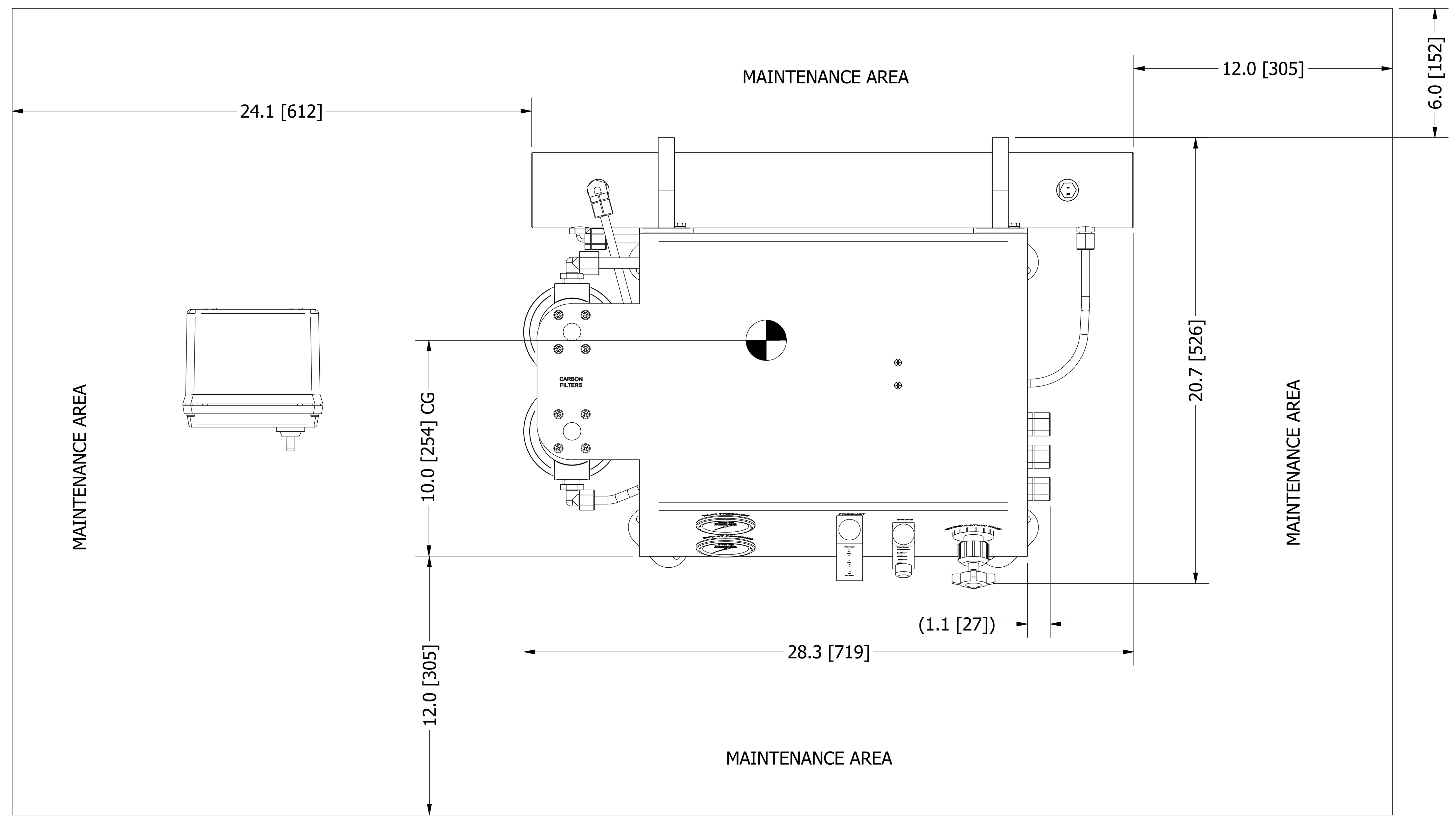
FEED WATER INLET ASSY

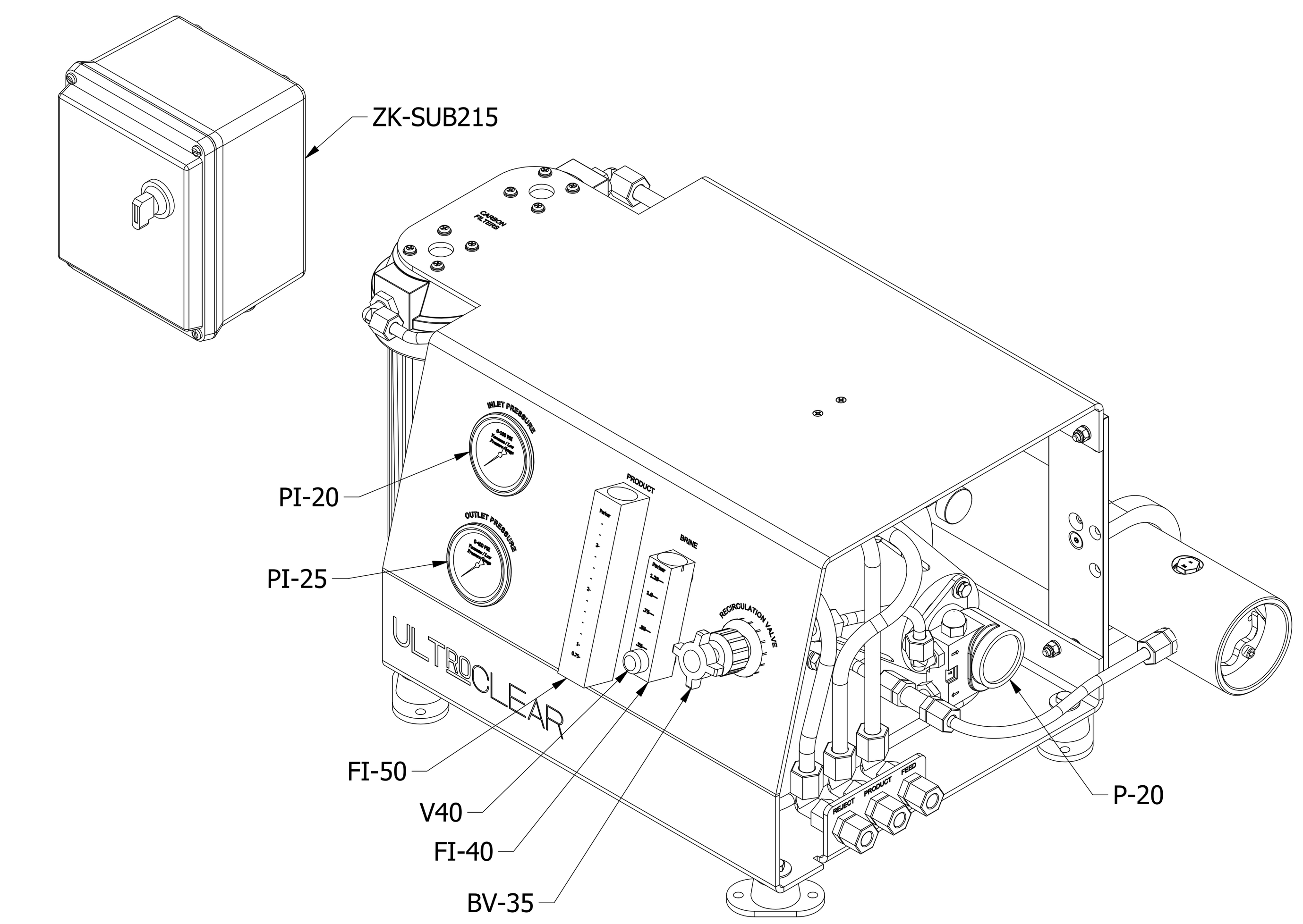
SIZE	DWG NO	REV
D	UC1200-116	D
SCALE		3 OF 3

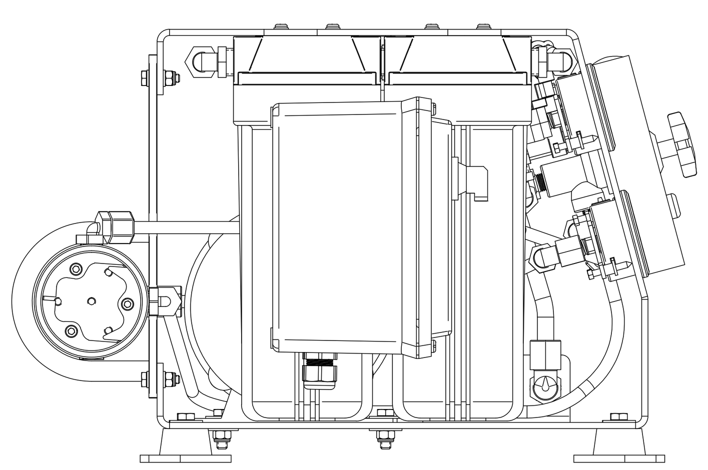
DWG NO UC1200-116 SH 3

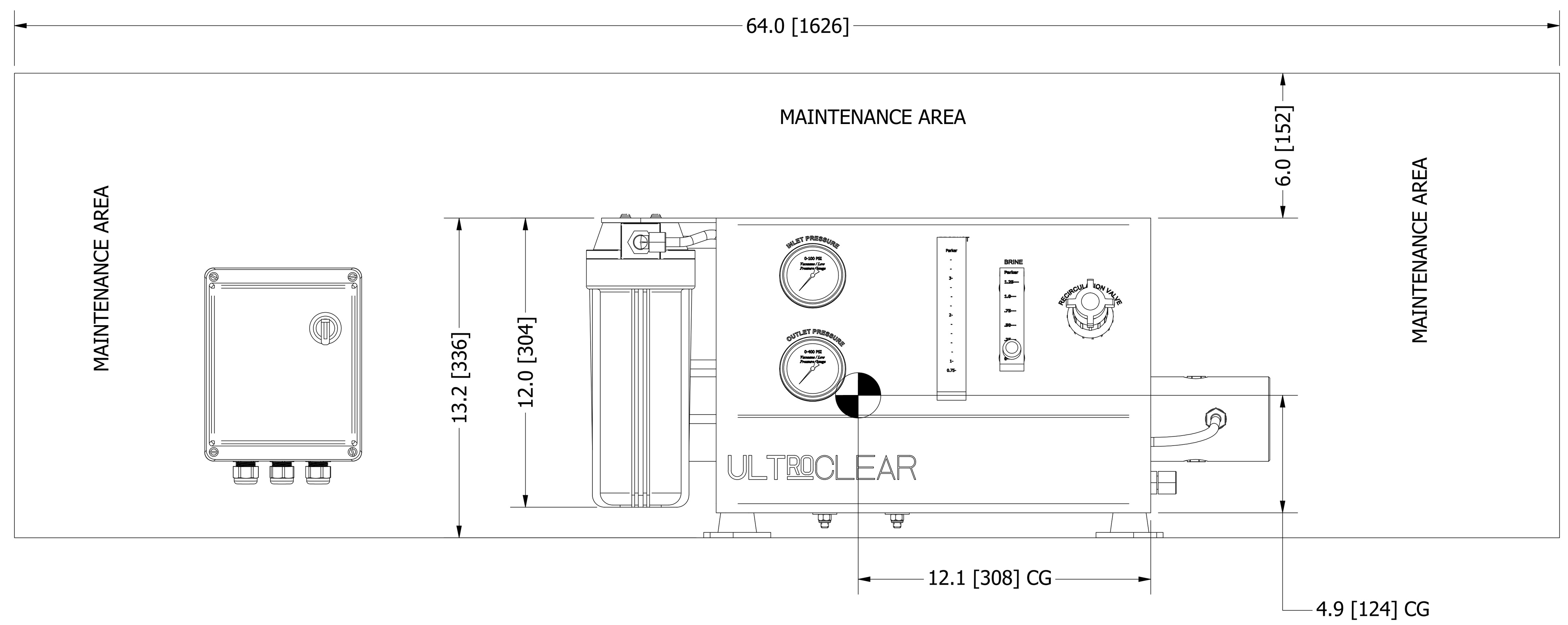
REVISION HISTORY					
REV	DATE	DESCRIPTION	DESIGNER	CHECKED BY	APPROVED
D	4/5/2019	UPDATED PS-50 SWITCH AND SURROUNDING COMPONENTS, ADDED ALL COMPONENT TAGS, CHANGED "PRV ASSY" TO "FEED WATER INLET ASSY", REVISED PLUMBING CONNECTIONS BEHIND EACH FLOW GAUGE	JPD	SY	BB

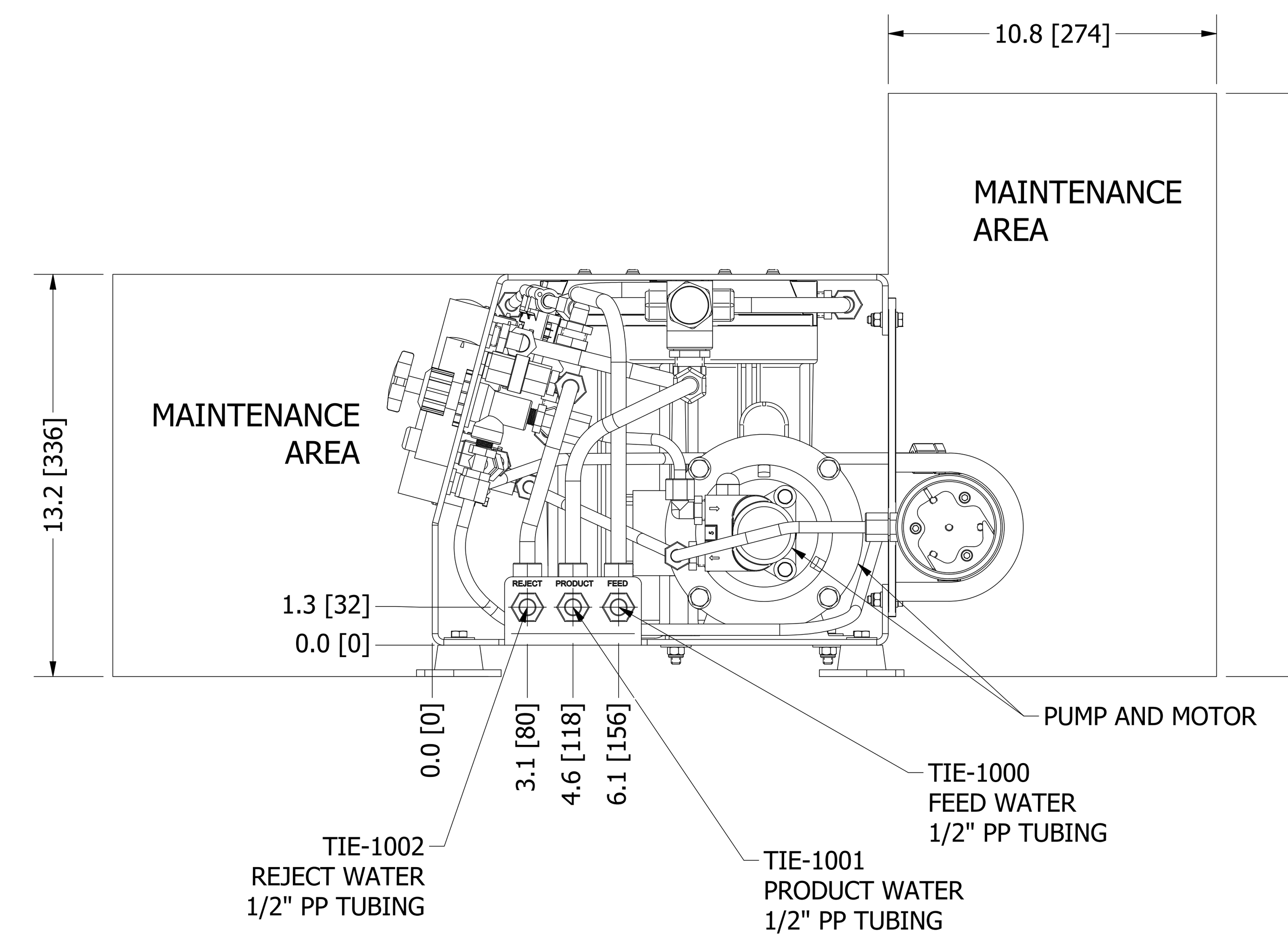


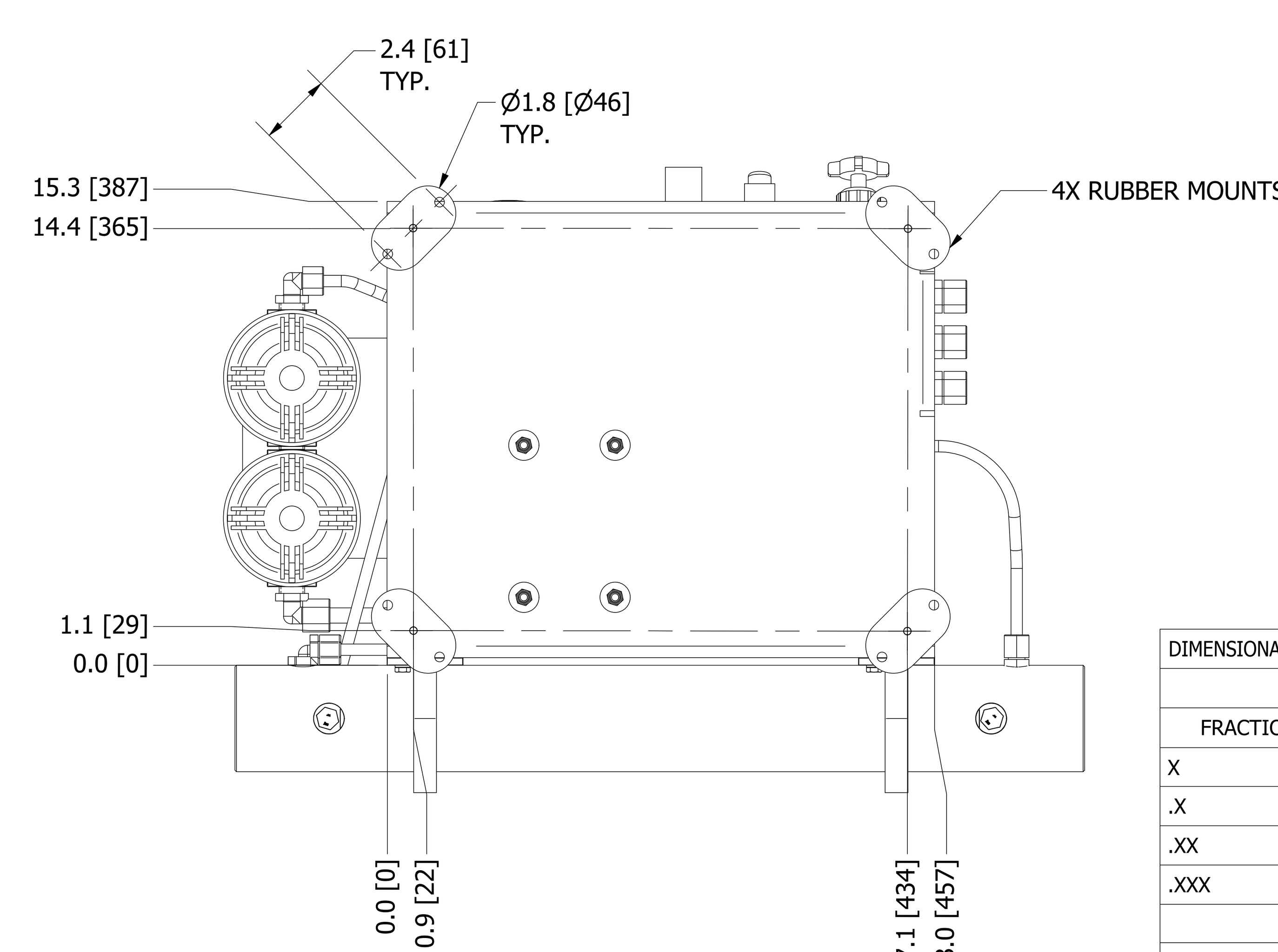












REFERENCE TP-0281

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 - BCW	DATE - 1/9/2019	
CHECKED - PK	DATE - 5/1/2018	
APPROVED - PK	DATE - 5/1/2018	
DRY WT: 81 lbs	37 kg	
WET WT: 93 lbs (42 kgs)		
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

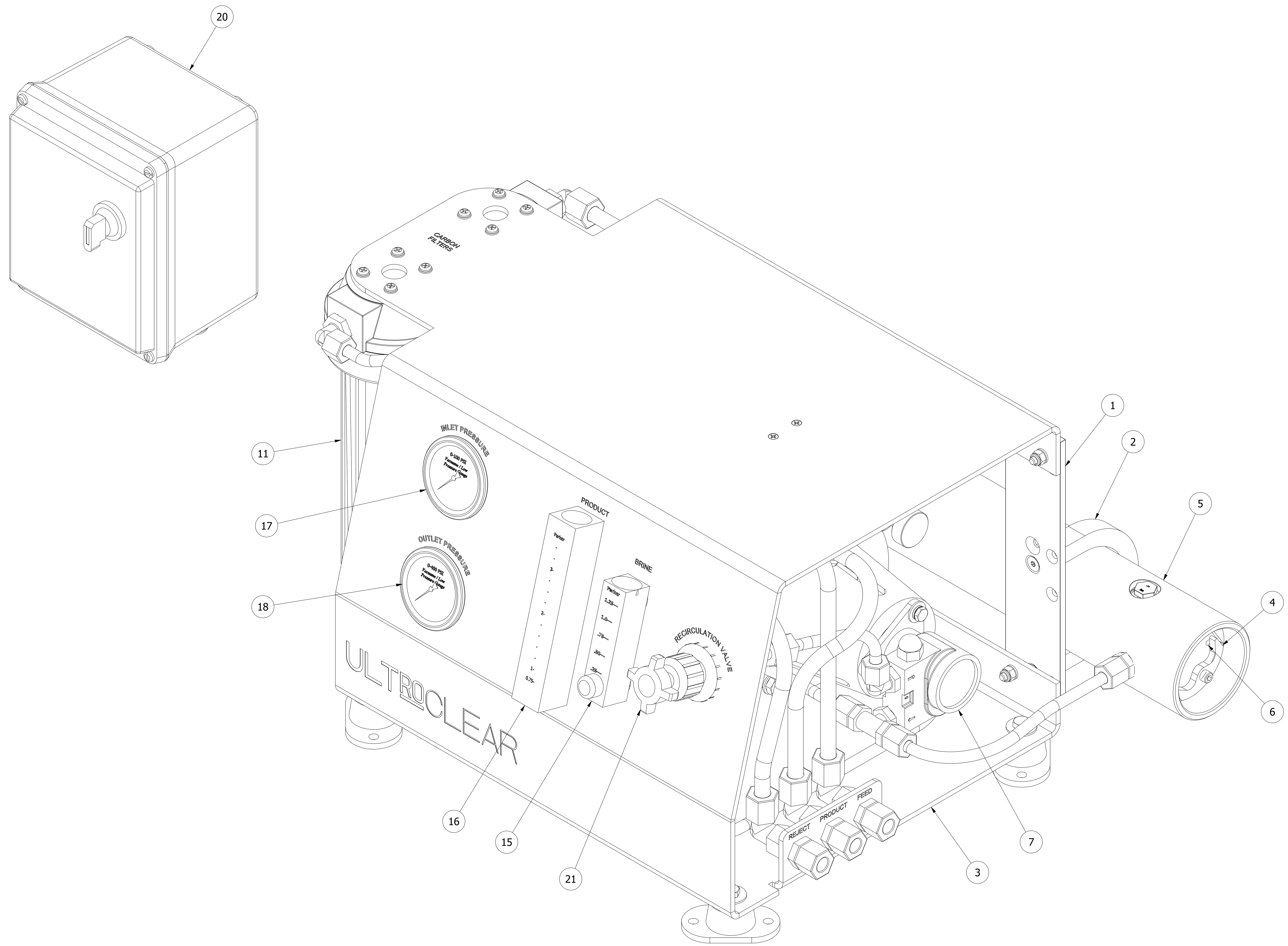
CUSTOMER DWG

UC,1200GPD,220V,1PH,50-60Hz

SIZE D | DWG NO UC1200-215 | REV D

SCALE 1 : 5 | 1 OF 3

DWG NO UC1200-215 SH 1

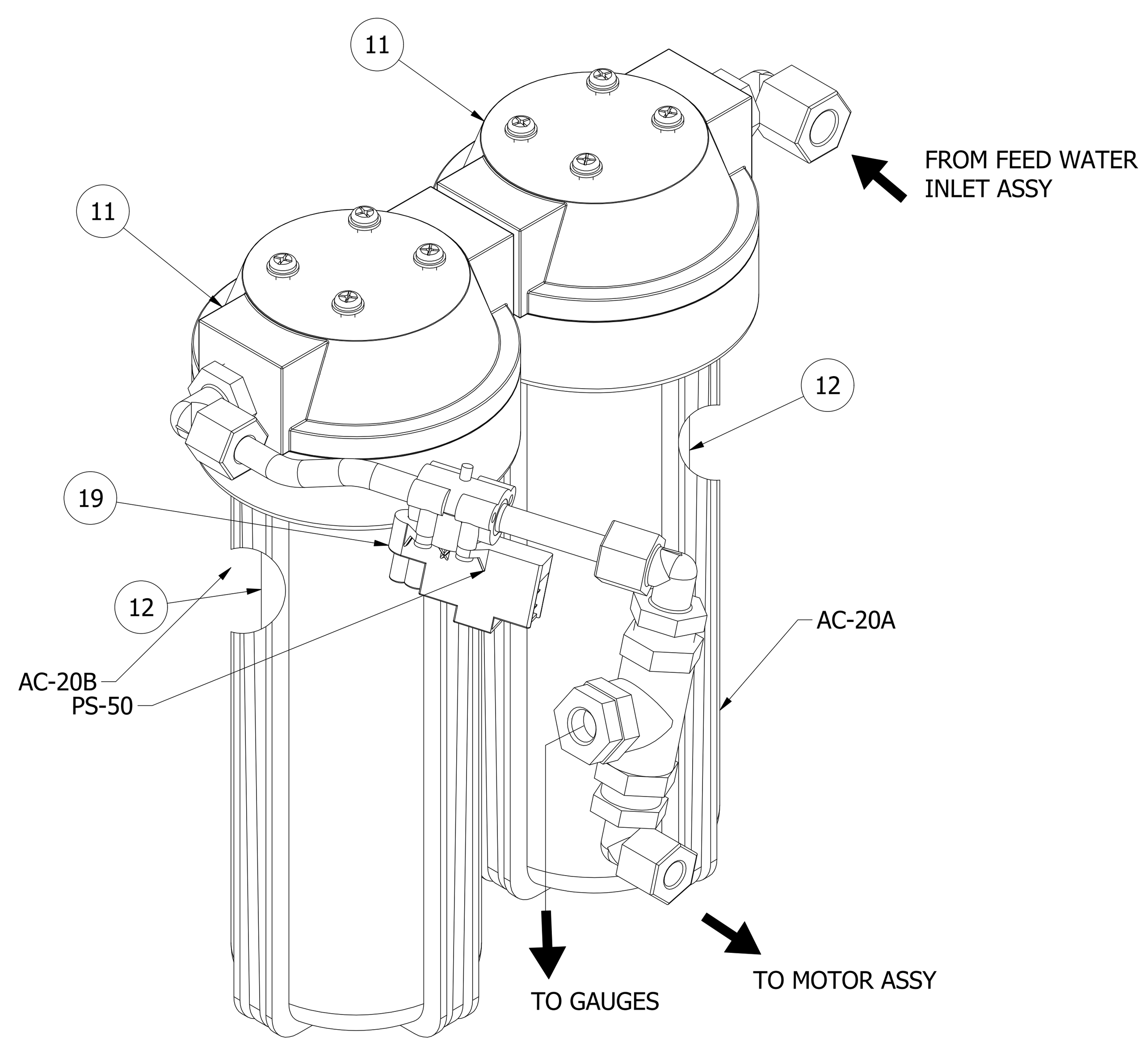


PARTS LIST

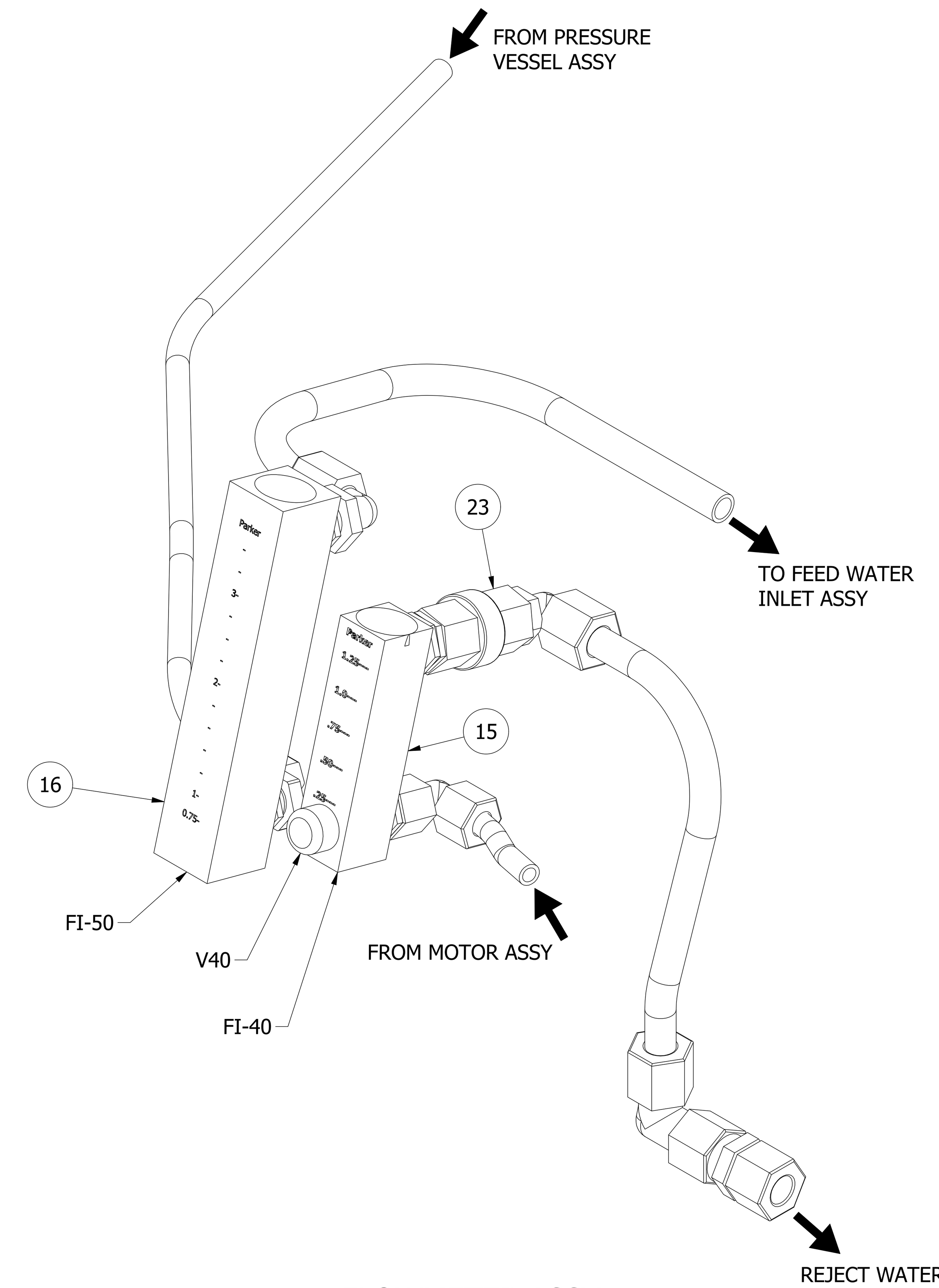
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	0520051800-1	MVA RACK , UWDX BJ
2	2	05202401GR	BRACKET,MVA U-CLAMP,3 IN
3	1	0861044	FRAME,ASSY,ZK SERIES
4	2	20201030000	SEGMENT RING AW (SET)
5	1	50012002	VESSEL, 3021 FRP
6	2	51012001	END PLUG, 3021, 1-4 IN PORTS
7	1	12176402DP	PUMP ROTARY VANE 140 GPH #15
8	1	12227601DP	COUPLING PUMP-MOTOR SHAFT
9	1	12227701DP	ADAPTER PUMP ROTARY VANE
10	1	15AG250912	MOTOR .33 HP 50-60-1
11	2	0713020873	FILTER HOUSING .50 X 10
12	2	0803004773	ELEMENT,CHARCOAL,2.5 x10.0
13	1	33-0321-X	ELEMENT,BRACKISH WTR,XLE-3021
14	2	05180851CC	BRACKET,GAUGE,CBM,SS
15	1	85012008	FLOWMETER,REGULATOR, 75 GPH,ACRYLIC
16	1	85012028	FLOWMETER,3.5 GPM,ACRYLIC
17	1	86012004	GAUGE 0-100PSI,CBM.NPT
18	1	86012005	GAUGE 0-400 CBM.NPT
19	1	86012007	SWITCH,40-20PSI,3/8" TUBE ENDS
20	1	ZK-SUB215	ELECTRICAL PANEL ASSY, 240VAC ULTROCLEAR
21	1	60-3406	VALVE,ANGLE,0.25FNPT,NYL
22	1	60-7742	VALVE, RELIEF, NYL, 3-4 FNPT
23	1	76012080	VALVE,CHECK,3/8FPT W/VITO PVC

DWG NO UC1200-215 SH 2

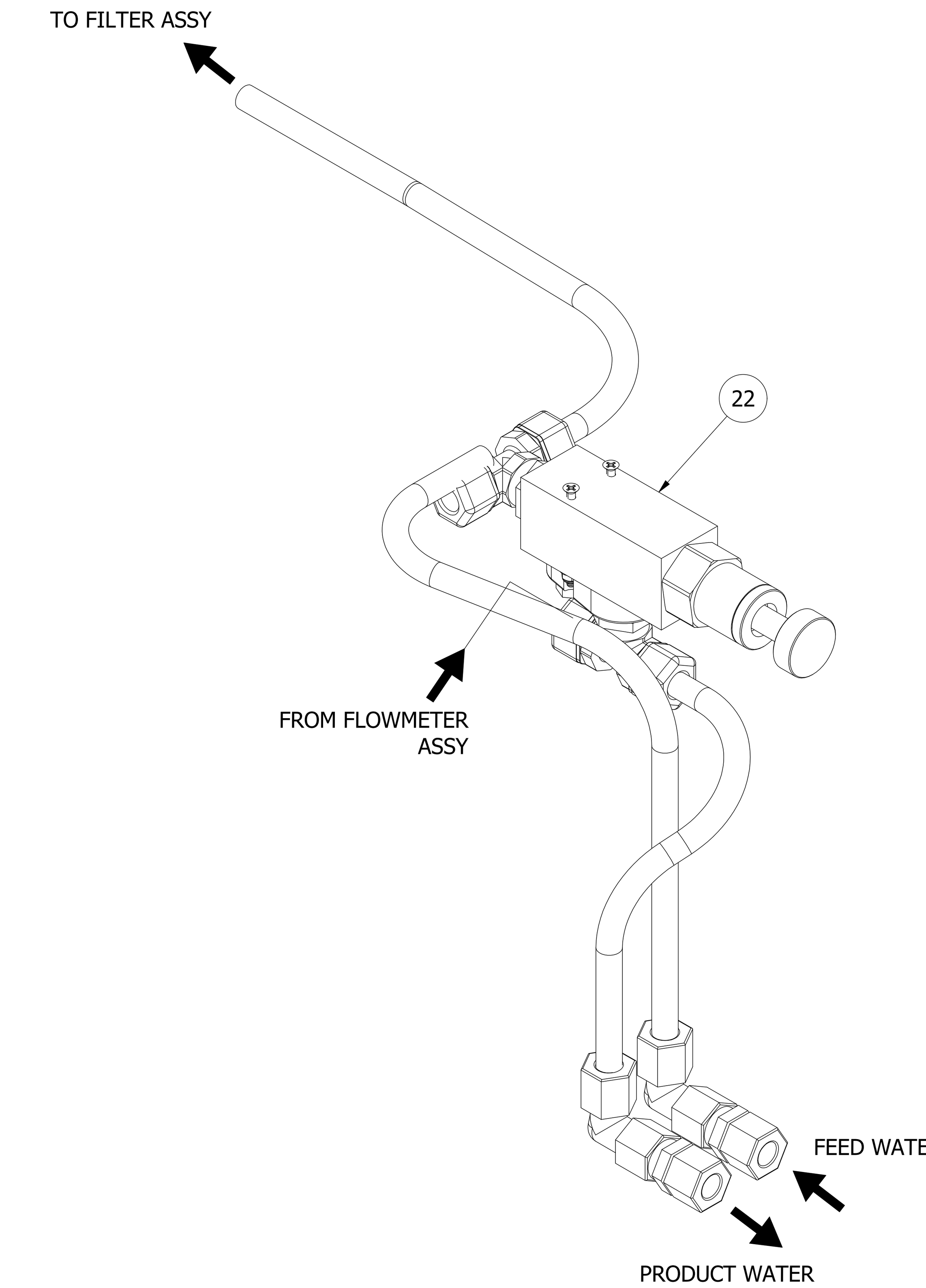
SIZE	DWG NO	REV
D	UC1200-215	D
SCALE	2 OF 3	



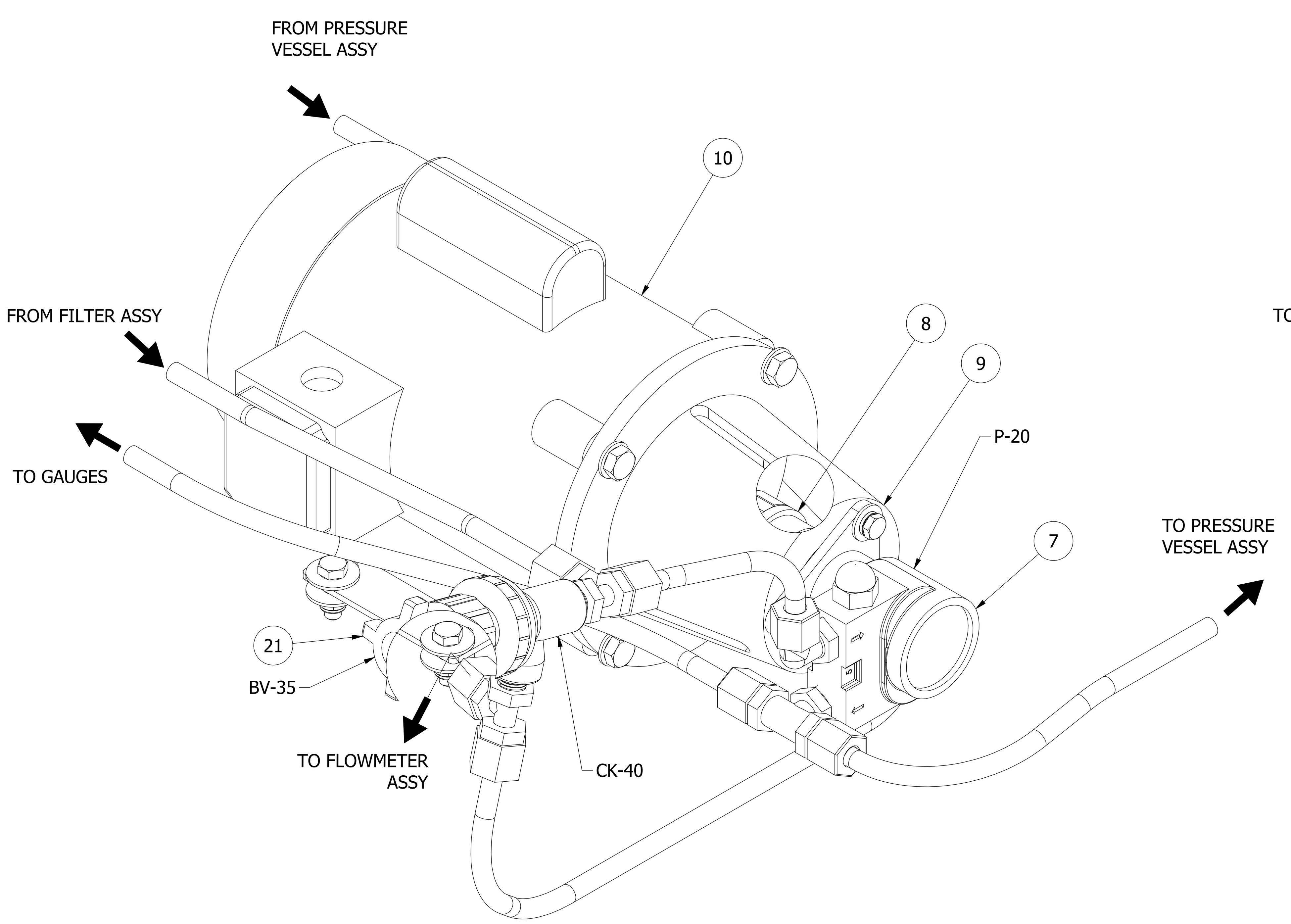
FILTER ASSY



FLOWMETER ASSY



FEED WATER INLET ASSY



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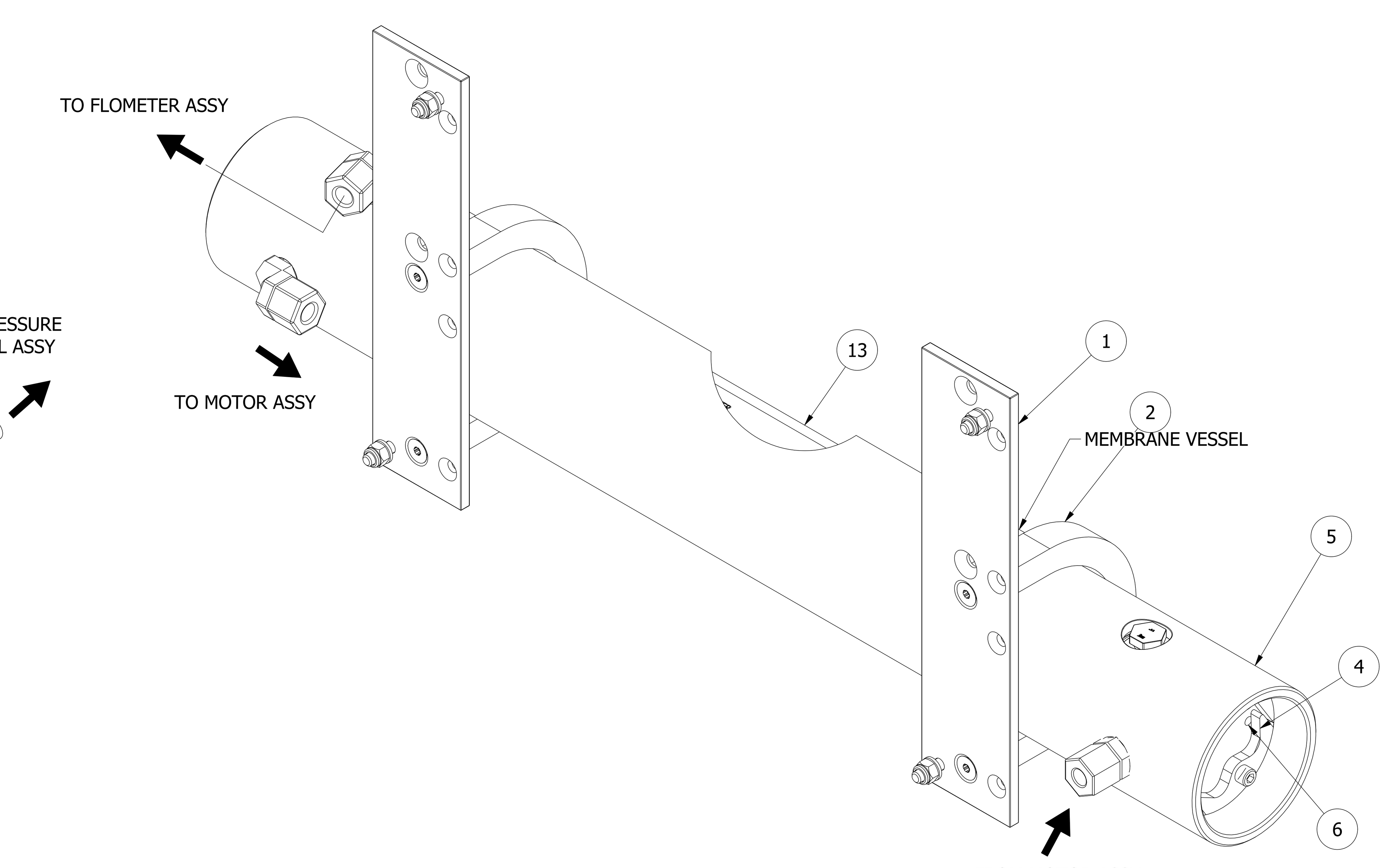
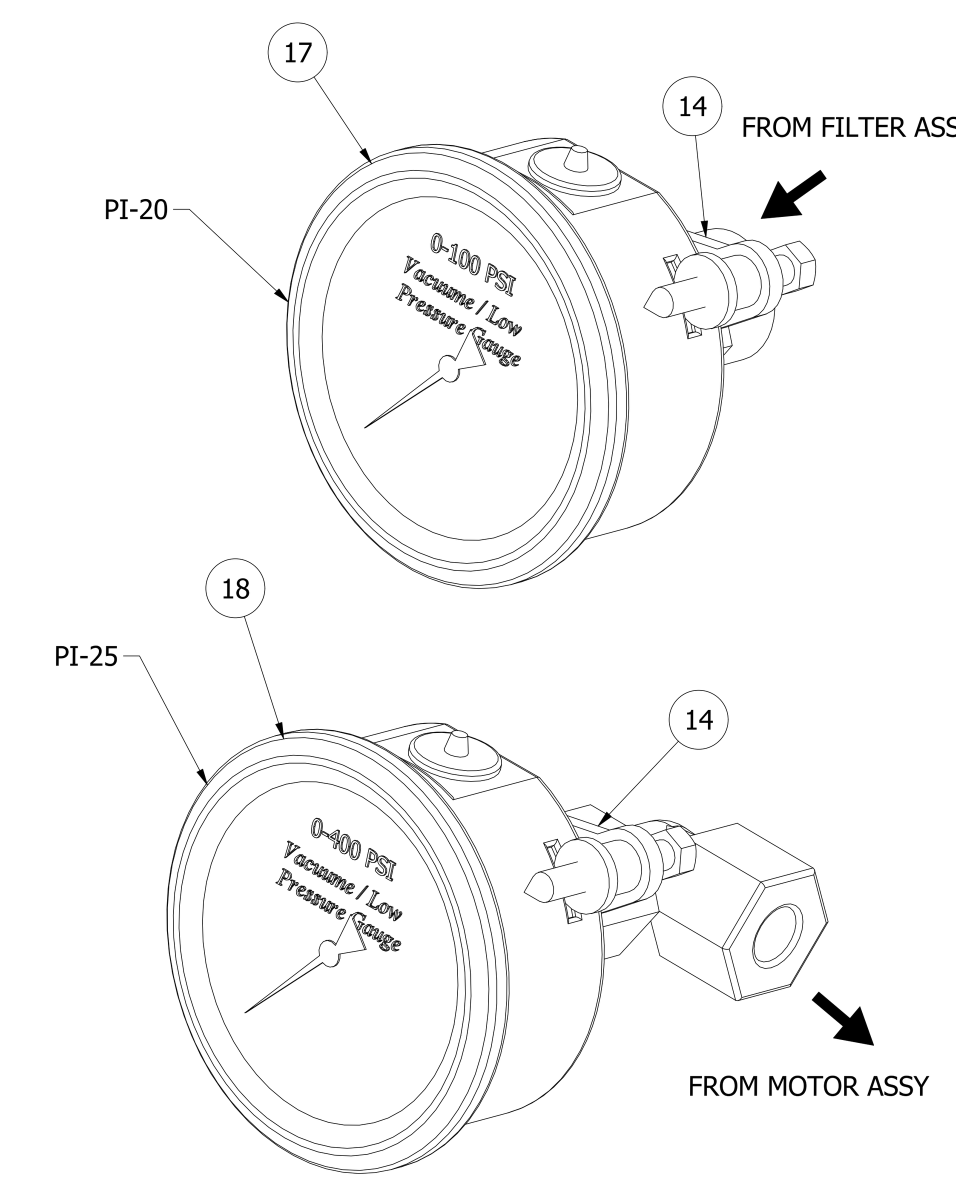


PRESSURE VESSEL ASSY

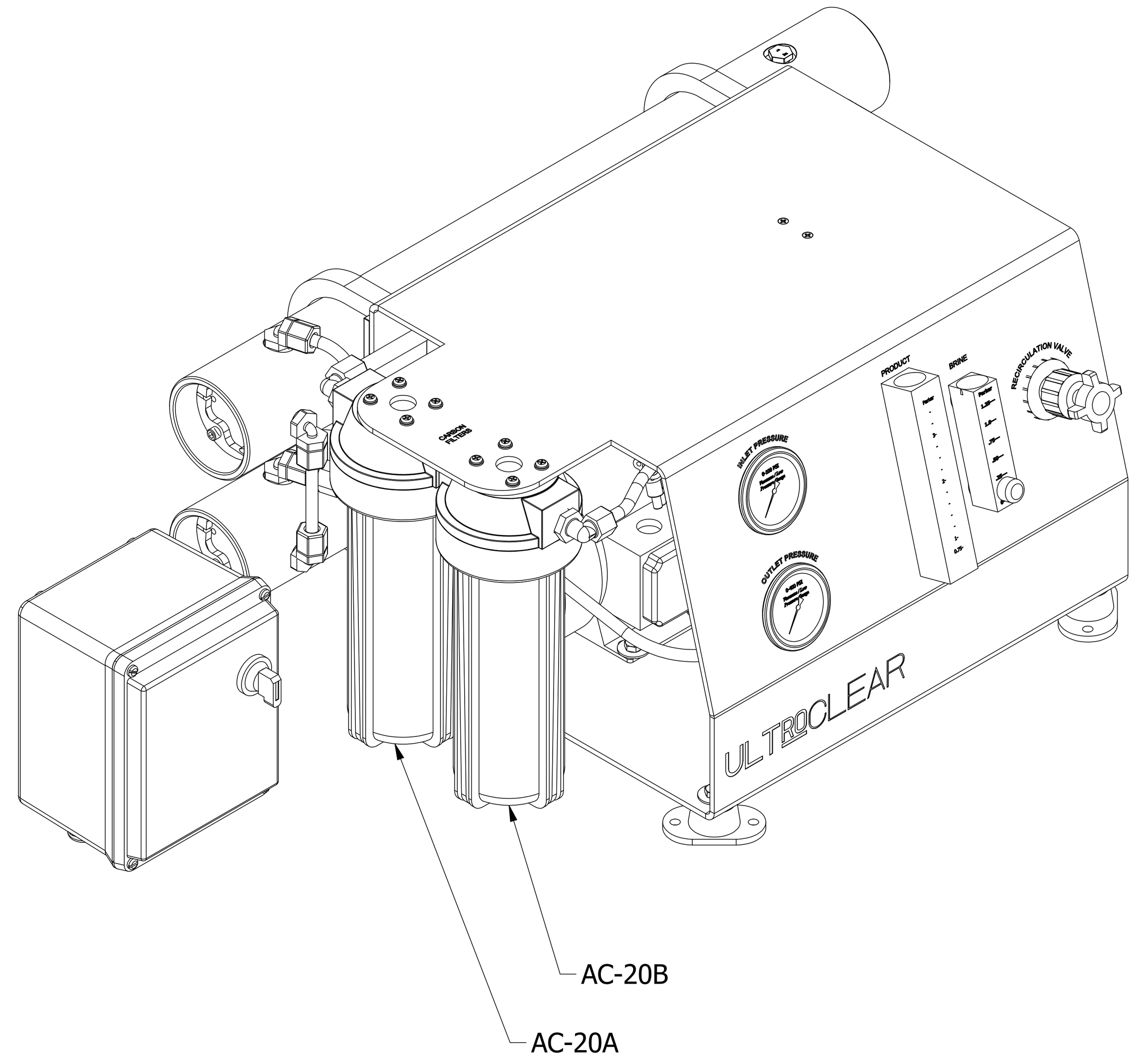


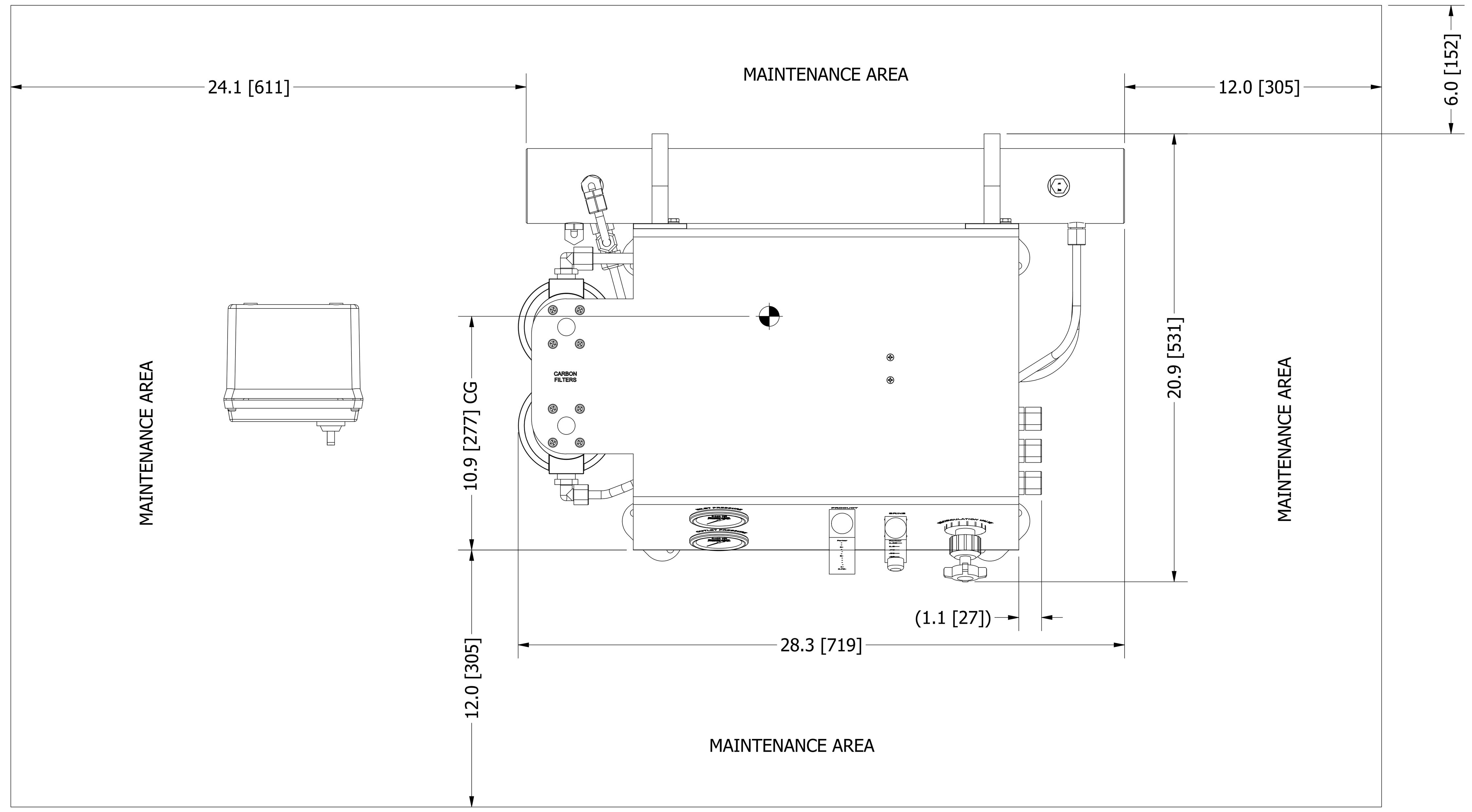
GAUGES

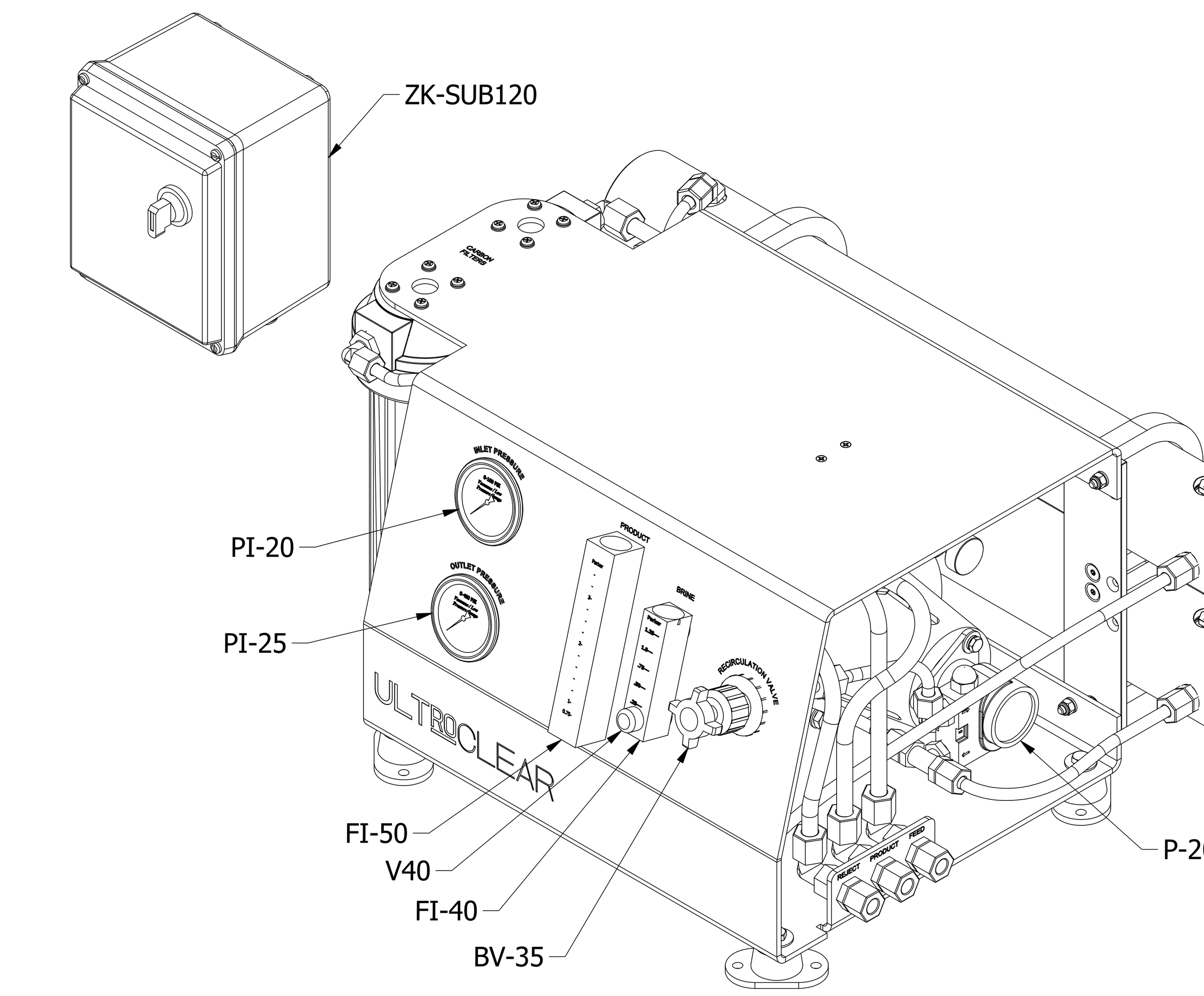
SIZE	DWG NO	REV
D	UC1200-215	D
SCALE	3 OF 3	

DWG NO UC1200-215 SH 3

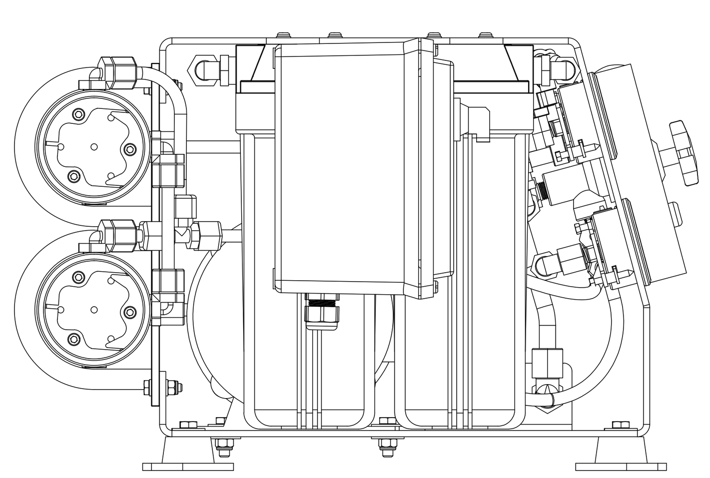
REVISION HISTORY					
REV	DATE	DESCRIPTION	DESIGNER	CHECKED BY	APPROVED
D	4/8/2019	UPDATED PS-50 SWITCH AND SURROUNDING COMPONENTS, ADDED ALL COMPONENT TAGS, CHANGED "PRV ASSY" TO "FEED WATER INLET ASSY", REVISED PLUMBING CONNECTIONS BEHIND EACH FLOW GAUGE	JPD	SY	BB

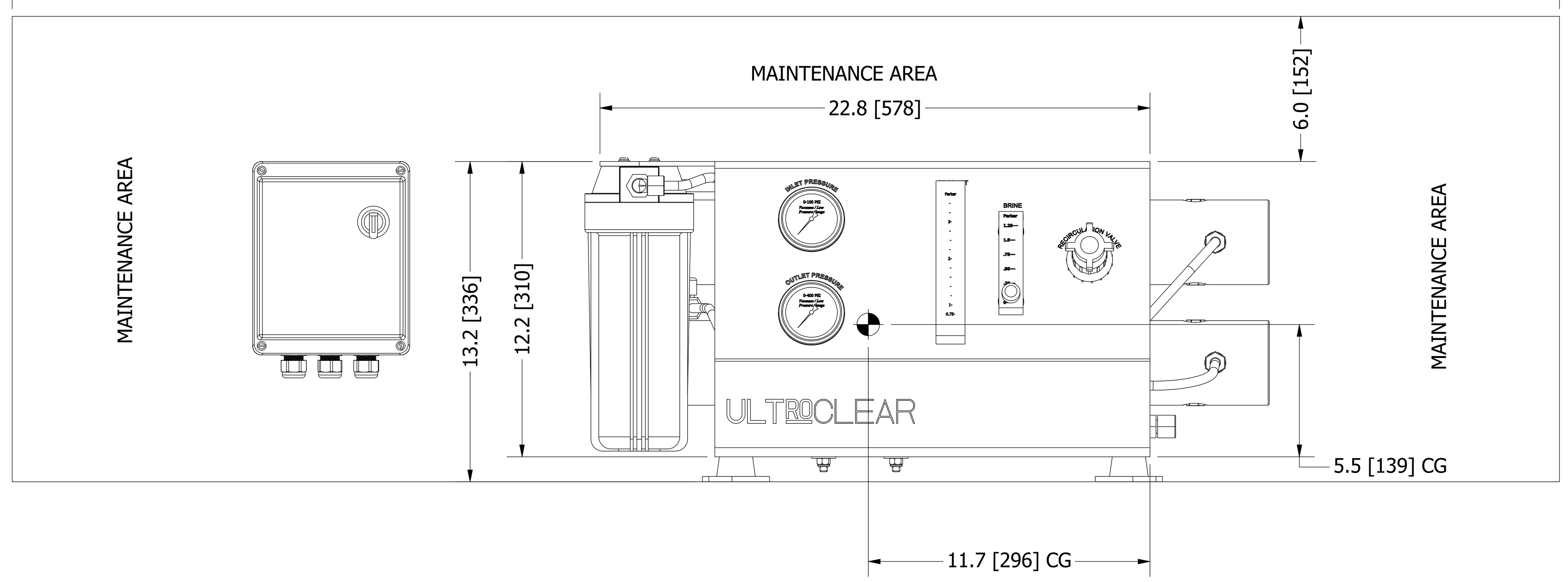


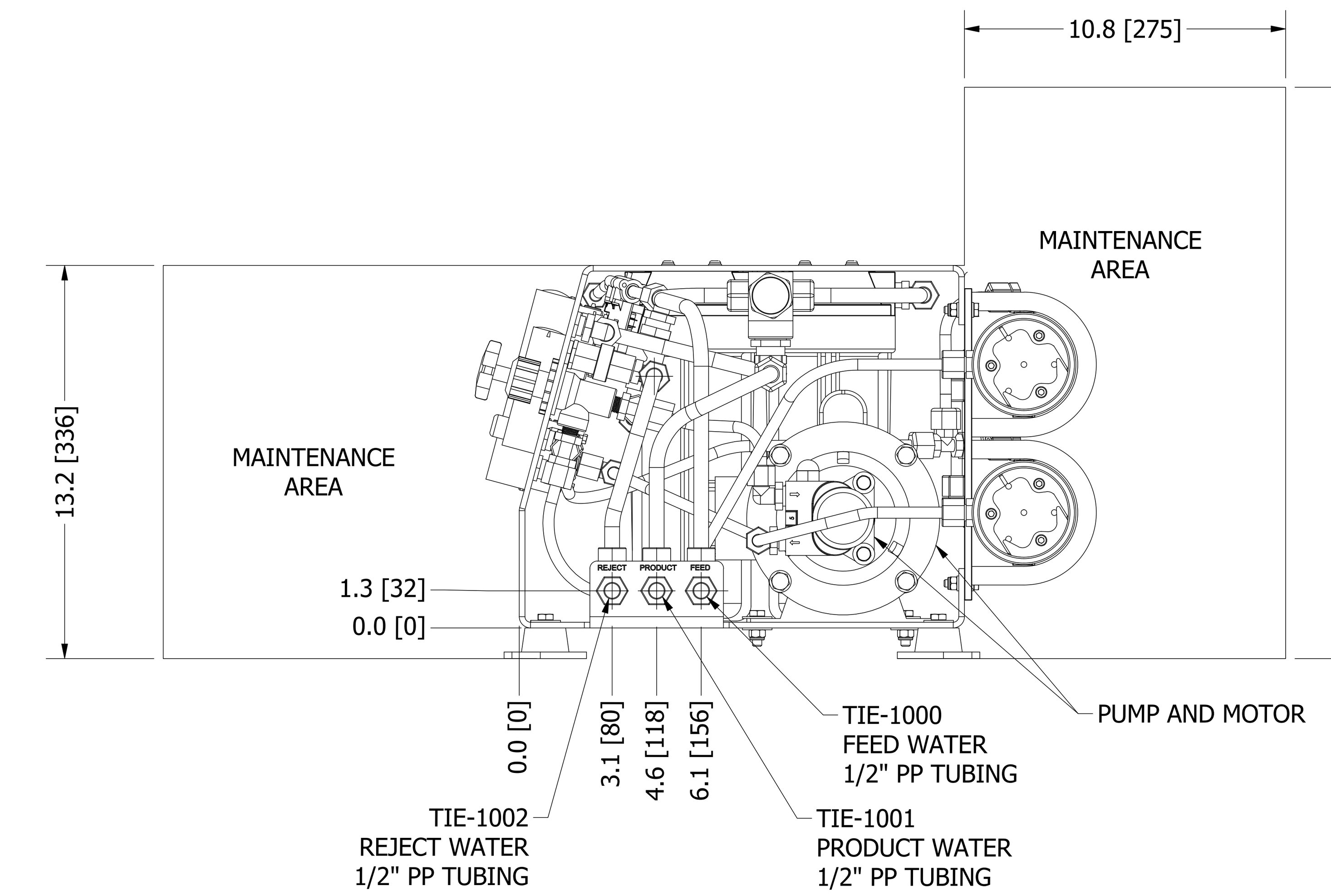


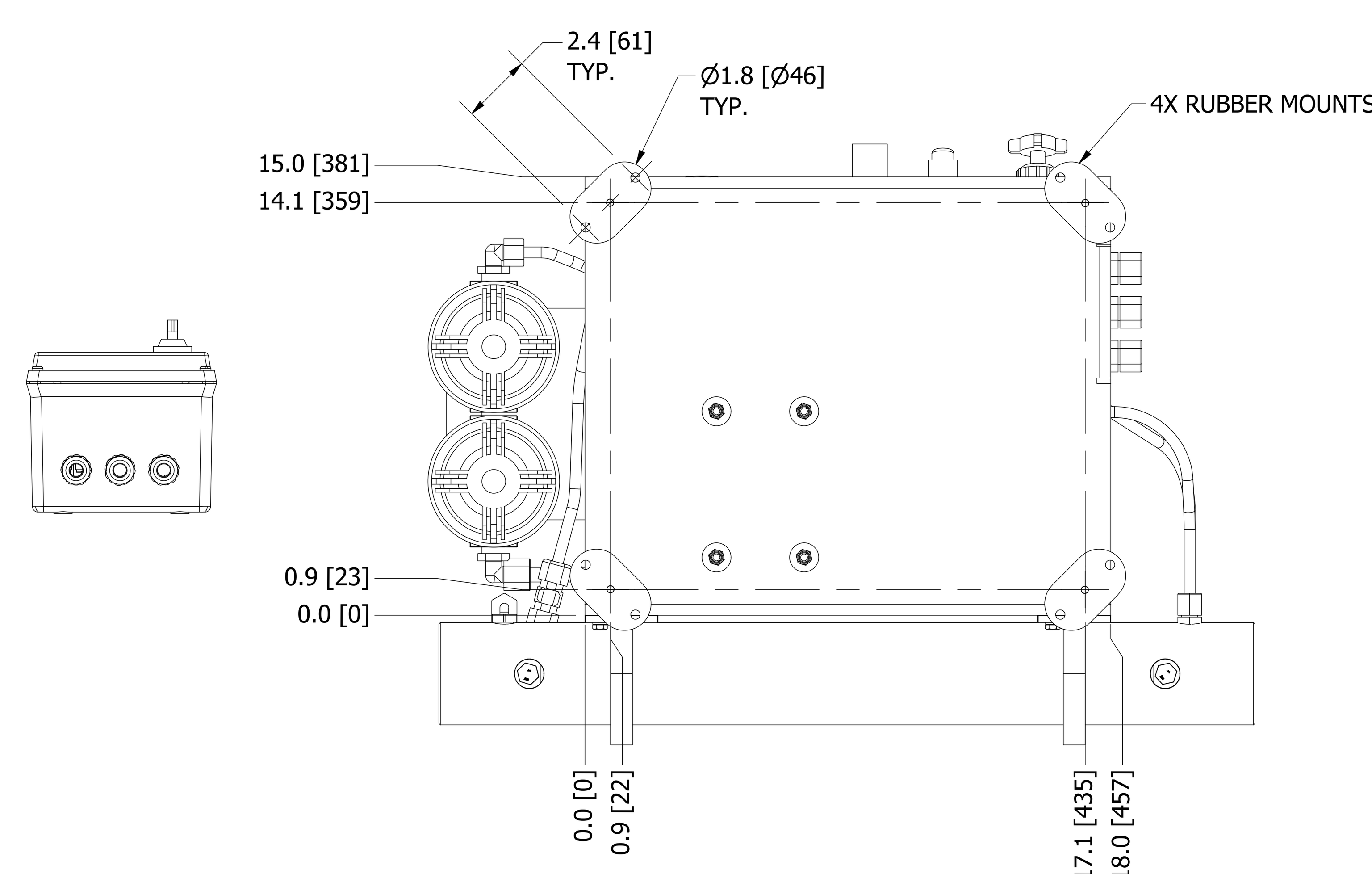


64.0 [1626]









REFERENCE TP-0281

PROPRIETARY STATEMENT

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 - BCW	DATE - 5/1/2018
CHECKED - PK	DATE - 5/1/2018
APPROVED - PK	DATE - 5/1/2018
DRY WT: 93 lbs	42 kg
WET WT: 111 lbs (50 kgs)	
CONTRACT NO	

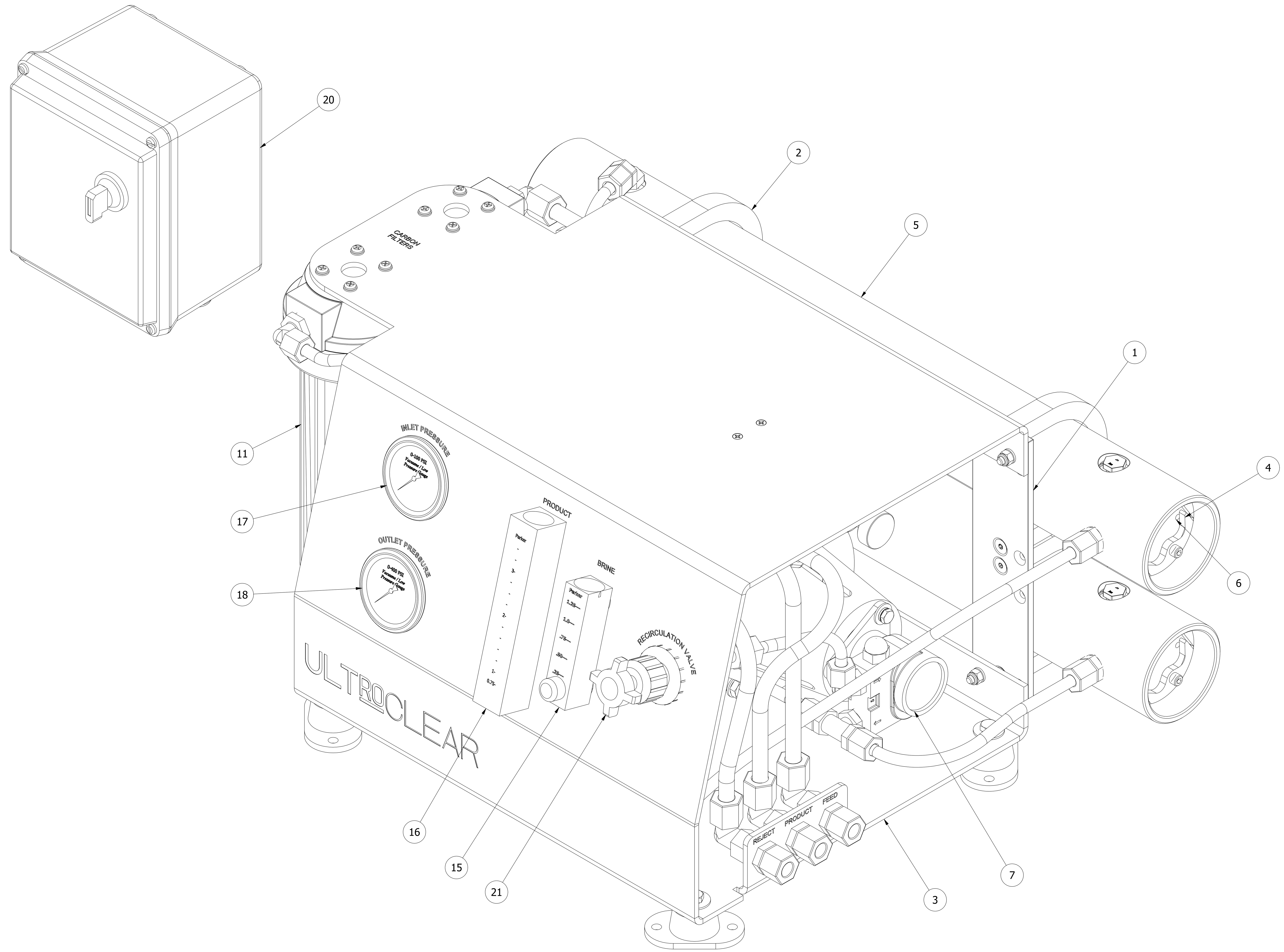
Parker Sea Recovery
Parker Hannifin Corporation
Filtration Group / Water Purification
2630 E. El Presidio Street
Carson, CA 90810
Contact
Office: 310-608-5600
Fax: 310-608-5692
www.parker.com

CUSTOMER DWG

UC,2400GPD,110V,1PH,50-60Hz

SIZE	DWG NO	REV
D	UC2400-116	D
SCALE 1 :5	1 OF 3	

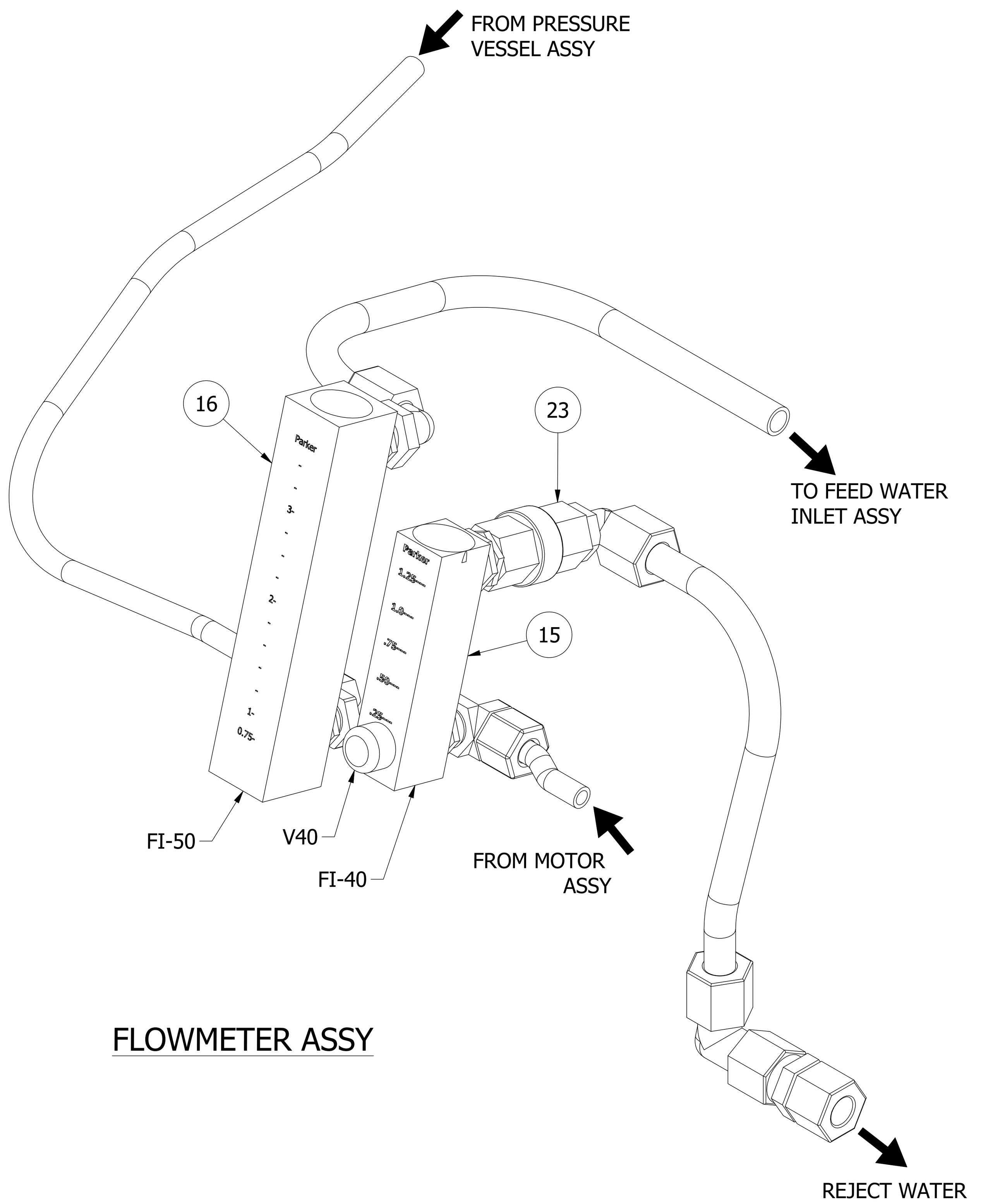
DWG NO UC2400-116 SH 1



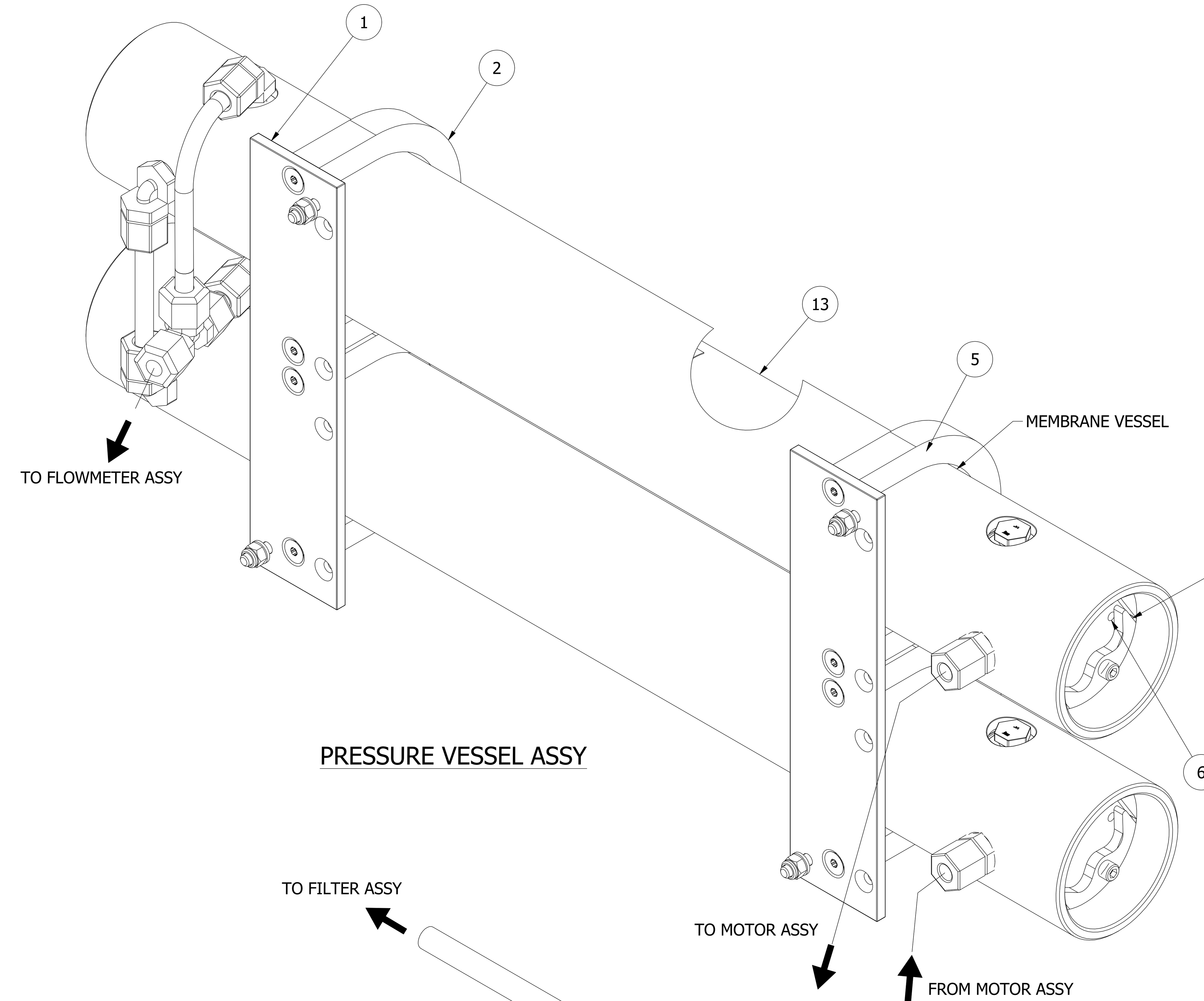
PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	0520051800-1	MVA RACK , UWDX BJ
2	4	05202401GR	BRACKET,MVA U-CLAMP,3 IN
3	1	0861044	FRAME,ASSY,ZK SERIES
4	4	20201030000	SEGMENT RING AW (SET)
5	2	50012002	VESSEL, 3021 FRP
6	4	51012001	END PLUG, 3021, 1-4 IN PORTS
7	1	12176402DP	PUMP ROTARY VANE 140 GPH #15
8	1	12227601DP	COUPLING PUMP-MOTOR SHAFT
9	1	12227701DP	ADAPTER PUMP ROTARY VANE
10	1	15AG250912	MOTOR .33 HP 50-60-1
11	2	0713020873	FILTER HOUSING .50 X 10
12	2	0803004773	ELEMENT,CHARCOAL,2.5 x10.0
13	2	33-0321-X	ELEMENT,BRACKISH WTR,XLE-3021
14	2	05180851CC	BRACKET,GAUGE,CBM,SS
15	1	85012008	FLOWMETER,REGULATOR, 75 GPH,ACRYLIC
16	1	85012028	FLOWMETER,3.5 GPM,ACRYLIC
17	1	86012004	GAUGE 0-100PSI,CBM.NPT
18	1	86012005	GAUGE 0-400 CBM.NPT
19	1	86012007	SWITCH,40-20PSI,3/8" TUBE ENDS
20	1	ZK-SUB120	ELECTRICAL PANEL ASSY,120VAC,UltROClear
21	1	60-3406	VALVE,ANGLE,0.25FNPT,NYL
22	1	60-7742	VALVE, RELIEF, NYL, 3-4 FNPT
23	1	76012080	VALVE,CHECK,3/8FPT W/VITO PVC

SIZE	DWG NO	REV
D	UC2400-116	D
SCALE	2 OF 3	

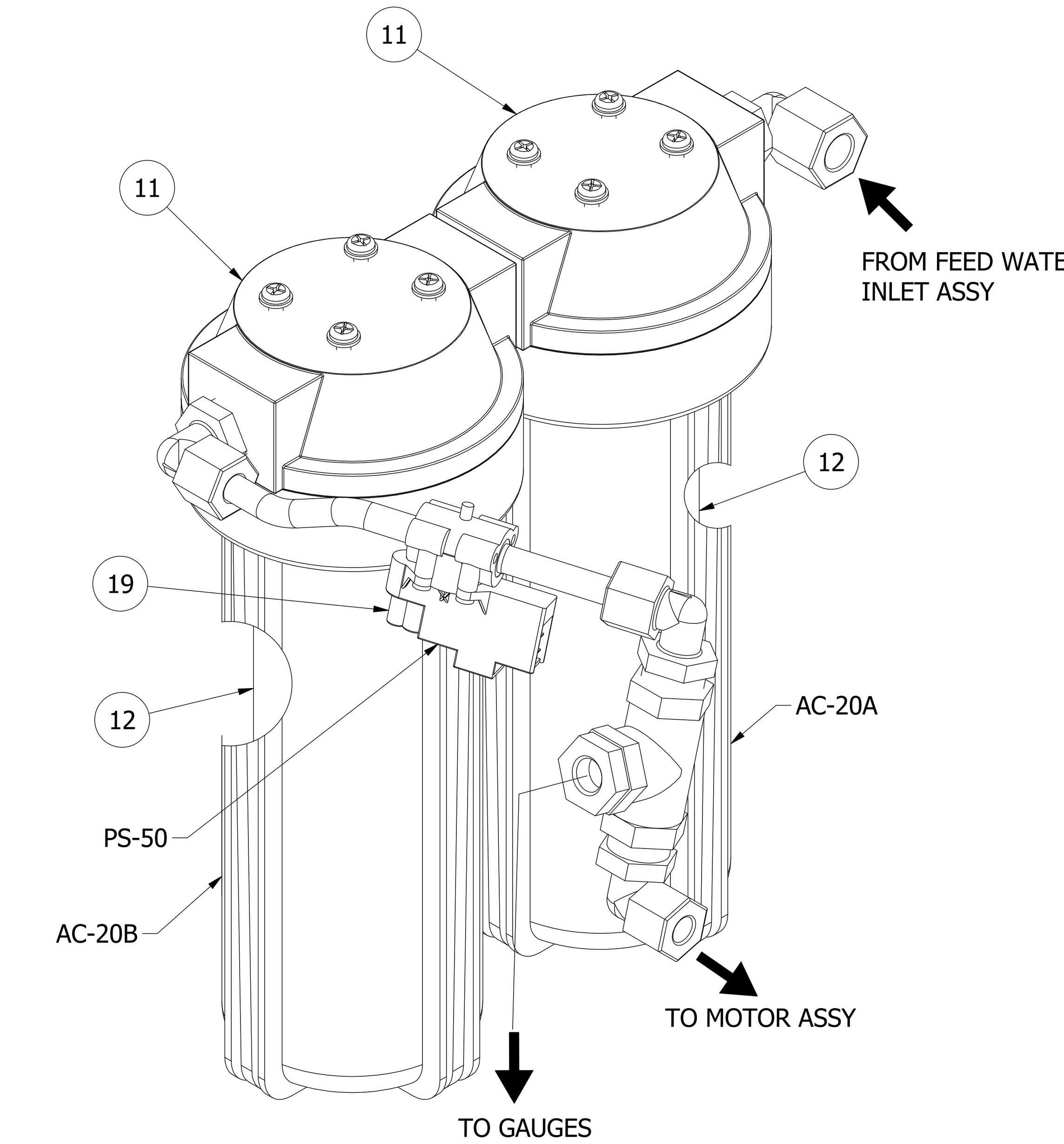
DWG NO UC2400-116 SH 2



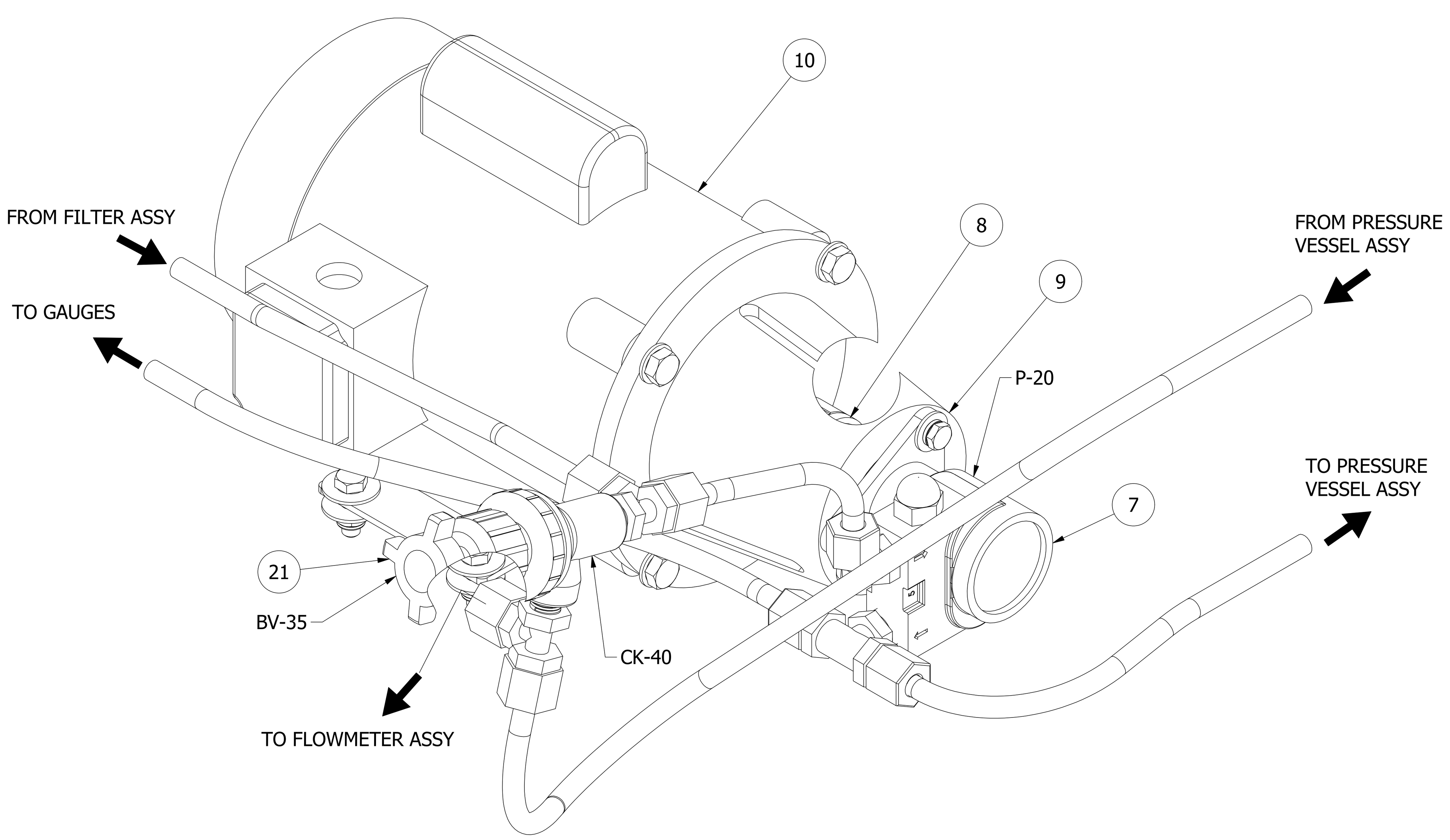
FLOWMETER ASSY



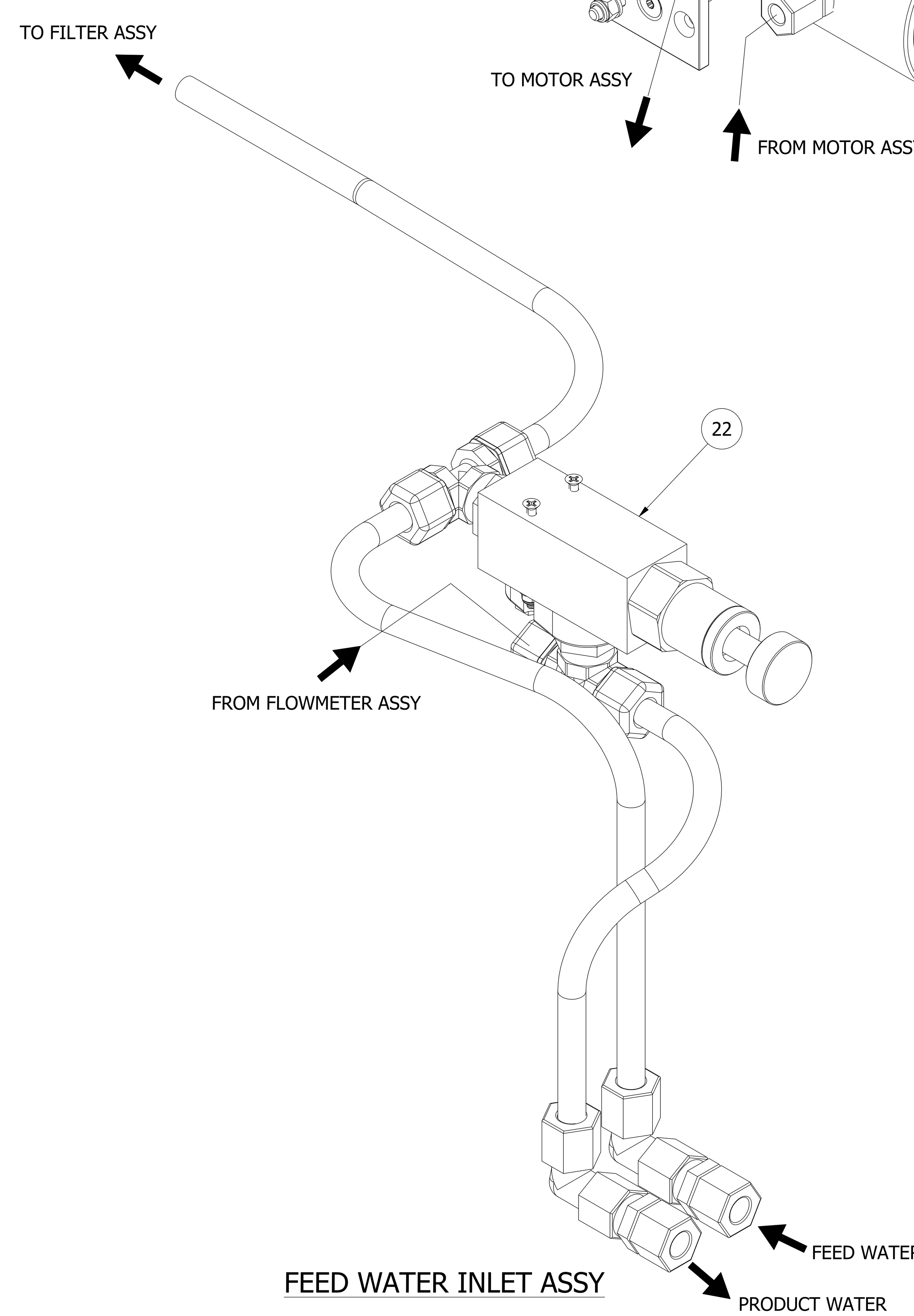
PRESSURE VESSEL ASSY



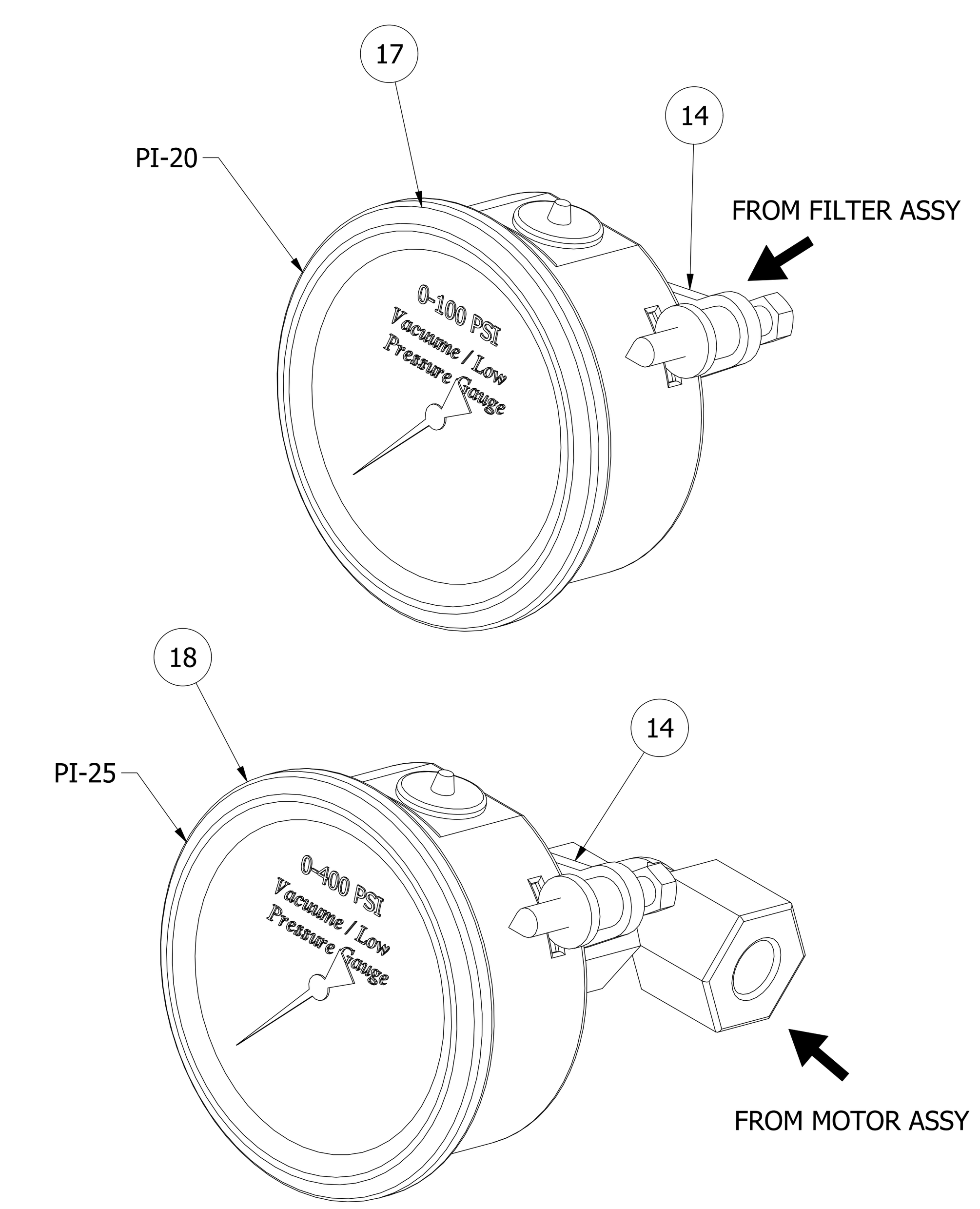
FILTER ASSY



MOTOR ASSY



FEED WATER INLET ASSY

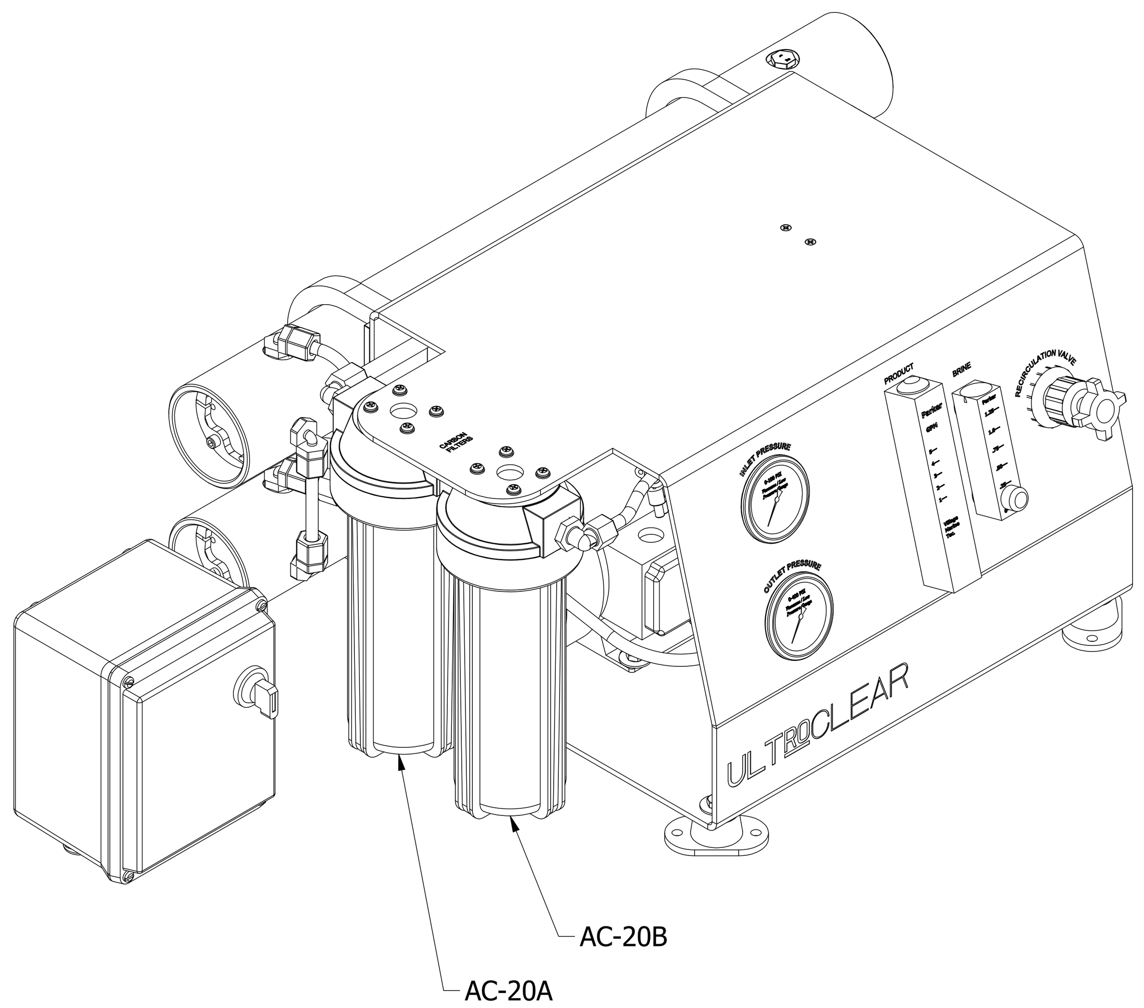


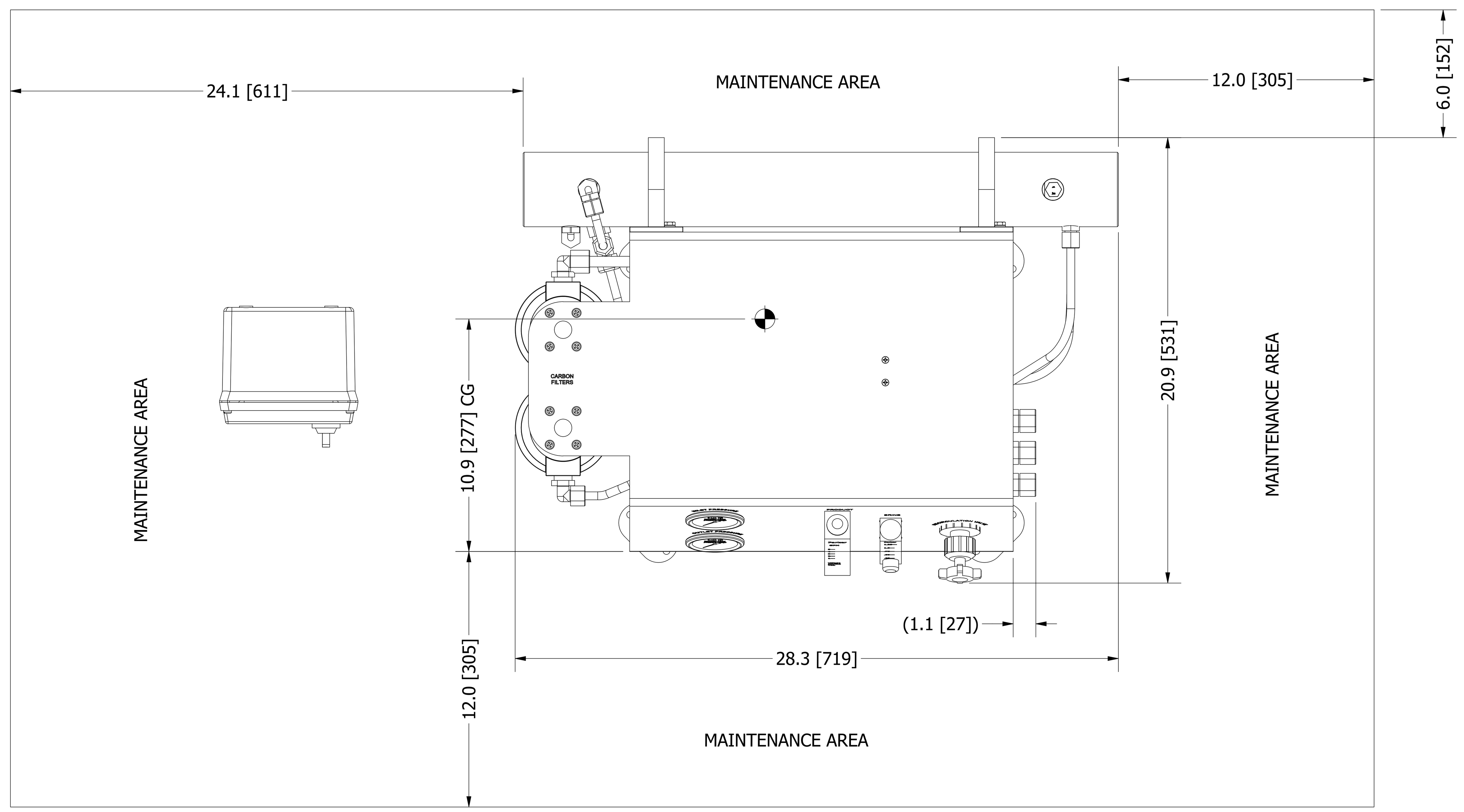
GAUGES

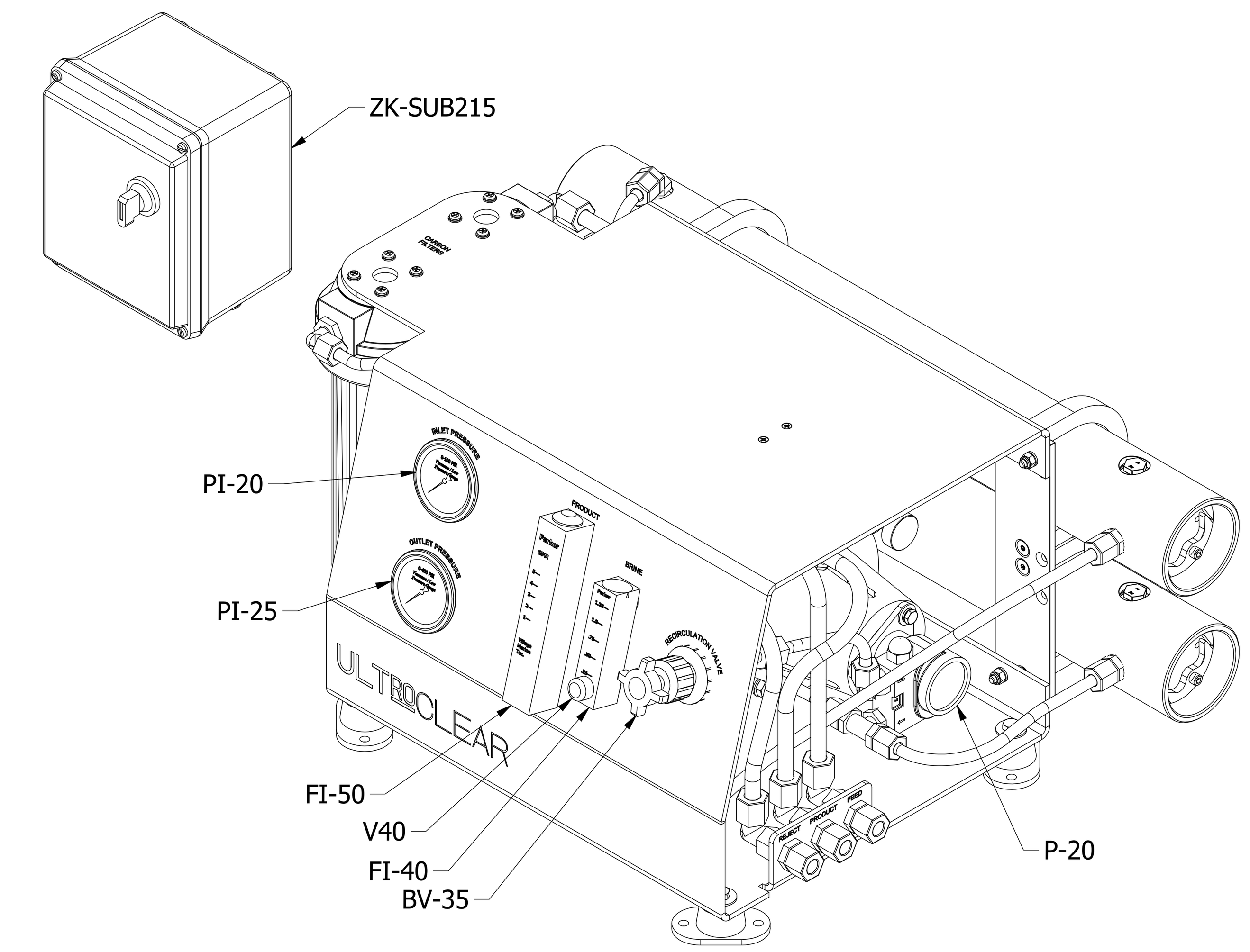
SIZE	DWG NO	REV
D	UC2400-116	D
SCALE	3 OF 3	

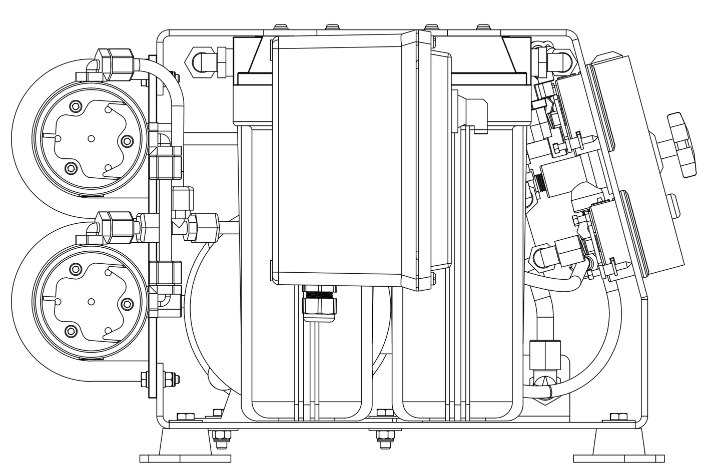
REVISION HISTORY

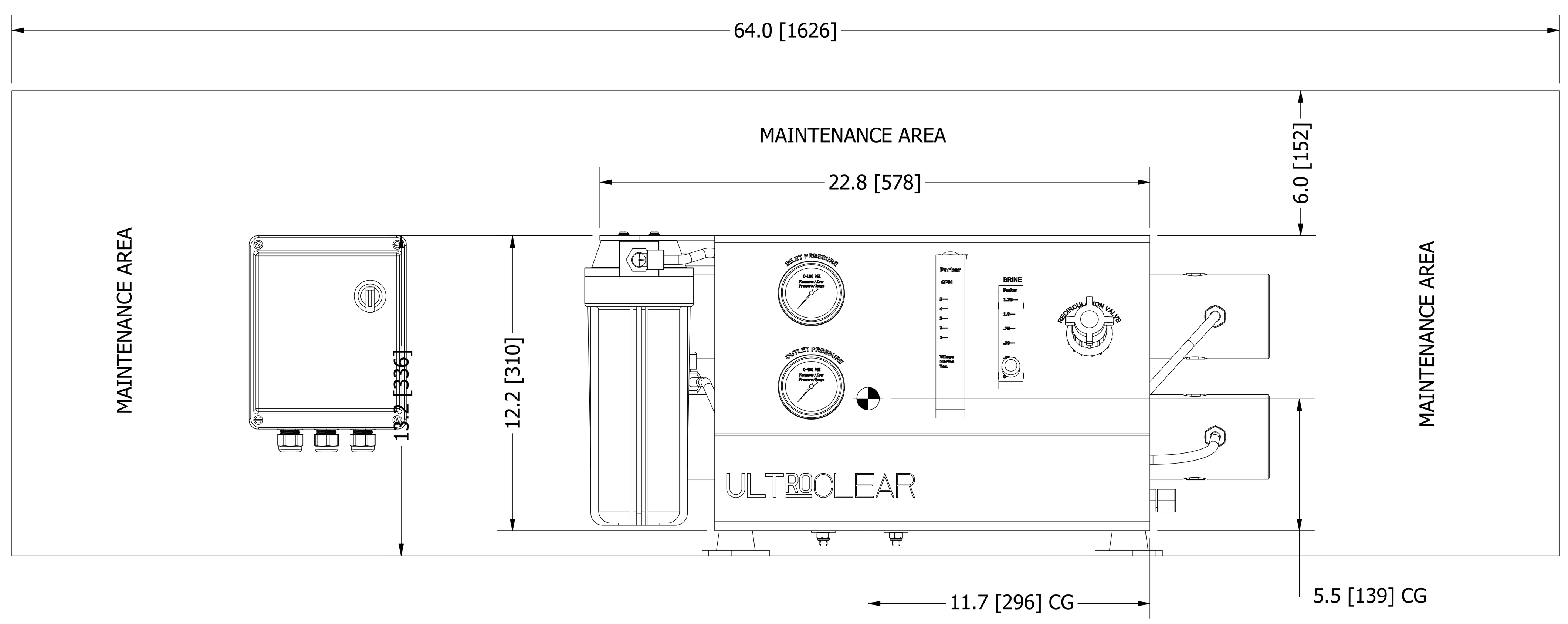
REV	DATE	DESCRIPTION	DESIGNER	CHECKED BY	APPROVED
D	4/8/2019	UPDATED PS-50 SWITCH AND SURROUNDING COMPONENTS, ADDED ALL COMPONENT TAGS, CHANGED "PRV ASSY" TO "FEED WATER INLET ASSY", REVISED PLUMBING CONNECTIONS BEHIND EACH FLOW GAUGE. UPDATED FLOWMETER PN.	JPD MD	SY	BB

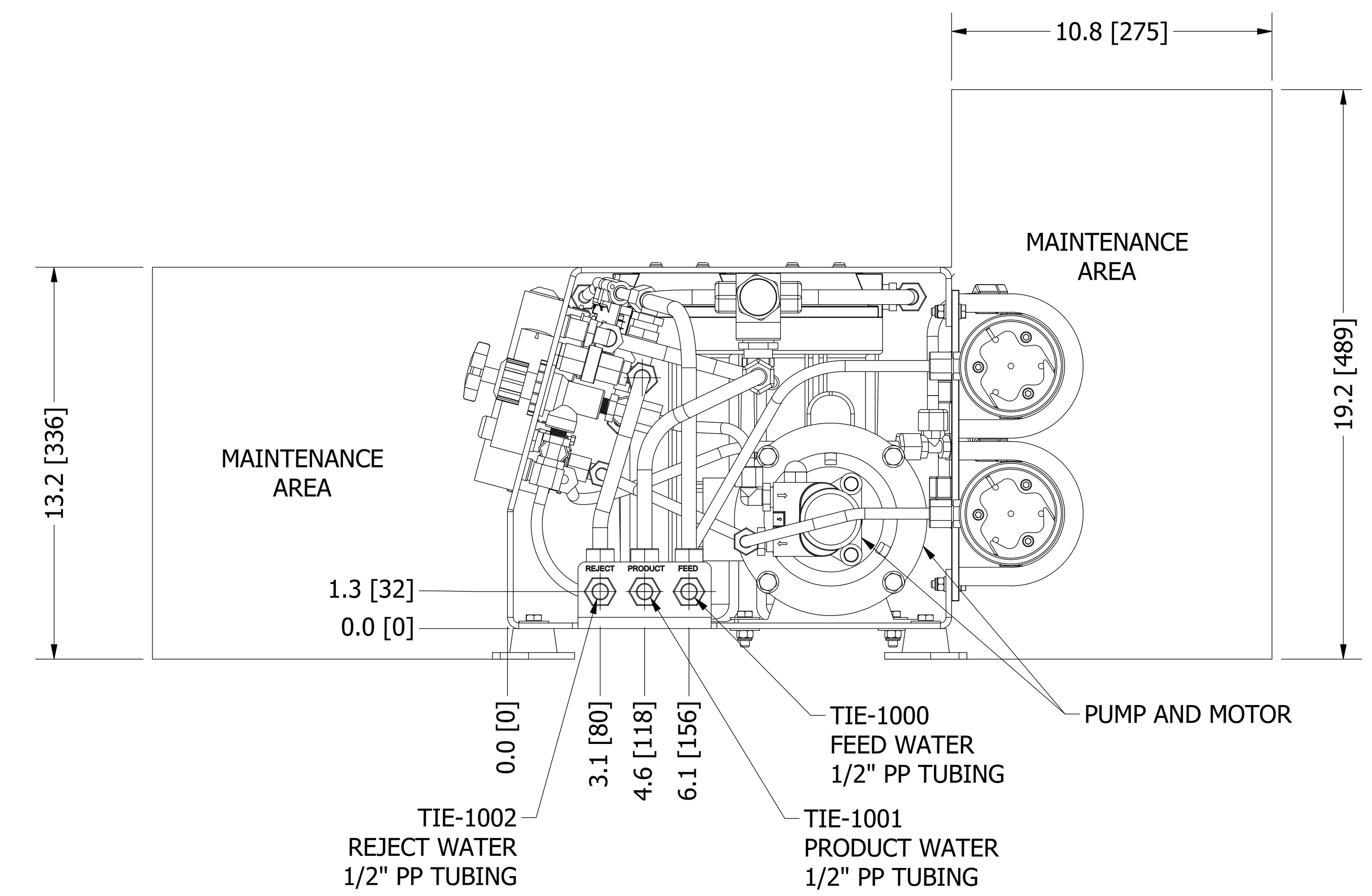


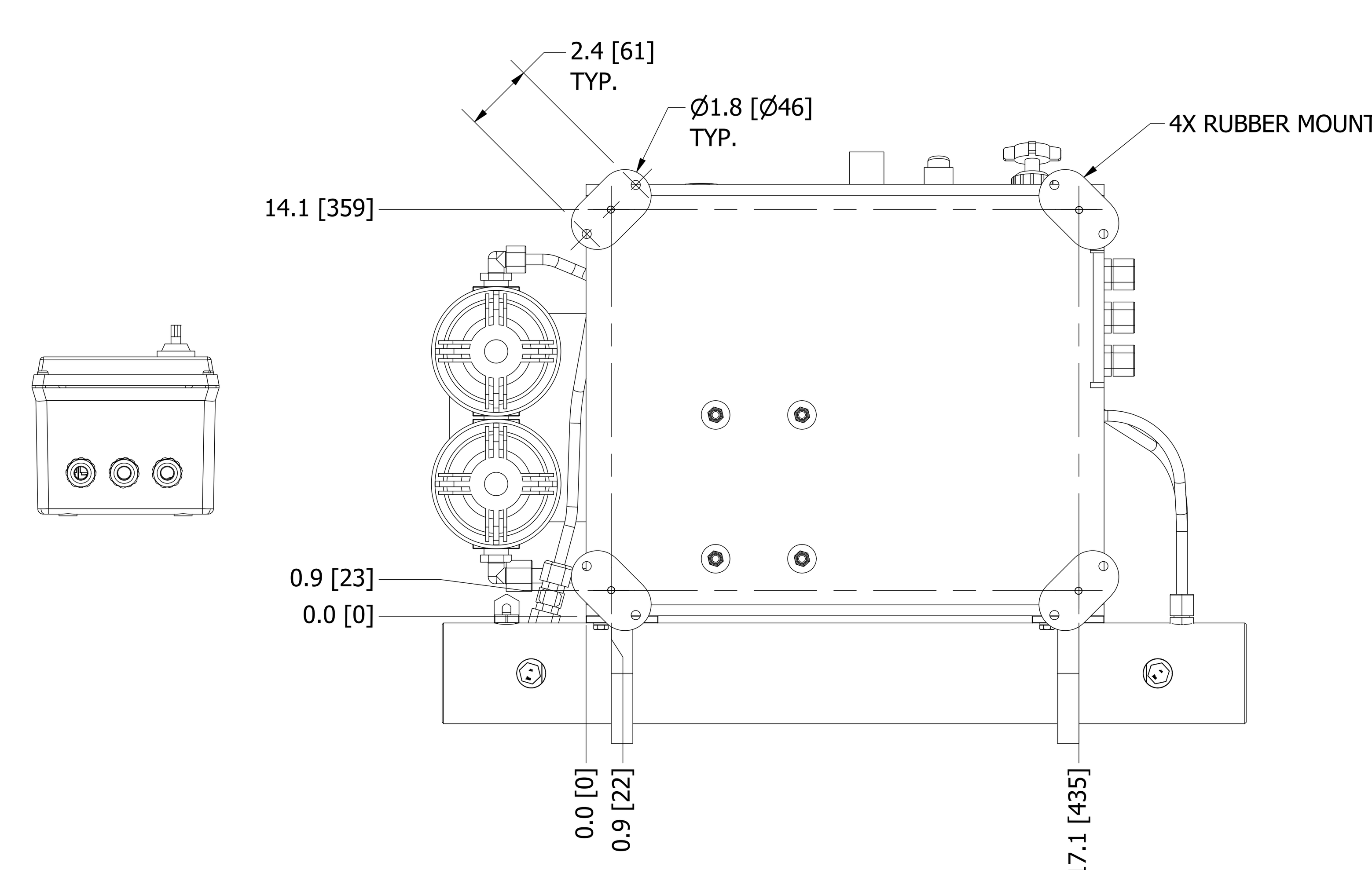












PROPRIETARY STATEMENT

REFERENCE TP-0281

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 - BCW	DATE - 1/9/2019
CHECKED - PK	DATE - 5/1/2018
APPROVED - PK	DATE - 5/1/2018
DRY WT: 93 lbs	42 kg
WET WT: 111 lbs (50 kgs)	
CONTRACT NO	

Parker Sea Recovery
Parker Hannifin Corporation
Filtration Group / Water Purification
2630 E. El Presidio Street
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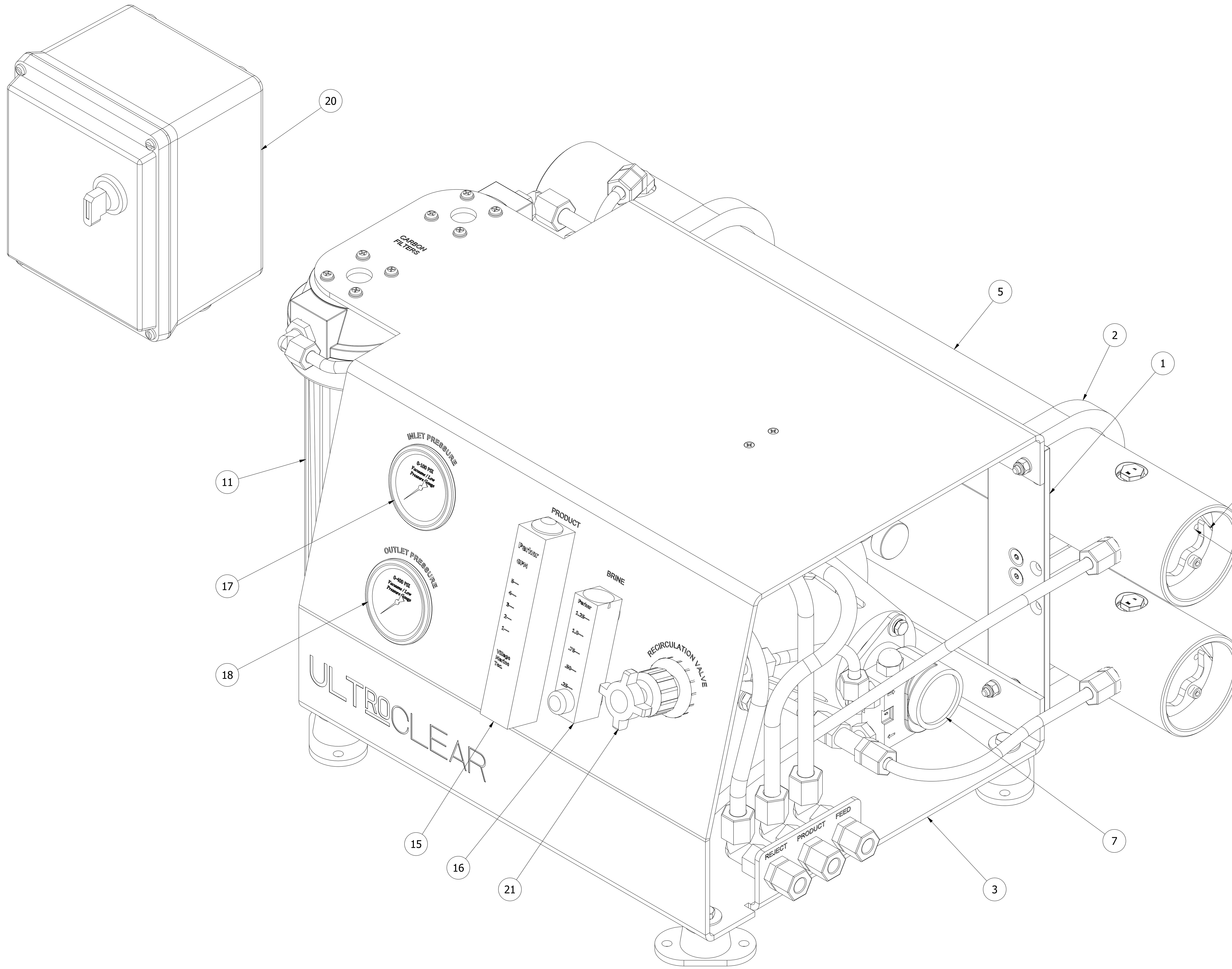
Fax: 310-608-5692
www.parker.com

CUSTOMER DWG
UC,2400GPD,220V,1PH,50-60Hz

SIZE	DWG NO	REV
D	UC2400-215	D

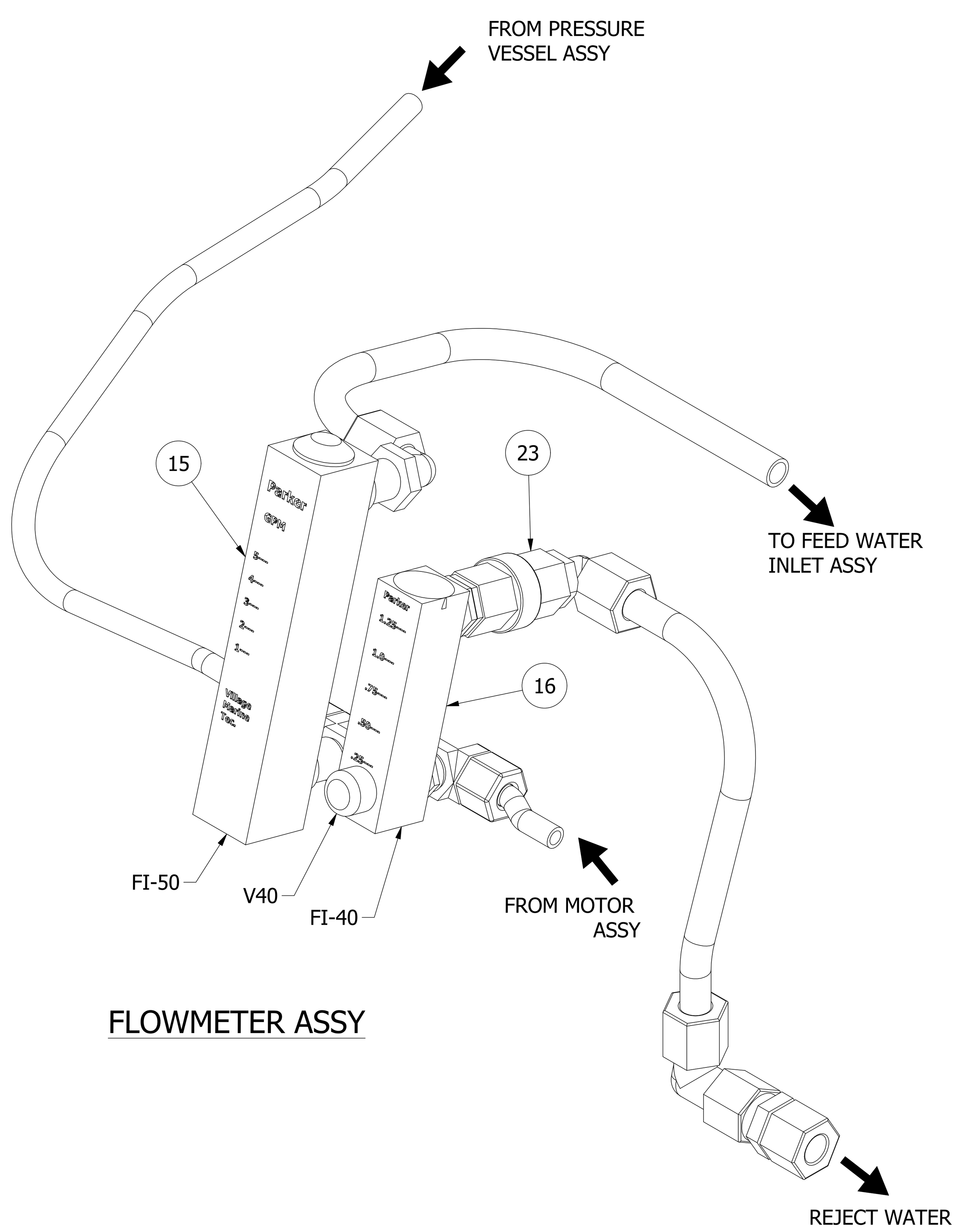
SCALE 1 :5 | 1 OF 3

DWG NO UC2400-215 SH 1

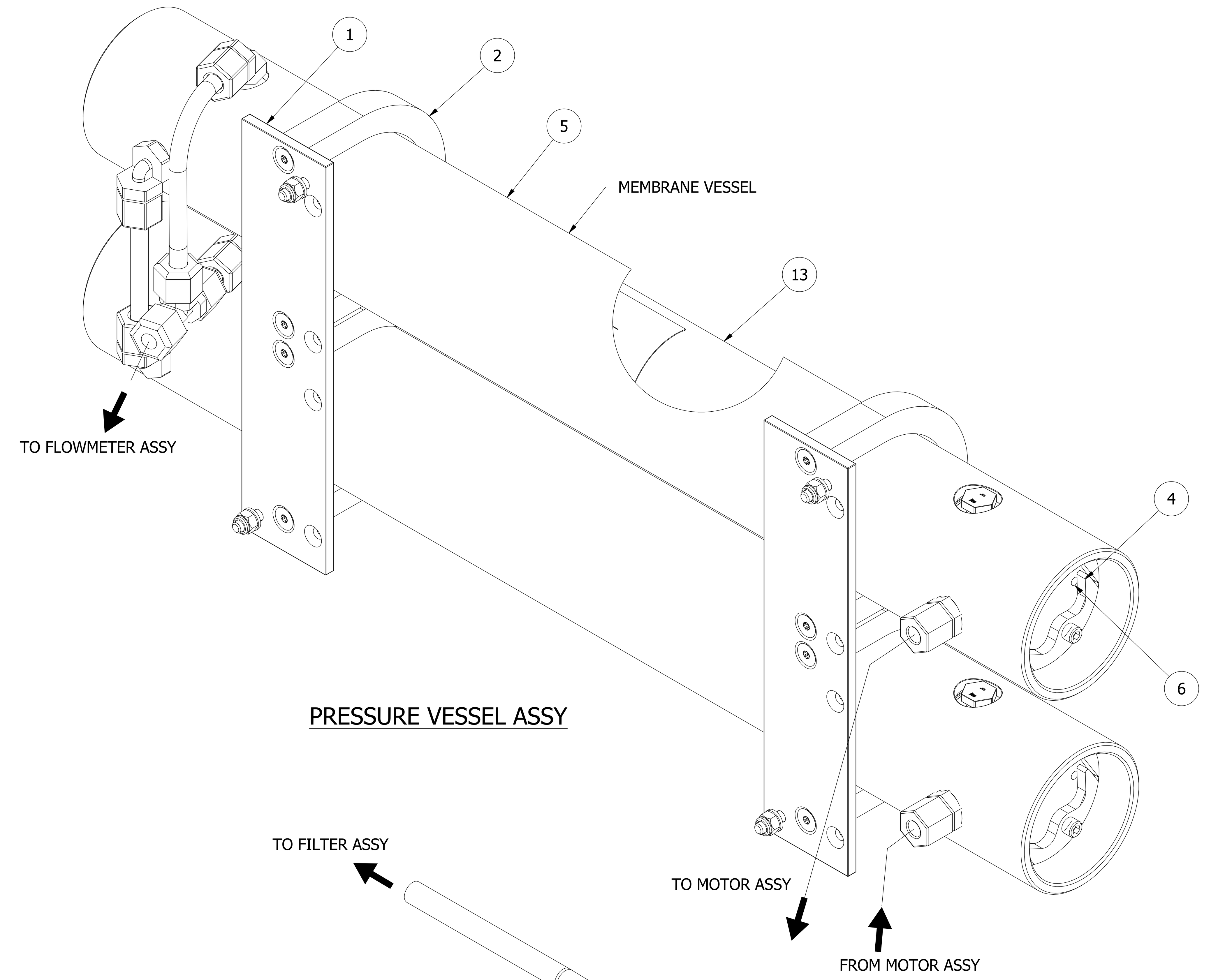


PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	0520051800-1	MVA RACK , UWDX BJ
2	4	05202401GR	BRACKET,MVA U-CLAMP,3 IN
3	1	0861044	FRAME,ASSY,ZK SERIES
4	4	20201030000	SEGMENT RING AW (SET)
5	2	50012002	VESSEL, 3021 FRP
6	4	51012001	END PLUG, 3021, 1-4 IN PORTS
7	1	12176402DP	PUMP ROTARY VANE 140 GPH #15
8	1	12227601DP	COUPLING PUMP-MOTOR SHAFT
9	1	12227701DP	ADAPTER PUMP ROTARY VANE
10	1	15AG250912	MOTOR .33 HP 50-60-1
11	2	0713020873	FILTER HOUSING .50 X 10
12	2	0803004773	ELEMENT,CHARCOAL,2.5 x10.0
13	2	33-0321-X	ELEMENT,BRACKISH WTR,XLE-3021
14	2	05180851CC	BRACKET,GAUGE,CBM,SS
15	1	40-5016	FLOWMETER,5 GPM-19 LPM,ACRYLIC
16	1	85012008	FLOWMETER,REGULATOR, 75 GPH,ACRYLIC
17	1	86012004	GAUGE 0-100PSI,CBM.NPT
18	1	86012005	GAUGE 0-400 CBM.NPT
19	1	86012007	SWITCH,40-20PSI,3/8" TUBE ENDS
20	1	ZK-SUB215	ELECTRICAL PANEL ASSY, 240VAC ULTROCLEAR
21	1	60-3406	VALVE,ANGLE,0.25FNPT,NYL
22	1	60-7742	VALVE, RELIEF, NYL, 3-4 FNPT
23	1	76012080	VALVE,CHECK,3/8FPT W/VITO PVC

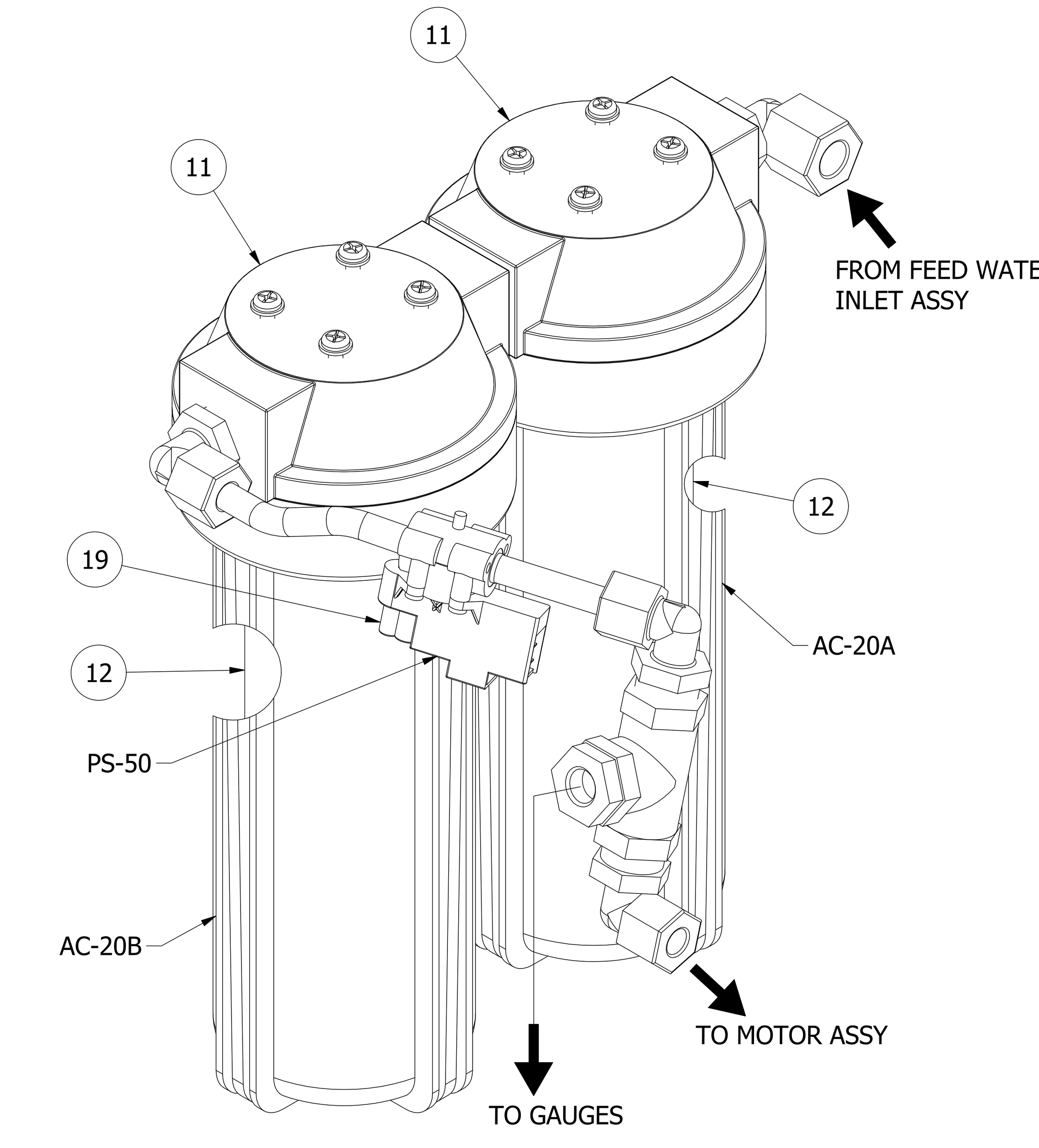
SIZE	DWG NO	REV
D	UC2400-215	D
SCALE		2 OF 3



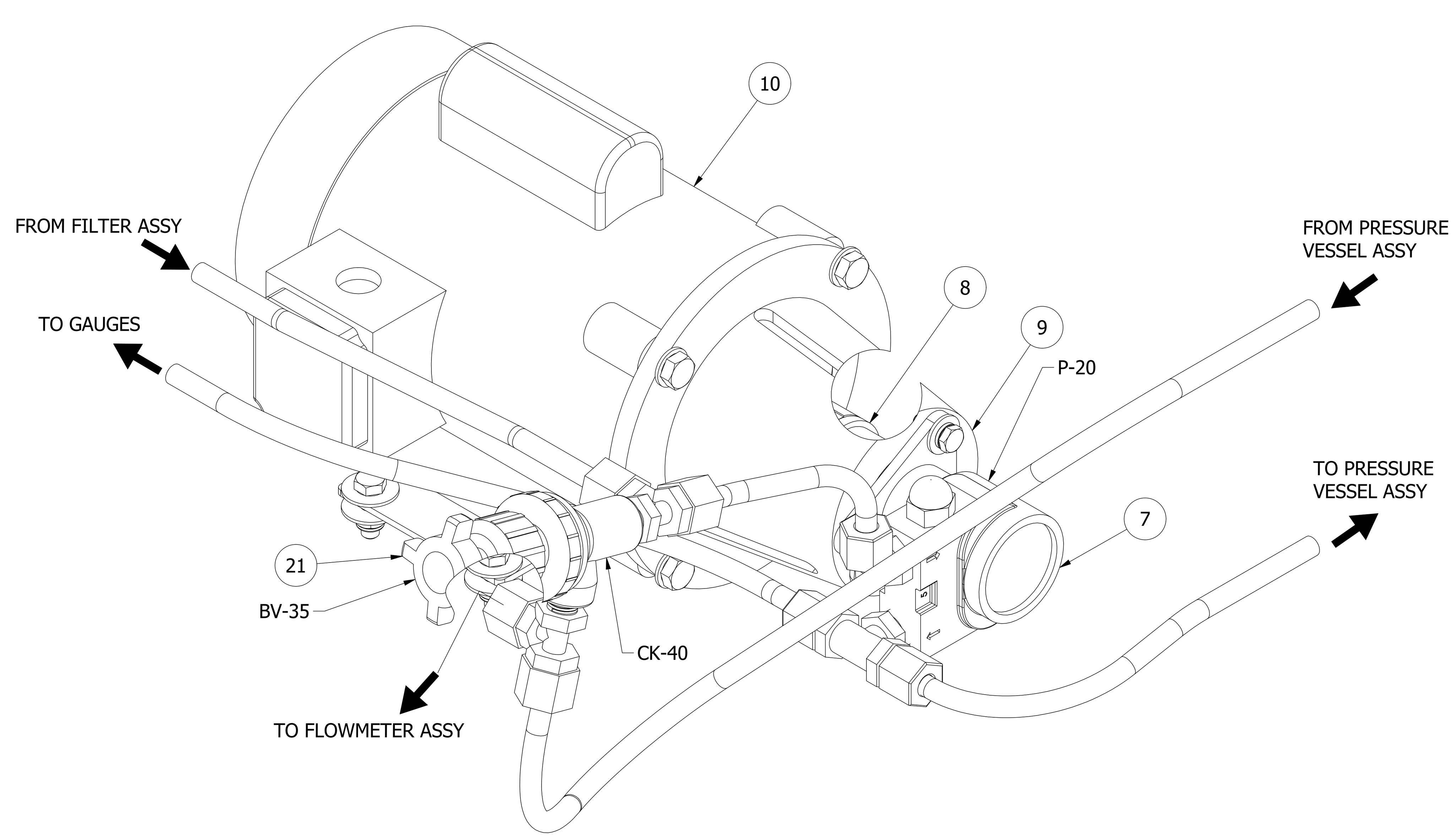
FLOWMETER ASSY



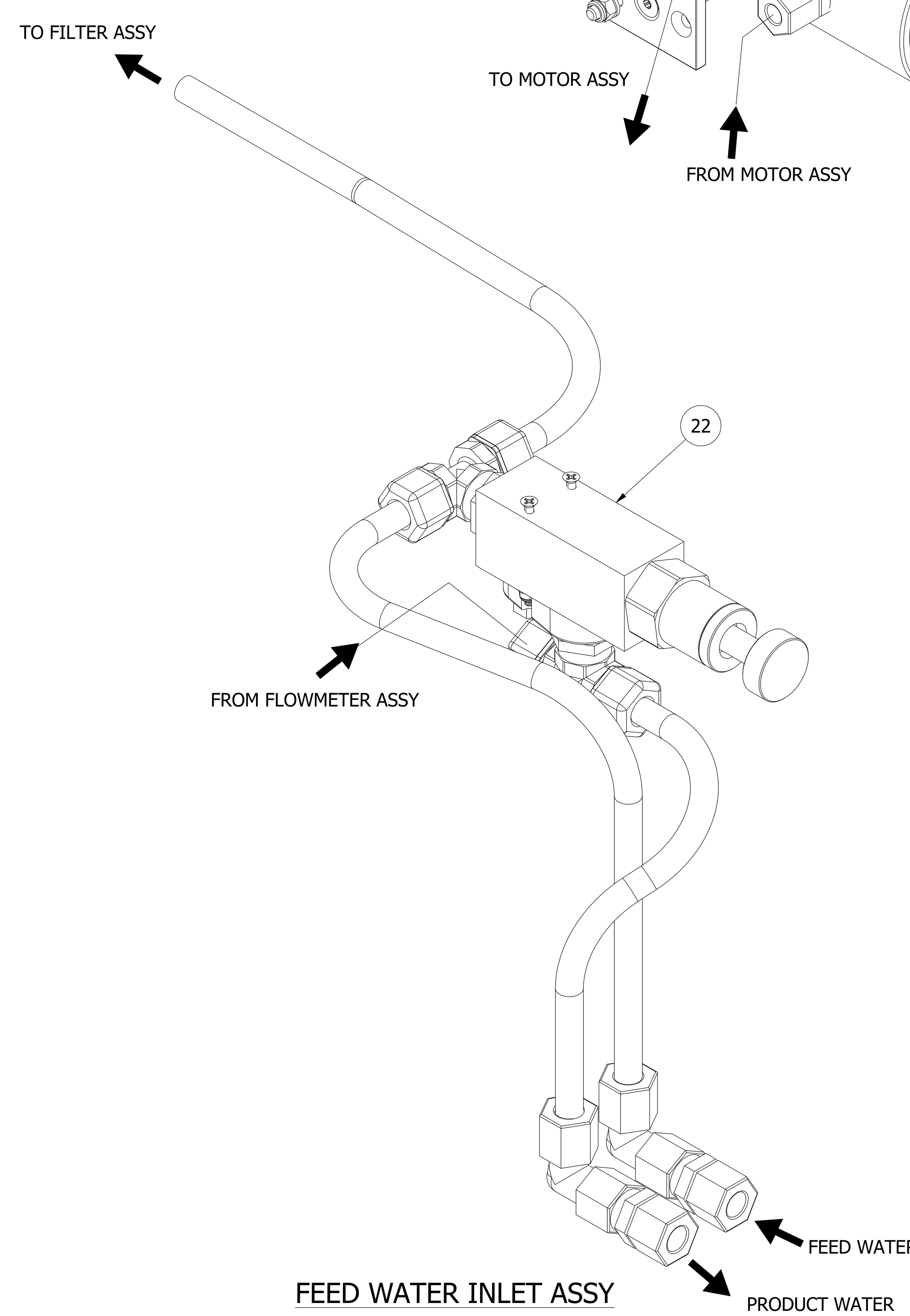
PRESSURE VESSEL ASSY



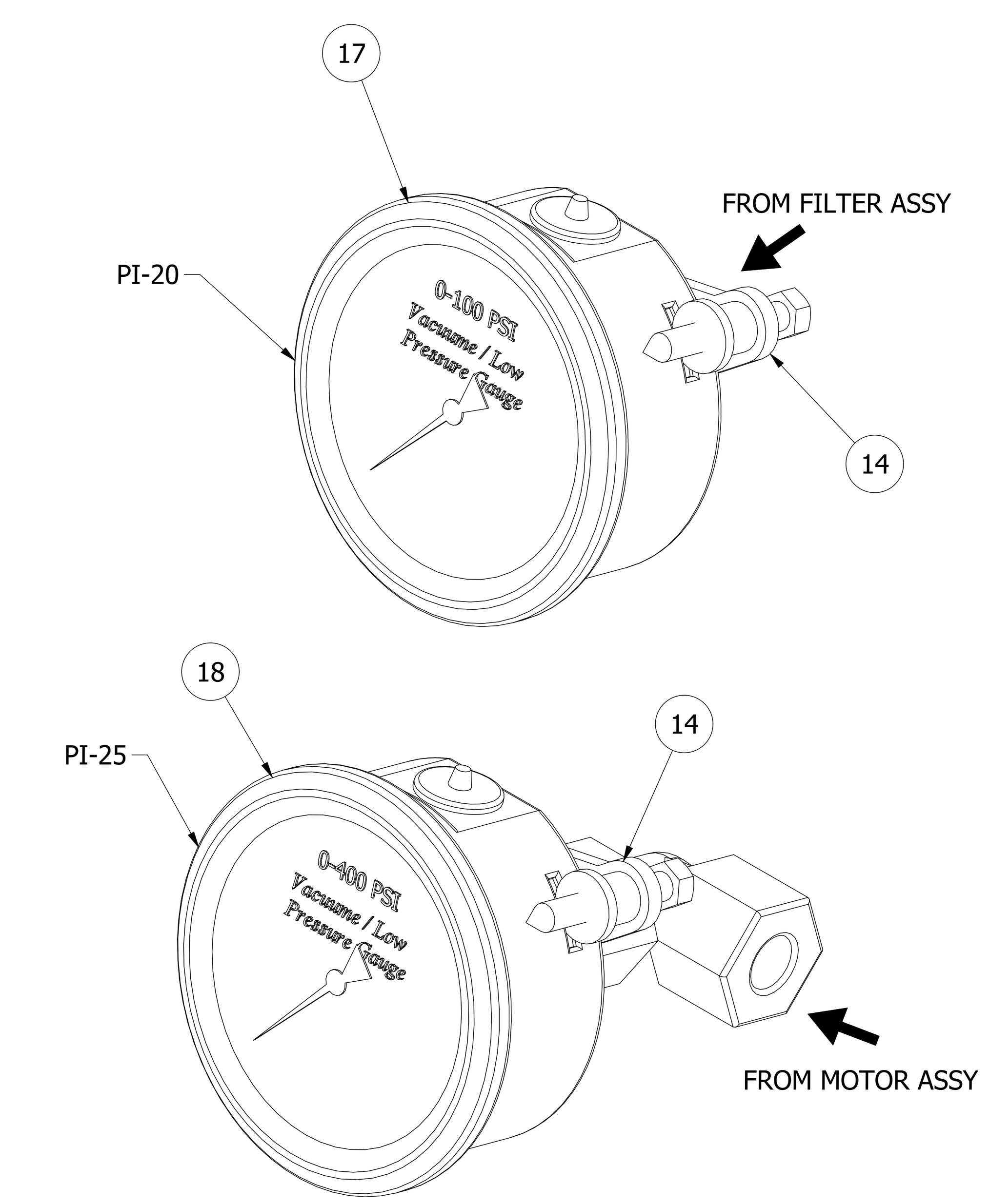
FILTER ASSY



MOTOR ASSY



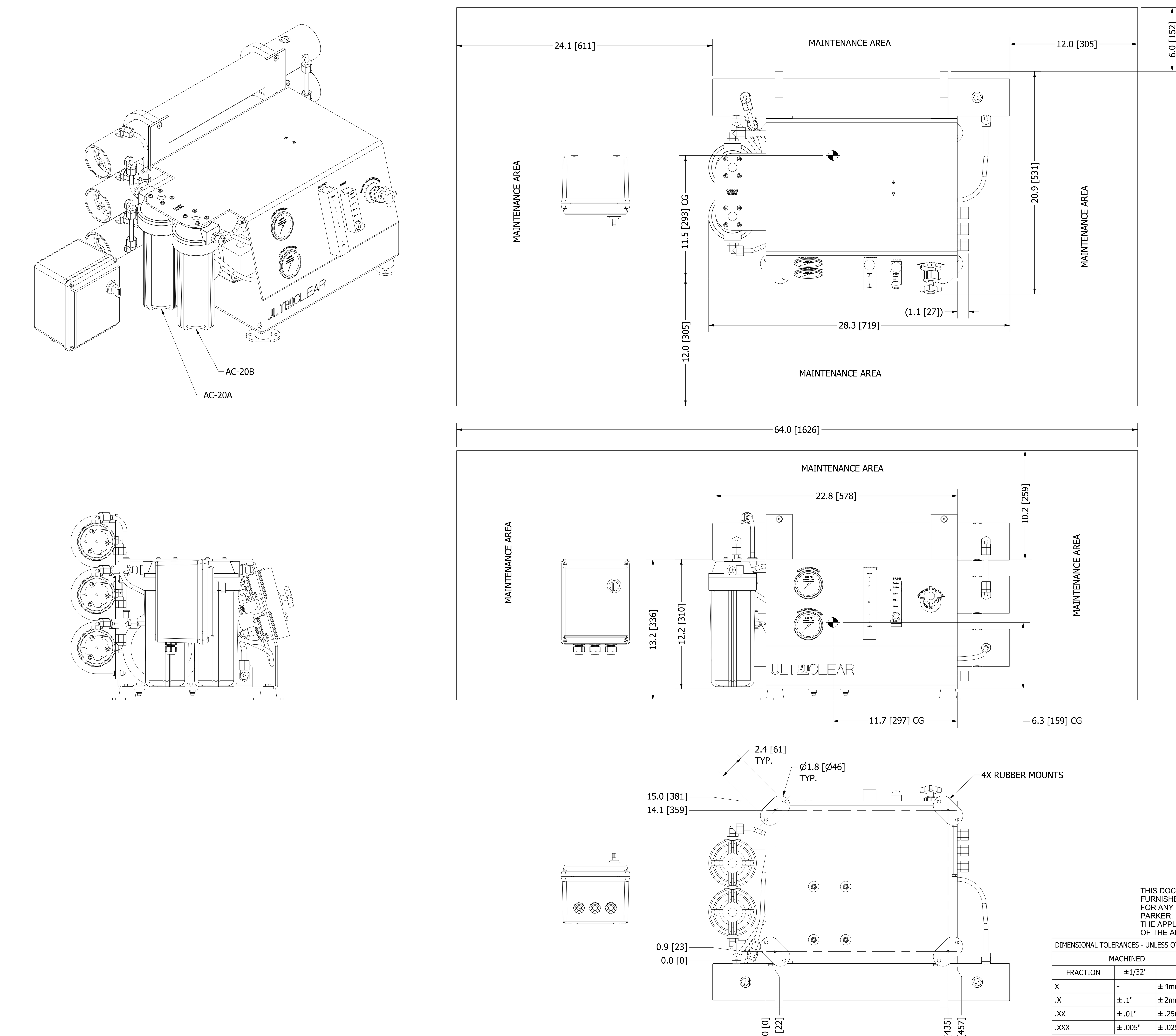
FEED WATER INLET ASSY

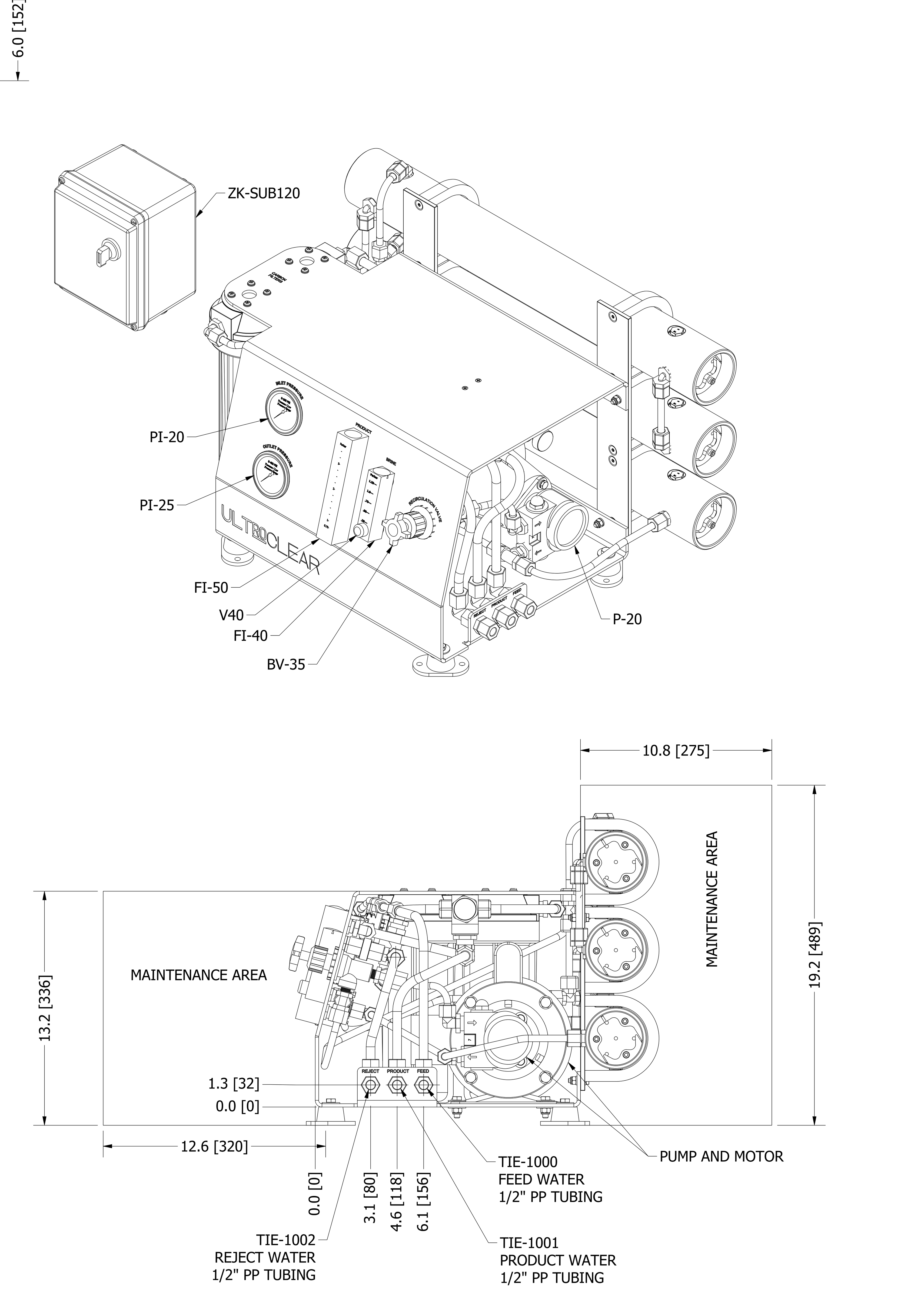


GAUGES

SIZE	DWG NO	REV
D	UC2400-215	D
SCALE		3 OF 3

REVISION HISTORY					
REV	DATE	DESCRIPTION	DESIGNER	CHECKED BY	APPROVED
D	4/8/2019	UPDATED PS-50 SWITCH AND SURROUNDING COMPONENTS, ADDED ALL COMPONENT TAGS, CHANGED "PRV ASSY" TO "FEED WATER INLET ASSY", REVISED PLUMBING CONNECTIONS BEHIND EACH FLOW GAUGE	JPD	SY	BB





REFERENCE TP-0281

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 - BCW	DATE - 6/25/2018	
CHECKED - SY	DATE - 6/25/2018	
APPROVED - BB	DATE - 6/25/2018	
DRY WT: 117 lbs	53 kg	
WET WT: 137 lbs (62 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

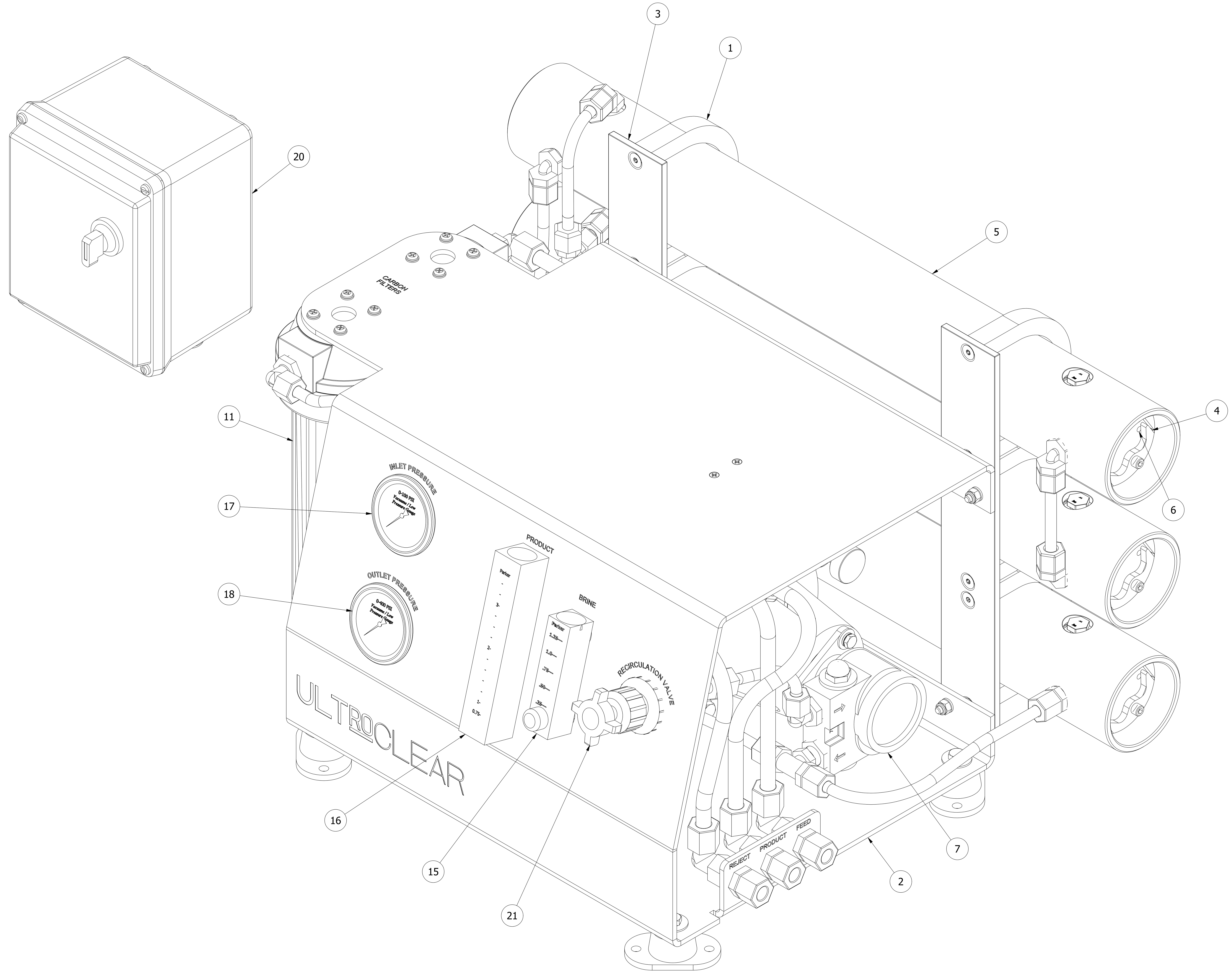
CUSTOMER DWG

UC,3400GPD,110V,1PH,50-60Hz

SIZE	DWG NO	REV
D	UC3400-116	D
SCALE 1 :5	1 OF 3	

DWG NO UC3400-116 SH 1

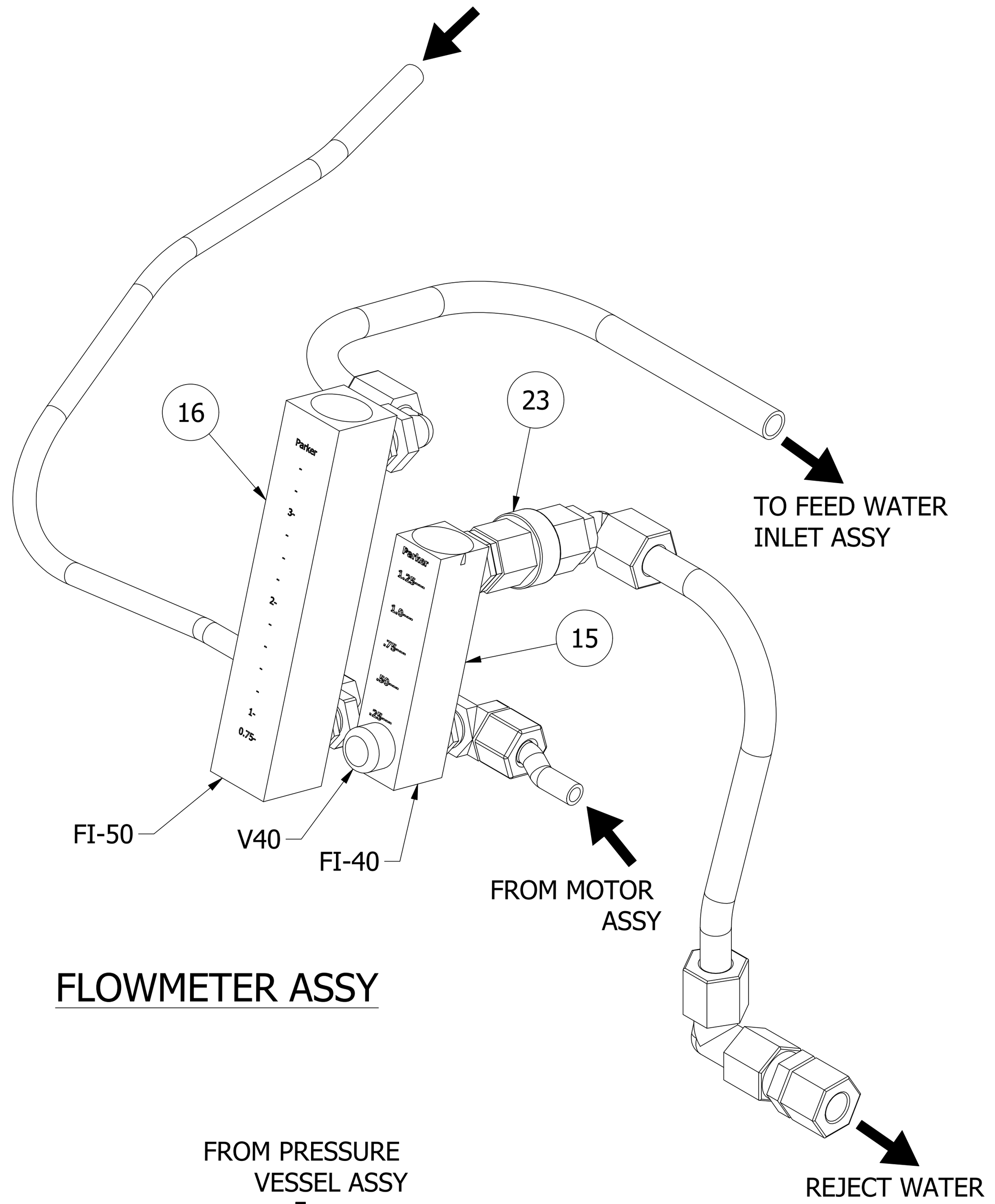
PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	6	05202401GR	BRACKET,MVA U-CLAMP,3 IN
2	1	0861044	FRAME,ASSY,ZK SERIES
3	2	11012179	RACK,MVA,3 VESSEL,AL
4	6	20201030000	SEGMENT RING AW (SET)
5	3	50012002	VESSEL, 3021 FRP
6	6	51012001	END PLUG, 3021, 1-4 IN PORTS
7	1	12176404DP	PUMP ROTARY VANE 215GPH #17
8	1	12227601DP	COUPLING PUMP-MOTOR SHAFT
9	1	12227701DP	ADAPTER PUMP ROTARY VANE
10	1	1519071010	MOTOR 1-2 HP 115-230 56C-1725
11	2	0713020873	FILTER HOUSING .50 X 10
12	2	0803004773	ELEMENT,CHARCOAL,2.5 x10.0
13	3	33-0321-X	ELEMENT,BRACKISH WTR,XLE-3021
14	2	05180851CC	BRACKET,GAUGE,CBM,SS
15	1	85012008	FLOWMETER,REGULATOR, 75 GPH,ACRYLIC
16	1	85012028	FLOWMETER,3.5 GPM,ACRYLIC
17	1	86012004	GAUGE 0-100PSI,CBM.NPT
18	1	86012005	GAUGE 0-400 CBM.NPT
19	1	86012007	SWITCH,40-20PSI,3/8" TUBE ENDS
20	1	ZK-SUB120	ELECTRICAL PANEL ASSY,120VAC,UltROClear
21	1	60-3406	VALVE,ANGLE,0.25FNPT,NYL
22	1	60-7742	VALVE, RELIEF, NYL, 3-4 FNPT
23	1	76012080	VALVE,CHECK,3/8FPT W/VITO PVC



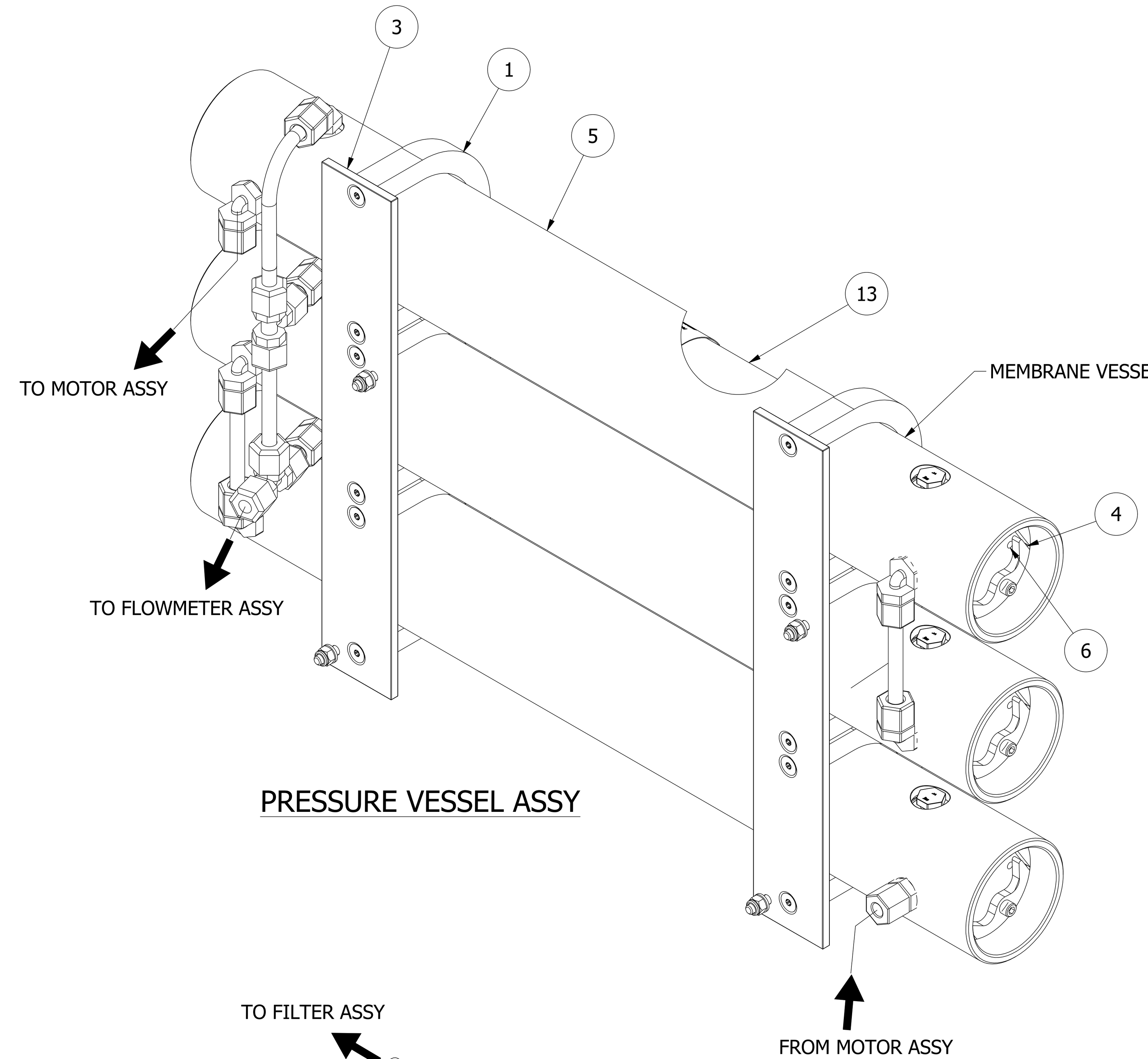
SIZE D | DWG NO UC3400-116 | REV D

SCALE | 2 OF 3

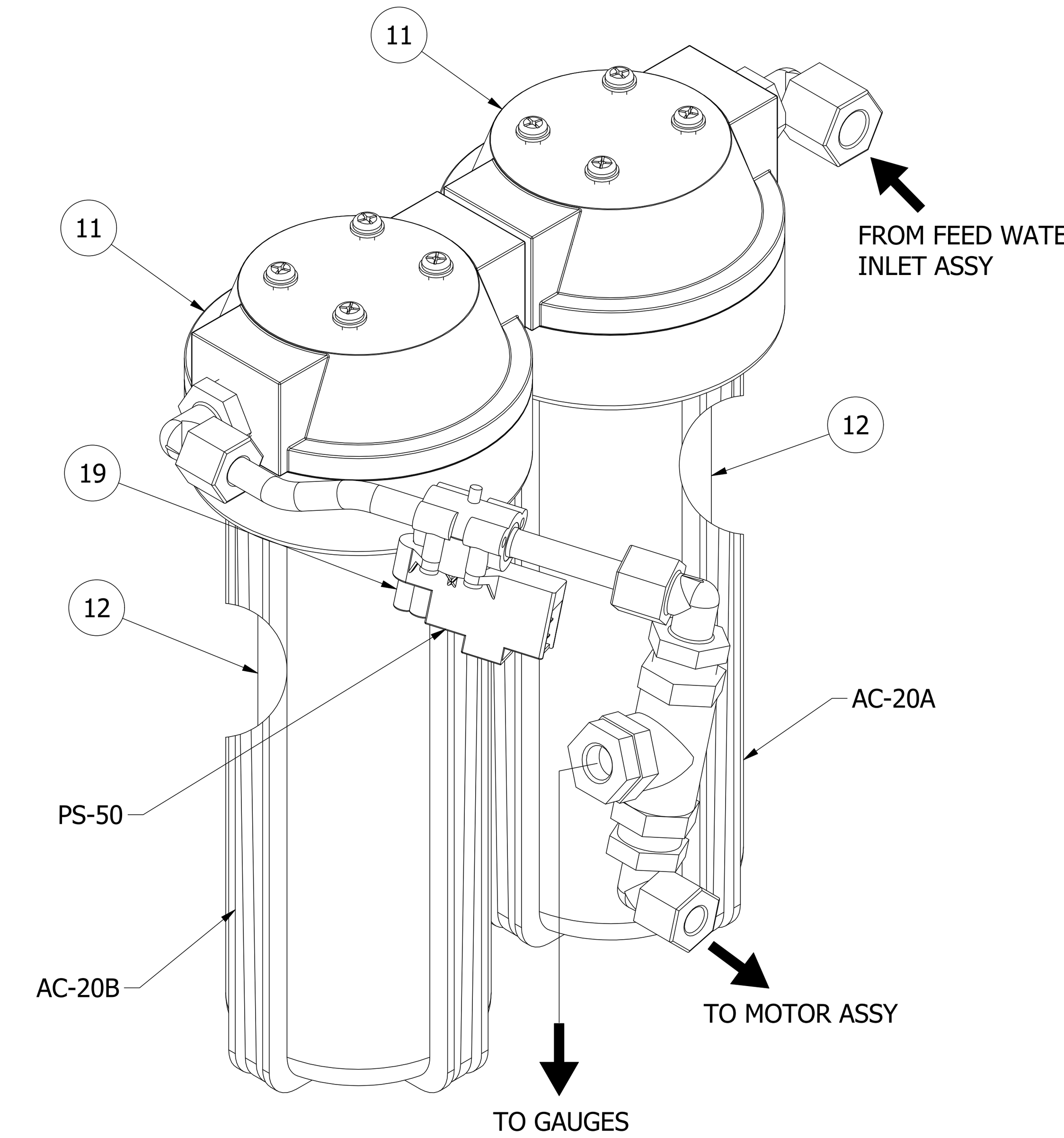
DWG NO UC3400-116 SH 2



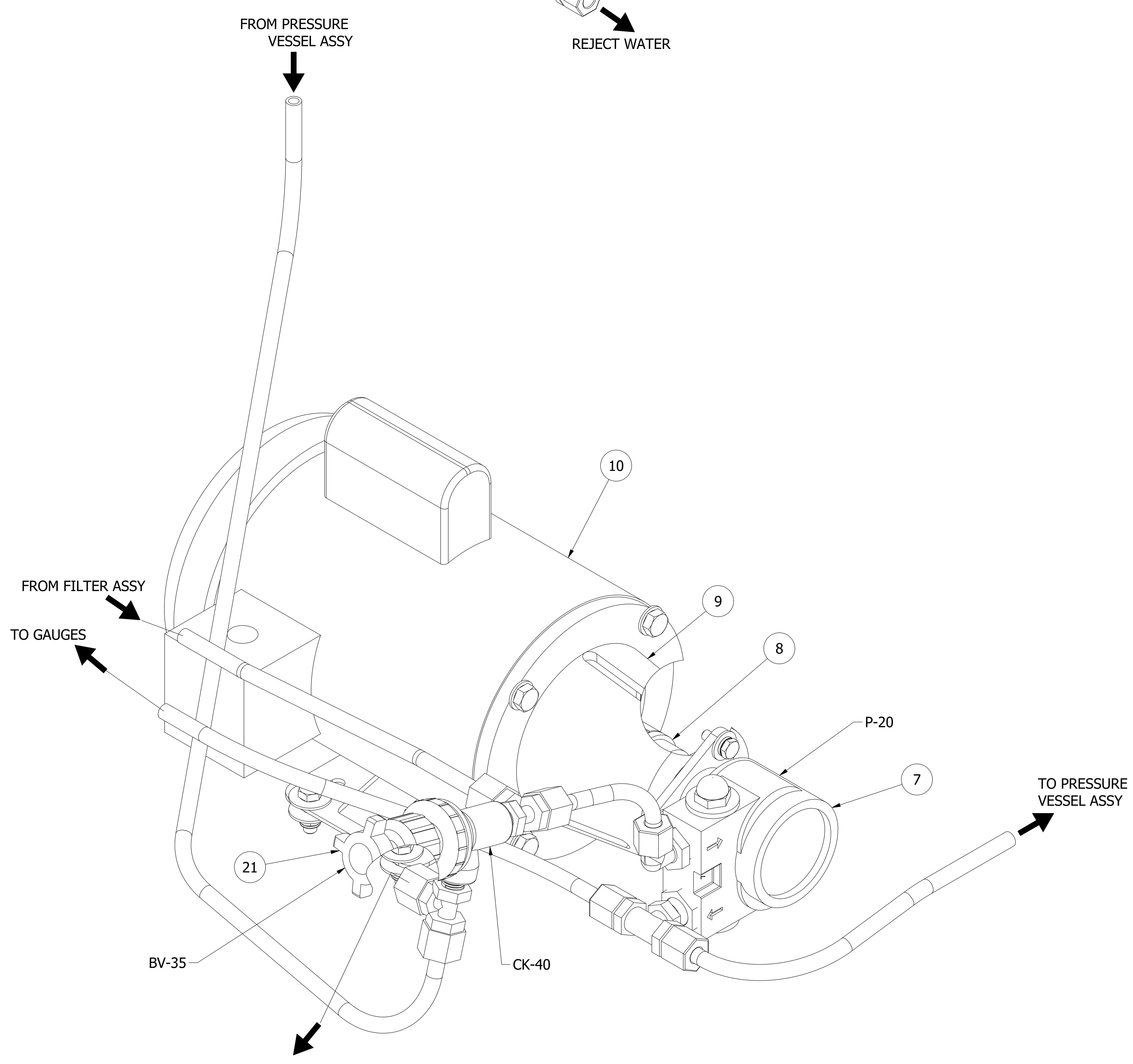
FLOWMETER ASSY



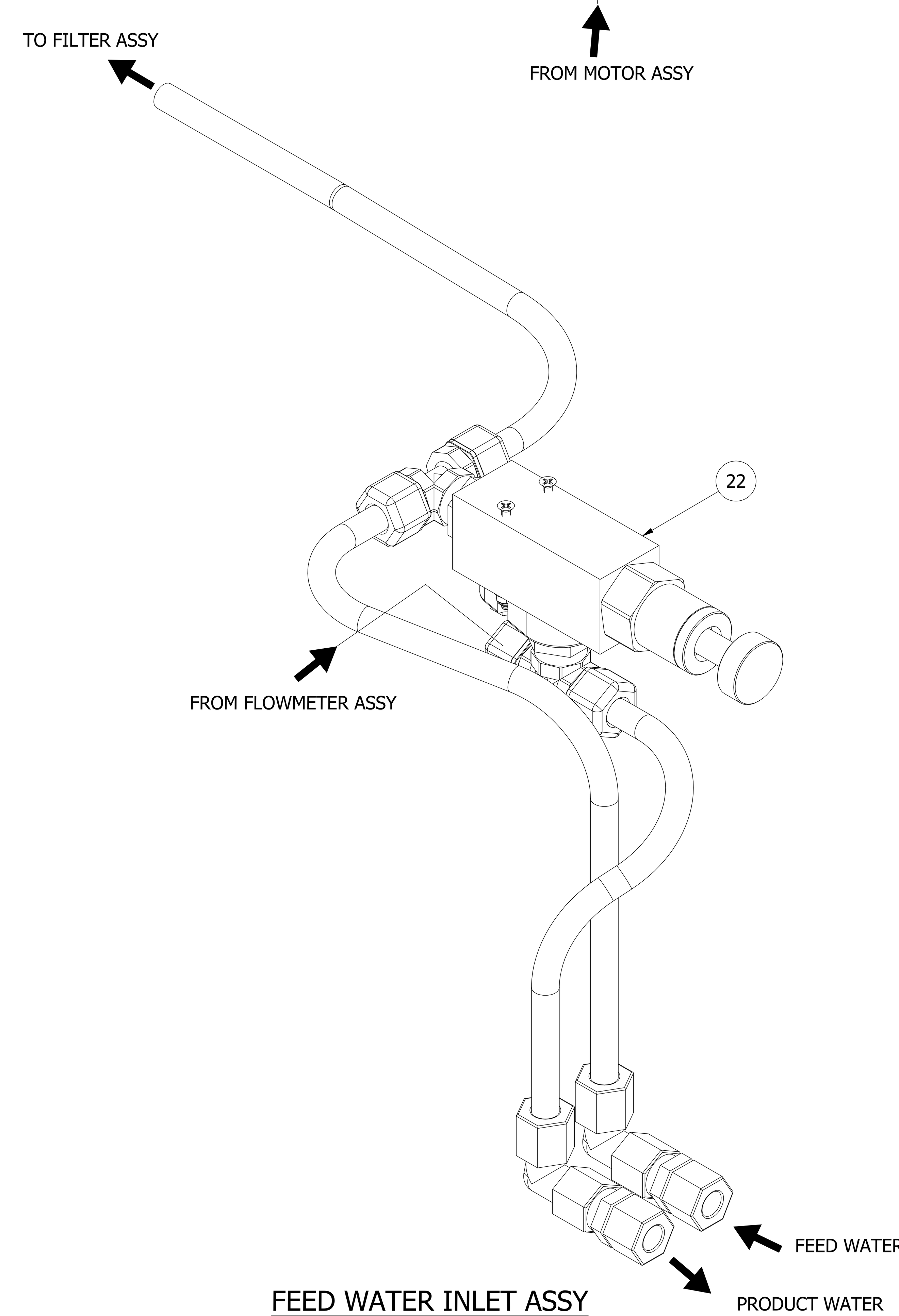
PRESSURE VESSEL ASSY



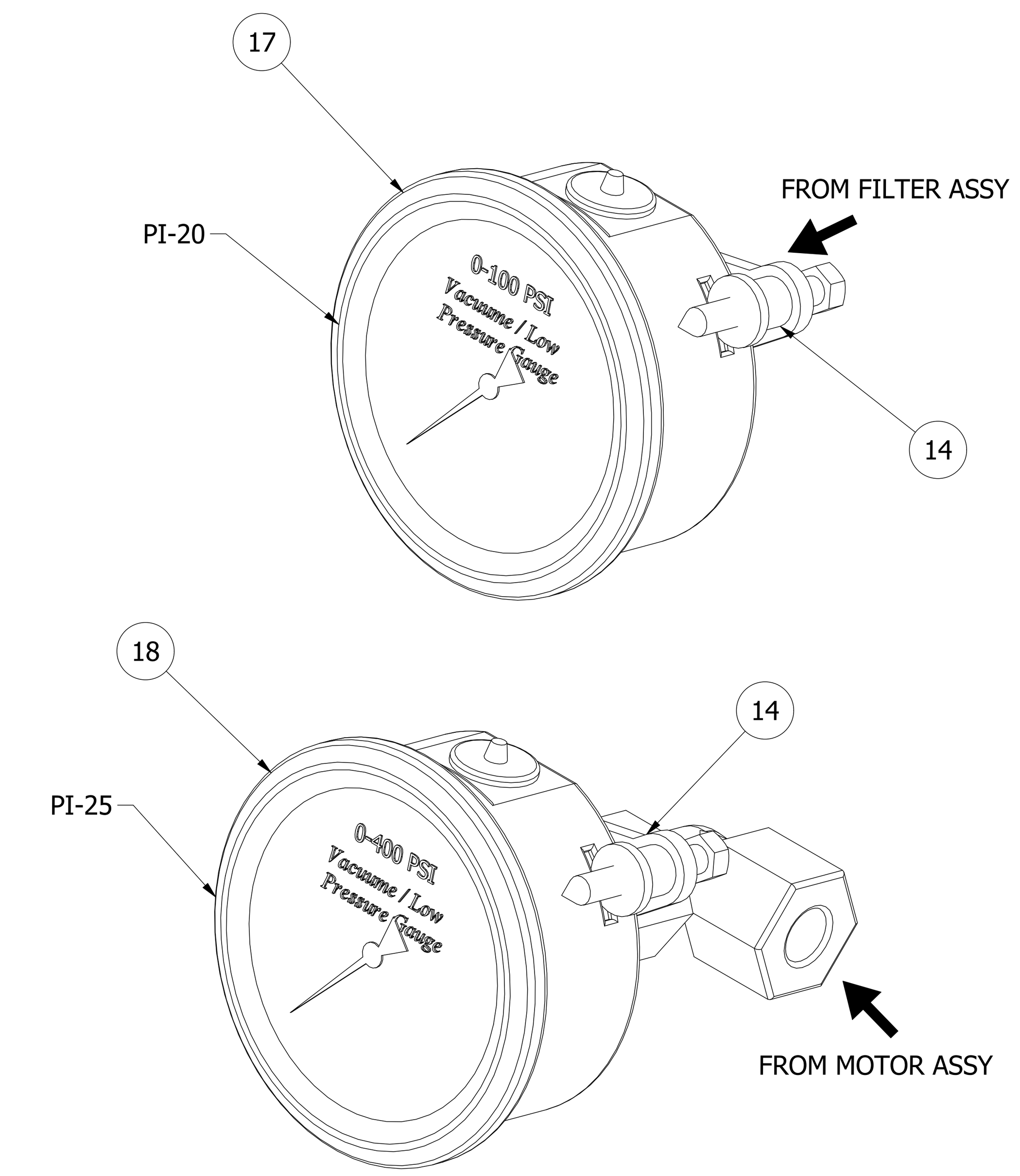
FILTER ASSY



MOTOR ASSY



FEED WATER INLET ASSY



GAUGES

SIZE	DWG NO	REV
D	UC3400-116	D
SCALE	3 OF 3	

DWG NO UC3400-116 SH 3