

User Manual for
Seawater Pressure Vessel Membrane Housings
1000 PSI | End Port | For 2.5" Dia. Elements



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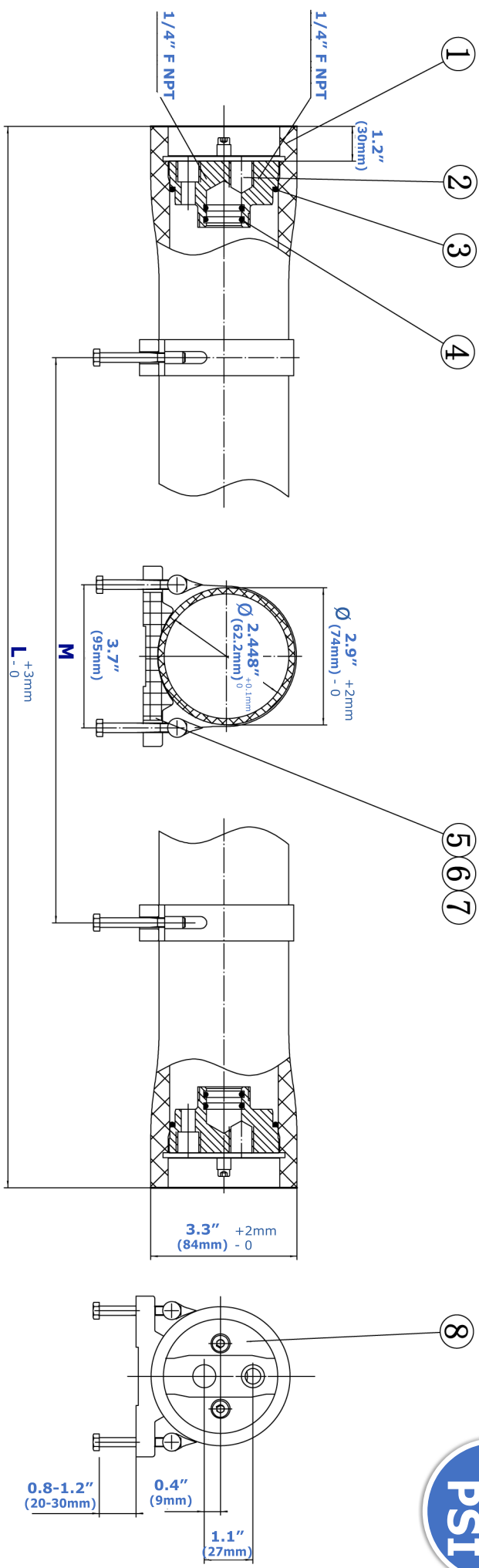
Description

AMI fiberglass SWRO 1000 psi membrane housings are specially designed for seawater reverse osmosis membranes used in marine applications, shipboard applications, watermakers, land-based desalinators and sea-based desalinators. AMI seawater pressure vessels use a strong coated fiberglass manufactured with a computer controlled winding process for exceptionable quality and precision. To ensure maximum quality, the pressure vessels undergo extensive fatigue tests, strategic thermocouple positioning, accurate temperature flow curing process, and are finished with UV resistant polyurethane paint. The end caps are designed for direct connection to Applied Membranes 2.5" standard, male style elements with ¾" PWT.

Model	For Membrane	Design Pressure	Prod./Brine Conn.	Configuration
PV2514A1000E	2.5" Dia. x 14"L	1000 psi	¼" FNPT	End Port
PV2521A1000E	2.5" Dia. x 21"L	1000 psi	¼" FNPT	End Port
PV2540A1000E	2.5" Dia. x 40"L	1000 psi	¼" FNPT	End Port

Membrane Housing Pressure Vessels for 2.5" Diameter Seawater RO Membranes

1000
PSI



Assembly Part#	Length (L)	Mounting Location (M)	Approximate Weight
PV2514A1000E	17.5" (445 mm)	7.9" (200 mm)	9lb (4 kg)
PV2521A1000E	24.5" (623 mm)	15.7" (400 mm)	9lb (4 kg)
PV2540A1000E	43.5" (1106 mm)	27.6" (700 mm)	13lb (6 kg)

Ref. #	Description	Material	Qty. Incl.
①	Vessel Shell	Epoxy FRP	1
②	End Plug	2507SST	2
③	Outer O-Ring	EPDM	2
④	Inner O-Ring	EPDM	4
⑤	Mounting Saddle	Rubber	2
⑥	Mounting Strap	316SST & Rubber	2
⑦	Strap Screw	316LSST	4
⑧	Locking Crescents	316LSST	4

Design Notes

1. Design Pressure: 1000 psi (69 bar)
2. Minimum Operating Temperature: 14°F (-10°C)
3. Maximum Operating Temperature: 120°F (49°C)
4. Factory Test Pressure: 1.5 x Design Pressure
5. Working Medium: Water, pH 3-11 (Cleaning <30 mins: pH 2-12)
6. Please operate in accordance with User Guide.
7. Flexible piping should be used on permeate connection to manifold.
8. Subject to change without prior notice.



General Usage Guidelines

General Warning

AMI RO pressure vessels are designed to provide safe operation over a long service life if properly installed, operated, and maintained. The vessel may cause loss of life, severe bodily harm, or property damage if it is NOT correctly installed, operated, or maintained. Please make sure you read and understand all the guidelines in the User Manual provided with the vessel. Observe every precaution contained therein. Failure to do so may result in malfunction and potential catastrophic failure. It is recommended that only qualified technicians experienced in servicing hydraulic systems work with this vessel. Misuse, incorrect assembly, or use of damaged/corroded components may result in catastrophic failure or may cause to void the warranty.

Vessel Use and Precautions

- Positive pressure up to the design pressure (PSI) of the specific model being used
- Accommodates standard 2.5" nominal diameter spiral-wound element
- The required vessel/element interface hardware is supplied with the vessel.
- Vessel expands under pressure and careful consideration must be taken when installing straps/saddles and system connection piping
- Installation with the straps/saddles provided is strongly recommended
- Vessel should not support any other system components, connections should be non-load bearing
- Periodic inspection of the vessel end cap is recommended to ensure all parts are dry and free of corrosion
- Failure to understand and follow all precautions may void warranty and result in catastrophic failure of the vessel
- These guidelines are subject to change without prior notice. Please check with AMI to ensure that the User Manual is the latest version for the vessel model being used.
- Mount vessel using strap/saddle hardware provided and span recommended in the engineering drawing
- Do not over tighten the straps - vessel must be allowed to expand under operation
- Maximize the connection flexibility to allow for vessel growth under pressure
- Align the side ports with the system manifold, correcting any misalignment before final installation
- Provide overpressure protection in the system safety devices
- Inspect end caps regularly for signs of corrosion. Immediate corrective action and/or replacement are recommended in case of corrosion.
- Relieve system pressure before working on the vessel
- Do not attempt to over-tighten the Permeate Port connections as this may damage the end cap. One turn past hand tight should be sufficient.
- Never operate the vessel in excess of its ratings. This may void the warranty and cause bodily or property damage.
- Do not operate the vessel permeate port over 125PSI.
- Flush the vessel with permeate before system shutdown to reduce the chance of corrosion
- Do not install the vessel under direct sunlight
- Operate the vessel within the recommended pH range
 - Operating pH Range: 3 – 11
 - Cleaning pH Range: 2 - 12 (less than 30 minutes)

Head Removal

Step 1- Shut Down the RO System and then Relieve the System Pressure

The RO system should be totally shut down and all pressure relieved before conducting any maintenance or repair on the vessel.

Step 2 - Disconnect Permeate Piping

The system permeate piping must be carefully removed from the permeate port of the vessel.

Step 3- Inspect the End Cap

The end cap should be inspected for any signs of corrosion or damage. Surface corrosion can be removed with a wire brush, while flushing with water. Damaged components should be replaced with approved components from AMI.

Step 4 - Disconnect the Locking Screws

Each of the two locking crescents is held in place with a single locking screw. The locking screws can be unthreaded using an M5 hex wrench. The locking screws should be unthreaded from the head only, not from the locking crescent. The locking screw and locking crescent can be removed at the same time.



Step 5 Remove the Locking crescent/Screw Assemblies

The locking crescent/screw assemblies should be easily removed from the retaining groove. Should the assemblies be difficult to remove, it may be necessary to rock the head slightly or tap the head inward with a rubber mallet. Be careful when using metal tools, avoid leveraging against the sidewall of the vessel or scratching the inside surface of the bell area.

Step 6 Remove the Head Assembly

A 1/4" Rc Male threaded PVC (or similar material) pipe should be threaded into the head permeate port to hand tightness. Pull the pipe outward to remove the head. If the vessel has been in operation for an extended time, a slight rocking motion or forceful tug may be required to break the head seal bond. Also, a handle at the end of the pipe will ease head removal - forming a T with the pipe that threads into the permeate port.

Head Installation

Step 1 Install Head - Hold the head assembly, square to the axis of the vessel. Push firmly until the head is correctly positioned and the retaining groove is visible. It may be necessary to use a rubber mallet to tap the head into its engaged position.

Step 2 Install Locking Crescents - Clean and dry the retaining groove. Position the first locking segment so that the end section sits in the retaining groove and the screw aligns with one of the threaded openings in the bearing plate. Use an M5 hex wrench to tighten the screw until snug. Do not over-tighten - maximum torque guideline: 10Nm. Install another crescent in the same manner. Conduct a final tightness check of each screw after two crescents are installed.

Step 3 Reconnect Permeate Piping - Reconnect the system permeate piping to the permeate port.

Step 4 Conduct Pre-Pressurization Inspection - A thorough pre-pressurization inspection should be conducted, including verifying that the heads are properly installed, system piping connections are in place, elements are installed, adapters are installed, and thrust cone is installed at downstream end of the vessel.

Step 5 Pressurize System

Step 6 Inspect for Leaks - All connections should be free from leaks. Do not operate leaking vessels. If leak persists, go back to step 1 of Head Removal.



Piping and Mounting Recommendations

- Use two flexible Victaulic™ connections with an intermediate section of pipe when possible. This is the preferred method for connecting the feed/concentrate ports to the system piping, especially when system manifold tolerances cannot be guaranteed. There is a maximum 0.03" misalignment allowance per port.
- Single flexible Victaulic™ connections should only be used when the axial misalignment from the port to the manifold is less than 0.03" per port. Make sure the vessel is centered on the rack when checking for port/manifold alignment.
- Using intermediate flexible Victaulic™ connections in the manifold will ease port alignment and vessel installation.
- Do not force any connections.
- The Header and related piping should be self-supported.
- Space strap/saddle locations using "M" dimension shown in model engineering drawing.
- Tighten straps to hand tightness plus one turn.
- Manifold span should be greater than vessel span to allow for vessel growth under pressure.

Replacement Parts Ordering Information

Model	Prod./Brine Conn.	Includes	Qty. Per Vessel
PV-EP25-1000E	End Plug – ¼" Permeate/Brine Ports <i>Two end plugs needed per vessel.</i>	1 End Plug (each)	2
PV-LC25-1000E	Locking Crescents and Locking Screws. <i>One kit needed per end plug.</i>	2 Locking Crescents 2 Locking Screws	2
PV-OR25-355	O-Ring – External for End Cap <i>One needed per end plug</i>	1 O-Ring	2
PV-OR25-265	O-Ring – Internal – for Product Water Tube <i>Two needed per end plug</i>	1 O-Ring	4
PV-MC25-1000A	Mounting Components Kit <i>One needed per vessel assembly</i>	2 Saddle Pads 2 Straps 4 Strap Screws	1

Product Warranty

- SELLER hereby warrants to CUSTOMER that the goods herein described will be free from any liens or encumbrances, that good title to said goods will be conveyed to CUSTOMER by sale of same.

SELLER warrants materials of its own manufacture against defects in material and workmanship under normal conditions of usage and service for one year from whichever of the following events occurs first:

- First use of the system
- Three (3) months following date of shipment from Vista.

Materials not manufactured by seller receive only such warranty, if any, of the manufacturer thereof and which are hereby assigned to CUSTOMER without recourse to SELLER.

SELLER'S obligation under this warranty is limited to and shall be fully discharged by repairing or replacing any defective part FOB its works. SELLER shall not be liable for repair or alterations made without SELLER's prior written approval; for membrane elements becoming plugged by suspended matter, precipitates, or biological growth; or failure to properly maintain the element. SELLER shall not be liable for damages or delays caused by defective material. Elements returned to SELLER for warranty examination must be shipped freight prepaid.

- **SELLER'S Liability.** SELLER SHALL NOT BE LIABLE FOR PROSPECTIVE PROFITS OR SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, NOR SHALL RECOVERY OF ANY KIND AGAINST SELLER BE GREATER IN AMOUNT THAN THE PURCHASE PRICE OF THE SPECIFIC GOODS SOLD AND CAUSING THE ALLEGED DAMAGE, WHETHER SUCH CLAIM BE BASED ON CONTRACT OR TORT; provided, however, the aforesaid to the contrary notwithstanding, SELLER shall not be liable for any bodily injuries or property damage directly caused by its willful, wanton or negligent acts.
- **All Other Warranties and Damages.** THERE ARE NO WARRANTIES ESTABLISHED, EXPRESS OR IMPLIED OR STATUTORY, INCLUDING THE WARRANTY OF MERCHANTABILITY, EXCEPT THOSE SET FORTH ABOVE OR ANY PERFORMANCE WARRANTY WHICH IS ATTACHED TO THIS ORDER.
- **Permits, Ordinances and Code Compliance.** CUSTOMER has full responsibility for obtaining any licenses, permits and inspections required with respect to installation and use of the goods herein described.
- **Governing Law.** Any agreement based upon this Order and the obligations thereby imposed on SELLER and CUSTOMER shall be governed by and construed according to the laws of the State of California.