ULTRA PURE SYSTEMS 2500 GPD RO/DI INSTALLATION AND OPERATION MANUAL

Thank you for choosing **UPS** (UltraPure Systems) for your RO (Reverse Osmosis) & DI solution. We are confident you have made the right decision. This system will effectively remove 99% of contaminants as well as organic and inorganic compounds.

Table of Contents

Product Specification

General:

5- Stage Reverse Osmosis Water Purification System

Capacity Generates: 2500 gallons per day depending on water temperature, pressure and chemistry variations.

Dimensions:

Cabinet: Height 67”, Width 39”, Depth 13”
Bladder: Height 46”, Diameter 26” FlexWave SSRO 85
Weight 340lbs 298lbs dry

About the System:

Reverse Osmosis process:

- The Reverse Osmosis process works via separation. Domestic water enters the system, and it is separated at the 3th stage membrane filter. One side would go to the storage tank (purified water); the other side carrying contaminants is purged to the drain. The ratio of purified water to drain water is approximately 1:2. That means for every gallon of water you use, it will drain approximately 2 to gallons. The drain is required for the RO process to work. If the drain is intentionally shut off, contaminants will accumulate inside the membrane, this will permanently damage all RO membranes.
- All Reverse Osmosis units require purging of water when producing water.

Purification Processes/ Filter specifications:

Removes microbiological contaminants like Cysts (protozoan), inorganic/Radiological contaminants like Barium, Cadmium, Copper, Chromium (hexvavalent), Chromim (trivalent), Fluoride, Lead, Radium 226/228, Selenium, etc. Ammonia, Arsenic, chloramines, chlorine, copper, lead, nitrate, phosphate, silica, hardness, calcium, magnesium, other dissolved solids.

- 1st Stage: Cloth Sediment, 4.5” X 20” height
- 2nd Stage: Carbon Filter, 4.5” X 20” height, composed of high-performance coconut carbon
- 3th Stage: TFC type membrane (1) 2500GPD 40” x 4” long in S/S housing.
- 4th DI tank
- 5th Stage VT-4 Viqua UV sterilizer light

Production:

The final purity of the water leaving the RO/DI System is between 0-10 PPM. Systems flow is rated at 2500 gpd +/- 15% based on 77degree water, 125 psi applied pressure. 500 ppm NaCl softened filtered water.

Drain rate:

The drain rate of the system is set at 3.47 gl /min. using a flow restrictor. This drain rate is constant, independent of input pressure. User adjustable with caution not to close needle valve.

Performance:

Average Rejection rate is 92 to 98% of dissolved solids after RO. 98 to 100% rejection rate after RO/DI resin. Permeate flow for individual elements may vary +/- 20%

Warranty:

- 1 year complete system Warranty on parts. Filters are not included under warranty.
- **WARNING:** IF KNOWN BACTERIA PROBLEMS EXIST AN ULTRA VIOLET LIGHT IS REQUIRED FOR PROPER OPERATION
- **WARNING:** DO NOT CONNECT HOT WATER TO THIS SYSTEM
- **WARNING:** INCORRECT INSTALLATION WILL VOID WARRANTY
- **WARNING:** USING OTHER BRANDS OF FILTERS WILL VOID WARRANTY

System Requirements:

- *Working pressure 60-80 psi inlet/feed water pressure required*.
- maximum water pump 100 psi.
- Working temperature 100-40 deg. F (37-4 deg. C)
- pH range 2-11

System Includes:

- Pre Filters, RO Membrane
- HDPE plastic cabinet with door hinges and lockable turn handles
- Storage Tank 85gl pressurized tank with pre-charge of 7-10 psi.
- (4) Pressure gauges (1) 0-300 psig and (3) 0-100 psig mounted on side of cabinet. Inlet pressure, feed pressure, pump pressure, tank pressure.
- (2) GPM flow meters mounted inside of cabinet. Permeate water flow and Concentrate water flow.
- Sterilizer Ultraviolet Light
- Digital RO & DI PPM monitor
- LED crystal with audible/visual alarm hen RO Membranes need changed
- ROC-5 Reverse Osmosis Controller 230v.
- HM Digital Meter
- (1) Single Point Bulk Head Connections.

Installation:

We have designed this system to be a turnkey solution to obtain RO. Although not required a water softener is suggested upstream of unit due to water flow demand. Once the Reverse Osmosis system arrives, inspect for damage and notate on delivery BOM all evident damage with pictures. Contact UPS promptly @ 800-729-5192 to resolve any issues immediately.

If no damage is evident proceed with uncrating the system.

(1) TOP: Pipe Domestic water to UPS system on side of cabinet and terminate piping with ½" MPT connection to inlet water connection. Install ½ ball valve to isolate domestic water manually. ¾" copper pipe recommended for proper flow. 60psi minimum operating pressure @ inlet of cabinet.

(2) MIDDLE: Pipe Drain water to approved Local Code waste water and terminate piping with ½" MPT connection on side of cabinet to Drain/Concentrate fitting.

(3) BOTTOM: Pipe RO water out with (3) ball valves. 1st ball valve will be in line with bladder to store RO water/ 2nd ball valve will be in tee going to process. 3rd ball valve pipe to approved drain for manually flushing system.

(4) Pipe RO water to External DI tank leading to storage tank.

(5) See recommended piping diagram last page of Engineering manual.

WARNING: Confirm Domestic water IN and Concentration OUT is piped correctly. Severe damage will occur if piped backwards.

Electrical:

Each system requires 115v/1/60Hz 15a dedicated circuit to operate system.

(1) Located on top left side of cabinet is #14 115v plug.
(2) **GFCI** required prior to operation
(3) Verify 115v

Final flushing:

(1) Close ball valve to storage tank, open RO/Process water ball valve to drain.
(2) Push start and wait for delay. Motor will start, and unit will start producing water. Allow to run for approx. 15min. This allows time for any debris that may have got stuck inside pipes during install to be removed.
(3) Shut unit down, reverse ball valves, close drain ball valve and open bladder ball valve.
(4) Turn system on system at which point tank will fill and turn off automatically once tank is full, or pressure switch opens (set @ 40/60psi) at which point system turns off.

System gauge tolerances after initial start-up:

- Inlet Pressure Gauge: (off 0psi) (on 60-80psi)
- Feed Pressure Gauge: (off 0psi). Over time feed pressure will drop across these 2 gauges. This indicates pre-filters need to be changed. 15 psi delta is a recommended time to change.
- Pump Pressure: (100-125 psi)
- Tank Pressure: System will function until tank pressure gauge reads 60psi or float in atmospheric tank opens. As RO water is used from bladder, pressure will drop to 40 psi and pump will start again or float will drop, and system will turn on.
- RO Meter: (.2-2.0 gpm)
- Concentration flow meter (.5-5 gpm)

Operation:

UPS-5000

- Domestic water enters the system via water in/feed inlet port on side of cabinet. When pressure drops or tank lowers, controller recognizes this and opens inlet water ball valve. Water enters system, goes through pre-filters and prior to pump there is a pressure transducer that verifies city pressure is present. This eliminates motor from turning on if no city pressure is present. Approx. 15 seconds motor will start, and RO water start to be produced. This is where the 1:2 ratio occurs. Concentrate water goes through flow meter and RO water goes through Permeate flow meter. Last pass through UV sterilizer removing any natural bacteria. Water exits cabinet to process storage tank/ atmospheric tank. Once tank pressure is satisfied ie. 60psi or tank is full system will automatically shut off.

Concentration Flow Gauge:

- The concentrate flow meter is a useful tool to review how much water system is purging at any given time while (pump is on).

Permeate Flow Meter Gauge:

- The Permeate flow meter is a useful tool to review how much water RO system is producing while in operation (pump on).

Inlet pressure: (pnds sq/in) gauge:

- The inlet glycerin gauge mounted on the side of cabinet monitors incoming domestic pressure while pump is on. This gauge will be helpful for diagnosing if domestic pressure has been lost or turned off. Gauge will read 0psi when system is not running due to inlet valve being closed.

Feed pressure: (pnds sq/in) gauge:

- The feed glycerin gauge mounted on the side door monitors pressure of the water after sediment/carbon filters. The feed gauge and the inlet pressure gauge is very helpful to determine when to change the pre-filters.
  Monitoring the monthly pressure difference of inlet and feed gives a good indication to replace pre-filters. Approximately 15psig psi differentials should prompt replacement of filters.

Pump pressure: (pnds sq/in) gauge:

- Pump glycerin gauge mounted on the side cabinet gauge is used for optimizing the amount of pressure put onto the entering port of the RO membrane. Each UPS-2500 delivered is tested at approx. 80psi. Depending on domestic pressure each unit should be dialed in to obtain 100-125psig on the discharge of the pump using the ball valve. This adjustment should only be performed be a qualified technician. Call UltraPure 1800 729-5192 for assistance adjusting if needed.

Tank pressure: (pnds sq/in) gauge:

- The tank pressure gauge will be 0psi upon start up. Once system starts making water and storage tank starts filling this gauge will move. Within 6-8 hrs this gauge should read 60psi and pump shuts off. Once pressure drops below 40psi the system will automatically start producing water until tank pressure is restored to 60 PSI.

  Note: All gauges with exception to tank pressure will show 0 psi with exception to tank pressure while system is off. This is due to ROC-5 controller closing inlet valve until a call for water occurs.

Atmospheric Tank:

- Normal operation, DI water will be delivered into tank until float is satisfied at which point contacts open and pump shuts off. Upon float dropping below threshold contacts close and pump starts process over.
  Contacts are field wired from tank to RO cabinet. Reference ROC-5 install manual for proper wiring Pin # E-81-E-82 in controller.

ROC Controller:

- Controller on front will scroll 3 useful readings.
- 1) City PPM
- 2. RO PPM
- 3. Temperature of water.
- PPM is factory calibrated and does not require any additional calibration once on site.
- HM Digital RO PPM & DI PPM

- Normally closed dry contacts can be used on green card to monitor RO & DI water PPM. This will annunciate an alarm remotely when RO PPM exceed 150PPM & DI exceeds 10PPM.
  (10vdc max required).

Maintenance / Filter Replacement:

Filter Life:

- 1nd **Stage Sediment Filter**: Recommend changing every 3 months BB 5-25m. Part # UPF_4283
- 2nd & 3rd **Stage Carbon Block Filter**: Recommend changing every 3 months BB 10m. Part # UPF_4284
- 3th Stage **RO Membranes:** Every 6 months depending on water quality after pre-filters have been changed. Should not exceed 150 PPM during normal operation.
  (1) MEM4040 Part # UPF_5299
- 4th Stage **UV Sterilizer:** Every 24 months or 6,000 hours respectively. Part # UPV_7292
- 5th Stage **10" x 54" DI Tank** Part #UPD_6294

Filter replacement:

Filter replacement changes from site to site. To maintain your system, we recommend putting your UPS-2500 on a regimented filter replacement throughout the year. Exact filters can be found on www.ultrapureus.com.

Pre-filters:

1) Turn System off; close bladder valve and domestic water valve.
2) Open ball valve from process to drain. This will remove any pressure from system.
3) Drain blue filters with ball valve. Proceed to unscrew used pre-filters in blue cylinders (CCW) counter clockwise until the filter drops off.
4) Proceed to install replacement pre-filters (CW) clockwise. Confrim O ring is on top of canister.
5) Once filters have been replaced turn system on and allow air to be removed from pre-filters canister.
   - If system is full, push manual button on ROC controller ONCE ONLY while drain line ball valve is open. Once system shuts off confirm ball valve to drain outside cabinet is closed, domestic and bladder ball valve is open. Turn the system on.
6) Inlet Pressure and Feed Pressure should be very close.

Membrane:

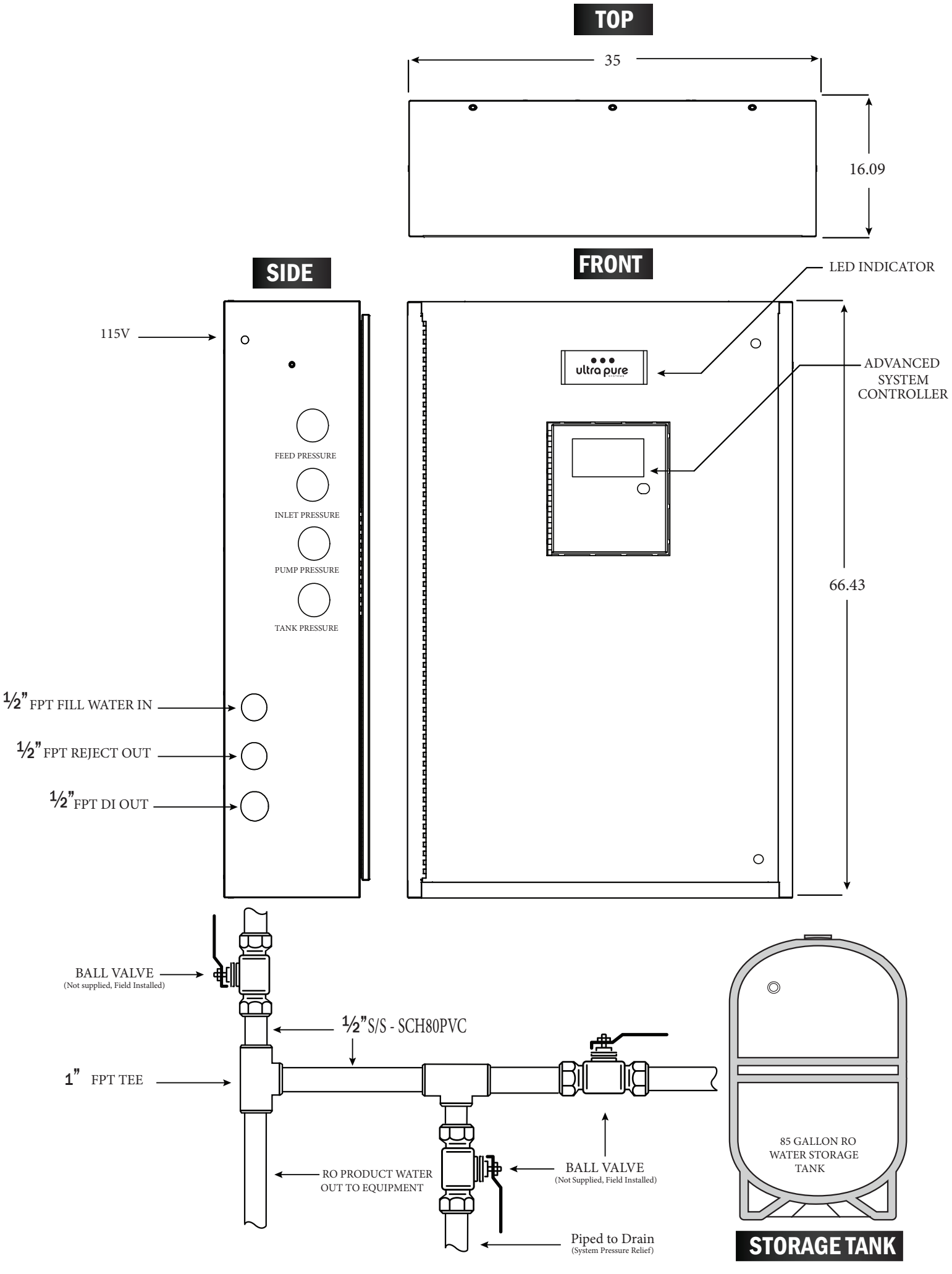
7) Turn System off; Open ball valve from process to drain. This will remove any pressure from system. Remove red clips from yellow, black and blue plastic fittings.

- Continue to remove (2) S/S housings from cabinet. With #10 wrench unscrew clamp that secures the black plug to the RO membrane housing.
- Carefully remove black plug from one side of membrane and set aside.
- Slide the membrane out of the housing and disregard.
- Slide new Membrane into tube and use Silicone to seal O ring prior to pushing plug back into housing.
- Reseal housing with clamp and install membrane into system.
    - **Careful attention to Blue and Black color tubing. Blue is middle push connection and Black is outside push connection. Damage will occur immediately if placed backwards and system starts**.
- Install red safety clips
- Once Membranes have been replaced confirm all valves are open and turn system on. Leave drain line open to remove any air build up for approx. 5 min.
- Close ball valve to drain.
- Turn system on.
- Permeate should read 0-60 PPM on ROC-5 controller and HM digital coontroller.

Web Site Support

If additional support is needed, we have videos on-line to assist with routine maintenance. www.ultrapureus.com

Ultra Pure Systems is always here to help. If at any time you have questions or concerns regarding the system please feel free to Contact us @ 1-800-729-5192. Thank you once again for choosing **UPS** for your Reverse Osmosis needs.


TOP
35
16.09
SIDE
FRONT
LED INDICATOR
ADVANCED SYSTEM CONTROLLER
115V
FEED PRESSURE
INLET PRESSURE
PUMP PRESSURE
TANK PRESSURE
66.43
½" FPT FILL WATER IN
½" FPT REJECT OUT
½" FPT DI OUT
BALL VALVE
(Not supplied, Field Installed)
½" S/S - SCH80PVC
1" FPT TEE
RO PRODUCT WATER OUT TO EQUIPMENT
BALL VALVE
(Not Supplied, Field Installed)
Piped to Drain
(System Pressure Relief)
85 GALLON RO WATER STORAGE TANK
STORAGE TANK