

PURASAN® EX2

OPERATION, MAINTENANCE AND INSTALLATION INSTRUCTIONS

Models PST*EX2 [*specify 12, 24]

THE FOLLOWING ARE CAUTIONARY STATEMENTS THAT MUST BE READ AND FOLLOWED DURING BOTH INSTALLATION AND OPERATION

WARNING: *Raritan Engineering Company, Inc. recommends that a qualified person or electrician install this product. Equipment damage, injury to personnel or death could result from improper installation. Raritan Engineering Company, Inc. accepts no responsibility or liability for damage to equipment, or injury or death to personnel that may result from improper installation or operation of this product.*



WARNING: HAZARD OF SHOCK AND FIRE



Always use recommended fuse or circuit breaker and wire size. Motors used with this product are "Ignition Protected". They are not however, explosion-proof.

WARNING: HAZARD OF FLOODING - When leaving the boat unattended always be sure seacocks are closed. Any installation made below waterline should have double hose clamps securing lines. **The halogen disinfectant is corrosive to aluminum, copper and steel. The plumbing system must not include any aluminum, copper or steel fittings, piping or holding tanks.**



IMPORTANT SAFETY INSTRUCTIONS FOR HANDLING PURASAN® TABLETS AND SOLUTION

WARNING: PURASAN® EX2 disinfecting tablets are a strong oxidizing agent and highly corrosive. Use or contact with oil, acids, petroleum products, reducing agents or other chlorine compounds such as swimming pool tablets, is extremely dangerous.



WARNING: Fire or explosion could result. Improper use of this tablet may cause personal injury or property damage. Tablets may be fatal if swallowed and tablet dust is irritating to the eyes, nose and throat. Keep out of reach of children and do not allow tablets or solution of tablets to contact skin, eyes or clothing. Handle and store tablets as per instructions provided with packaging. Contact Raritan if handling instructions are missing. Store only in sealed original container in well-ventilated area. Read tablet container label carefully prior to use. It is unsafe and violation of Federal law to use tablets in a manner inconsistent with its labeling.



The PURASAN®EX2 is a U. S. Coast Guard Certified Type I Marine Sanitation Device for use on uninspected vessels 65 feet (19.7 m) and under. It must be operated within navigable waters inside the three mile limit that are not declared Federal No Discharge Zones (NDZ) by the U.S. Environmental Protection Agency (EPA). Other countries - check with local authorities. The PURASAN®EX2 is designed for recreational use and accommodates most marine toilets. It can be used with up to two toilets. The PURASAN®EX2 is available in 12 or 24 VDC.

DESCRIPTION:

Each time the toilet is flushed an equal amount of previously treated waste is discharged. The flushing action of the toilet pump moves the waste through the PURASAN®EX2 and out.

Water is diverted to the Tablet Dispenser during the flush cycle, creating a halogen solution during hold time. After the hold time the Air Pump activates and solution drains into the Treatment Unit.

The first chamber macerates to reduce particle size and uniformly mix the waste with injected halogen solution. The second chamber mixes to ensure uniform treatment of contents.

Model and Serial#:

Please have this available if support is needed.



Link to online
Warranty
Registration



OPERATION

Single Button Operation -

Both toilet and PURASAN®EX2 are operated by one of the following options:

Note: Toilet may be flushed as often as necessary during first 30 seconds. Do not exceed recommended flush volume of 1.5 Gallons (5.7 liters) per flush.

Option #1: (recommended)

Toilet Push Button -

Flushing toilet will activate treatment cycle. Two toilets can activate one PURASAN®EX2.

Option #2:

PURASAN®EX2 Switch Panel

“START/STOP” button activates both the toilet and treatment cycle.

Note: Toilet flush time is programmable. Only one toilet can be activated by PURASAN®EX2 panel.

Pressing START/STOP during the cycle will stop the cycle.

Independent Operation (toilet and treatment)

1. Press START/STOP button.
2. Flush toilet as often as necessary. Do not exceed recommended flush volume of 1.5 gallons (5.7 liters).

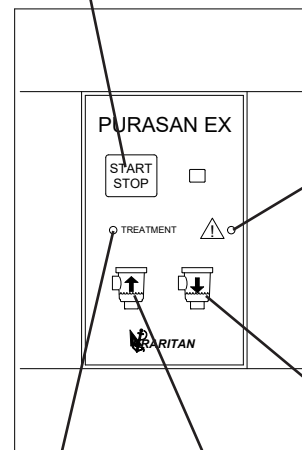
After cycle is started:

- Water is diverted to the Tablet Dispenser and must rise to the water level line (dotted line) but no higher. (See programming to adjust)
- The PURASAN®EX2 should not be activated again until the cycle is complete.
Note: Pressing START/STOP during the cycle will stop the cycle. If water is in the Tablet Dispenser, the Air Pump will activate to remove water after stop button is pressed.
- Flashing Treatment LED indicates treatment cycle in process.
- Slow flashing Error LED indicates tablet refill is needed (1 flash every 2 seconds).
- Fast flashing Error LED indicates that Tablet Dispenser is overfilled with water or more than two tablets are loaded during refill (2 flashes every second).
- Solid Error LED indicates motor fuse is blown in SPCC (see Item 86, Page 12).

FIG 1

SWITCH PANEL

START/STOP



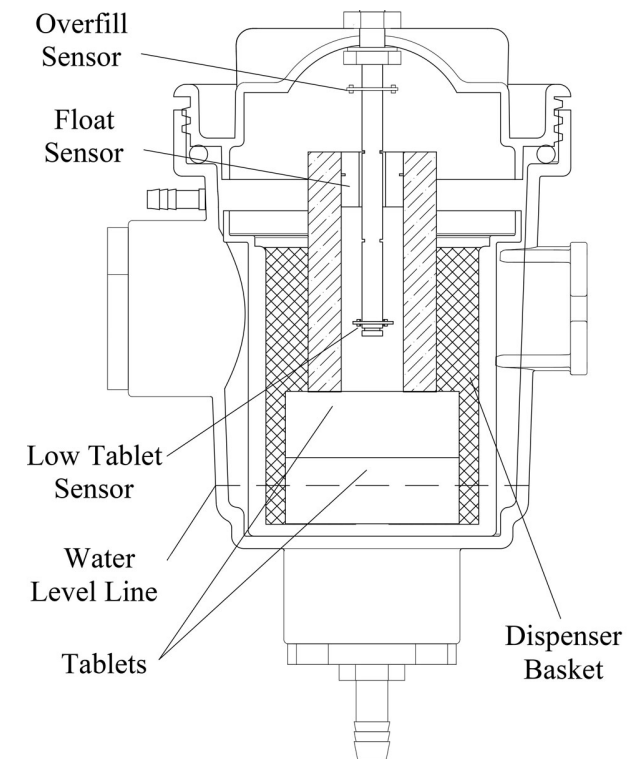
Error LED:
Slow flashing--refill tablet.
Fast flashing--overfilled dispenser.
Solid--check motor fuse inside SPCC control box.

EMPTY:
Activates Air Pump momentarily.

Treatment LED

FILL:
Activates Water Valve and fills Tablet Dispenser momentarily.

FIG 2



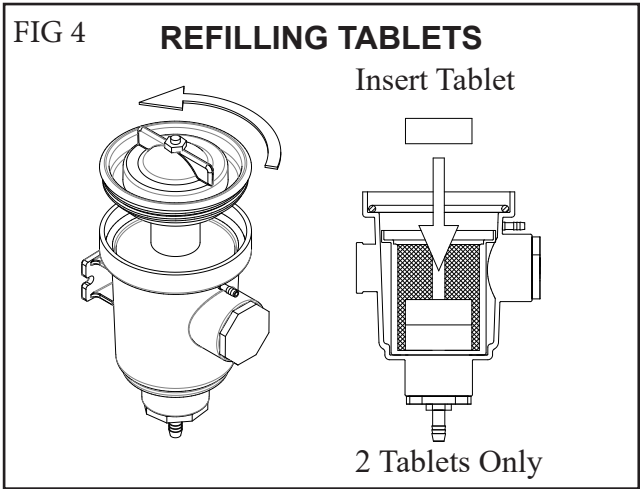
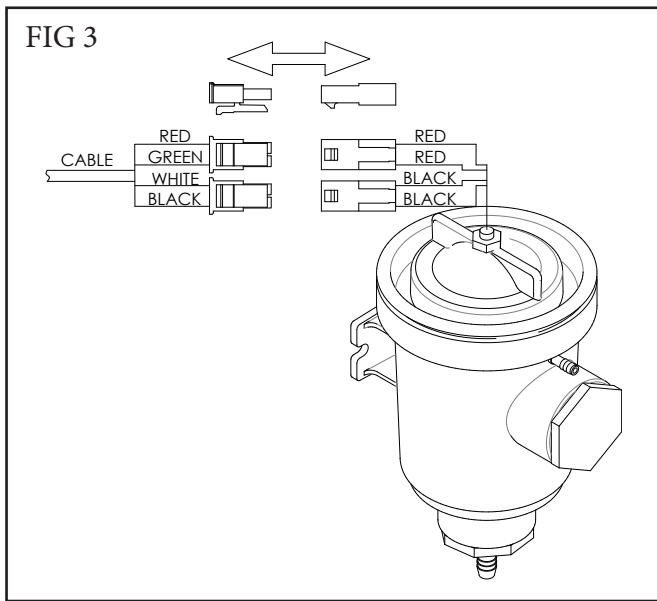
MAINTENANCE

REFILLING TABLETS (#41-135A)

IMPORTANT: Read all Safety precaution on the Tablet Dispenser before handling and installing tablets. Use ONLY PURASAN® Tablets.

Flashing (slow) Error LED indicates tablets in dispenser are depleted to less than one tablet and refill is needed.

1. Remove all water from dispenser (Press and hold EMPTY button).
2. Turn off power.
3. Unplug connectors on dispenser lid as shown on FIG 3.
4. With adequate ventilation available, unscrew Tablet Dispenser lid (FIG 4).
5. Gently place two tablets into the cartridge (FIG 4).
6. Tightly replace lid on Tablet Dispenser.
7. Reconnect connectors as shown in FIG 3.
8. Turn on power



CLEANING OF TANK CHECK VALVE (41-170) 3/8" AND 1/2" HOSE

- A. Raritan recommends that the Tank Check Valve (Part # 41-170, Item 58, Page 12) be replaced after approximately 300 cycles or one depleted bucket.
 1. Press "FILL" button until water fills up entire 3/8" hose just below tablet dispenser.
 2. Press and hold "EMPTY" button until all hoses up to check valve on treatment tank are empty.
 3. Repeat steps 1&2 three more times.
 4. Close seacocks
 5. Close hose clamp completely (Part #31-304C, Item 59, Page 12). Remove check valve assembly. Thoroughly clean assembly with warm water. Make sure check valve plunger is moving by using a paper clip. If check valve is stuck, replace it.

CLEANING: Raritan C.P. (part # 1PCP32) - Cleans Potties is the only factory-recognized cleaning product that may be used in the toilet.

DO NOT ADD ANY OTHER CHEMICALS OR CLEANING PRODUCTS TO THE TOILET OR THE TREATMENT SYSTEM.

INITIAL START-UP AFTER ALL INSTALLATION STEPS ARE COMPLETE

CAUTION: Do not load tablets into Tablet Dispenser until Steps 1-7 are completed.

1. Remove crossover cap from Treatment Unit tower. Using a funnel or drill pump, fill tank with 3 gallons (11.5 liters) of water into Treatment Unit. Replace crossover cap.
2. Turn on pressurized water to water valve on Control Module.
3. Turn on power to Control Module.
4. Priming: Press and hold "FILL" button until water reaches the line on the lower portion of the Tablet Dispenser (Refer to FIG 2).
5. Press and hold "EMPTY" button until Tablet Dispenser and 3/8" tube to Treatment Unit is empty.
6. Operate the system. Check water level in the dispenser making sure water rises to fill level. If starting for first time or if water is not rising to water level line, see instruction in Programming section to adjust timing.
7. Check for leaks.
8. Load tablets (see refilling tablet section).

IMPORTANT:

Improper winter lay up is a major cause of failure.

WARNING:

Do not use anti-freeze of any kind to winterize the PURASAN® EX2 system.

Treatment Unit

1. Flush toilet and activate PURASAN®EX2 several times to clean out hoses and tank.
2. Turn off water supply to the toilet and flush toilet as dry as possible.

NOTE: Use caution when flushing toilet dry. Review manufacturer's instructions to ensure no damage is done to any components.

3. Shut off pressurized water supplying Control Module.
4. Press "EMPTY" button to drain out all water from Tablet Dispenser and tubing.
5. Turn off power and disconnect wires from PURASAN®EX2 Control Module.
6. Remove water connection to Control Module and drain tube.
7. Close seacocks.
8. Slowly open crossover plug (#25 page 12)

Caution: If Treatment Unit is the lowest part of the system, water will spill out. Review plumbing carefully before slowly opening plug.

9. Using a drill pump or equivalent, remove water from each side of partition in Treatment Unit through crossover plug.
10. Disconnect and drain waste hoses.

Winterizing the Toilet - Follow the instructions in the Owner's Manual for that particular toilet.

Recommissioning

IMPORTANT:

- Do not turn on pressurized water feeding Control Module until Treatment Tank is full.
- Do not operate PURASAN®EX2 until Treatment Unit is filled with water.

Treatment Tank

1. Reconnect waste hoses and open seacocks.
2. Reconnect wires to Control Module
 - 2a. Reconnect pressurized water supply connection to Control Module.

NOTE: Purasan® Treatment Unit must be full before activating a cycle.

3. Fill the Treatment Unit: (Depends on how unit is activated)
 - Single button operation - Remove crossover plug from Treatment Unit and fill with a minimum of three gallons of water. Replace crossover plug and o-ring.
 - Independent operation - flush toilet allowing three gallons of water to pass into PURASAN®EX2
4. Turn on power to Control Module.
5. Turn on pressurized water to Control Module.
6. Priming: Press and hold "FILL" button until water reaches to the water level line on the Tablet Dispenser. Press and hold "EMPTY" button until Tablet Dispenser and 3/8" tube to Treatment Unit are empty.
7. Operate the system. Check water level in the cartridge and make sure water is rising to the water level line. If starting for first time or if water does not rise to the water level line, see instruction in Programming section to adjust timing.
8. Check for leaks.

ANTIFREEZE WARNING -

If Antifreeze is used to winterize toilet, it must be removed prior to connecting hoses to the Treatment Tank. It **MUST** not pass through the Treatment Unit.

U.S.C.G. Type I MSD Certification #159.015/0010133/0

Maximum Roll/Pitch Angle: 30°

Maximum Temperature Exposure: 120° F (49° C)

Maximum Total Flush Volume: 1.5 gallons/flush (5.7 liters/flush)

Water - fresh, salt or brackish approximate number of cycles per tablet--50

NOTES: for Wiring

- Distances are from source to unit and back to source
- Recommended conductor wire minimum AWG (mm) for 3% voltage drop.
- Recommended conductor sizes are based on 105°C rated insulation. Refer to ABYC standards for other insulation ratings.

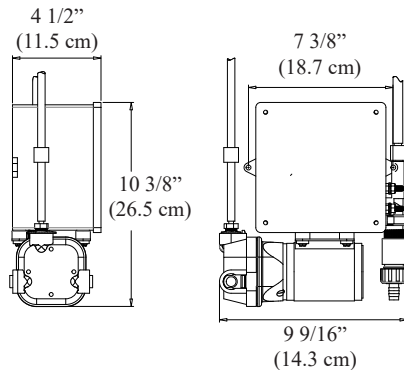
Recommended Wire and Fuse/Circuit Breaker Size

Units Voltage	Circuit Breaker/ fuse size (amps)	Amp. draw @ nominal voltage	10 feet	15 feet	20 feet	25 feet	30 feet	40 feet	50 feet
12 VDC	20	10	12 AWG	12 AWG	10 AWG	10 AWG	10 AWG	8 AWG	6 AWG
24 VDC	15	8	14 AWG	14 AWG	14 AWG	12 AWG	12 AWG	10 AWG	10 AWG

Fuse Specifications:

Fuse F1 for Motors (12V and 24V) located in the SPCC Control Box:
ATC 10 AMPS, Maxi blade type.

CONTROL MODULE DIMENSIONS



CONVERSIONS

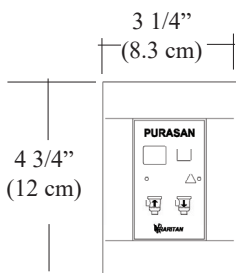
Wire - AWG to mm²

AWG	16	14	12	10	8	6	4	2
mm ²	1.5	2.5	4.0	6.0	10.0	16.0	25.0	35.0

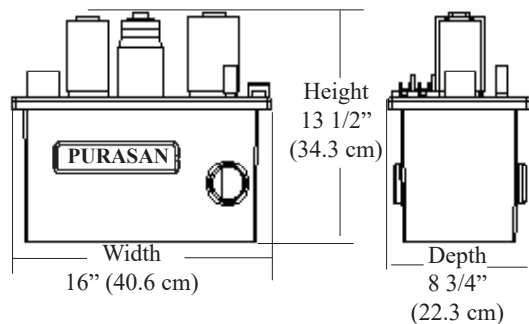
Feet to Meters

Ft	10	15	20	25	30	40	50
M	3.1	4.6	6.1	7.6	9.2	12.2	15.2

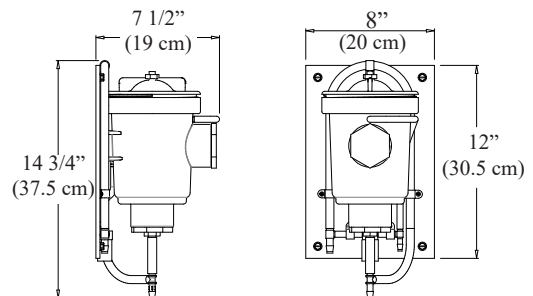
SWITCH PANEL DIMENSIONS



TREATMENT UNIT DIMENSIONS



TABLET DISPENSER DIMENSIONS

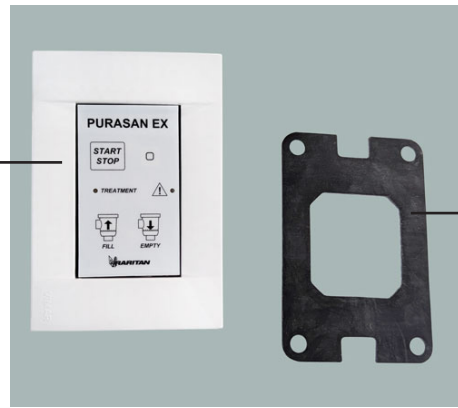


INSTALLATION

Parts included in the Box:

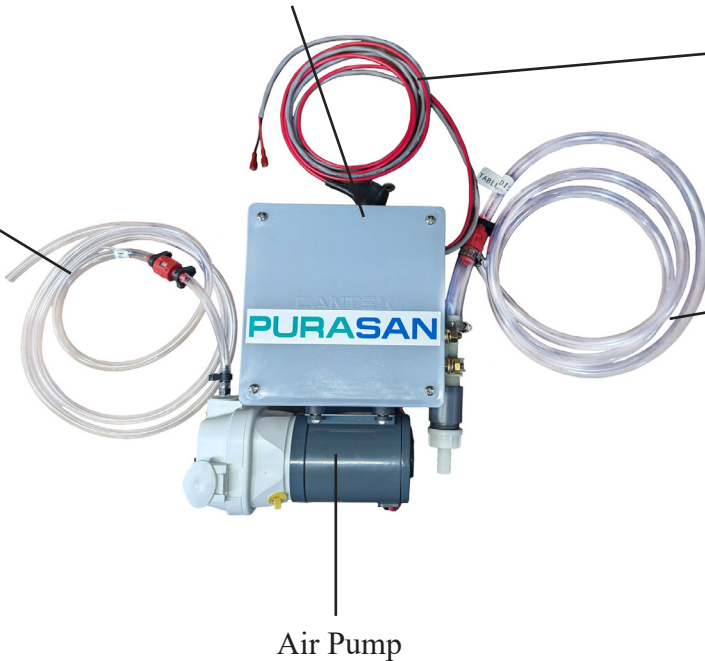


Switch Panel



Control Module includes Water Valve & Control Box (SPC)

6' of 1/4" tubing to Tablet Dispenser



6' of black and red wire to connect Treatment Tank

6' of 3/8" tubing to Tablet Dispenser

LOCATION AND MOUNTING

Treatment Tank:

WARNING: Do not locate in an area where ambient temperature exceeds 120° F (49° C).

1. Locate top of treatment tank at or below discharge of toilet and within six feet (1.8 m) of toilet.

Note: Longer runs require additional flush time to avoid sewage laying in the hose.

Note: If mounting the system higher than the discharge of the toilet, a vented loop must be used between the toilet and the Treatment Tank. This does not exclude the potential need of a second vented loop on the overboard side of the Treatment Tank System for safety.

2. Make and secure mounting frame to flat surface. (FIG 5)
3. Secure tank to frame using 3/4" (1.9 cm) mounting straps.

Note: Placing a 3/8" (.9 cm) rubber pad under tank will help to reduce vibration and noise.

Control Module:

Note: Wires and tubes supplied are 6 feet (1.8 m) between tank and Control Module and 6 feet (1.8 m) between Tablet Dispenser and Control Module.

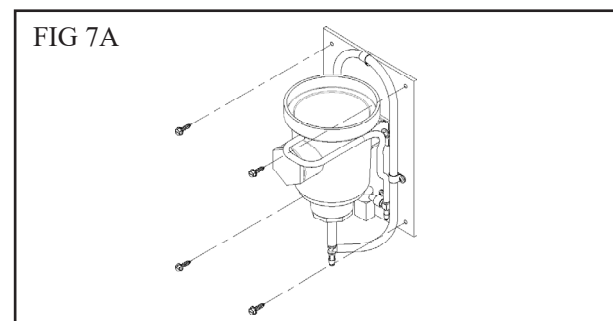
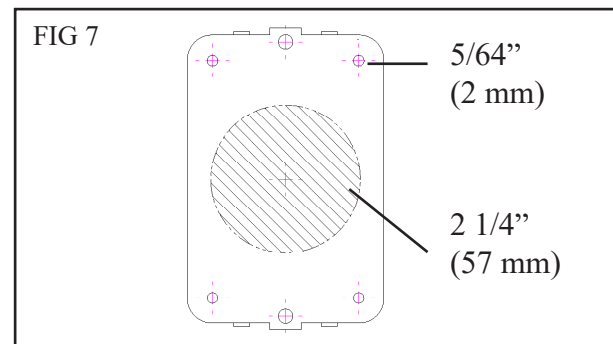
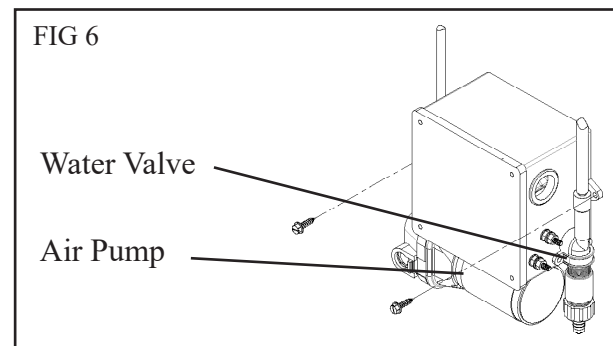
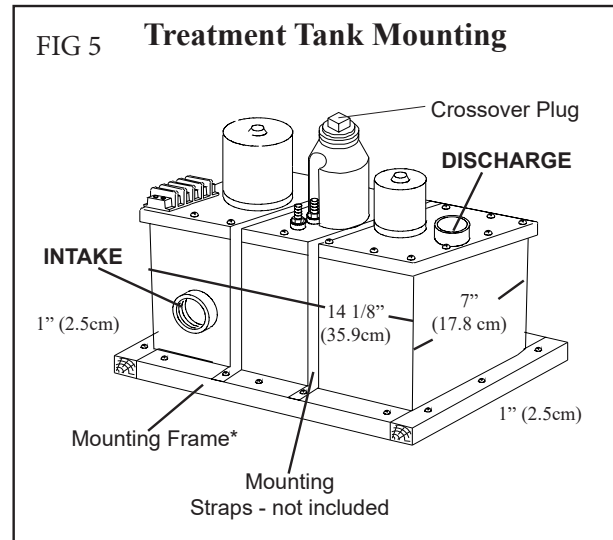
1. Locate Control Module between Tablet Dispenser and Treatment Unit. Vertical mounting recommended (FIG 6)
2. Using screws, secure Control Module to the wall (FIG 6).

Switch Panel: Cable Supplied is 16 feet (5 m)

1. Locate in head compartment where indicator lights will be visible.
2. Using base plate, mark the cutout for the panel. (See FIG 7)
3. Route cable between switch panel and PURASAN®EX2 Control Module.
4. Attach cable to back of switch panel.
5. After wiring and testing entire system: Mount panel using 4 screws. Apply a bead of nonpermanent sealant around rear edges of panel if located in shower area.

PURASAN®EX2 Tablet Dispenser

1. Locate tablet dispenser in a location where refill of tablet is convenient. (To easily remove lid and refill tablets a clearance of 8" (20 cm) from top of lid is recommended.)



2. Attach to wall or suitable structure using 1/4" (6 mm) bolts.

NOTE: Do Not load tablets into Tablet Dispenser at this time. Load tablets after completing start up procedure.

PLUMBING

WARNING: HAZARD OF FLOODING

- Installations at or below waterline, at greatest angle of heel, **MUST** have a **VENTED LOOP** installed between Treatment Tank and Seacock/Thru Hull Fitting. Install vented loops per manufacturer's instructions.
- **Double clamp** all below waterline hose connections.
- Use only non-corrosive fittings

A. Treatment Unit:

NOTE: Use PTFE tape or nonpermanent thread sealing compound on threaded PVC fittings and connections. Avoid low areas in hose that would allow untreated waste to collect.

1. Connect discharge of toilet to one intake port.
2. Insert plug or second toilet discharge into other intake port.
3. Determine position and glue discharge elbow to top of tank using PVC cement.

Note: Be certain that the discharge elbow is in the correct position before gluing.

4. Connect discharge hose from elbow to thru hull fitting.

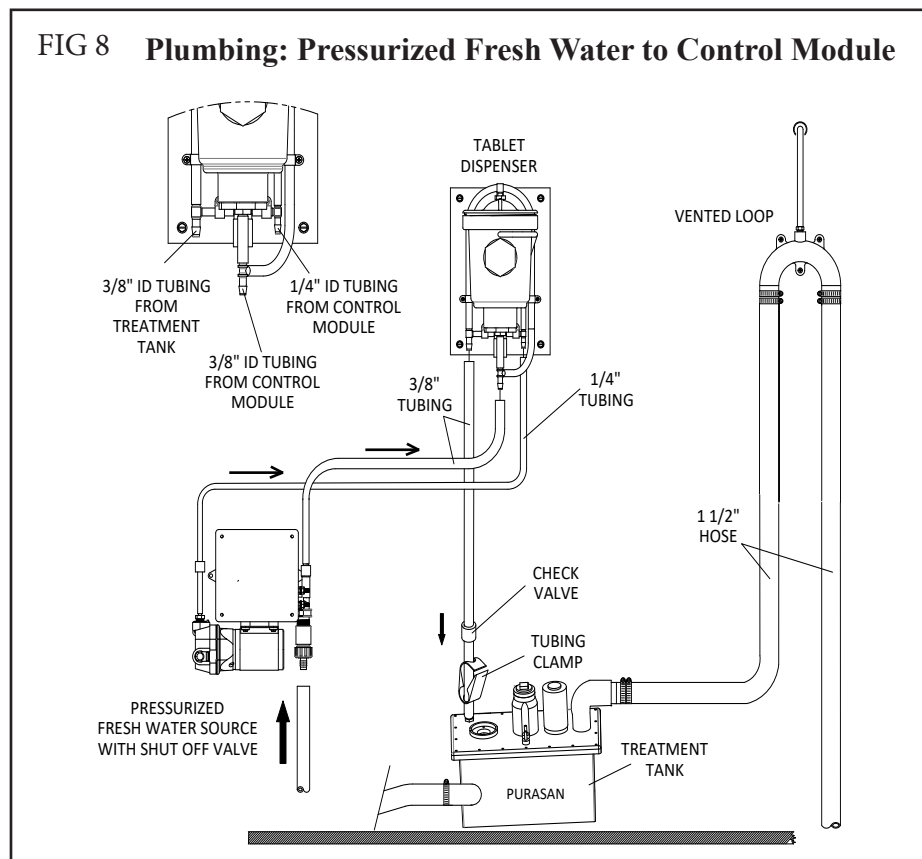
B. Control Module: (see FIG 8)

1. A shutoff valve between pressurized water source and Water Valve on Control Module is recommended. Connect pressurized water hose to Control Module.
2. Connect 3/8" and 1/4" tubing to Tablet Dispenser from Control Module assembly.
3. Connect 3/8" tubing between Tablet Dispenser and Treatment Unit.
4. Use hose clamps for all connections.

WIRING

WARNING: Hazard of Shock and Fire

- Always use proper wire, connectors and fuse/circuit breaker. See Specification Chart Pg. 5
- Secure wire properly.
- Do not connect other appliances to PURASAN® EX2 circuit.
- Make sure power is off before proceeding.
- Improper wiring can damage components and void warranty.



NOTE: Raritan recommends that the electric toilet be installed for single touch operation (Option #1 page 2).

SEE FIG 9 FOR CONNECTIONS:

Treatment Unit

1. Connect two wires from Control Module to terminals on Treatment Tank.

Control Module:

1. Determine proper wire size from wire chart on specifications page.
2. Run supply wire from source Positive to Positive (POS) terminal on the Control Module and source Negative to Negative terminal on the Control Module.
3. Fuse or circuit breaker must be installed between source and Control Module on positive wire.

Switch Panel

1. Connect cable from switch panel to Control Module.

Tablet Dispenser:

1. Run sensor cable from Tablet Dispenser to Control Module. Using cable clamp, secure cable on the wall near Dispenser.
2. Connect sensor cable to Control Module.

Flushing Option #1: (Recommended)

Toilet Push Button -

Flushing toilet will activate treatment cycle.

Note: Toilet may be flushed as often as necessary during the first 30 seconds, do not exceed recommended flush volume.

1. Mount switch panel near toilet.
2. See Figure 10 for Raritan toilets that utilize the STC Control Module.
3. See Figure 11 for standard electric toilets.

NOTE: Contact Raritan Tech Support if you have any questions regarding wiring of control.

Flushing Option #2:

PURASAN®EX2 Switch Panel

START/STOP button activates both the toilet and treatment cycle.

Note: Toilet flush time is programmable. Only one toilet can be activated by PURASAN®EX2 panel. Pressing Start/Stop during the cycle will stop the cycle.

Toilets not utilizing an STC control:

1. See Figure 12 for standard electric toilets.

CAUTION: If wiring per Fig. 12, use Raritan CDS (failure to do so will damage the control board, voiding warranty).

Toilets utilizing STC control:

1. Run wire from the H1 on the Purasan®Ex2 Control (SPCC) to FROM MSD on the STC control.

Dual installation:

Dual installation kit PSTDCEX is available if two toilets are connected to one treatment unit. Each kit comes with (1) Indicator panel, (1)15' CAT5E cable, (1) dual connector for two CAT5E cables and (1) hose fitting adapter.

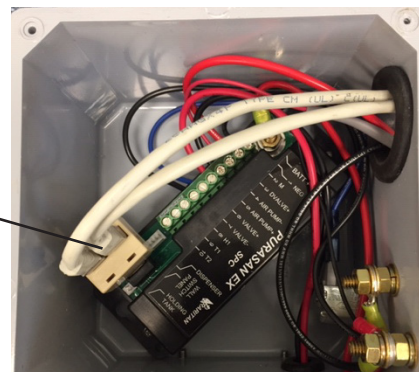
Dual installations only apply when flushing using Independent Operation (page 2) or Flushing Option #1. **Flushing Option #2 cannot be used.**

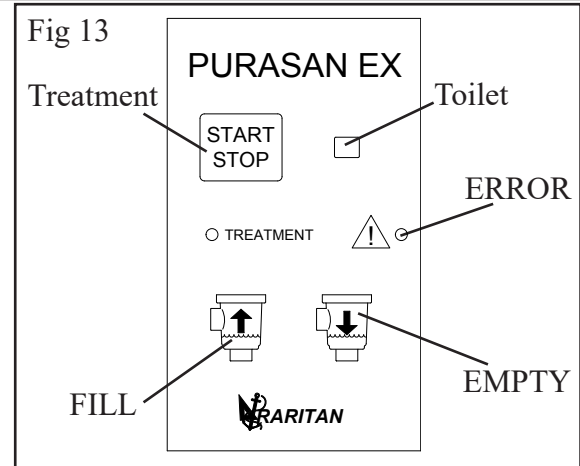
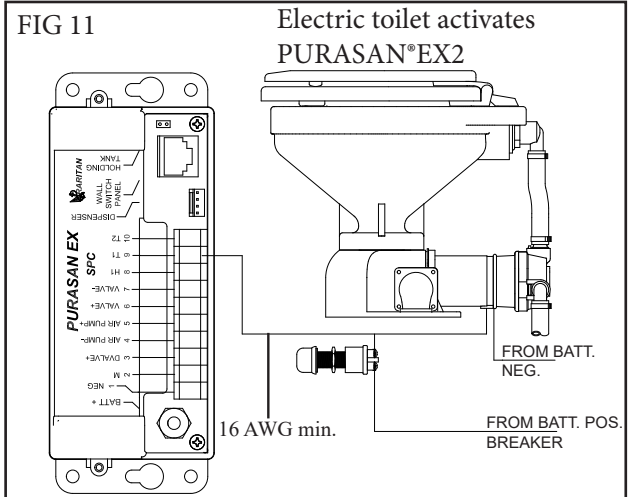
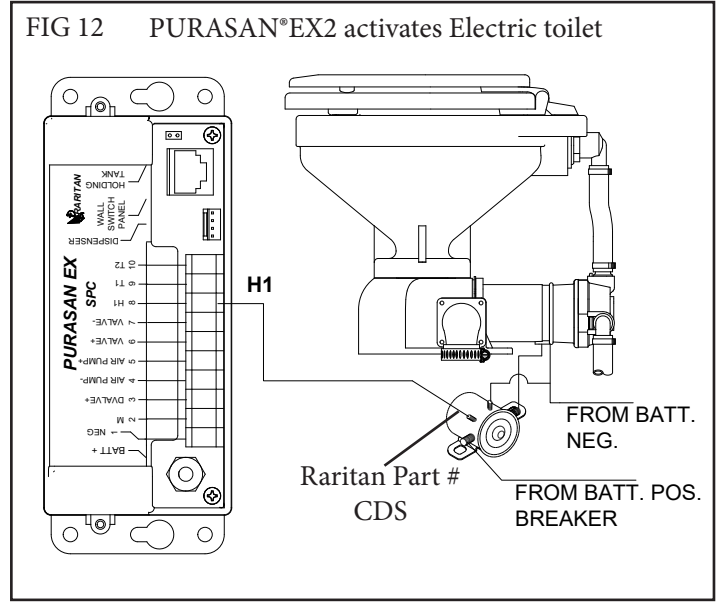
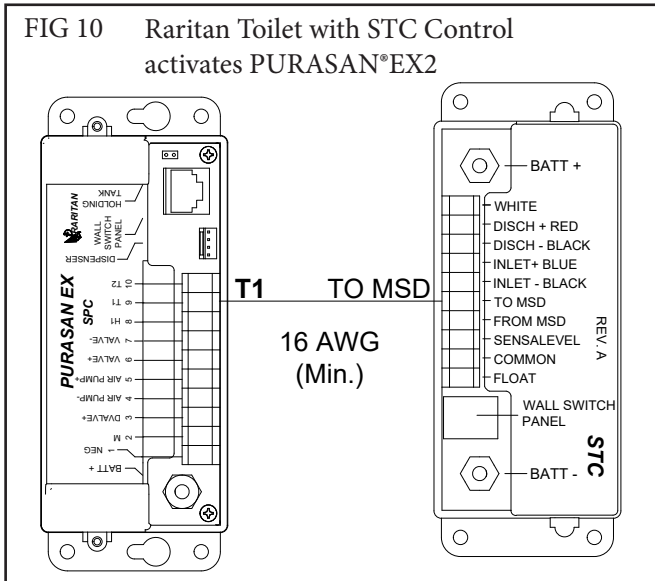
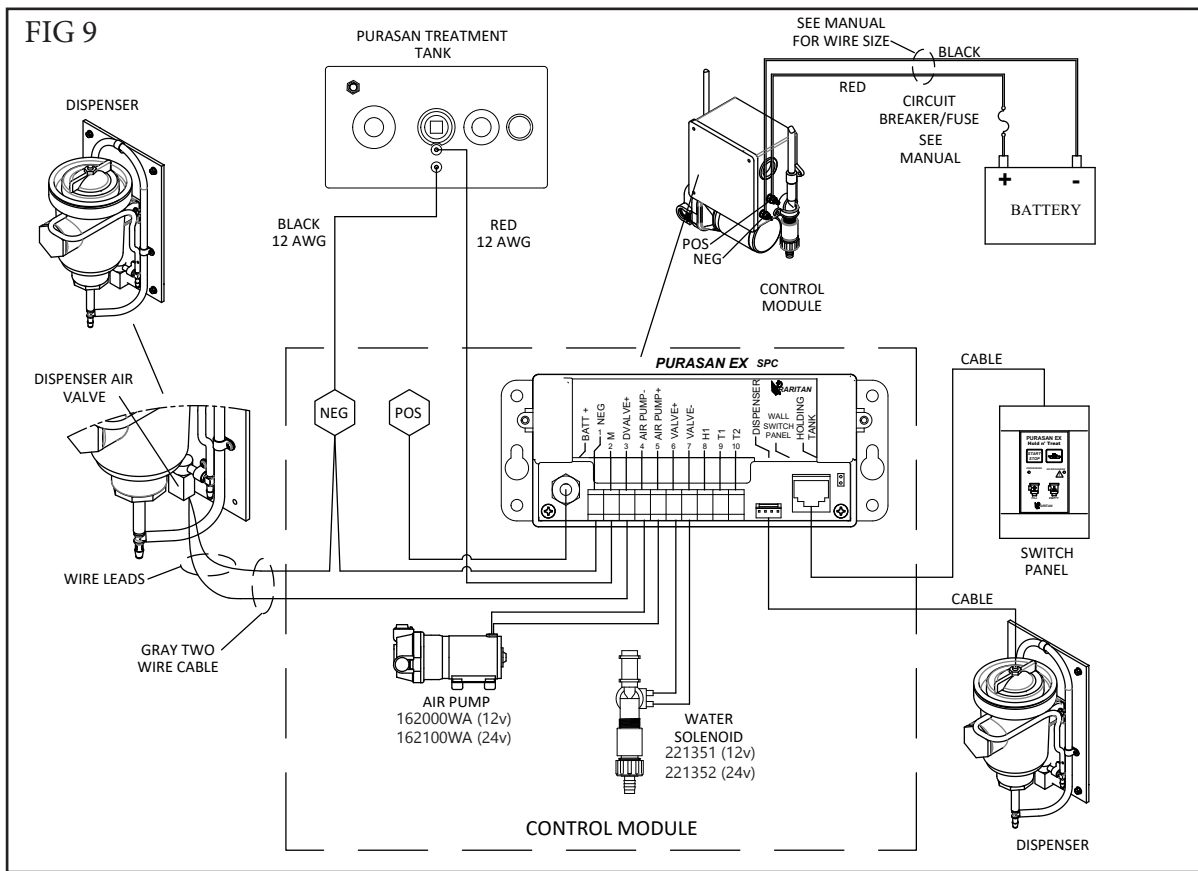
Please note: When using Flushing Option #1, both panels will indicate the system is in use when one toilet is flushed. User must wait until system is complete to start next cycle.

Installation of Dual Connector:

Remove plug from front of box and install the dual connector in location indicated below.

Install Dual Connector here, then plug Panel #1 and Panel #2 cables in as shown





ADJUSTING “FILL” and “EMPTY” settings

NOTE: This is only necessary if the system isn't performing as described in “Initial Start-Up” section.

Must be completed during installation to be sure water reaches water level line on dispenser. Initial setting is done without tablet in dispenser.

NOTE: If saving time settings fail, try programming at a faster pace.

1. All settings should be done with water source (on board pressure pump or shore water supply) that will be used with PURASAN® EX2. Settings done will only be valid for that source, and may need to be reprogrammed if another source is utilized. Dispenser lid must be closed tight during setting and use.
2. Dispenser must not contain tablets during initial set-up. Program “FILL” time without tablet to reaches 1/4” below water level line. Unplug sensor cable at Control Module.
3. With power on, press “FILL” and count seconds until water reaches 1/4” below water level line on dispenser. Record seconds as fill. If recorded seconds are greater than 18 , Open the hole to approx 1/8” when metering washer between water valve and check valve (PX50W) and repeat.
4. Press “EMPTY” button and count seconds until water empties dispenser and tubing all the way to Treatment Tank. Record seconds as empty.
5. **SET PRELIMINARY “FILL” time:**
 - Hold the EMPTY & FILL buttons down together for three seconds. The error LED will give three quick flashes indicating you have entered program mode - release both buttons.
 - Press “FILL” button as many times as fill seconds recorded in step 2. example: 8 seconds press 8 times. Note: maximum is 20 seconds and minimum is 2 seconds.
 - Push the “START/STOP” button to store this value (the unit will flash three times indicating the time has been set and you have left program mode).
6. **SET PRELIMINARY “EMPTY” time:**
 - Hold the EMPTY & FILL buttons down together for three seconds. The error LED will give three quick flashes indicating you have entered program mode - release both buttons.
 - Press “EMPTY” button as many times as empty seconds recorded in step 4. Note: Minimum time is set at 10 seconds. Each press of the “EMPTY” button will add 1 second to minimum time. Maximum is 20 seconds.

- Push the “START/STOP” button to store this value (the unit will flash three times indicating the time has been set and you have left program mode).

7. TEST SETTINGS:

Without tablets: If wired to start with toilet, flush toilet else press “START/STOP” button. After 20 seconds, water level should rise in dispenser, WITHOUT TABLETS, to 1/4” below water level line. Hold time of water is 20 seconds and not programmable.

After hold time, air pump and drain valve will drain solution.

MAKE SURE THAT WATER IS DRAINED FROM ENTIRE TUBE UP TO TREATMENT TANK.

Increase empty time using step 6 if drain time is not sufficient. After drain cycle, air pump and water solenoid will stay on for 10 more seconds (non-programmable) to flush check valve near tank. Repeat flush cycle to check fill time. If water level, in dispenser, is not rising to 1/4” below water level line, increase or decrease fill time using steps 2 to 6.

Note: Treatment cycle after drain cycle can be stopped by pressing “START/STOP” button at any time.

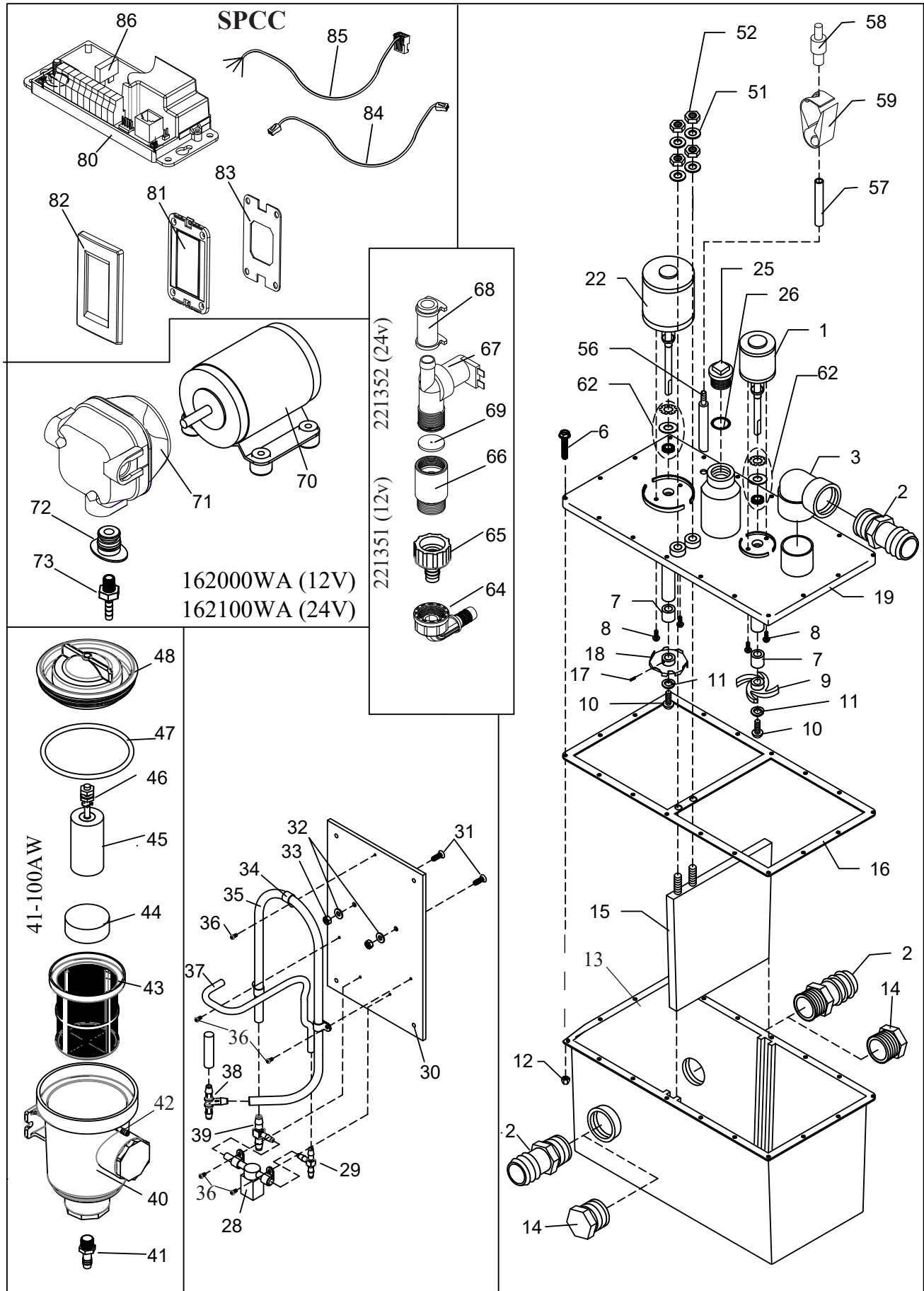
With tablets: Follow start up procedure. Load tablets and plug sensor cable into Control Module. If wired to start with toilet: flush toilet, press “START/STOP” button, water level should fill up to water level line. Make final adjustment as per above instructions if needed.

Setting of Toilet flush time :

- Hold the EMPTY & FILL buttons down together for three seconds. The error LED will give three quick flashes indicating you have entered program mode - release both buttons.
- Press small button (see Fig 13) marked “□” (next to START /STOP button) as many times as needed set toilet flush time (One push = 1 sec’s, two = 2 sec’s, three= 3 sec’s etc.). The LED will flash once indicating a valid key push. **Note: Maximum is 12 seconds.**
- Push the “START/STOP” button to store this value (the unit will flash three times indicating the time has been set and you have left program mode).

PURASAN® EX2 EXPLODED VIEW

EXPLODED PARTS



PURASAN® EX2 PARTS LIST

<u>Item</u>	<u>Part #</u>	<u>Description</u>
1	32-102AW	Mixer Motor 2 1/2" Dia. 12 V DC
1	33-102AW	Mixer Motor 2 1/2" Dia. 24 VDC
		(1) includes shaft seals and bushing for mixer motor)
2	31-121	Hose Fitting (2)
3	31-120	Discharge Elbow 90°
6	31-134	Cover Hold down Bolt, 10-32 x 1" (18)
7	31-103	Motor Shaft Bushing (2) (see 62)
8	F351	Motor Hold down Bolt, 10-32x1", S/S (4)
9	31-109	Mixer Impeller
10	31-110-1	Impeller Bolt, 12-24 x 5/8", S/S (2)
11	31-110-2	Impeller Lock Washer, #12, S/S (2)
12	31-114	Lock Nut, 10-32 (18)
13	31-115PS	Treatment Tank
14	31-122	Intake Plug
15	41-102	Tank Divider
16	31-112	Cover Gasket
17	31-108	Macerator Set Screw
18	31-107	Macerator Impeller
19	41-101W	Treatment Cover (includes 56, 25,26)
22	33-101AW	Macerator Motor for 12 and 24 VDC unit
25	31-104CW	Crossover Plug with O-ring (Includes 31-105)
26	31-105	O-Ring
51	M31	#14 Brass Flat Washer (4)
52	M30	1/4"-20 Brass Nut (4)
56	31-325A	Tank Lid Adapter
57	221335	Tubing
58	41-170	Tank check valve
59	31-304C	Tubing clamp

TABLET DISPENSER MOUNT ASSEMBLY:

42-100 (12 V) / 43-100 (24V)

27	HW1	1/4 Split Lock Washer S/S
28	41-107-12W	Air vent valve with connector (1)
29	41-112	1/4" Tee Connector (1)
30	41-116P	Dispenser mounting plate (1)
31	F121	1/4-20 X 3/4 Screw (2)
32	F321	1/4" Flat washer (2)
33	1226B	1/4-20 Nut (2)
34	31-111	Cable Clamp 1/2" X 1/2" (5)
35	31-319	3/8" PVC Tubing (1-30" L, 1-2" L)
36	F123	#8 x 5/16 Mounting Screw (5)
37	31-305	1/4" Tubing (1)
38	41-108	3/8" Tee Connector (1)

WATER VALVE:

64	221358W	Inlet hose adapter - 90°
65	221356W	Inlet hose adapter - straight
66	PX50W	Double Check Valve assembly
67	221351	Water Solenoid 12V
67	221352	Water Solenoid 24V
68	221335	1/2" Tubing
69	41-157	Metering washer

AIR PUMP FOR TABLET DISPENSER:

162000WA (12V) / 162100WA (24V)

70	166012A	12 Volt Motor
	166024A	24 Volt Motor
71	162000W	Intake Pump Assembly,air pump
72	162415A	Plug machined
73	41-120	Male Pipe Adapter
39	41-113	3/8" x 1/4" Incline Tee (1)

TABLET DISPENSER, COMPLETE

41-100AW

40	41-130A	Dispenser Body.
41	41-177	Adapter 1/2" NPT x 1/2" barb
42	41-188	Dispenser Nipple
43	41-156W	Dispenser Basket
44	41-135A	Purasan® Tablets (sold separately)
45	41-179	Float extension (foam)
46	41-178W	Float sensor
47	RWS5A	O-Ring
48	41-131M	Dispenser Cap (machined)

Not Shown:

41-114	1/8" PVC Tubing (1)
41-146	Hose Clamp 1/4" (5)
41-147	Hose Clamp 3/8" (3)
41-188	Dispenser Nipple (1)

CONTROLS:

42-600A (12V) / 43-600A (24V)

80	SPCC	Purasan® Control
81	41-500A	Wall Panel circuit board
82	221524	Wall Panel cover, white
83	221525	Wall Panel gasket
84	31-618	Cable for SPC wall panel
85	41-505A	Cable for Float Sensor
86	EFC10	ATC fuse 10A

62 ESTRK

EST/PST Repair Kit includes following:

31-102	Motor Shaft Seal (2)
31-102-1	Macerator Seal Washer
31-102-2	Macerator Retaining Ring
31-102-3	Mixer Seal Washer
31-102-4	Mixer Retaining Ring
31-103	Motor Shaft Bushing (2)
31-105	O-Ring
F351	10-32x7/8" w/ O-ring (4)
31-112	Cover Gasket
31-113-2	Terminal Block Bolt (4)
31-114	Lock Nut, 10-32 (4)
SL1CC	Super Lube

OTHER (Not shown)

41-135A	Purasan® Tablets (Refill)
42-1000A	Treatment Unit 12V
43-1000A	Treatment Unit 24V
PSTDCEX	Purasan® Dual Control
DIAPUMPRK	Diaphragm Pump Repair Kit

EXPLODED PARTS

SEQUENCE OF OPERATION FOR TREATMENT CYCLE

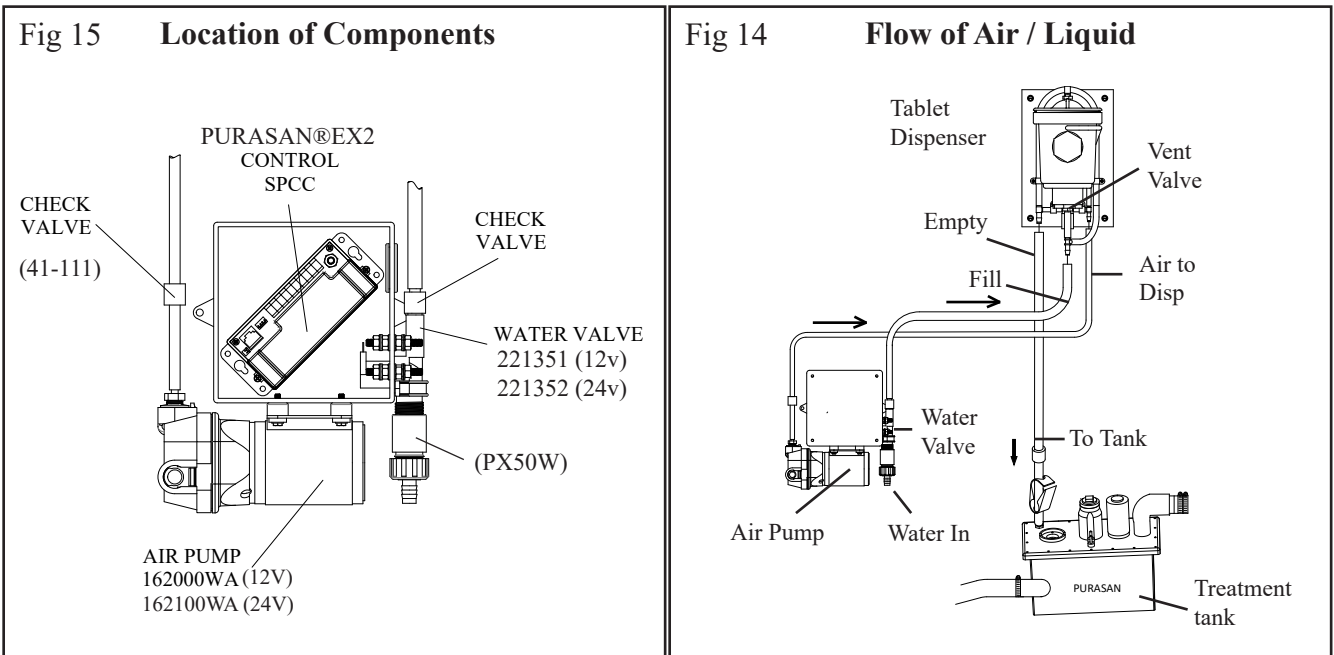
NOTE: Toilet timing, dispenser fill time and dispenser empty time is programmable. Total treatment time is approximately 120 seconds. Following flow chart is an example of timing sequence.

Toilet flush= 10 seconds

Fill= 3 seconds

Empty= 3 seconds

Time@ (sec)	Event	Motors	Air Pump	Vent Valve	Water Valve	H1 (Toilet)
0	Start	ON	OFF	OFF	OFF	ON
10	Toilet Signal					OFF
20	Dispenser Fill Start			ON	ON	
23	Dispenser Fill Stops. Hold Starts.			ON	OFF	
28	Vent Valve			OFF		
43	Dispenser Hold Ends. Drain Starts.		ON			
46	Dispenser Drain Stops. Line Tubing Flush Starts.				ON	
56	Tubing Flush Stops.		OFF		OFF	
120	Cycle Ends.	OFF	OFF	OFF	OFF	OFF



TROUBLESHOOTING

WARNING: After the Tablet Dispenser has had water added, it contains a very strong halogen solution. Always wear protective gloves and ventilate well to work on tablet dispenser. Before doing any maintenance or repairs, follow WINTERIZING/STORAGE procedures .

CAUTION: Tablet Dispenser may be under pressure. Open lid slowly to relieve pressure.

See exploded part view for location of parts

No water to Tablet Dispenser

- **Control malfunction**
Check voltage from control to water solenoid valve. Press fill button and check voltage on the terminal for water solenoid
- **Clogged line, check valve or fitting**
Check for clog between Water valve and Tablet Dispenser. Clean or replace clogged part. Clean or replace Check Valve (41-103P).
- **Empty time not programmed correctly**
If Air Pump is energized too short to fill the Tablet Dispenser, reprogramming is needed. See page 11.

Nothing happens when button is pushed

- **Fuses blown**
Check fuse on circuit board
- **Water level is too high**
If water level is high , “START” and “FILL” button are disabled. “EMPTY” button will continue to function.
- **Cable connection:**
Check if cable for switch panel is corroded or loose.

Overflow or water level too high in dispenser

- **Clogged discharge fitting in Tablet Dispenser**
Press “EMPTY” button to run air pump and clear any clog.
- **Clogged Check Valve (treatment tank adapter)**
Clean or replace check valve (41-170) located on the tank
- **Water fill time not programmed correctly**
If Water Valve is energized too long it will overflow the dispenser, reprogramming is needed. See page 11.
- **Air pump malfunction:**
Press “EMPTY” button and check voltage on the air pump terminals. Check the pressure of air pump (should be at least 5 PSI). Clean or replace Check Valve (41-111).
- **Float sensor malfunction:**
If error LED indicates water level high and actual water level is not high, check float sensor for proper operation.

Error LED

Error LED	START BUTTON	CAUSE
On	Does not work	Motor fuse blown
Slow flashing	Works	Tablets need refill
Fast flashing	Does not work	Dispenser overfilled

NOTE:

Discharge of raw, untreated sewage is prohibited in all U.S. waters inside the three mile limit except in the Gulf of Mexico where the limit is nine miles. "Y" valves, if installed, must direct toilet discharge to a U.S.C.G. approved treatment system or holding tank and must be secured in that position while inside the three-mile limit.

The EPA standards state that in freshwater lakes, freshwater reservoirs or other freshwater impoundments whose inlets or outlets are such to prevent the ingress or egress by vessel traffic subject to this regulation, or in rivers not capable of navigation by interstate vessel traffic subject to this regulation, marine sanitation devices certified by the U.S. Coast Guard installed on all vessels shall be designed and operated to prevent the overboard discharge of sewage, treated or untreated, or any waste derived from sewage. The EPA standards further state that this shall not be construed to prohibit the carriage of Coast Guard-certified flow-through treatment devices which have been secured so as to prevent such discharges. They also state that waters where a Coast Guard-certified marine sanitation device permitting discharge is allowed including coastal water estuaries, the Great Lakes and interconnected waterways, freshwater lakes and impoundments accessible through locks, and other flowing waters that are navigable interstate by vessels subject to this regulation (40 CFR 140.3)

LIMITED WARRANTY

Raritan Engineering Company warrants to the original purchaser that this product is free of defects in materials or workmanship for a period of one year from the product's date of purchase. Should this product prove defective by reason of improper workmanship and/or materials within the warranty period, Raritan shall, at its sole option, repair or replace the product.

1. TO OBTAIN WARRANTY SERVICE, Consumer must deliver the product prepaid, together with a detailed description of the problem, to Raritan at 530 Orange St., Millville, N.J. 08332. When requesting warranty service, purchaser must present a sales slip or other document which establishes proof of purchase. **THE RETURN OF THE OWNER REGISTRATION CARD IS NOT A CONDITION PRECEDENT OF WARRANTY COVERAGE.** However, please complete and return the owner Registration Card so that Raritan can contact you should a question of safety arise which could affect you.
2. **THIS WARRANTY DOES NOT COVER** defects caused by modifications, alterations, repairs or service of this product by anyone other than Raritan; defects in materials or workmanship supplied by others in the process of installation of this product; defects caused by installation of this product other than in accordance with the manufacturer's recommended installation instructions or standard industry procedures; physical abuse to, or misuse of, this product. This warranty also does not cover damages to equipment caused by fire, flood, external water, excessive corrosion or Act of God.
3. **ANY EXPRESS WARRANTY NOT PROVIDED HEREIN, AND ANY REMEDY FOR BREACH OF CONTRACT WHICH BUT FOR THIS PROVISION MIGHT ARISE BY IMPLICATION OR OPERATION OF LAW, IS HEREBY EXCLUDED AND DISCLAIMED.** ALL IMPLIED WARRANTIES SUCH AS THOSE OF MERCHANTABILITY AND OF FITNESS FOR A PARTICULAR PURPOSE, IF APPLICABLE, AS WELL AS ANY IMPLIED WARRANTIES WHICH MIGHT ARISE BY IMPLICATION OF LAW, ARE EXPRESSLY LIMITED TO A TERM OF ONE YEAR. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG A LIMITED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.
4. **UNDER NO CIRCUMSTANCES SHALL RARITAN BE LIABLE TO PURCHASER OR ANY OTHER PERSONS FOR ANY SPECIAL OR CONSEQUENTIAL DAMAGES, WHETHER ARISING OUT OF BREACH OF WARRANTY, BREACH OF CONTRACT, OR OTHERWISE.** SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.
5. No other person or entity is authorized to make any express warranty, promise or affirmation of fact or to assume any other liability on behalf of Raritan in connection with its products except as specifically set forth in this warranty.
6. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.



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