

PURASAN® EX Hold n' Treat

OPERATION, MAINTENANCE AND INSTALLATION INSTRUCTIONS

(Models PST*EX [*specify 12,24] Manufactured after December 2013)

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.

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® EX 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®EX is a U. S. Coast Guard Certified Type I Marine Sanitation Device for use on uninspected vessels 65 feet 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®EX is designed for recreational use and accommodates most marine toilets. The PURASAN®EX is available in 12 or 24 VDC.

DESCRIPTION:

Each time the transfer pump cycles an equal amount of previously treated waste is discharged. The pumping action of the transfer pump moves the waste through the PURASAN®EX and out.

Water is diverted to the Tablet Dispenser during the treatment cycle, creating a halogen solution during hold time. After the hold time, the Drain Manifold and Air Pump turn on and the 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 its contents.

The Hold n' Treat is designed to integrate both a Type I and Type III MSD (Marine Sanitation Device) to provide the user with a system that will be legal in all areas.

All waste is stored in a holding tank and the treatment mode will determine how the waste is processed. This system eliminates the need for pump-out stations in most areas.

OPERATION

TREAT/NO DISCHARGE MODE;

Press no discharge button on panel once to toggle mode from treat to no discharge.

If position sensing shutoff valve is installed close valve to set no discharge mode

Open Valve and press treat/no discharge button on panel to set treat mode.

If key switch panel is installed, turn key switch to no discharge to set no discharge mode.

Turn key to treat position and press treat /no discharge button on panel to set treat mode.

Note: Pause at least 10 seconds after mode is switched to switch again.

Basic Operation:

When the Hold n' Treat System is in treatment mode and level in holding tank is above the LOW LEVEL, treatment cycle starts. Macerator pump is activated and moves approximately 1 gallon of waste from the holding tank to the treatment tank. Treatment cycles runs for 2 minutes. At the end of the cycle, system waits in treatment mode for 8 seconds and cycle is repeated until the level in the tank falls below the LOW LEVEL. If the LOW LEVEL is not reached after ten cycles, the system will enter into a COOL DOWN mode for ten minutes. When the system is set to NO DISCHARGE, waste will enter the holding tank and will not be treated until set to treatment mode.

PROCESSING LED:

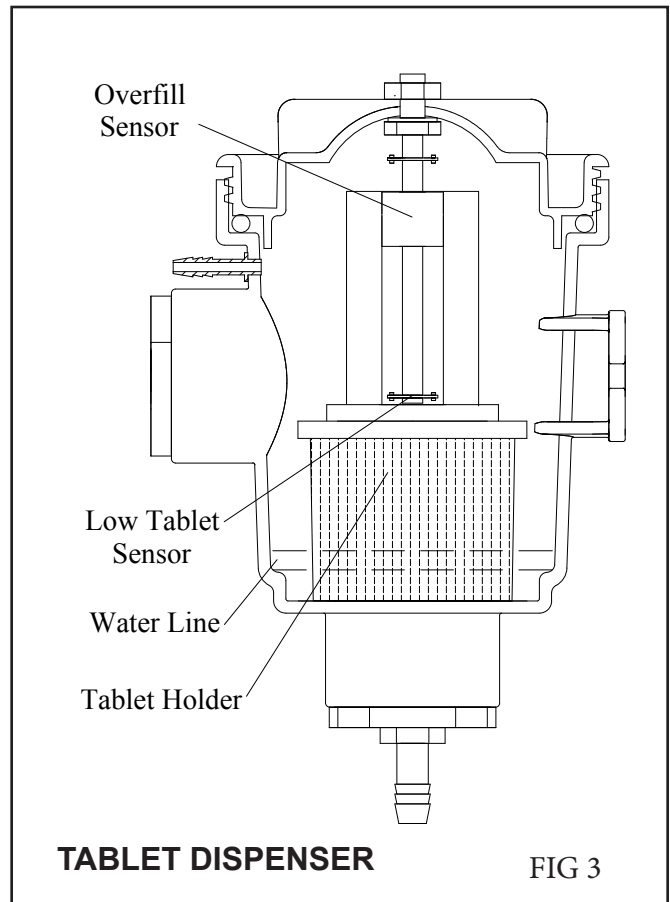
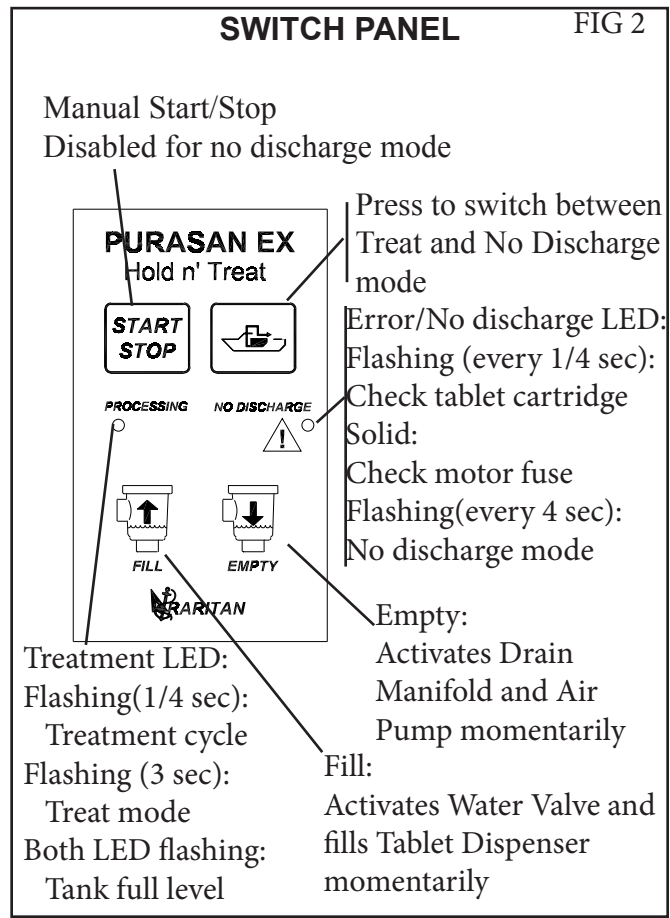
- blinks twice per second when unit is in treatment cycle.
- blinks every 3 second if unit is in treat mode and holding tank level is below LOW level or in between treatment cycle
- blinks twice per seconds with error LED when holding tank level is above HIGH level.

No discharge LED:

- blinks every 4 seconds when in no discharge mode
- blinks twice per seconds when tablet dispenser needs to be checked for tablets or water level.
- on solid when motor fuse is blown

START/STOP BUTTON: Press start button to start a cycle during treat mode to process holding tank below LOW level. DO NOT RUN MACERATOR PUMP DRY.

Note: There is 8 seconds pause between cycles.



OPERATION NOTES:

1. If start/stop button is pressed during first 20 seconds of treatment cycle, motor will stop, A drain cycle will start to empty out and water in the dispenser before stopping the cycle. If waste level is higher than the low level sensor , next cycle will start immediately.
2. A cycle can be terminated by pressing NO discharge mode button. A drain cycle will run to empty out water in the tablet before terminating cycle. Cycle will not restart until mode is changed to treatment mode and Level is higher than low level.
3. If cycle completes normal, there is a 8 second pause before next cycle will start. During this pause none of the buttons except No Discharge mode button is functional.

MAINTENANCE

Use ONLY PURASAN® Tablets.

DO NOT add any other chemicals or cleaning products to the toilet or the treatment system. Raritan C.P. (part # 1PCP22) - Cleans Potties is the only factory-recognized cleaning product that may be used in the toilet.

REFILLING TABLET CARTRIDGE (#41-135A)

When Error LED is flashing it is an indication tablets in the dispenser are depleted to less than one tablet and refill is needed.

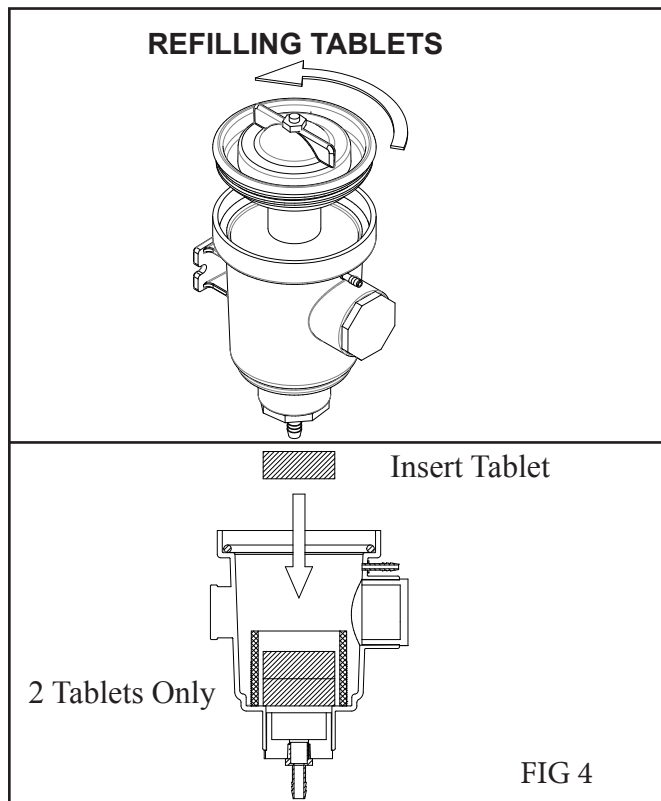
Press No discharge button to stop cycling.

1. Remove all water by pressing “empty” button on the panel before opening lid.
2. Turn off power.
3. With adequate ventilation available, unscrew tablet dispenser lid.
4. Reload with two tablets into the cartridge.
5. Replace lid on Tablet Dispenser.
6. Turn on power
7. Press NO DISCHARGE mode button to return to treatment mode

CLEANING: Do not add any other chemicals or cleaning products to the toilet or the treatment system.

CLEANING OF TANK CHECK VALVE(41-156) AND ½” HOSE

- A. Every 50 cycles, clean ½” hose and check valve (41-156) on tank using following procedure:
 1. Press fill button till water fills up entire ½” 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.
- B. Every time tablets are refilled, check valve assembly on the treatment tank must be cleaned.
 1. Close seacocks
 2. Close hose clamp completely. Remove check valve assembly and thoroughly clean assembly with warm water. Make sure check valve plunger is moving by actuating with a paper clip. If check valve is stuck, replace



INITIAL START-UP - AFTER ALL INSTALLATION STEPS ARE COMPLETE

CAUTION: Do not load tablets into Tablet Dispenser until Steps 1-6 are completed.

1. Remove crossover cap (see FIG 12; #25) from Treatment Unit tower. Pour 3 gallons (11.5 liters) of water into treatment unit. Replace crossover cap.
2. Turn on water to the Water Valve.
3. Turn on power to unit.
4. Priming: Press and hold “FILL” button until water reaches to the water line on the Tablet Dispenser. Press and hold “EMPTY” button until Tablet Dispenser and 3/8” tube to Treatment Unit is empty.
5. Operate the system. Check water level in the cartridge and make sure water is rising to the mark. If starting for first time or if water does not rise to the mark, see instruction in Programming section to adjust timing.
6. Check for leaks.
7. Load the Tablet (see refilling tablet section).

WINTERIZATION

IMPORTANT:

Improper winter lay up is a major cause of failure.

WARNING:

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

Treatment Unit and Tablet Dispenser

1. Turn off water supply to the toilet and flush toilet as dry as possible.

Note: Check toilet manufacturer's instructions to ensure no damage is done to any components.

2. Activate PURASAN EX several times using start/stop button to empty holding tank.
3. If drain or flushing fittings are installed in plumbing, Flush entire system with fresh water.
4. Shut off water valve feeding Control Module.
5. Press EMPTY button to drain out all water from Tablet Dispenser and tubing.
6. Turn off power and disconnect wires from Purasan EX Control Module.
7. Remove water connection to Control Module and drain tube.
8. Close seacocks.
9. 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.

10. Using a pump and 3/8" tube, remove water from each side of partition in Treatment Unit through crossover plug.
11. Disconnect and drain waste hoses.
12. Proceed to toilet winterization by following instructions for that particular toilet.

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

Recommissioning

IMPORTANT:

- Do not open shut-off valve feeding control module until Treatment Tank is full.
- Do not operate PURASAN®EX until Treatment Unit is filled with water.

Treatment Tank

1. Reconnect waste hoses and open seacocks.
2. Reconnect wires to control module

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

3. Fill the Treatment Unit: Remove crossover plug from Treatment Unit and fill with a minimum of three gallons of water. Replace crossover plug and o-ring.
4. Turn on power
5. Open water valve feeding control module.
6. Priming: Press and hold "FILL" button until water reaches to the water line on the Tablet Dispenser. Press and hold "EMPTY" button until Tablet Dispenser and 3/8" tube to Treatment Unit is empty.
7. Operate the system. Check water level in the cartridge and make sure water is rising to the mark. If starting for first time or if water does not rise to the mark, 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.

Winterization of Holding tank

Use anti-freeze only if there is a way to pump out contents of holding tank without flushing into purasan treatment tank during recommissioning, else drain or pump out contents of the tank.

U.S.C.G. Type I MSD Certification #159.015/0010133/0 (12V) 159.015/0010134/0 (24V)

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

Hold n Treat capacity: 6 gallons (23 liters) per hour , 140 Gallon(530 Liters) per day

NOTES: for Wiring

1. Distances are from source to unit and back to source
2. Recommended conductor wire minimum AWG (mm) for 3% voltage drop.
3. 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 with macerator pump

Units Voltage	Circuit Breaker/Fuse sizes(AMPS)	Amp. draw @ nominal voltage	Macerator amps @ nominal voltage	10 Feet	20 Feet	30 Feet	40 Feet	50 Feet
12V	30	10	17	8AWG	6AWG	6AWG	6AWG	4AWG
24V	20	8	9	14AWG	12AWG	10AWG	10AWG	8AWG

Fuse Specifications:

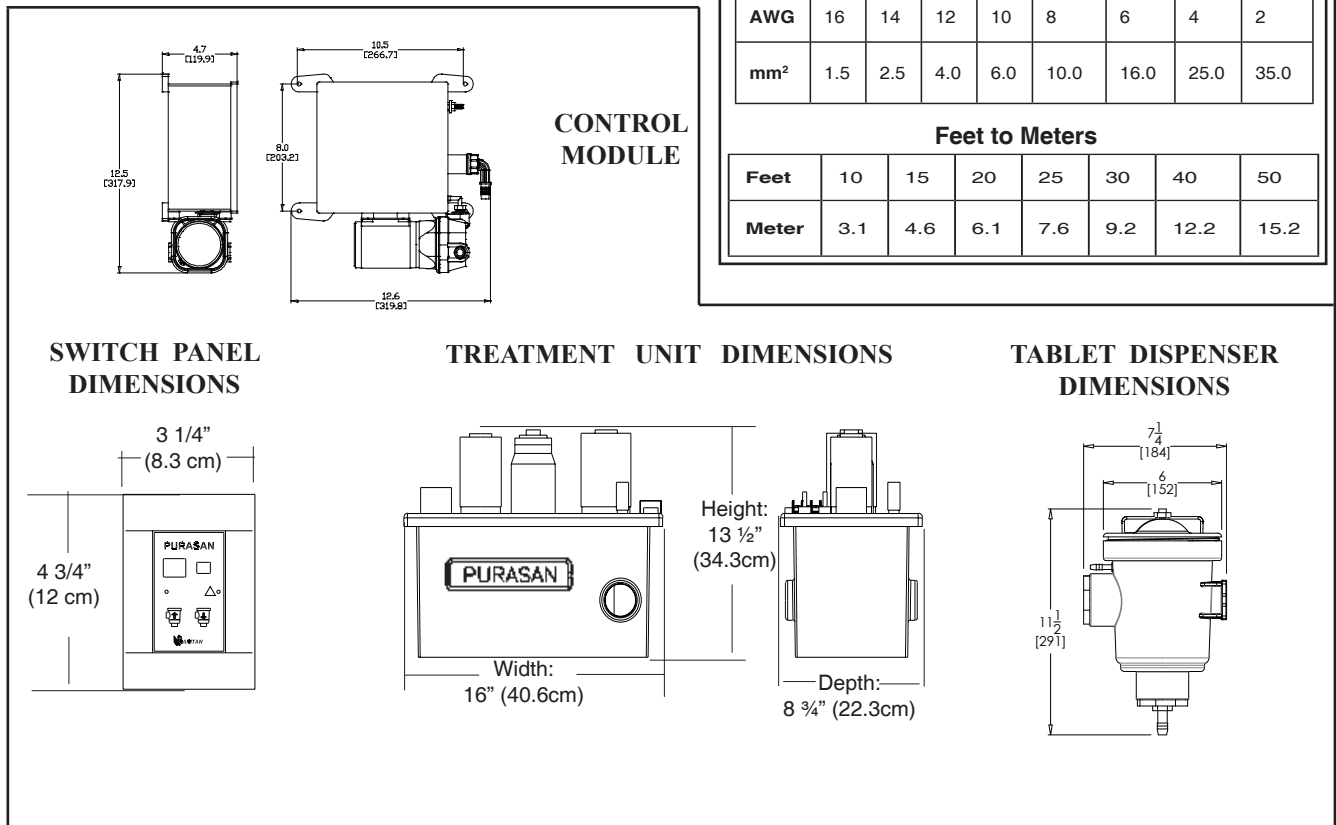
Fuse F1 for Motors (12V and 24V) Located in the SPC Control Box:

ATO 10 AMPS, Maxi blade type.

CONVERSIONS

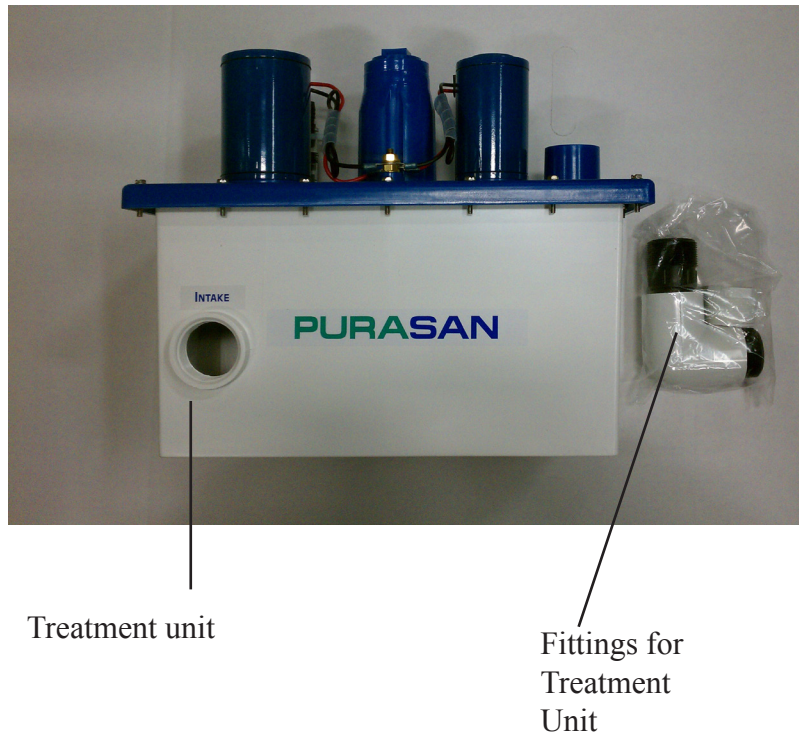
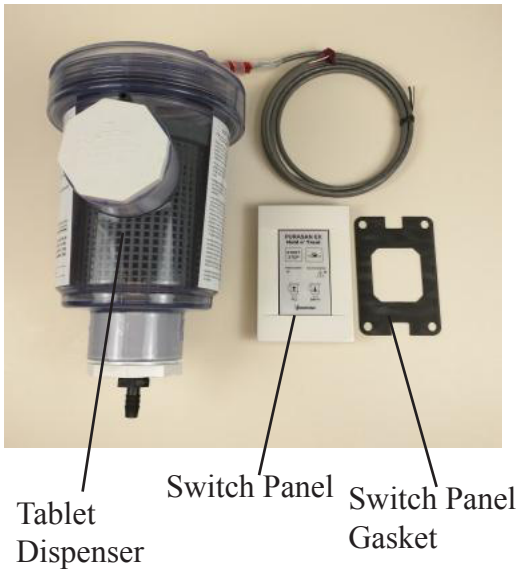
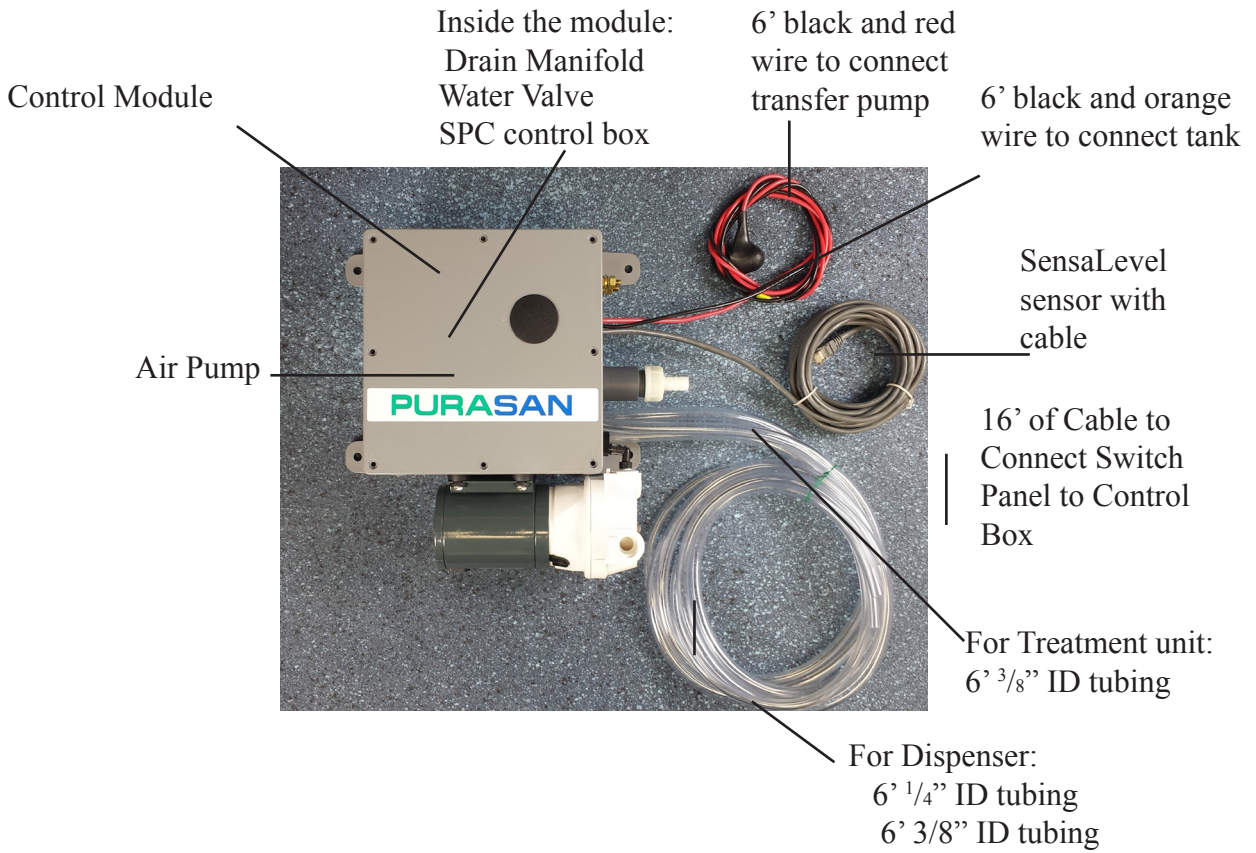
Wire - AWG to mm ²								
AWG	16	14	12	10	8	6	4	2
mm ²	1.5	2.5	4.0	6.0	10.0	16.0	25.0	35.0

Feet to Meters							
Feet	10	15	20	25	30	40	50
Meter	3.1	4.6	6.1	7.6	9.2	12.2	15.2



INSTALLATION

Parts Included in the Box:



LOCATION AND MOUNTING

Treatment Unit:

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 (1.5 m) of toilet.

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

Note: If mounting treatment tank higher than discharge, a vented loop must be used between toilet and Treatment Unit.

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 supplied are 6 feet between tank and control module

1. Locate control module between Tablet Dispenser and Treatment Unit. Vertical mounting is recommended (FIG 6)
2. Using screws secure manifold to the wall (FIG 6)

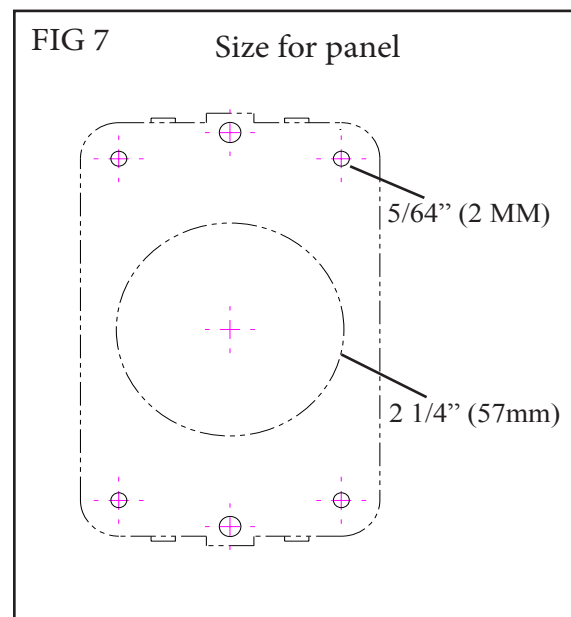
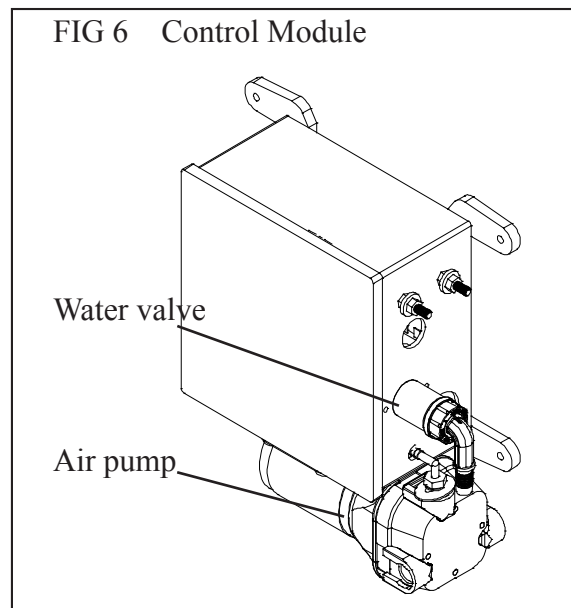
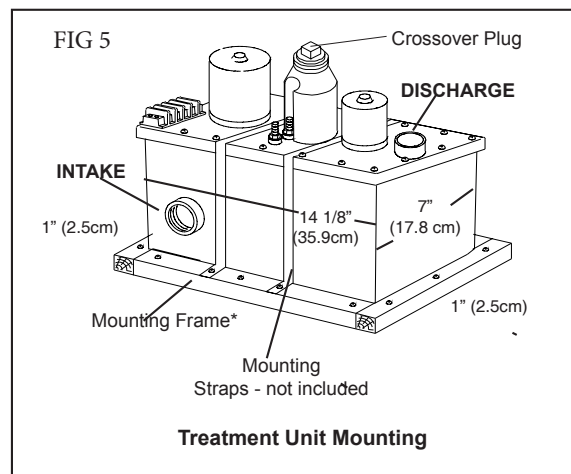
Switch Panel: Cable Supplied is 16 feet

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®EX 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®EX 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" 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

WARNINGS:

- All installations made below the waterline **MUST** be protected by installing vented loops. Top of the vented loop must be 4”(10 cm) above waterline at boat’s greatest angle of heel.
- Always double clamp fittings below waterline
- Use only non-corrosive fittings

A. Macerator pump:

1. Install macerator pump between holding tank and treatment system.

B. Pressurized water for Tablet Dispenser:

1. Connect hoses from control module to treatment tank and tablet dispenser as per FIG 8
2. A shutoff valve between source and Water Valve assembly is recommended.

3. Use hose clamps to secure hoses

C. 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 macerator 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.

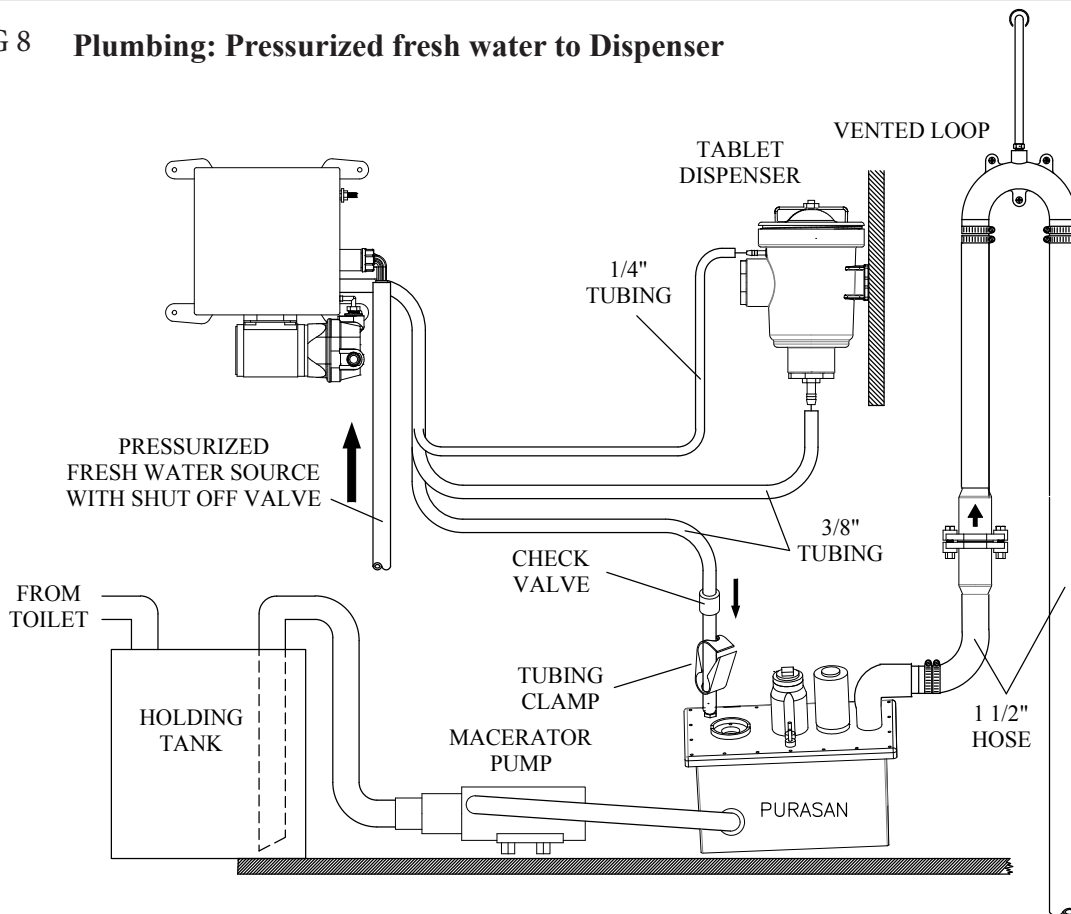
Note: Be certain that the discharge elbow is in the correct position before gluing.

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

Fittings for winterization:

It is recommended that T- fitting with a shut of valve or plug should be installed near intake port of the treatment unit or lowest part of the plumbing for draining or flushing system

FIG 8 Plumbing: Pressurized fresh water to Dispenser



during winterization

WIRING (See Fig 10)

WARNING: Hazard of Shock and Fire

- Always use proper wire, connectors and fuse/circuit breaker. See Specification Chart.
- Secure wire properly.
- Do not connect other appliances to PURASAN® EX circuit.
- Make sure power is off before proceeding.
- Improper wiring can damage the circuit board and void warranty.
- Motors used with this product are “Ignition Protected”. They are not however, explosion-proof as defined in 46CFR 110.15-65(e), Subchapter J-Electrical Engineering.

Control Module:

Note: Air pump motor and solenoid coils used in 12V models are marked 24V.

1. Determine proper wire size from wire chart on specifications page.
2. Fuse or circuit breaker must be installed between source and control module on positive wire.
3. Run supply wire from source POS to Positive (POS) terminal on control module, Install rubber boot on terminal.
4. Run supply wire from source NEG to Negative (NEG) terminals on module.
5. Run and connect two wires supplied between macerator pump and control module.

Treatment Unit

1. Run and connect two wire supplied from control module to treatment tank terminal studs.

Switch Panel

1. Connect cable from switch panel to SPC

Tablet Dispenser:

1. Run float cable from Tablet Dispenser to Control module. Using cable clamp - secure cable on the wall near dispenser.
2. Connect sensor cable to control module SPC.

Note: Complete programming for Fill and Empty timing before connecting shutoff valve, key

switch panel or Sensors.

Optional position sensing shutoff valve:

1. Run wires between valve and control module SPC as per wiring diagram

Optional key switch panel:

1. Run wire between key switch panel and control module SPC as per wiring diagram

Dual installation:

Dual installation kit PSTEXHNTDC includes instruction for wiring second switch panel

SensaLevel™ sensor installation:

(sensors are preinstalled at factory for 21Sxxx systems)

Note: Complete all wiring and programming before installing sensors

1. Turn off power to Control module.
2. Connect wires to the control module as per wiring diagram FIG 10.
3. Turn on power and place finger in the middle of low sensor pad. The treatment cycle will start immediately.
4. Place fingers on both sensor, both LED should start blinking. If LED's do not start blinking, check wiring or contact Raritan technical support.
5. Identify a position outside the tank that will indicate LOW and HIGH level. Low level is the level where treatment starts. (FIG 9)
6. Lightly sand the locations where sensors are to be located to remove oil and dirt.
7. Remove adhesive cover and apply to tank. Press firmly to remove any air bubbles.

FIG 9

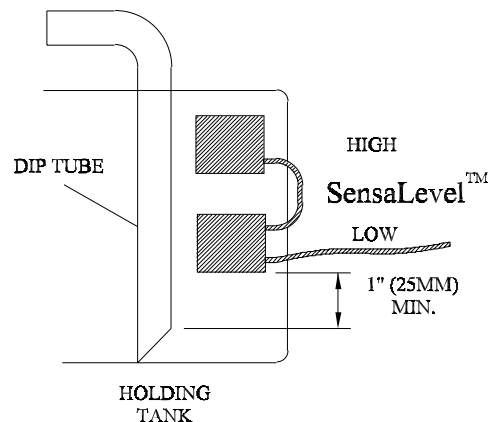
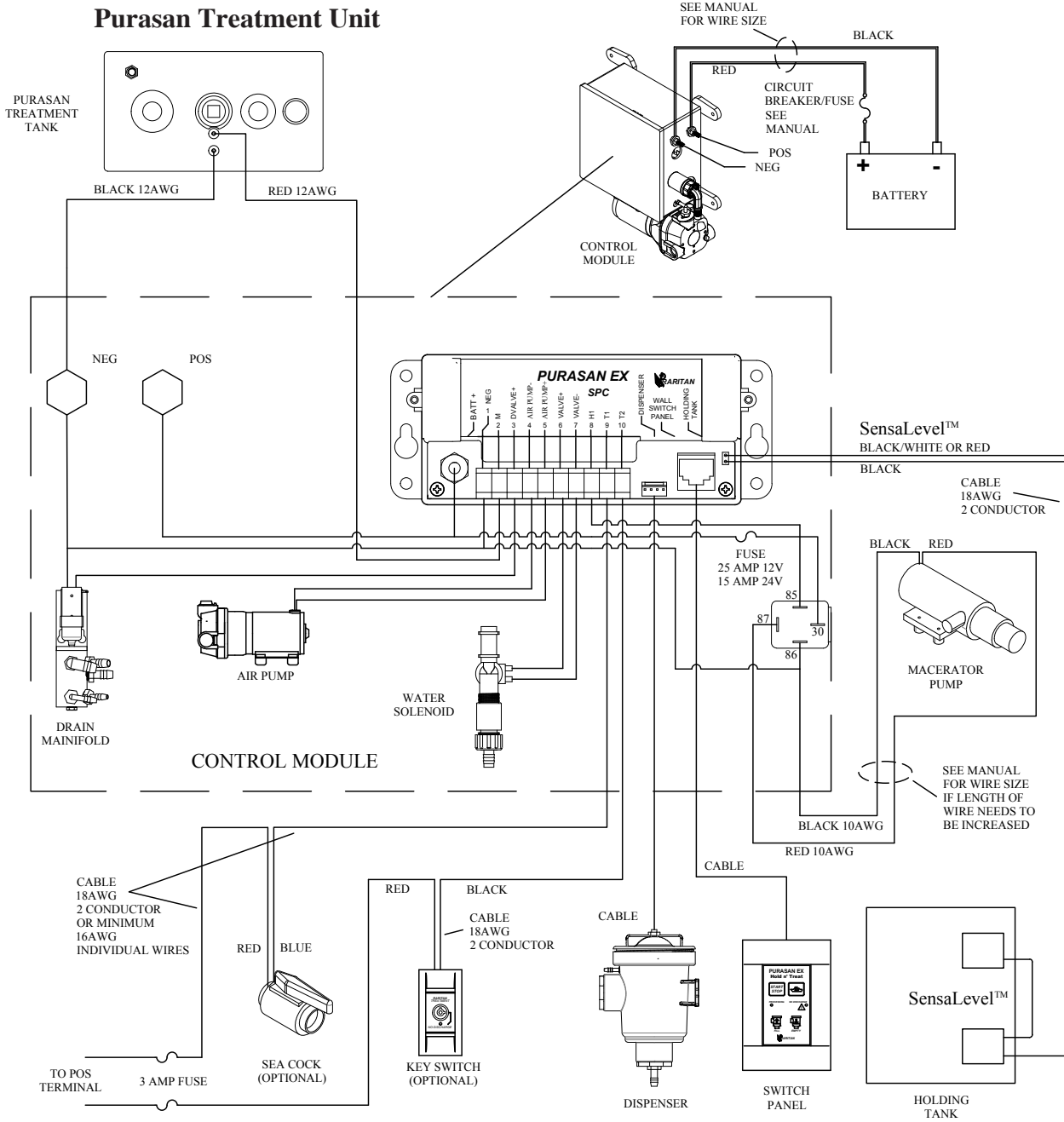


Fig 10



INITIAL SETTING OF “FILL” and “EMPTY”

Must be completed during installation to be sure water reaches level mark on dispenser.

1. All settings should be done with water source (on board pressure pump or shore water supply) that will be used with PURASAN. Settings done will only be valid for that source, and may need to be reprogrammed if another source is utilized. 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 reach 1/4” below top marked lines, Unplug sensor cable at Control Module.
3. With power on, press “fill” and count seconds until water reaches to water level mark on dispenser. Record seconds as fill. If recorded seconds are greater than 18, Open the hole to approx 1/8” in metering washer between water valve (221352) and check valve (PX50W) and repeat.
4. Empty water below tablet dispenser bottom and entire 3/8” tube till treatment tank while pressing “empty” button and counting seconds. 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 and minimum is 2.
- 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 3. Note: maximum is 20 and minimum is 2.
- 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: Press start/stop button. Water should fill up in the dispenser at least up to lower line but no higher than half way between 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 is not filling up to level between lines, increase or decrease fill time using steps 2 to 6.

Note: 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. If wired to start with toilet: flush toilet, else press “START/STOP” button, water should fill up between level line. Make final adjustment as per above instructions if needed.

Setting of Transfer/macerator pump on time:

Note: Pump time is set to 10 seconds as shipped.

- 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 no discharge button (FIG 11) (next to start/stop button) as many times as needed set pump on 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 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).

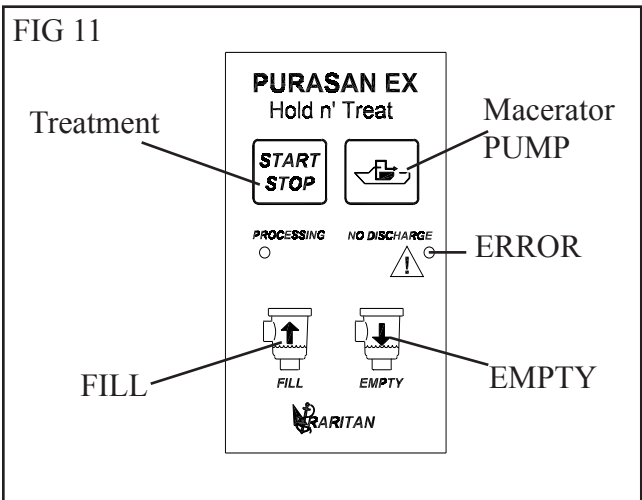
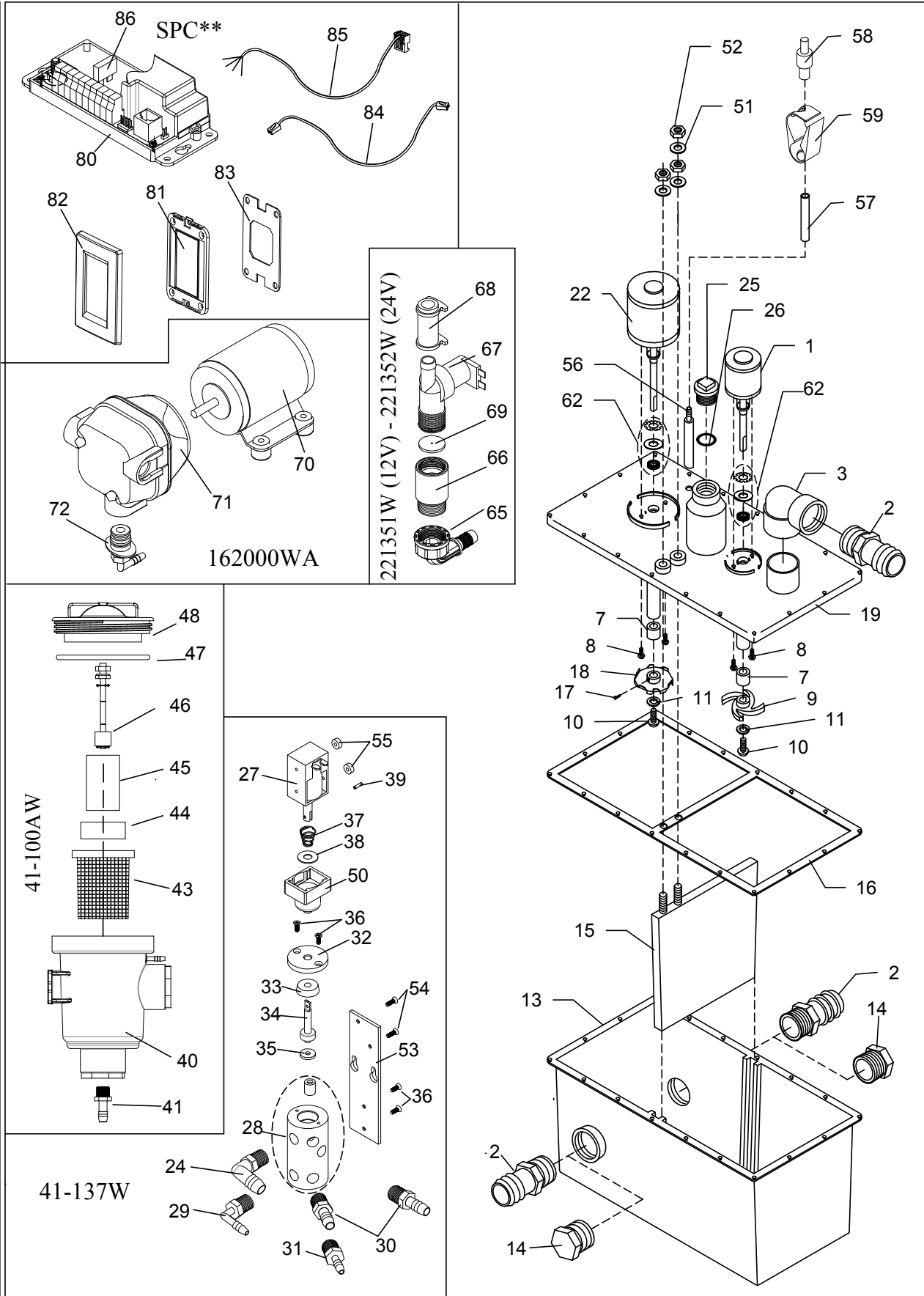


FIG 12

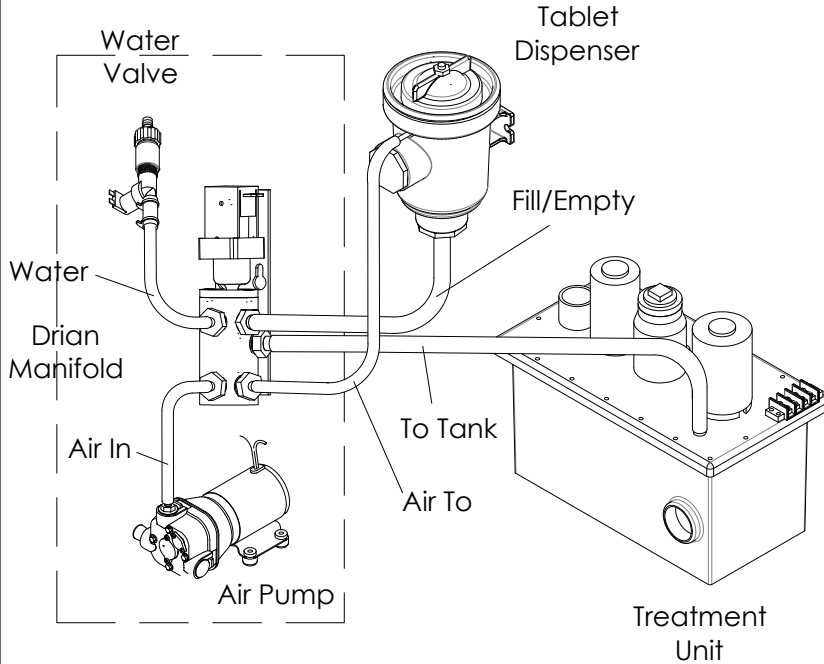
EXPLODED PARTS



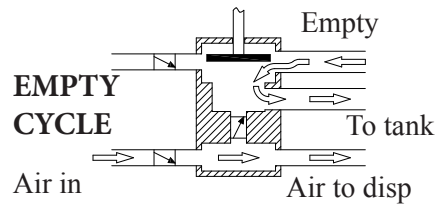
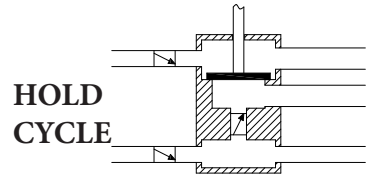
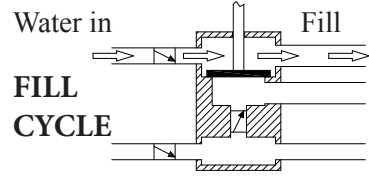
PURASAN PARTS LIST

<u>Item</u>	<u>Part #</u>	<u>Description</u>			
1	32-102AW	Mixer Motor 2 1/2" Dia. 12 V DC	38	F203	Washer 5/16" x 3/4"
1	33-102AW	Mixer Motor 2 1/2" Dia. 24 VDC	39	F233	Spring Roll Pin
(1)	includes shaft seals and bushing for mixer motor		50	41-187	Shaft Boot
2	31-121	Hose Fitting (2)	53	41-152	Base Plate
(Not shown)		90° hose fitting (PLA401)	54	F232	6-32 x 7/16" Flat head mach. screw (2)
3	31-120	Discharge Elbow 90°	55	F231	Spacer 6" x 5/32"
6	31-134	Cover Hold down Bolt, 10-32 x 1" (16) (not shown)	TABLET DISPENSER (41-100AW)		
7	31-103	Motor Shaft Bushing (2) (see 62)	40	41-130A	Dispenser Body.
8	31-106	Motor Hold down Bolt, 10-32x1", S/S (4)	41	41-177	Adapter 1/2"NPT x 1/2" barb
9	31-109	Mixer Impeller	43	41-156W	Tablet holder assembly.
10	31-110-1	Impeller Bolt, 12-24 x 5/8", S/S (2)	44	41-135A	Purasan Tablets (sold separately)
11	31-110-2	Impeller Lock Washer, #12, S/S (2)	45	41-179	Float extension pipe
12	31-114	Cover Hold down Nut, 10-32 (18)	46	41-178W	Float sensor
13	31-115PS	Treatment Tank	47	RWS5A	"O" Ring
14	31-122	Intake Plug	48	41-131M	Dispenser Cap (machined)
15	41-102	Tank Divider	85	41-505	Cable for Float sensor
16	31-112	Cover Gasket	WATER Valve (221351W, 12V - 221352W, 24V)		
17	31-108	Macerator Set Screw	65	221356W	Inlet hose adapter
18	31-107	Macerator Impeller	66	PX50W	Double Check Valve assembly
19	41-101W	Treatment Cover (includes 62,56, 25,26)	67	221351	Water Solenoid 12V
22	33-101AW*	Macerator Motor for 12 V DC unit	67	221352	Water Solenoid 24V
22	34-101AW*	Macerator Motor for 24 V DC	68	221335	1/2" Hose
(22)	includes shaft seal and bushing for Macerator motor		69	41-157	Metering washer
25	31-104CW	Crossover Plug with O-ring	AIR PUMP for tablet dispenser (162000WA)		
26	31-105	O-Ring	70	166024A **	Motor
51	M31	#14 Brass Flat Washer (4)	71	162000W	Intake Pump Assembly,air pump
52	M30	1/4"-20 Brass Nut (4)	72	162415A	Plug with barbed fitting
56	31-325A	Adapter Tank Lid	DIAPUMPRK Diaphragm Pump Repair Kit		
57	221335	Hose	CONTROLS		
58	41-170	Tank check valve	80	SPCCHNT	Purasan Control
59	31-304C	Hose clamp	81	41-502	Wall Panel circuit board
62	ESTRK	EST/PST Repair Kit includes following	82	221514	ME: wall panel cover,white
(Not Shown)	31-102	Motor Shaft Seal(2)	83	221525	ME; wall panel gasket
	31-102-1	Macerator Seal Washer	84	31-618	Cable for SPC wall panel
	31-102-2	Macerator Retaining Ring	86	FUSE10	ATO fuse 10A
	31-102-3	Mixer Seal Washer	OTHER (Not shown)		
	31-102-4	Mixer Retaining Ring	41-135A	Purasan Tablets (Refill)	
	31-103	Motor Shaft Bushing(2)	42-1000A	Treatment Unit Complete 12V	
	31-105	O-Ring	43-1000A	Treatment Unit Complete 24V	
	31-106	10-32x 7/8" Screws (4)	*NOTE: 12VDC units are equipped with a 24VDC		
	31-112	Cover Gasket	Macerator Motor, 24VDC units are equipped with a		
			32VDC Macerator Motor.		
DRAIN MANIFOLD ASSEMBLY(41-137W)			**NOTE: All models use a 24VDC Motor		
24	41-151A	Adapter 1/4" x 1/2" elbow with check valve			
27	41-145	Pull Solenoid			
28	41-137	Drain Manifold assy.(with check valve)			
29	41-151B	Adapter 1/8" x 1/4" elbow with check valve			
30	41-141	1/4" NPT x 1/2" barbed adapter			
31	PLA3	1/4" Barbed x 1/4" NPT Adapter			
32	41-139	Cap, manifold			
33	41-138C	1/4" x 3/4" U cup seal			
34	41-138 B	Plunger			
35	41-138A	Washer for plunger			
36	F204	6-32 x 3/8" Flat head mach. screw(4)			
37	LWS	Spring			

Fig13



DRAIN MANIFOLD PORTS



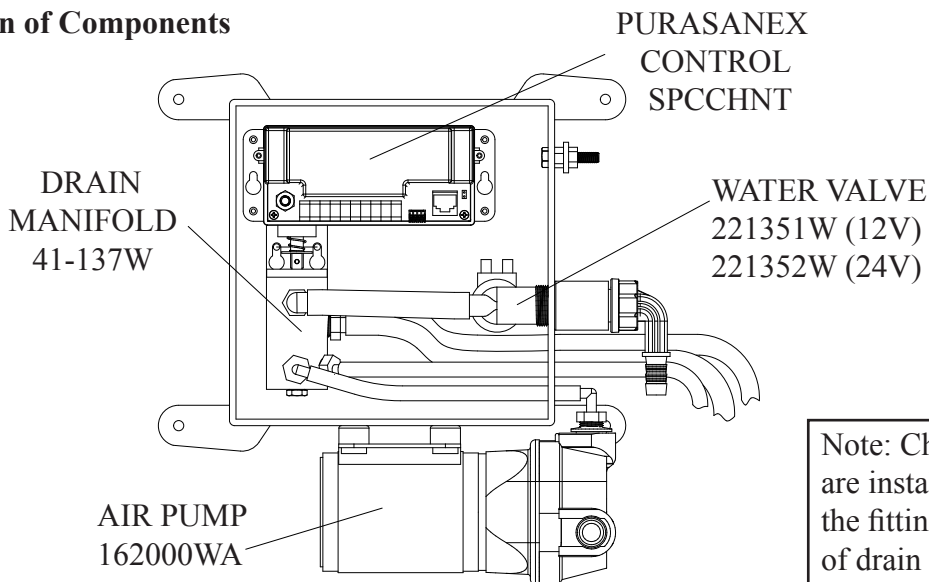
CHECK VALVE SYMBOL

TIME SEQUENCE

Note: Fill time and Empty times are programmable, Total treatment time is 120 seconds

Cycle sequence	Motor	Drain Solenoid Air pump	Water Solenoid	H1
Start	ON	OFF	ON	ON (1 second)
Fill cycle	ON	OFF	ON	OFF
Hold cycle (20 seconds)	ON	OFF	OFF	OFF
Empty cycle	ON	ON	OFF	OFF
Wash Cycle (10 sec)	ON	ON	ON	OFF
Treatment cycle	ON	OFF	OFF	OFF

Location of Components



Note: Check valves are installed inside the fittings (41-151) of drain manifold

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. Check valve is located inside the fitting 41-151A (#24).
- **Empty time not programmed correctly**
If Drain Manifold and Air Pump is energized too short to fill the Tablet Dispenser, re programming 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 a 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, re programming 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). Check valve for air pump is located inside the fitting 41-151B(#29).
- **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, or 3101 SW 2nd Ave. Ft. Lauderdale, FL 33315. 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.
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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.



530 Orange Street, Millville, NJ 08332 USA
Telephone: 856-825-4900 FAX: 856-825-4409
Website: www.raritaneng.com
Southern Office and Plant:
3101 SW Second Avenue, Fort Lauderdale, FL 33315 USA
Telephone: 954-525-0378 FAX: 954-764-4370