

PURASAN®

U.S. Coast Guard Certified Type I Marine Sanitation Device

Certification # 159.015/106/0

MAINTENANCE AND INSTALLATION INSTRUCTIONS

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 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: HAZARD OF DANGEROUS CHEMICAL REACTION



1. Use ONLY Purasan Tablets.
2. DO NOT add any other chemicals or cleaning products to the toilet or the treatment system. Raritan C.P. - cleans Potties is the only factory-recognized cleaning product that may be used in the toilet.

WARNING: HAZARD OF SEVERE INJURY



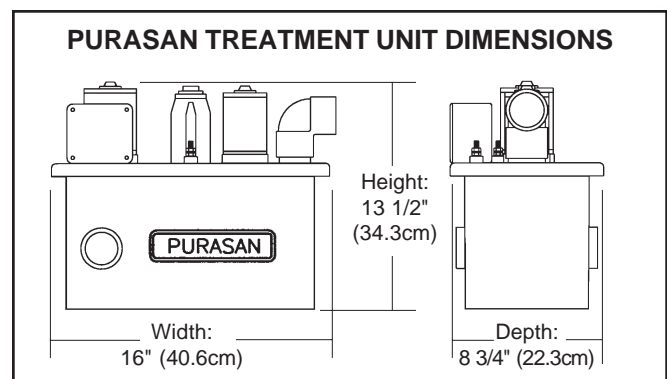
1. DO NOT allow tablets to come in contact with skin, eyes or clothing. If contact occurs immediately wash affected area with fresh water. Remove and wash any affected clothing.
2. Use a well ventilated area when handling Purasan Tablets. DO NOT breathe dust from tablets - severe damage to mucous membrane of the respiratory passages could occur.
3. Do not ingest.
4. Follow all cautions and warnings associated with handling of tablets.
5. When reloading the Tablet Dispenser, ventilate area well and wear chemical resistant protective gloves and eye protection.
6. DO NOT ATTEMPT TO REFILL EMPTY CARTRIDGES.

INTRODUCTION

The Purasan is a U.S. Coast Guard Certified Type I Marine Sanitation Device for uninspected vessels 65 feet (19.8 meters) or less in overall length. It is designed and approved to treat waste for overboard discharge in areas that have not been declared a No Discharge Zone by the U.S. Environmental Protection Agency. The Purasan provides flow-thru treatment of waste from a variety of marine toilets. A portion of the toilet's intake water passes over Purasan tablets creating a halogen solution that mixes with and treats waste inside the treatment unit where maceration and disinfection takes place.

1. **Switch Panel** (#41-350) - Begins the treatment cycle and indicates on/off. Can be utilized to flush an electric toilet.

2. **Treatment Unit** (#42-1000 [12VDC], #43-1000 [24VDC] or #44-1000 [32VDC]) - Consists of two chambers which mix and macerate solids and treats waste.
3. **Tablet Dispenser** (#41-100) houses a **Tablet Cartridge** (#41-135). Cartridge is shipped separately.



4. **Control Cable** (#41-355) - 12' long (3.65m) cable that connects the Switch Panel to the Circuit Board Assembly on Treatment Unit.

OPERATION

Depending on the type of toilet and the installation, use one of the following methods for operation.

Electric Toilets in general:

1. Integral Activation: Press "Push to Cycle" switch on switch panel. This starts the Purasan and flushes toilet.
2. Independent Operation: Start Purasan by pressing "Push To Cycle" switch on switch panel. Then flush toilet independently.
3. Pressing the toilet's flush switch flushes the toilet and starts the Purasan.

Raritan Atlantes toilet:

1. Integral Activation: Pressing the Atlantes flush lever (A5 models) or "Push to Flush" touch pad (A6 models) will flush the toilet and start the Purasan Treatment Cycle; or press "Push to Cycle" switch on switch panel to flush the toilet and start the Purasan Treatment Cycle.
2. Independent Operation: First, start the Purasan by pressing "Push to Cycle" switch on the Switch Panel. Then flush toilet independently.

IMPORTANT: The toilet can be flushed more than once to clear the bowl if necessary, however, the treatment cycle must end before the next use. (The treatment cycle has ended when the two lights on the switch panel go off.) When the toilet is flushing, check that the water level in the tablet dispenser rises to the Water Level Line (see Fig. #5) on the side of the tablet dispenser.

MAINTENANCE

WARNING: Read and understand all safety instructions (including Material Safety Data sheet) for handling Purasan Tablets before proceeding with Maintenance, Replacing Tablet Cartridge, Winterization and Recommissioning.

Periodically (at least once a month) check tablet level in cartridge and check that all tubes to and from the tablet dispenser are unobstructed. Tablet dispenser and tubes are clear for easy visual inspection. Re-

place tablet cartridge only when completely empty. Clean or replace tubes if any obstruction is found.

REPLACING TABLET CARTRIDGE (#41-135)

Removing used tablet cartridge - With adequate ventilation available, unscrew tablet dispenser lid and lift out used tablet cartridge. Rinse thoroughly with water to remove any residual tablet particles. Dispose empty cartridge with other recyclable plastics.

Loading new tablet cartridge in dispenser

1. Hold new tablet cartridge over tablet dispenser with large end down. Remove tablet cartridge cap and allow any loose tablet particles to drop into the tablet dispenser. Slide tablet cartridge down into tablet dispenser.
2. Cut nipple off tablet cartridge to create an air hole.
3. Replace lid on tablet dispenser.

CLEANING: Do not add any other chemicals or cleaning products to the toilet or the treatment system. Use only water for cleaning; the halogen solution will act as its own cleaning agent.

WINTERIZING/STORAGE

Tablet Dispenser

1. Close flow metering clamp (#31-304C) to prevent intake water from entering tablet dispenser.
2. Flush out tank by activating toilet and treatment cycle several times; leaving only water in the treatment tank.
3. Carefully remove the small tube from the white "T" fitting (#41-200) (Tube #1 in Figs. #1 and #2). Drain tube into a clean plastic container.
4. Carefully remove the small tube at the bottom of the black "T" fitting (#41-115) (Tube #2 in Figs. #1 and #2). Drain tube into container.
5. Connect Tube #1 to bottom of black "T" fitting (#41-115) to minimize fumes and dripping.
6. Connect Tube #2 to white "T" fitting (#41-200).
7. Take solution collected in container and pour into toilet bowl. Do not splash or spill. Rinse container with water to remove any residual particles, pour rinse water into toilet and dispose of container in the trash.
8. Flush toilet several more times to dilute solution poured into the bowl.

Fig. #1 PURASAN Type I MSD, Mechanical and Plumbing Layout (w/Atlantes Marine Toilet) Direct Injection into Treatment Tank

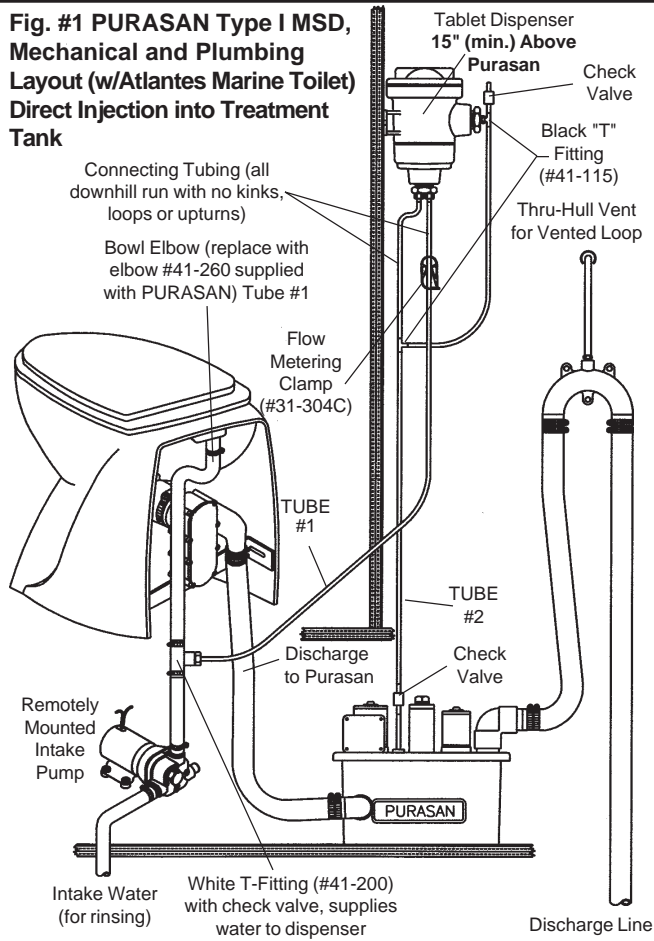


Fig. #2 PURASAN Type I MSD, Mechanical and Plumbing Layout (w/Crown Head Toilet) Direct Injection into Treatment Tank

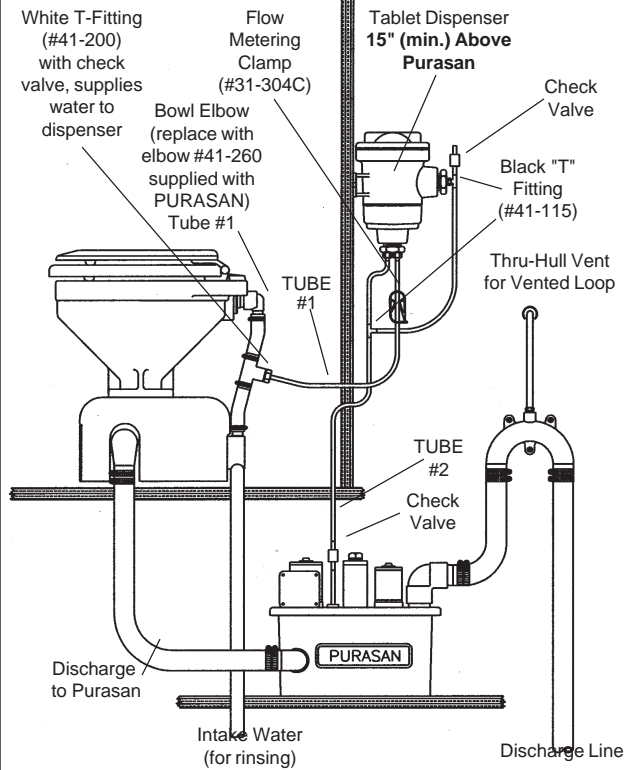


Fig. #1A PURASAN Type I MSD, Mechanical and Plumbing Layout (w/Atlantes Marine Toilet)

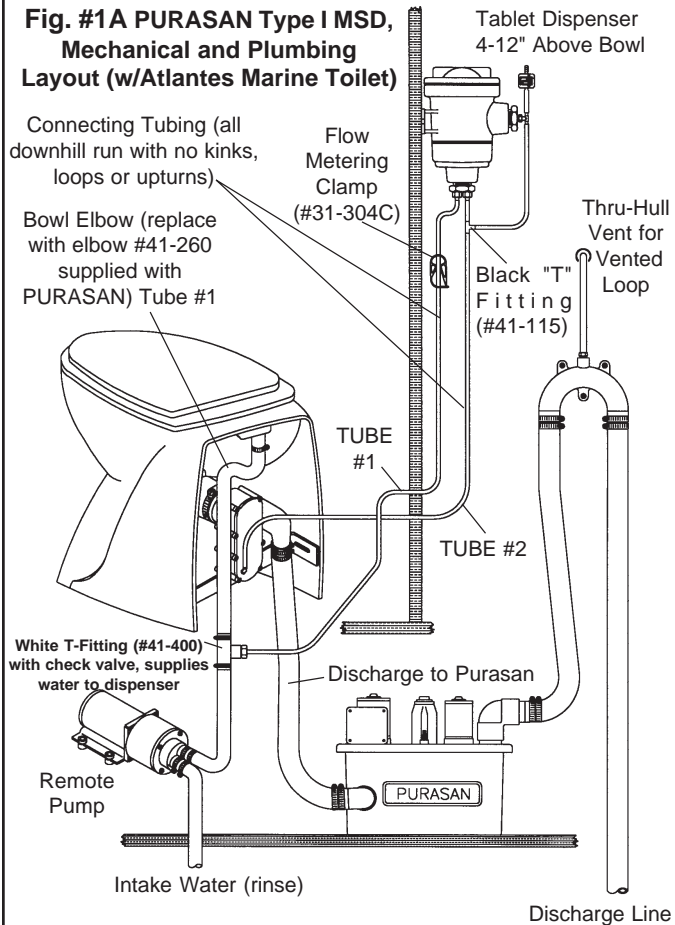
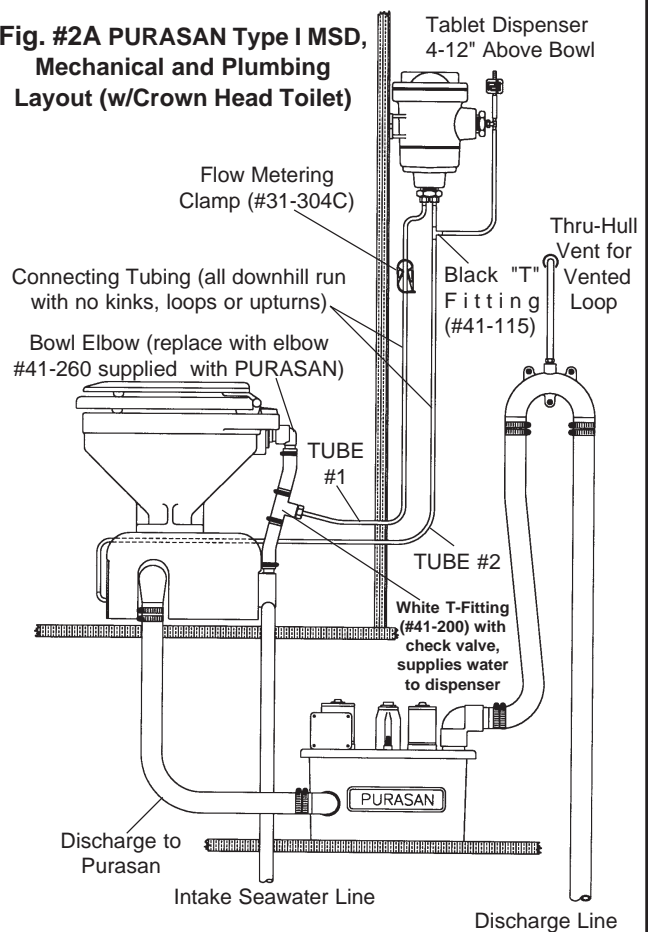
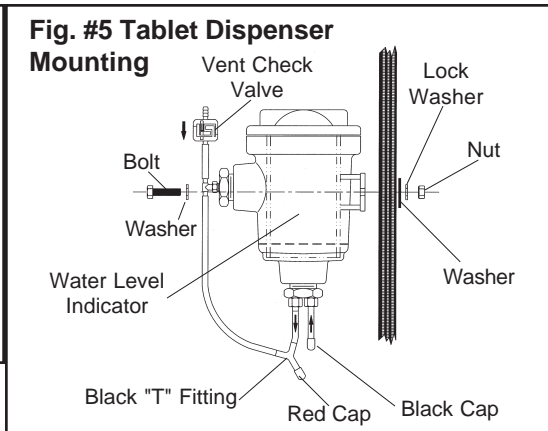
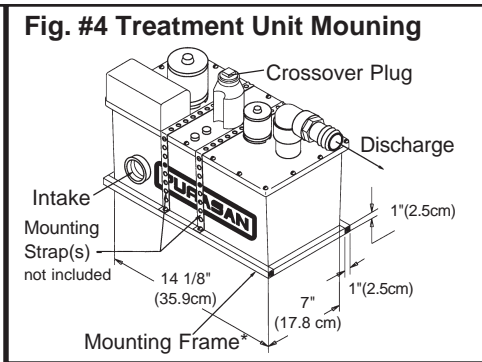
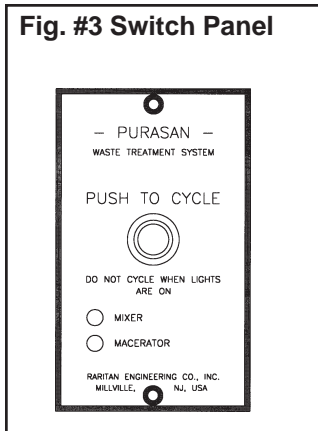


Fig. #2A PURASAN Type I MSD, Mechanical and Plumbing Layout (w/Crown Head Toilet)





- a. Open seacocks.
 - b. Flush toilet several times to fill system with water.
 - c. Check for leaks.
 - d. Turn on power to Purasan.
3. Reconnecting the Tablet Dispenser.

IMPORTANT

- **Make sure everything is working properly before proceeding.**
- **These instructions are the reverse operation outlined in winterizing the Tablet Dispenser, steps 3 through 6.**

- a. Remove small tube (Tube #1 - Figs. #1 and #2) from the bottom of the black "T" fitting (#41-115) at bottom of Tablet Dispenser.
- b. Remove small tube (Tube #2 - Figs. #1 and #2) connected to white "T" fitting (#41-200) and connect it to small black "T" fitting (#41-115) at bottom of Tablet Dispenser.
- c. Connect small tube, removed in step 1, to white "T" fitting (#41-200).
- d. Follow **Start-Up** procedure (steps 4, 5, and 6) for rest of Recommissioning Procedure.

INSTALLATION

IMPORTANT; For below waterline installations see the warning at the beginning of Plumbing Instructions.

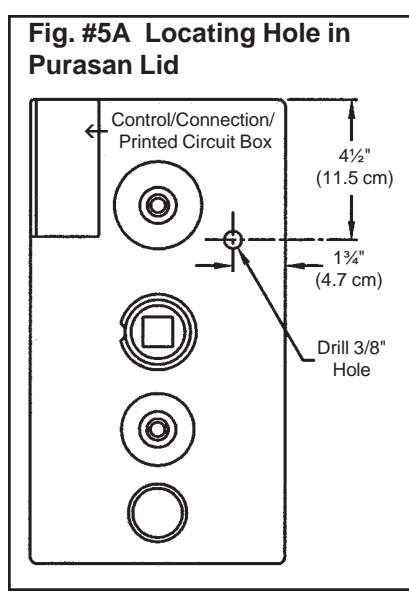
A. Switch Panel - Mounting (Fig. #3)

1. Locate Switch Panel (#41-350), in head compartment where it will be convenient for operation and the indicator lights will be visible.
NOTE: Locate in an area where the Cable can be routed to the Switch Panel. Cable (#41-355) length is 12' (3.65m).
2. Using template provided (See back page), mark cutout for panel. Cut out only hatched area and drill mounting holes (3/32" [2.4mm] drill).

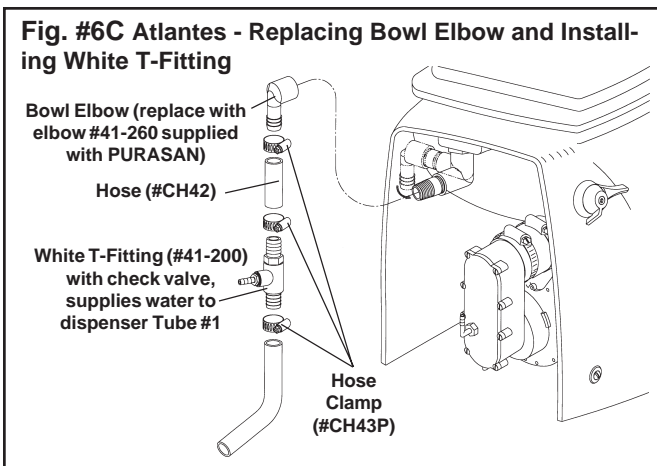
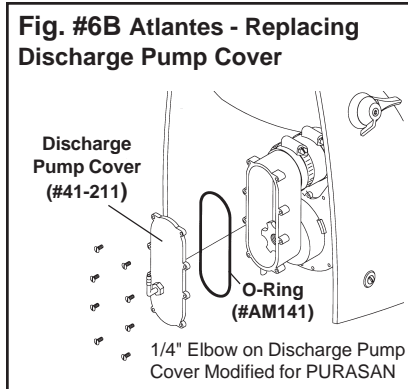
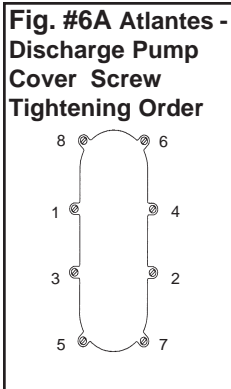
3. Route cable (#41-355) from Switch Panel to where Treatment Tank will be mounted. Secure Cable every 18" (45.7cm). Do not damage insulation.
4. Connect Cable to Switch Panel (see Wiring section Fig. #8 or Fig. #9).
5. Secure Switch Panel with screws (#F087).

B. Treatment Unit - Mounting (Fig. #4)

1. Location:
 - a. Locate unit so its discharge elbow is lower than discharge of toilet. Unit must also be mounted on a solid, flat deck surface within a six foot hose run (2 m) from toilet.
 - b. DO NOT locate in an area where ambient temperature will exceed 120° F. (49° C).
2. Secure:
 - a. Make a mounting frame following Fig. #4.
 - b. Secure frame to deck using suitable fasteners.
 - c. Use 3/4" (1.9 cm) mounting straps to secure unit to frame. A rubber pad under the tank will help reduce vibration and noise.
3. For direct-injection of halogen solution into the Purasan treatment unit (preferred), Figs. #1 and #2, drill a 3/8" hole in the treatment unit cover,



per Fig. #5A, and glue in gray PVC nozzle #41-XXX, using PVC solvent cement. If the halogen solution will be directed back into the macerator of the toilet Crown Head, Crown Head II, and Atlantes toilets only, do not drill the hole and mount the gray nozzle



#41-XXX

C. Purasan Tablet Dispenser Mounting (Fig. #5)

1. Locate Tablet Dispenser so its bottom is 15" (38 cm.) above the top of the Purasan discharge line or vented loop. **IMPORTANT:** 1/4" tube #2 (Figs. #1 and #2) must be a downward run to Purasan tank with no loops, kinks or upward turns. If routing the halogen solution back into the macerator portion of the head (Crown Head, Crown Head II, Atlantes), the tablet dispenser must be situated between 4" and 12" higher than the toilet bowl.
2. Locate Tablet Dispenser where it will be easily accessible and the water level can be observed

during flushing. **NOTE: Tubing that connects Tablet Dispenser to Purasan tank or to toilet is 6' (1.8m) in length.**

3. Attach to wall or suitable structure using 1/4" (6mm) bolt (Fig. #5).

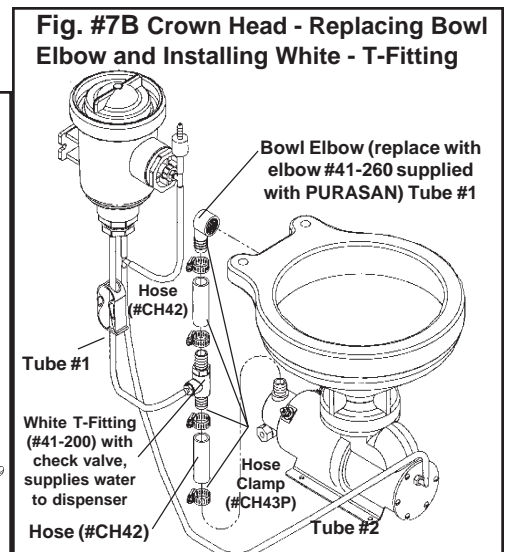
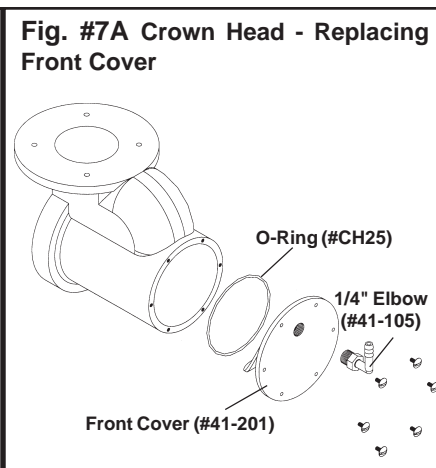
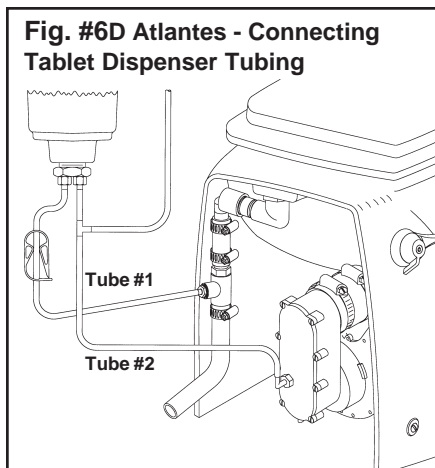
IMPORTANT: Do not load Tablet Cartridge into Tablet Dispenser at this time. Load Tablet Cartridge after completing Start Up procedure.

D. Toilet Connections:

Note that when connecting the Purasan to a marine toilet, the existing elbow at the rear of the toilet bowl must be removed and replaced with the replacement bowl elbow #41-260, supplied with the Purasan.

Atlantes (Figs #1, #6A, #6B, #6C and #6D):

1. Turn off power to toilet.
2. Close intake and discharge seacocks and drain water from toilet system.
3. Slide toilet forward to gain access to back of toilet.
4. Disconnect intake hose from bowl elbow.
5. Remove existing bowl elbow.
6. Remove existing discharge pump cover from toilet.
7. Install new O-Ring (#AM141) on the new discharge pump cover (#41-211).
8. Install new discharge pump cover (#41-211). Tighten screws as shown. Do not over tighten. See Figs. #6A and #6B.
9. Install new bowl elbow (#41-260), Fig. #6C.
10. Install a 4" length (10.2cm) of 3/4" white hose (#CH42) to new bowl elbow (#41-260) using one hose clamp (#CH43P), Fig. #6C.
11. Install White "T" Fitting (#41-200) to the hose



using the other hose clamp.

12. Reattach intake hose, removed in step 4, to the White "T" Fitting (#41-200).

TIP: Do not set the toilet back in place until system is operational and checked for leaks.

Discard any deodorant systems presently being used.

Crown Head and Crown Head II (Figs. #2, #7A and #7B):

1. Turn off power to toilet.
2. Close intake and discharge seacocks and drain water from toilet system.
3. Remove shroud from base of toilet.
4. Crown Head toilets - remove hose from intake pump to bowl elbow.
Crown Head II toilets - disconnect intake hose from bowl elbow.
5. Remove existing bowl elbow.
6. Remove existing front cover (Fig. #7A).
7. Install new bowl elbow (#41-260). See Fig. #7B.
8. Install one of the 4" lengths of hose (#CH42) to new bowl elbow (#41-260) using one of the hose clamps (#CH43P) - provided.
9. Install White "T" Fitting (#41-200) to the hose using the other hose clamp.
10. Crown Head toilets: Attach the second of the 4" lengths of hose to White "T" Fitting and the other end to the intake pump.
Crown Head II toilets: Reattach intake hose, removed in step 4, to White "T" Fitting.
11. Install new O-Ring (#CH25) on new front cover (#41-201). See Fig. #7A.
12. Install 1/4" elbow (#41-105) into front cover (#41-201).
13. Install new front cover (#41-201). See Fig. #7A.

TIP: Do not reinstall the Crown Head II toilet shroud until system is operational and checked for leaks.

Other electric marine toilets, including Raritan SeaEra:

If the toilet has an integral seawater pump, similarly to the Crown Head, follow plumbing connections for the Crown Head. If the toilet has a remotely-mounted seawater pump as in the Crown Head II or Atlantes toilets, follow the directions for either the Crown Head II or the Atlantes toilet.

PLUMBING

WARNING: Hazard of flooding. Below waterline installations must include a vented loop with the top of loop above the waterline at maximum heel

to prevent back siphoning. See toilet and vented loop manufacturers instructions for installation requirements including the installation height above waterline. See Figs. #1 and #2. Double clamp all hose fittings below waterline.

Treatment Tank:

Use only high quality, smooth interior 1 1/2" (38mm) I.D. sanitation hose to avoid odor problems, available from Raritan by the foot (#SH), when connecting toilet to Treatment Unit. **DO NOT USE METAL PIPE OR WIRE REINFORCED HOSE.**

1. Apply nonpermanent thread sealing compound or tape to screw-in hose fitting (31-121) and intake plug (#31-122).
2. Screw one hose fitting (#31-121) into discharge elbow (#31-120).
3. Screw other hose fitting (#31-121) into one of the intake ports at the side of Treatment Unit.
4. Screw intake plug (#31-122) into intake port that will not be used.
5. Glue Discharge Elbow (#31-120) to discharge port at the top of Treatment Unit with PVC cement and allow to set.

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

6. Connect discharge hose from toilet to intake port on the side of Treatment Unit.
7. Connect hose from discharge port at the top of Treatment Unit through a vented loop to the holding tank or thru hull fitting (Figs. #1 or #2).

IMPORTANT: A vented loop must be installed between the Purasan Treatment Unit and the thru hull fitting to protect against back siphoning and maintain residual water in the toilet bowl for cleaning. The minimum height of the vented loop must be above the waterline at the greatest angle of heel or at a height equal to the top of the toilet, which ever is greater.

Tablet Dispenser:

IMPORTANT: 1/4" Tube #2 (Figs. #1 and #2) must be a downward run to toilet with no loops, kinks or upward turns.

1. Connect 1/4" tubing from the installed Atlantes Discharge Pump Cover (#41-211) or Crown Head Front Cover (#41-201) to black "T" fitting (#41-

115) with the red cap on the Tablet Dispenser (Tube #2, Figs. #1, #2 and #5).

2. Slide flow metering clamp onto remaining piece of tubing (Tube #1). See Figs. #1 and #2.
3. Install tubing with flow metering clamp on 1/4" nipple on white "T" fitting (#41-200) and the intake of the Tablet Dispenser (black cap). See Figs. #1, #2 and #5.

WIRING

WARNING: Hazard of electrical shock and fire.

- Turn power off before proceeding
- Use only recommended conductor wire gauge and fuse/circuit breaker - see Specifications Table 1.

NOTE: Raritan recommends that the electric toilet be installed for single touch operation. ATLANTES INSTALLATIONS: Flush lever or touch pad activates the Purasan when the toilet is flushed or the switch panel flushes the Atlantes and activates the Purasan. CROWN HEAD II AND CROWN HEAD INSTALLATIONS: The Switch Panel flushes the toilet and activates the Purasan. See Dual Installations section for two toilets.

A. Switch Panel (#41-350)

Wire switch panel cable to Circuit Board located on Purasan Treatment Unit (Fig. #8 and #9).

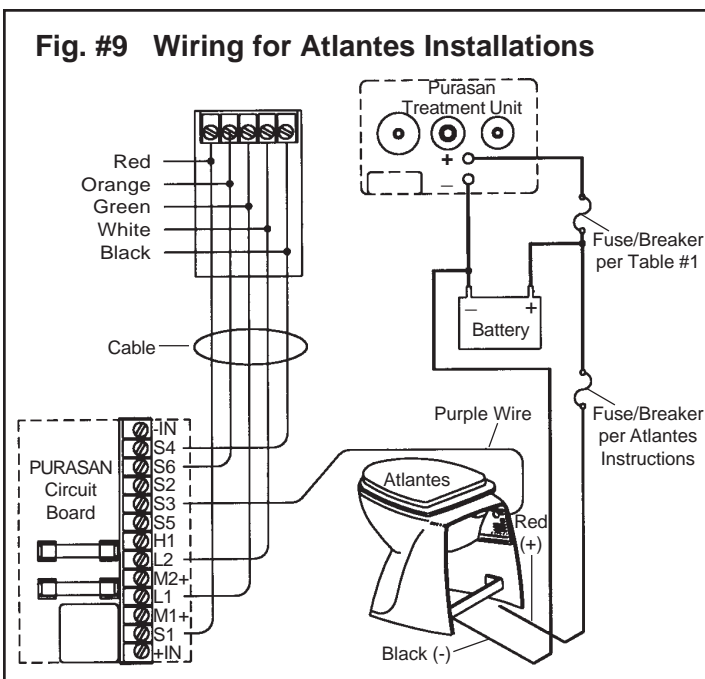
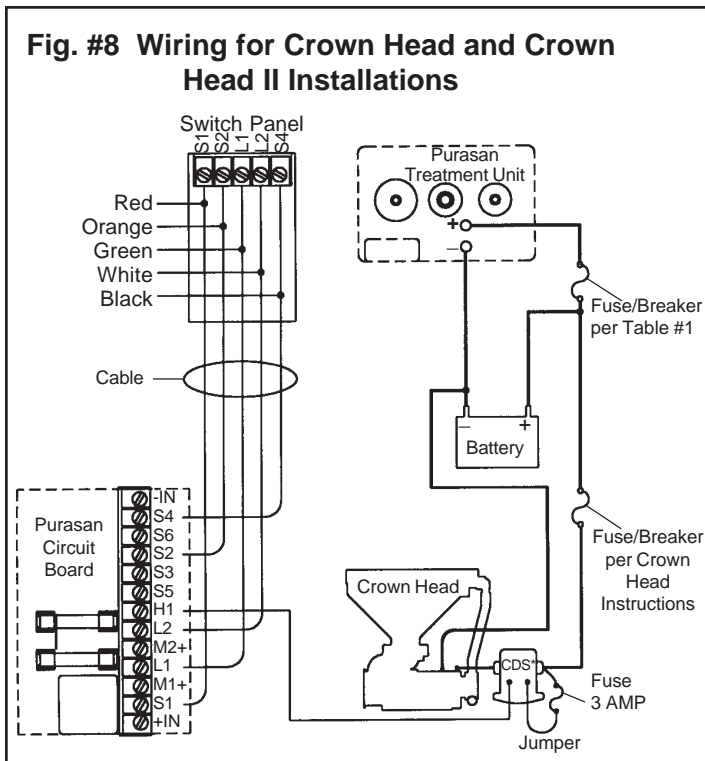
B. Toilet Wiring

Atlantes:

- a. To activate Purasan when toilet is flushed by pressing the flush handle (Atlantes A5 model) or the Atlantes Wall Switch Touch Pad (Atlantes A6 Model). Use 16 AWG (1.5mm²) wire, connect yellow wire located in the back of Atlantes to Purasan Circuit Board terminal S2 (Fig. #9).
- b. To flush toilet (Atlantes A5 or A6 Model) by pressing "Push to Cycle" button on Purasan Switch Panel, use 16 AWG (1.5mm²) wire to connect purple wire located in the back of Atlantes to Purasan Circuit Board terminal S3 (Fig. #9).

Crown Head and Crown Head II: Installation of a solenoid/relay is required.

* Specify Voltage (12, 24 and 32V DC)



INSTALLING AND OPERATING TWO TOILETS WITH A PURASAN® (Dual Installation)

CAUTION: Use only a solenoid/relay with an isolated coil such as the Raritan #CDS* (failure to do so will damage Circuit Board).

Run 16 AWG (1.5mm²) wire from terminal H1 on Circuit Board to one of the relay terminals. Run a wire from the other relay terminal to Positive supply from battery. Install a 3 amp fuse in positive wire (Fig. #8).

C. Treatment Unit

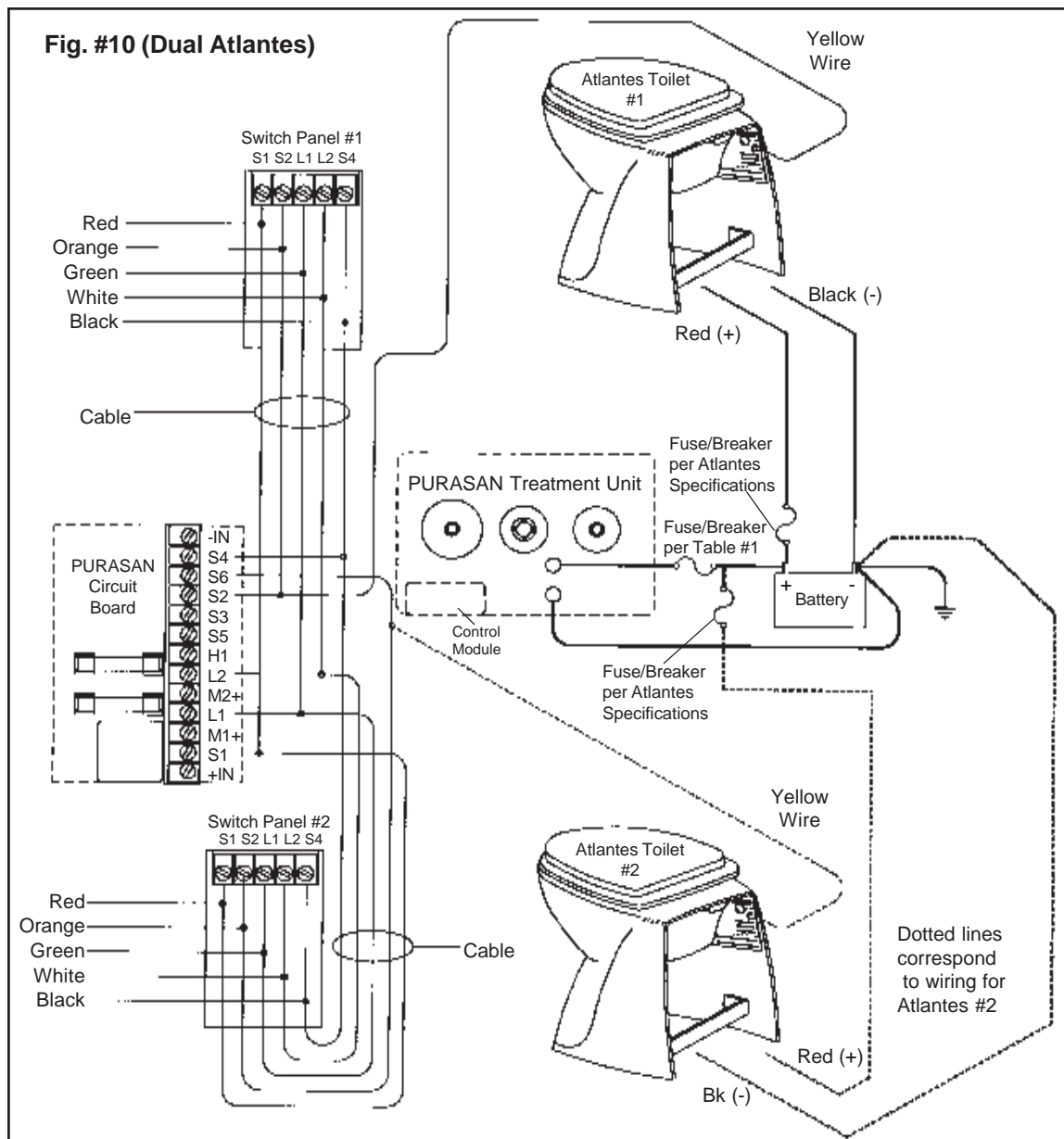
1. Be sure wires from Switch Panel are correctly wired according to Figs. #8 and #9.
2. Determine proper size wire and fuse/breaker needed from Specification Table 1.
3. Wire Purasan Treatment Unit following Figs. #8 and #9.

START UP

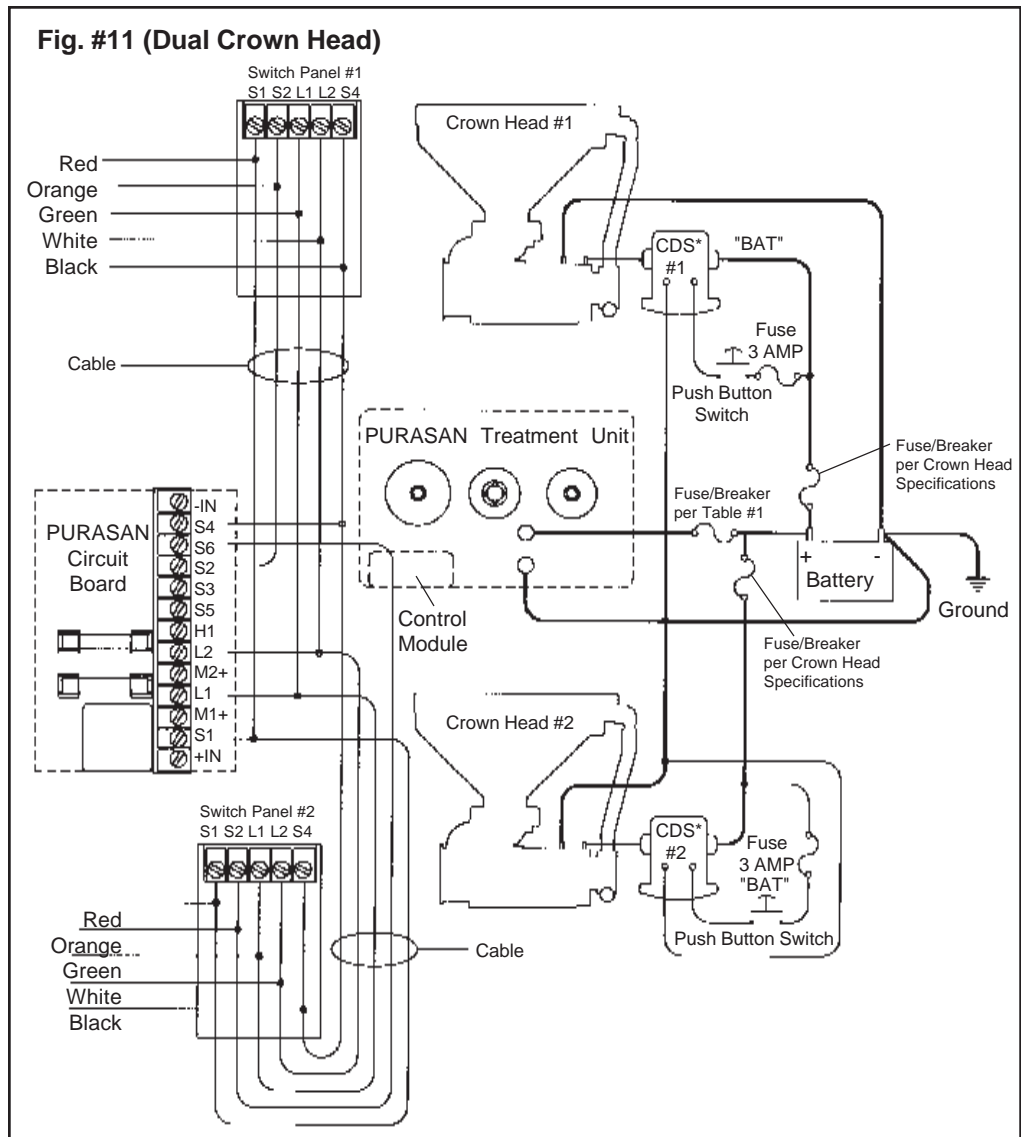
IMPORTANT:

- Do not load Tablet Cartridge into Dispenser until system is powered and operational.
 - Do Not Operate Purasan unless Treatment Unit is filled with water.
1. Remove Crossover Plug (#31-104C) from Treatment Unit tower. Pour 3 gallons (11.5 liters) of water into Treatment Unit. Replace Crossover Plug (#31-104C) and O-Ring (#31-105).
 2. Open seacocks.
 3. Turn on power to unit.

* Specify Voltage (12, 24 and 32 VDC)



4. Fill toilet bowl half full with water from a bucket before beginning.
5. Close metering clamp completely, then open slightly.
6. Flush toilet. Check water level in Tablet Dispenser during flush cycle. Water level should rise to waterline on Tablet Dispenser while toilet is flushed, then drain out.
7. Adjust clamp until water reaches the line; opening clamp allows more water into Tablet Dispenser. Flush toilet each time clamp adjustment is changed to be sure water continues to be at the proper level.
8. Load Tablet Cartridge (see Replacing Purasan Tablet Cartridge).



A Purasan can be connected to two toilets within six feet (1.85 meters) of the Treatment Unit to reduce pressure requirements of moving waste through the system and to decrease the possibility of untreated sewage remaining in the lines. In addition a Purasan

TROUBLESHOOTING

WARNING: Once the Tablet dispenser is filled with water it contains a very strong halogen solution, always use protective gloves and ventilate area well to work on tablet dispenser. Before doing any maintenance or repairs, follow WINTERIZING/STORAGE, Procedures #1 - #8.

SYSTEM COMPONENTS

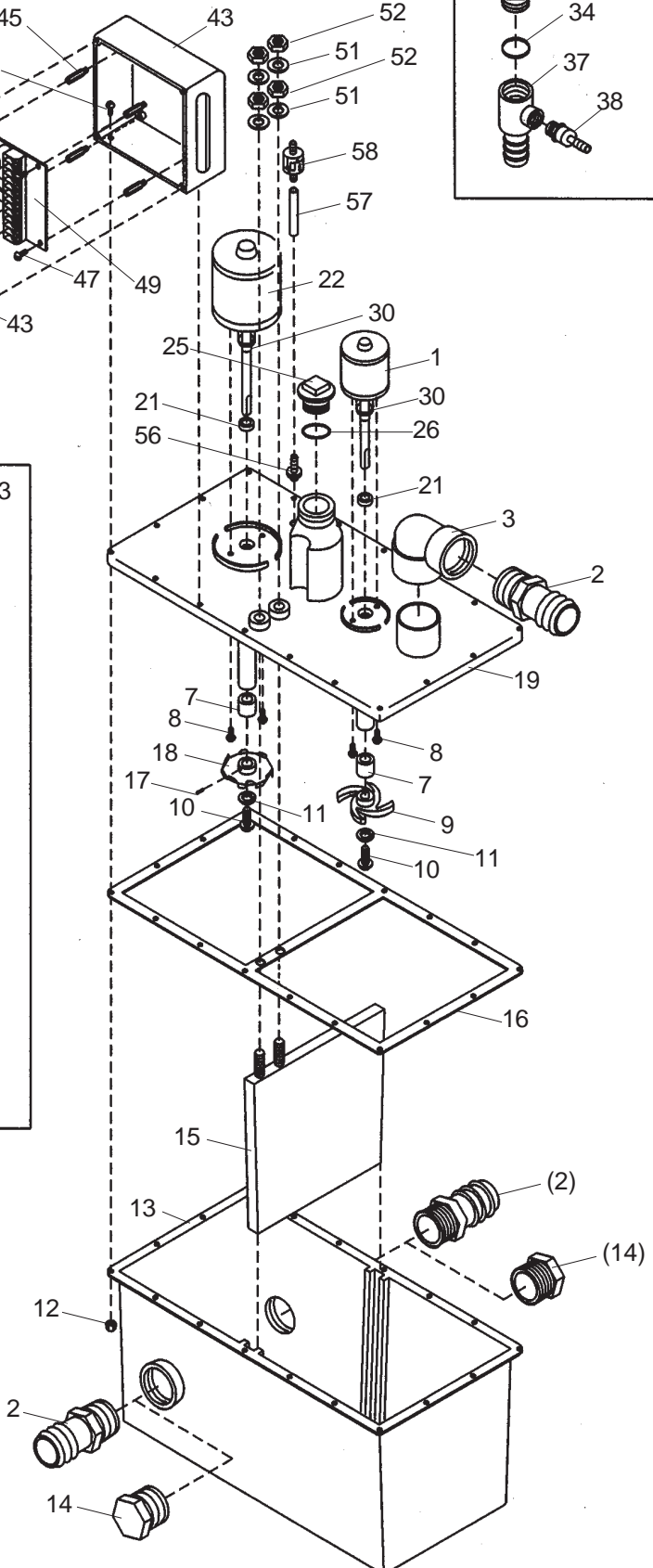
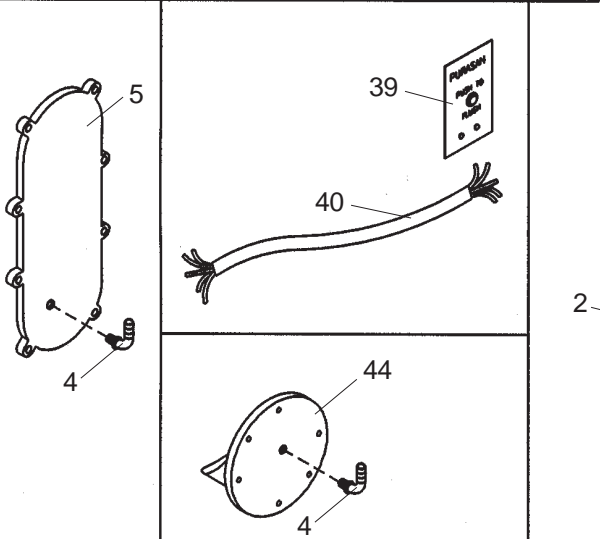
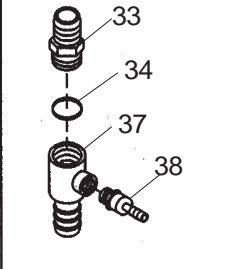
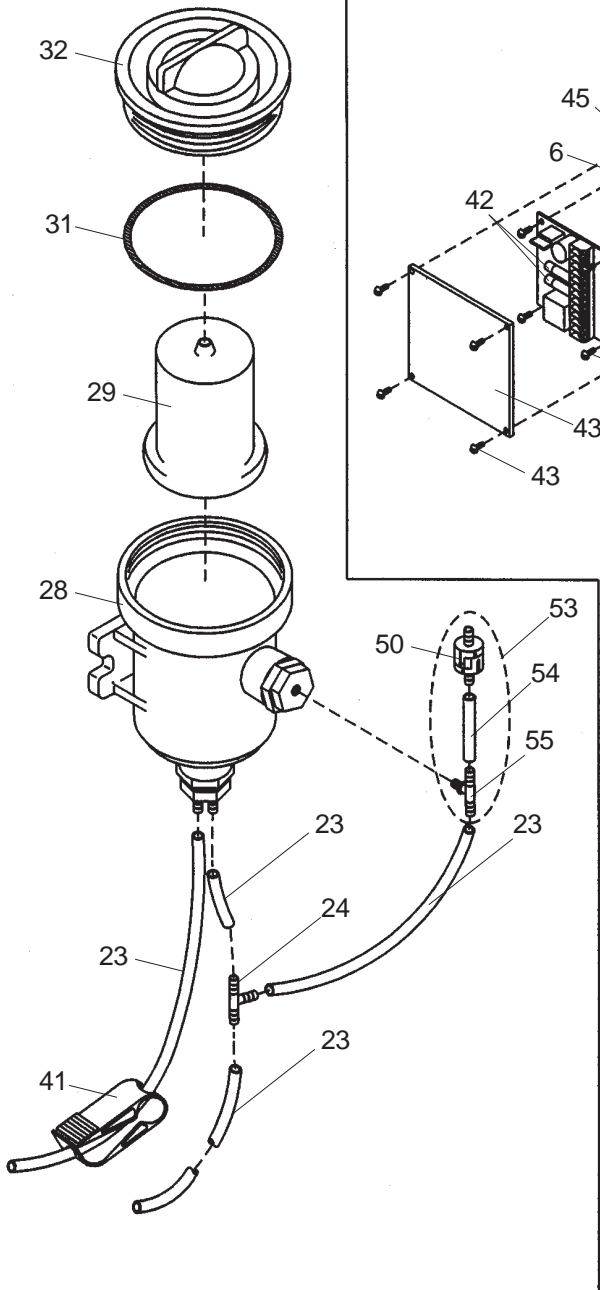
PROBLEM	POSSIBLE CAUSE	CORRECTION
Purasan Dual Control components necessary for second toilet installation:	1. Clogged check valve (see Fig #41-200)	1a. Clean or replace check valve
1. Switch Panel Complete (#41-350)	2. Clogged intake fitting to dispenser	1b. Clean or replace intake plug assembly
2. Tablet Dispenser Complete (#41-100) with tubing	1c. Intake pump problem	1c. See Crown Head, Crown Head II or Atlantes manual.
2. Overflow/water level too high	1d. Intake tubing clogged	1d. Clean line.
3. Tablet Cartridge (#41-135)	2a. Metering clamp not adjusted properly	2a. Adjust clamp (see start up)
4. Control Cable (#41-355)	2b. Clogged discharge fitting in tablet dispenser	2b. Clean or replace plug assembly
3. Toilet Adapter Kits, Crown and Crown II (#41-251) or Atlantes (#41-252)	2c. Fitting to front cover clogged	2c. Clean or replace fitting on front cover
	2d. Clogged or defective check valve (#41-111)	2d. Clean or replace
	3a. Check fuses	3a. Check fuses
	3b. Replace switch panel	3b. Replace switch panel

6. White T-Fitting (#41-200)

IMPORTANT: A solenoid relay (#CDS*) and

41-100

41-200



PARTS LIST OF PURASAN

<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 V DC				
1	34-102AW	Mixer Motor 2 1/2" Dia. 32 V DC				
2	31-121	Hose Fitting (2)				
3	31-120	Discharge Elbow 90°				
4	41-105	90° elbow, 1/4" insert x 1/4" NPT				
5	41-211	Atlantes Discharge Pump Cover (Modified AM140)				
6	31-106	Cover Hold down Bolt, 10-32 x 7/8", S/S(18)			BLANK FOR CUTTING OUT TEMPLATE ON REVERSE SIDE	
7	31-103	Motor Shaft Bushing (2)				
8	31-113-3	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	Cover Hold down Nut, 10-32 (18)				
13	31-115	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	31-101W	Treatment Cover				
21	31-102	Motor Shaft Seal (2)				
22	33-101AW	Macerator Motor 12 V DC				
22	34-101AW	Macerator Motor 24, 32 V DC				
23	31-305	1/4" I.D. Tubing				
24	41-115	Union Tee 1/4" Barbed				
25	31-104C	Crossover Plug				
26	31-105	O-Ring				
27	41-125	Bottom Plug Assy.				
28	41-130	Dispenser Body (PVC)				
29	41-135	Cartridge (refill) PURASAN Tablets				
Note: Cartridge must be shipped in a separate container, call 856-825-4900.						
30	31-101-2	Slinger (2)	50	41-110		Vent Kit for Tablet Dispenser (Incl. #53, 54, & 55)
31	RWS5	"O" Ring	51	M31		#14 Brass Flat Washer (4)
32	41-131	Dispenser Cap	52	M30		1/4"-20 Brass Nut (4)
33	31-307D1	Outlet Adapter		41-100		Tablet Dispenser Complete (less cartridge)
34	31-307E	O Ring		41-200	T-Fitting (Incl. #33, 34, 37 &38)	
37	31-307D	T-Check Valve Body		42-1000	Treatment Unit Complete 12 V DC	
38	41-205	Check Valve Assy.		43-1000	Treatment Unit Complete 24 V DC	
39	41-350	Switch Panel Complete		44-1000	Treatment Unit Complete 32 V DC	
40	41-355	Control Cable		CDS*	Continuous Duty Solenoid	
41	31-304C	Flow Metering Clamp		PSTDC	Purasan Dual Control	
42	32-218	Fuse (1) MDL 6 1/4 (12 V DC)		PSTDC-01	Purasan Dual Control (Atlantes Head)	
	42-220	Fuse (1) MDL 12 (12 V DC)		53	41-111	Check Valve
	32-218	Fuse (2) MDL 6 1/4 (24 V DC)		54	31-305	2" (5cm) long 1/4" I.D. Tubing
	34-218	Fuse (2) MDL 5 (32 V DC)		55	41-106	"T" Fitting
43	41-301	Control Box w/Cover and Screws		F087	Screw: 4 x 1/2 phil oval T-A 18-8 S/S (not shown)	
44	41-201	Front Cover (Modified - CH18A)		CH25	Front Cover O-ring (not shown)	
45	F41-312	Standoff (4)		CH42	Hose, 3/4 reinforced PVC high gloss white (not shown)	
47	CH46VT	Circuit Board Mounting Screw (4)		CH43P	Nylon hose clamp 1 1/32 (not shown)	
49	42-303	Circuit Board, 12 V DC		AM141	Atlantes Cover O-Ring (not shown)	
	43-303	Circuit Board, 24 V DC		41-260	Bowl Elbow with restrictor (not shown)	
	44-303	Circuit Board. 32 V DC				
	42-300	Electronic Control Complete*, 12 V DC				
	43-300	Electronic Control*, 24 V DC				
	44-300	Electronic Control*, 32 V DC				

*Incl. #43, 45, 47, 49

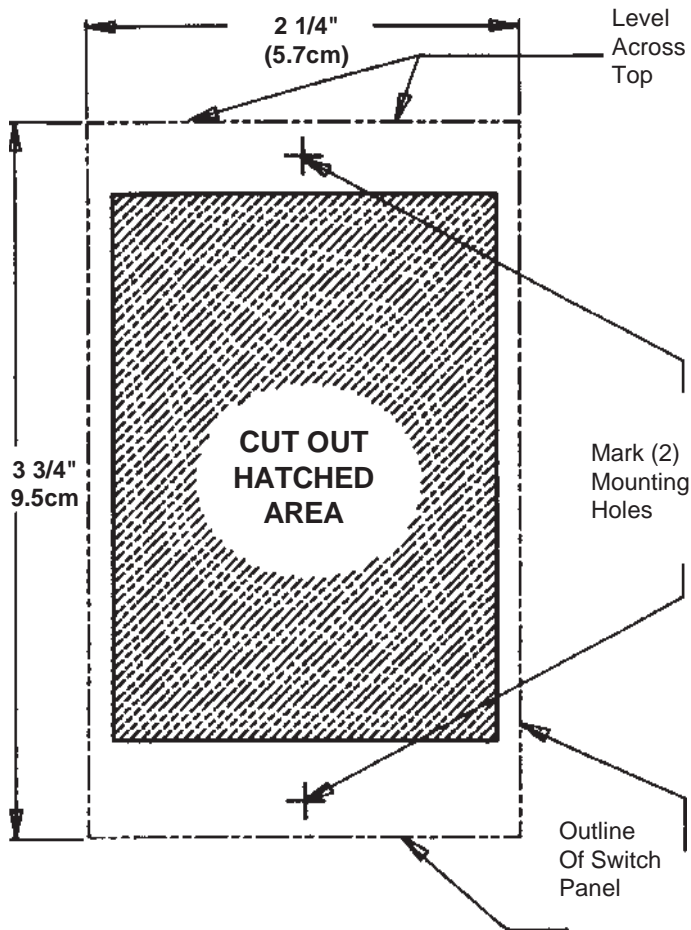


TABLE #1 - SPECIFICATIONS

ELECTRICAL:							
Voltage Nominal	12VDC	24VDC	32VDC				
Voltage Minimal	11.5V	23V	30.5V				
Power	.3 amp hr	.3 amp hr.	.3 amp hr.				
Current	10 A	8 A	8 A				
Fuse/Brkr	20A	15A	15A				
Max Amperage:							
Solid Reduction Motor	5	4	4				
Fuse 2; Type MDL	12	6 1/4	5				
Mixer Motor amp	5	4	4				
Fuse 1; Type MDL	6 1/4	6 1/4	5				
WIRE SIZES:							
	Distance from source to unit and back to source [feet (m)]						
UNITS	10'(3.1)	15'(4.6)	20'(6.1)	25'(7.2)	30'(9.2)	40'(12.2)	50'(15.2)
Voltage	Minimum recommended conductor wire AWG (mm ²) for 3% voltage drop						
12	12(4.0)	12(4.0)	10(6.0)	10(6.0)	10(6.0)	8(10.0)	6(16.0)
24	14(2.5)	14(2.5)	14(2.5)	12(4.0)	12(4.0)	10(6.0)	10(6.0)
32	14(2.5)	14(2.5)	14(2.5)	14(2.5)	14(2.5)	12(4.0)	12(4.0)
NOTE: Recommended conductor sizes based on 105°C rated insulation. Refer to ABYC Standards for other insulation ratings.							
ENVIRONMENT: Max. Ambient Temp. - 120° F - 49° C							
Water - Fresh, Brackish or salt							
DESIGN CAPACITY: 576 gallons/day							
MSD TYPE: Type I, U.S.C.G. certified for vessels < 65' For inspected vessel, contact factory.							

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.
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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