



Models EST12, EST24 and EST32 Installation and Maintenance 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 SHOCK AND FIRE - Always use recommended fuse/circuit breaker and wire size.



WARNING: HAZARD OF FLOODING - Always shut off seacocks before leaving boat unattended. Double clamp all hose fittings below the waterline, check hose clamps frequently for integrity.



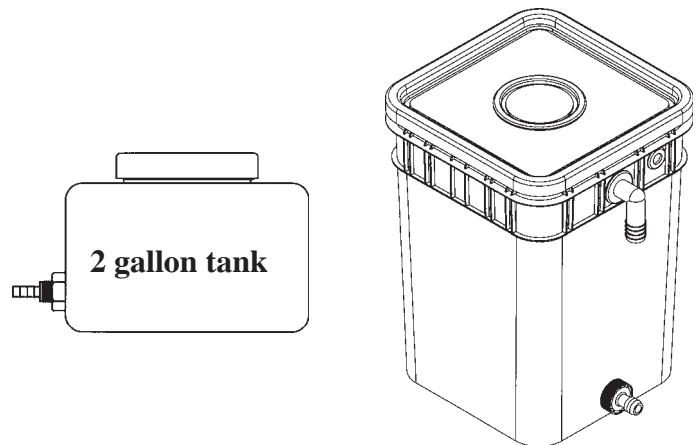
WARNING: *The electro scan operates on an Electrochemical principle. Introduction of any substance other than salt water, human waste, Raritan Concentrate, Raritan C.P. or toilet tissue may cause heat build up and extensive damage. If any other substance is introduced by accident, the electro scan must not be turned on until entire system is flushed out with water.*



electro scan with control



optional salt feed systems



2 gallon tank

4 gallon tank

electro scan™ is a U. S. Coast Guard Certified Type I Marine Sanitation Device for use on inspected and uninspected vessels 65 feet (19.7 Meters) and under. It must be operated within areas that are not declared a Federal No Discharge Zone (NDZ) by the U.S. Environmental Protection Agency (EPA). This is applicable for all U.S. territorial waters inside the three mile limit. Other countries - check with local authorities.

electro scan is designed for recreational use and accommodates most marine toilets* it can be used with one or, in some cases, two toilets. The electro scan is available in 12, 24 or 32 V DC.

The system consists of a Control Unit, LCD Display, System Status Panel and Treatment Tank. A salt feed system (optional) **must** be utilized if operating in fresh or brackish water.

* for use with the VacuFlush® marine toilet manufactured by Sealand Technology, Inc., (See Application note L286)
VacuFlush® is a registered trademark of Sealand Technology, Inc.
Lectra/San® is a trademark of Exceltec. electroscan™ is a trademark of Raritan Engineering Co., Inc., patent pending

(depends on installation chosen)

Single Button operation -

Both toilet and electro scan are operated by one of the following options:

Option #1: System status panel Touch Pad

"Start/Stop" button activates both the toilet and treatment cycle. Button may be pressed as often as necessary to flush toilet until system status green light begins to blink 35 seconds after activation.

Note: Toilet flush time is factory pre-set for 10 seconds and is adjustable, see "setting toilet flush time"

Option #2: Toilet Push Button -

Flushing toilet will activate treatment cycle. Flush toilet as often as necessary until system status green light begins to blink.

Independent Button operation -

"Start/Stop" button must be pressed before toilet is flushed. Flush toilet as often as necessary until system status green light begins to blink 35 seconds after activation.

To Stop Treatment Cycle -

Pressing "Start/Stop" again stops the treatment cycle, If wired per option #1 it will also stop the toilet from flushing.

Notes:

- 1) Total flush volume must not exceed 1.5 gallons (5.7 liters) per cycle.
- 2) Operating with red light for extended periods will damage electrode and void warranty

How it works -

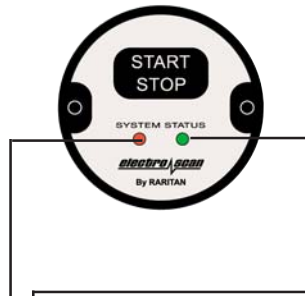
Each time the toilet is flushed an equal amount of previously treated waste is discharged. The electro scan does not pump waste out. The flushing action of the toilet moves the waste through the electro scan.

The first chamber macerates to reduce particle size. The second chamber mixes to ensure uniform treatment of contents. When the tank is full with salt water the electrode plates, when electricity is applied, generate bactericide in both chambers.

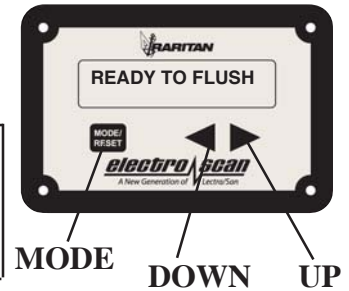
When first activated both motors come on and run for the entire cycle. The user then has 35 seconds to flush toilet. After 35 seconds the electrode is energized to begin the treatment process which lasts for approximately 2 minutes.

Note: If the green light is not flashing during treatment, the cycle has been automatically extended to ensure proper treatment. The unit MUST not be operated in extended cycle for long periods as damage to electrodes will occur. Immediately attempt to determine the cause and fix a red light condition.

System Status Panel



LCD Display

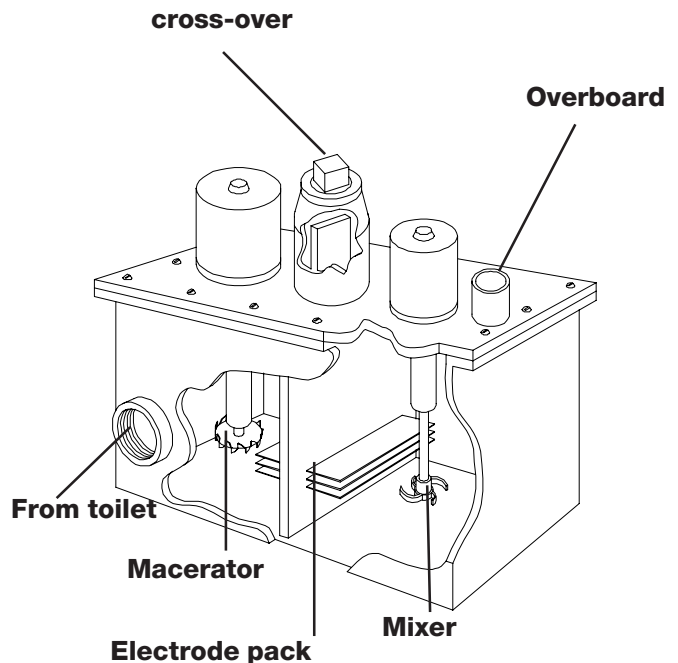


Solid Green- OK to flush toilet

Blinking Green-Normal operation, do not flush toilet

Blinking red- Check warning on display

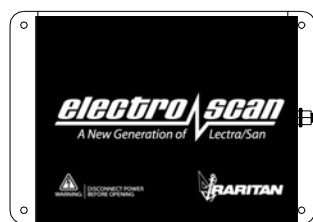
Solid red- Check error on display, Push and hold mode button to clear



The **electro scan** has four basic components:

- **System Status Panel** - Begins treatment cycle and if wired flushes an electric toilet at the same time.
- **Control Unit** – Serves as the system’s central control. The unit contains three boards: **Main** (contains the power and logic components), **Microprocessor/Memory** (contains system program and stores operational data) and **I/O** (where connections are made for accessories).
- **Treatment Tank** - Consists of two chambers and electrode pack that temporarily converts saltwater into a powerful bactericide for the duration of the treatment cycle.
- **LCD Display** – Provides information during treatment cycle and summary of historical data. Also contains RESET button if system error occurs.

Control Unit



System Status Panel



Setting time and date on LCD Display:

- Scroll to "time screen" using < and > keys when unit is not in cycle.
- Hold “mode” button until digits flash
- use < and > button to set hour in military time
- Push “mode” again for next digits (minutes)
- Use < and > to set minutes
- Repeat above until time and date are set
- Use < or > to move to next screen when no digits are flashing.

LCD Display



Setting toilet Flush time on LCD Display:

- Scroll to "flushtime" screen using < and > keys when unit is not in cycle.
- Hold ‘mode’ button until digits flash
- Use < or > keys to set time in seconds for toilet 1
- Repeat above for toilet 2 (flushtime 2).

Toilet only flush:

Use only for servicing, storage or recommissioning. It is illegal to discharge untreated sewage in U.S. waters.

- Scroll to Flushtime (1 or 2) screen using < or > keys when unit is not in cycle.
- Hold "mode" button and press < or > key.
- Toilet will flush for set time.

LCD Display



Most operation and troubleshooting information is displayed on the LCD display panel.

Following is the description of display screens and what they mean.

RED LED blinks for warning and is solid for errors

Display	Panel LEDs		Status
	Red	Green	
READY TO FLUSH	<input type="radio"/>	<input type="radio"/>	Previous cycle ended normally Ready for next cycle
****WARNING**** VOLTAGE LOW	<input checked="" type="radio"/>	<input type="radio"/>	Previous cycle completed with low voltage, Ready for next cycle, low voltage should be corrected
****WARNING**** AMPS< 14	<input checked="" type="radio"/>	<input type="radio"/>	Previous cycle completed with low electrode amps, Ready for next cycle, low amps should be corrected
PRETREATMENT VOLTAGE= 100%	<input type="radio"/>	<input checked="" type="radio"/>	Unit is in pretreatment cycle after start, voltage displayed,
TREATMENT VOLTAGE= 100%	<input type="radio"/>	<input checked="" type="radio"/>	Unit goes to treatment cycle after pretreatment for 120 seconds, voltage and amps are displayed alternately.
TREATMENT AMPS = 15	<input type="radio"/>	<input checked="" type="radio"/>	
****WARNING**** AMP = 10	<input checked="" type="radio"/>	<input type="radio"/>	During the treatment cycle if electrode amps drop below 14, Warning is displayed, and cycle is extended up to 240 seconds
****WARNING*** VOLTAGE< 87%	<input checked="" type="radio"/>	<input type="radio"/>	During the entire cycle if voltage drops below 89% of full battery voltage, warning is displayed, cycle continues

Treatment terminates in ERROR condition for reasons listed below. To clear error condition after corrective action is taken, hold mode/reset button on display for four seconds.

*****ERROR**** LOW VOLTAGE	<input checked="" type="radio"/>	<input type="radio"/>	Voltage was less that 83% of full voltage during the cycle; check battery , connections and wire sizes.
*****ERROR***** LOW ELECTROD AMP	<input checked="" type="radio"/>	<input type="radio"/>	Electrode amps were lower than 7 amps, check salt, clean electrode with acid treatment, check all connections.
*****ERROR***** MIX MOTOR OVERLD	<input checked="" type="radio"/>	<input type="radio"/>	Mixer motor amps were high, Check for foreign material in mixer chamber, seal leaks, motor shorts
*****ERROR***** MAC MOTOR OVERLD	<input checked="" type="radio"/>	<input type="radio"/>	Macerator motor amps were high, Check for foreign material in macerator chamber, seal leaks, and motor shorts
*****ERROR***** ELECTROD OVERLD	<input checked="" type="radio"/>	<input type="radio"/>	Electrode amps were higher than 28 amps during fresh water operation, check for excessive salt, shorted electrode, wiring.
*****ERROR***** POS FUSE BLOWN	<input checked="" type="radio"/>	<input type="radio"/>	Positive/Negative fuse on I/O connection board is blown due to some external short, check toilet solenoid type, wiring to solenoid.
*****ERROR***** NEG FUSE BLOWN	<input checked="" type="radio"/>	<input type="radio"/>	Solenoid (relay) to toilet must be isolated coil type or Raritan solenoid.

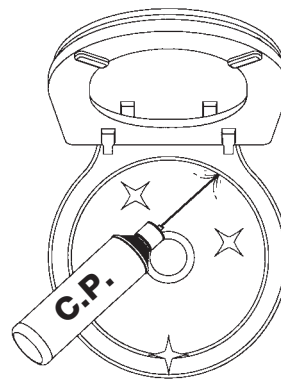
Following screens can be seen by scrolling up (>) and down (<) keys. These screens display historical summaries of the data and allow setting of clock and flush timers

TIME 00:00:00 DATE: 01/01/00	FLUSHTIME 1 05	FLUSHTIME 2 10	NUMBER OF CYCLES 00100	CYCLE W/O LST 000
NUMBER OF RESETS 00	LOW AMP 14-18 000	LOW AMPS 7-14 000	LOW AMP SHUT- DOWN 000	LOW VOLTS < 90% 05
LOW VOLT < 83% 01	LOW VOLT SHUTDOWN 05	MIN TEMPERATURE 20	MAX TEMPERATURE 90	

Cleaning Instructions

IMPORTANT: Do not use bowl cleaners that contain ammonia, ethyl acetate, phosphoric acid or concentrated chlorine bleach. These will cause damage to treatment system. C.P. is the only toilet bowl cleaner recommended by Raritan.

Using Raritan's C.P. Cleans Potties, a bio-enzymatic toilet bowl cleaner, will keep the bowl clean and fresh smelling and won't damage the treatment system.



Recommended Visual Inspection

- ✓ Leaks at hose connections
- ✓ Hose clamps
- ✓ Condition of hoses
- ✓ Seacocks
- ✓ Condition of wires and connections

Treatment/Electrode cleaning

Note: Cleaning is recommended every **SIX MONTHS** or if red light and warning for low electrode amps are always on during treatment cycle.

1. Activate the electro scan and flush toilet several times, allowing all waste to be treated.
2. Turn off water supply and flush toilet as dry as possible.

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

3. Turn off power and disconnect wires to electro scan.

WARNING: electro scan must not be activated while muriatic acid solution is in the system.

4. In plastic bucket combine 1.5 pints (.852 liters) of muriatic acid with 3 gallons (13.635 liters) of fresh water.
5. Carefully pour solution into the toilet and flush until bowl is as dry as possible.
6. Pour one gallon (3.8 liters) of additional fresh water into bowl to dilute any acid remaining.
7. Allow to stand for a **minimum** of 45 minutes.
8. Turn on water supply and flush a minimum of 10 gallons (38.0 liters) of water to dilute and discharge muriatic acid solution.

(see section OPERATION Toilet only flush)

9. Reconnect wires and restore power to electro scan.

Storage

Short Term - If system will not be used for a week, flush toilet and run treatment cycle several times.

Long Term - If system will not be used for several weeks, flush toilet and run treatment cycle several times. Then flush freshwater into system. Prior to use - flush toilet several times to re-fill treatment tank with ocean salinity salt water.

IMPORTANT

- **Improper winter lay up is a major cause of failure due to freezing or buildup.**

Steps

1. Flush toilet and activate electro scan several times to clean out hoses and tank.
2. Turn off water supply and flush toilet as dry as possible.

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

3. Turn off power and disconnect wires to electro scan.
4. Close seacocks.
5. Slowly open cross-over plug.

Caution: Open plug slowly as unit may be under pressure.

5. Using a pump and 3/8" tube, remove water from each side of partition in treatment tank through crossover plug.
6. Disconnect and drain hoses.

Recommissioning & Start-Up

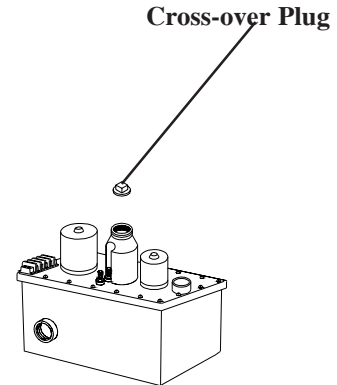
1. Reconnect hoses and open seacocks.
2. Reconnect wires and turn power on.

NOTE: electro scan treatment tank must be full with **sea water salinity** water before activating a cycle.

3. Flush toilet using one of the following methods to fill the treatment tank with salt water.
 - Scroll to Flushtime (1 or 2) screen using < or > keys when unit is not in cycle. Hold "mode" button and press < or > key. Toilet will flush for set time.
 - Separate operation - flush toilet allowing three gallons of water to pass into electro scan.
 - if toilet operates electro scan - you must disconnect power from electro scan while flushing to allow three gallons (13.6 liters) of water to pass into electro scan.

NOTE: In fresh and brackish water operation, salt content of treatment tank must be ocean water salinity prior to using unit for treatment. Ocean water salinity is 3% or approximately four ounces of salt to one gallon of water (32g/liter).

4. Inspect all connections for leaks.
5. System is ready for use.



U.S.C.G. Type I MSD Certification #159.015/0107/1

Maximum Roll/Pitch Angle: 30° Capacity: 575 Gallons Per Day

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

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

Maximum cable length for LCD Display: 16' (5M)

Maximum cable length system status panel: 25' (7.6M)

NOTES FOR WIRING:

1.	Distances are from source to unit and back to source.
2.	Recommended conductor wire minimum AWG (mm ²) for 3% voltage drop.
3.	Recommended conductor sizes are based on 105°C rated insulation. Refer to ABYC Standards for other insulation ratings.
4.	Unit is designed to work on batteries, do not use unfiltered power supply

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	60	37	6 AWG	6 AWG	4 AWG	4 AWG	2 AWG	2 AWG	1 AWG
24 VDC	50	27	10 AWG	8 AWG	6 AWG	6 AWG	6 AWG	4 AWG	4 AWG
32 VDC	50	25	12 AWG	10 AWG	10 AWG	8 AWG	8 AWG	6 AWG	6 AWG

Electronic trip Overload settings

	12 VDC Trip point /Fuse Maximum amperage	24 VDC Trip point / Fuse Maximum amperage	32 VDC Trip point/ Fuse Maximum amperage
Mixer Motor	9 amps / 35 amps 5 amp draw	9 amps /35 amps 4 amp draw	9 amps/ 35 amps 4 amp draw
Electrode Pack	35 amps /35 amps 25 amp draw	35 amps / 35 amps 22 amp draw	35 amps/ 35 amps 22 amp draw
Macerator Motor	30 amps/ 35 amps 20 amp draw	30 amps /35 amps 16 amp draw	30 amps/ 35 amps 9 amp draw

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

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

Salt Feed System Options

IMPORTANT:

A salt feed tank is required when operating system with fresh or brackish water. Operating in low salt conditions without the addition of salt will shorten life expectancy of the electrode plate and will void warranty.

The following are available to purchase:

NOT FOR USE WITH PRESSURIZED FRESH WATER TOILETS:

Two Gallon (7.6 liters) Salt Feed Tank

(Part #31-3001) - Tank must be filled with a saturated salt solution which is dispensed via a T-check valve into incoming water. One system per toilet. For use in slightly brackish water. If used in fresh water tank will only last for approximately 15 flushes of the toilet.

Four Gallon (15.2 liters) Salt Feed Tank

(Part #31-3002) - Tank must be connected to pressurized fresh water and filled with solar salt. The saturated salt solution is dispensed via a T-check into incoming water. One system per toilet. Requires manual adjustment as water salinity changes.

OK FOR USE WITH PRESSURIZED FRESH-WATER TOILETS:

Four Gallon (15.2 liters) Salt Feed Tank with Pump

(Part #32-3003 12 Volt and #33-3003 24 Volt) The tank must be connected to pressurized fresh water and filled with solar salt. The pump is controlled by the control box. This system can only be used with the electro scan. One system per electro scan. This is the most accurate system to use as the amount of saturated salt solution is controlled by the actual operating conditions of the electro scan.

Parts Included with the electro scan

- 1 1/2" hose adapters (2)
- 1 1/2" NPT Intake Plug
- 90° 1 1/2" slip PVC fitting
- Treatment tank
- system status panel, control unit, LCD display, cables
- Wiring harness between control unit and tank

Optional Parts available for purchase:

- Dual Control
- Salt Feed Systems
- Manual head sensor for automatic activation

Parts Required (not included)

- Teflon tape or non-permanent thread sealing compound
- PVC Cement
- 1 1/2" (3.8 mm) I.D. sanitation hose (rاران part # SH)
- Hose clamps
- 1" (2.54 cm) x 1" (2.54 cm) wood strips and fasteners to secure to floor (wooden frame)
- 3/4" (1.9 cm) strapping
- Electrical connections, wire and fuse or circuit breaker

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)

MOUNTING

Treatment Tank and Control Unit

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

Note: Control Unit should be located in dry location and accessible after installation

1. Locate top of treatment tank at or below discharge of toilet and within six feet (1.5 m).
2. Make and secure mounting frame to flat surface.
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.

4. Secure Control Unit within 30" of Treatment Tank

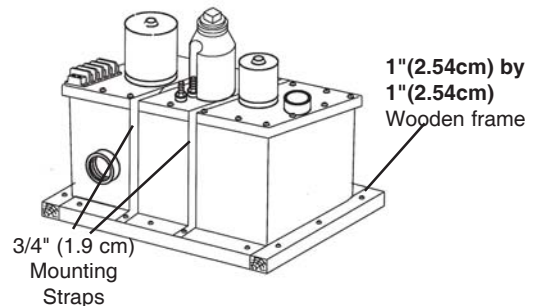
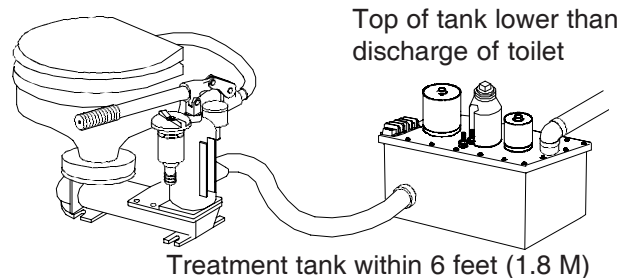
Note: Cables supplied are 16 feet (5 m)

System Status Panel

1. Locate in head compartment where system status lights will be visible.
2. Drill 1 1/2" hole for back of panel
3. Route cable between panel and Control Unit.
4. Plug cable into back of panel and Control unit.
5. Mount panel using 2 screws.

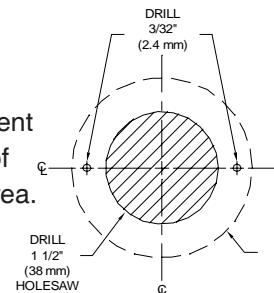
LCD Display

1. Locate in an area where display can be read if necessary.
2. Secure to wall with 2 screws.
3. Route cable between display and Control Unit.



System Status Panel

Apply a bead of nonpermanent sealant around rear edges of panel if located in shower area.



not to scale

PLUMBING

WARNING:

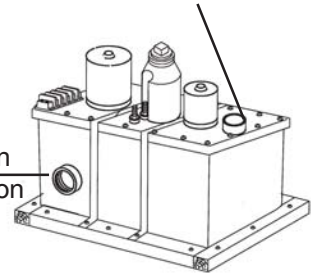
- All installations made below the waterline **MUST** be protected by installing vented loops in proper location
- Always double-clamp fittings below waterline
- Do Not use metal fittings

NOTE: Use teflon tape or non-permanent 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 inlet port.
2. Insert plug or second toilet discharge into other inlet port.
3. Determine position and glue discharge elbow to top of tank using PVC cement.
4. Connect discharge hose from elbow to thru hull fitting.

Discharge from electro scan to thru-hull

Discharge from toilet:
each side if dual installation
one side in single installation



WIRING

WARNING: Hazard of Shock and Fire

- Always use proper wire, wire connectors and fuse/circuit breaker. See Specification Chart.
- Secure wire properly.
- Do not connect other appliances to electro scan circuit.
- Make sure power is off before proceeding.
- Improper wiring can damage the Circuit Board and void warranty.

Treatment Unit

1. Determine proper wire size from wire chart on specifications page.
2. Run supply wire from source Positive (POS) to control unit and Negative (NEG) terminals on Treatment tank.
3. Fuse or circuit breaker must be installed between source and electro scan on positive wire.

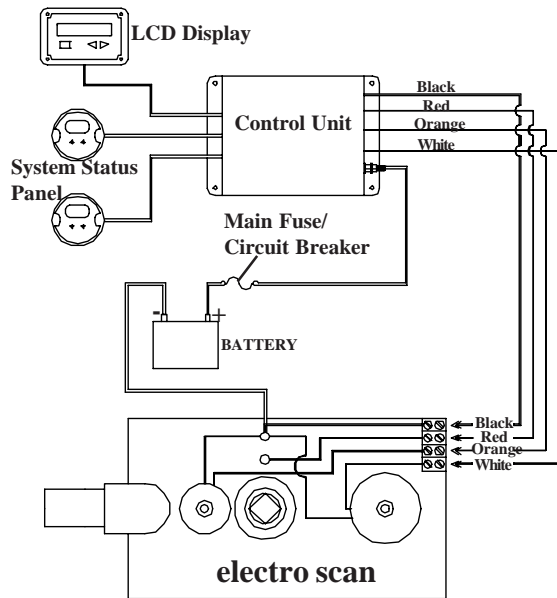
NOTE: Future access to control box is imperative. If unit is installed in an area where access will be difficult contact Raritan for instructions on mounting the control box for distance more than two feet.

System Status Panel

1. Connect cable from System Status Panel to panel 1 jack on Control Unit.
2. Secure cable strain relief.
3. Follow same procedure for panel 2 if dual installation.

LCD Display

1. Connect cable from LCD Display to display jack on the Control Unit.
2. Secure cable strain relief.



Single Button operation -

Both toilet and electro scan are operated by one of the following options:

NOTES:

- Use only a solenoid/relay with an isolated coil Raritan part number CDS* (*specify voltage)
- Connect only the solenoid/relay (CDS) coil to toilet 1 or 2 quick connect. **DO NOT** connect toilet negative and positive directly to outputs.
- Do Not connect switches or any other components to the Toilet 1 or 2 outputs or the CDS.

Option #1:

System status panel

"Start/Stop" button activates both the toilet and treatment cycle.

Note: Toilet flush time is factory pre-set at approximately 10 seconds and is adjustable.

1. Determine proper wire size from toilet manufacturer.
2. Connect wire from lug not marked "BAT" on the CDS to toilet positive.
3. From top posts of CDS connect positive and negative to toilet 1 or 2 outputs on control box utilizing .
4. Connect wire from positive source to Raritan CDS (solenoid/relay) post marked "BAT" utilizing proper fuse in positive line.
5. When "Start/Stop" button is pressed both toilet and electro scan will activate. Toilet flush time is controlled by Control box and can be adjusted - factory preset is for 10 seconds.

Option #2:

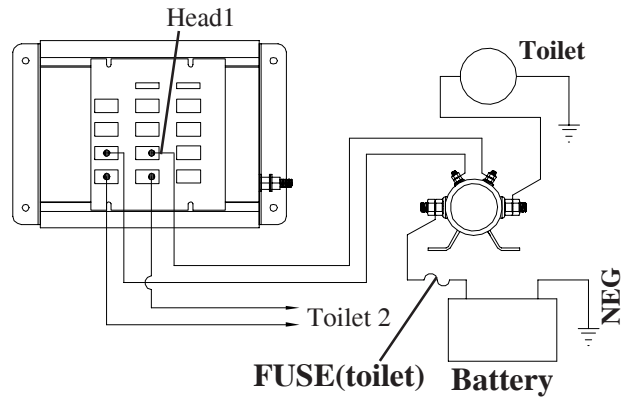
Toilet Push Button -

Flushing toilet will activate treatment cycle.

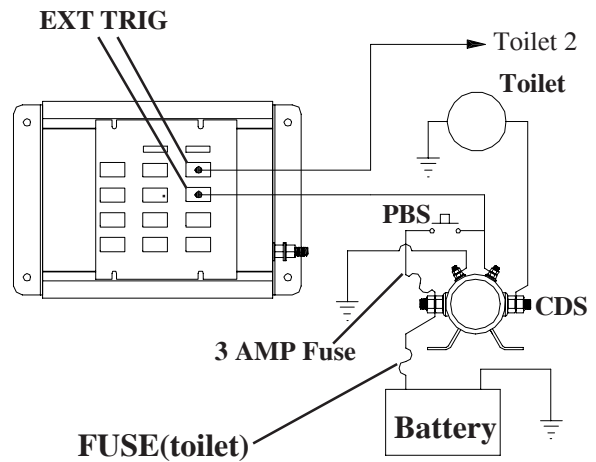
Toilet Push Button

1. Determine proper wire size from toilet manufacturer.
2. Connect wire from lug not marked "BAT" on the CDS to toilet positive.
3. Connect wire from top post of CDS to one of the ext. trig. (external trigger) outputs.
4. Connect wire from positive source to Raritan CDS (solenoid/relay) post marked "BAT" utilizing proper fuse in positive line.
5. When Toilet Push Button is pressed both toilet and electro scan will activate.

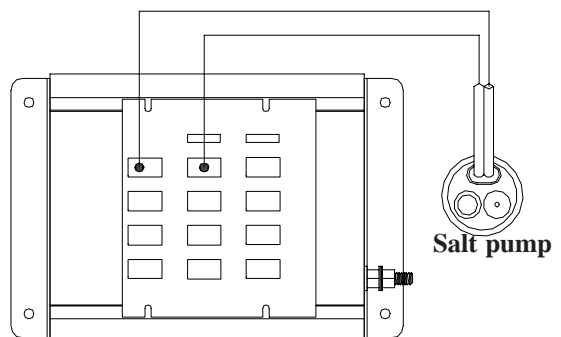
Option #1



Option #2

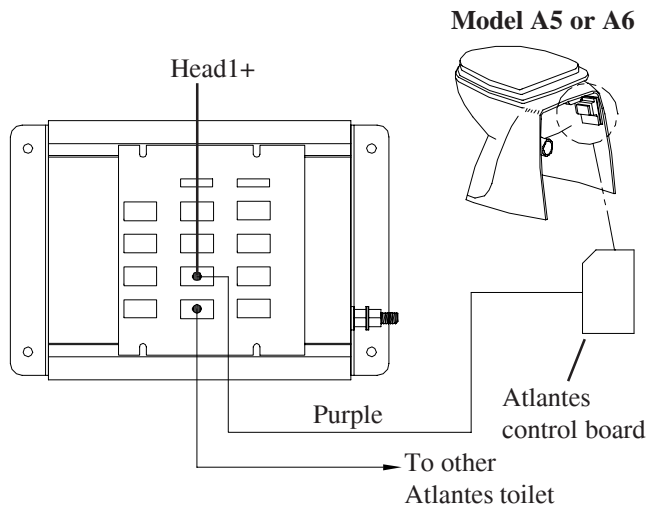


Wiring Salt feed pump

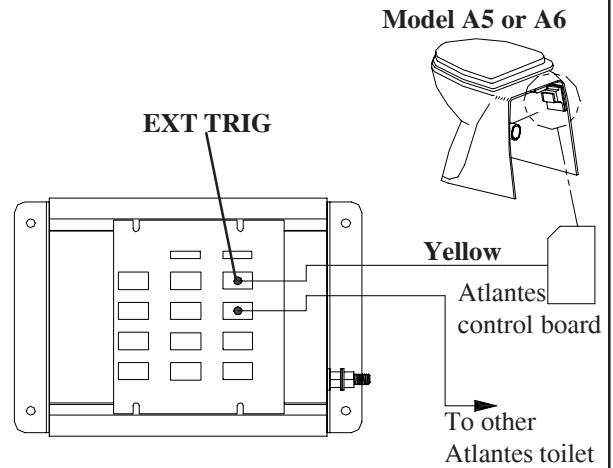


Wiring Atlantes to Electro Scan

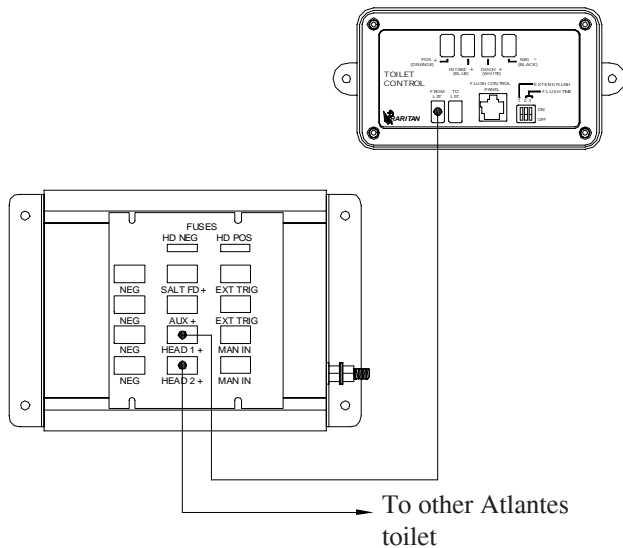
Option #1 - Activation of Atlantes from System Status Panel



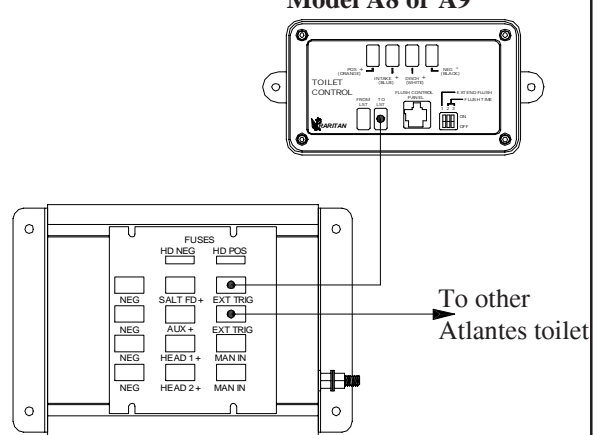
Option #2 - Activation of Electro Scan from Atlantes handle or wall switch



Atlantes Freedom Model A8 or A9



Atlantes Freedom Model A8 or A9



NOTE: If installation is done with Atlantes the flush time adjustment on the LCD display must be set to one second.

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When "Push to Flush" doesn't activate system

- **No Power to unit**
Check circuit breaker or main fuse to unit
Check wiring to unit
- **Open or loose connection**
Check and clean wiring connections
- **Display**
Check display for errors
- **Inoperative control indicator panel**
Check, replace if necessary
- **Damage to control indicator panel cable**
Check, replace if necessary
- **Extreme low voltage when unit starts**

OVERLOAD ERROR/ FUSE ERROR

- **Motor overload**
check motors for jam and reset
overheating, cool down and reset
check fuse on mother board
- **Electrode overload**
Excessive salt, shorted wiring, bad electrode.
- **POS fuse blown**
check toilet relay or salt feed pump and wiring. replace fuse
- **NEG fuse blown**
Check toilet relay or salt feed pump and wiring, replace fuse

LOW AMP ERROR OR WARNING ON DISPLAY

- **Low salt**
Add salt to system, install salt feed system if operating in fresh or brackish water
- **Dirty electrode pack**
Clean following instructions in Maintenance
- **Nonfunctioning electrode pack**
Check, replace if necessary

LOW VOLTAGE ERROR OR WARNING

- **Low voltage**
Discharged or bad battery, charge or replace
- **Drop in line voltage**
Check voltage between pos post and negative post
- **Other equipment on same circuit as Electro Scan**
Isolate Electro Scan
- **Open or loose connections**
Check and clean wire connections

Sewage Odor

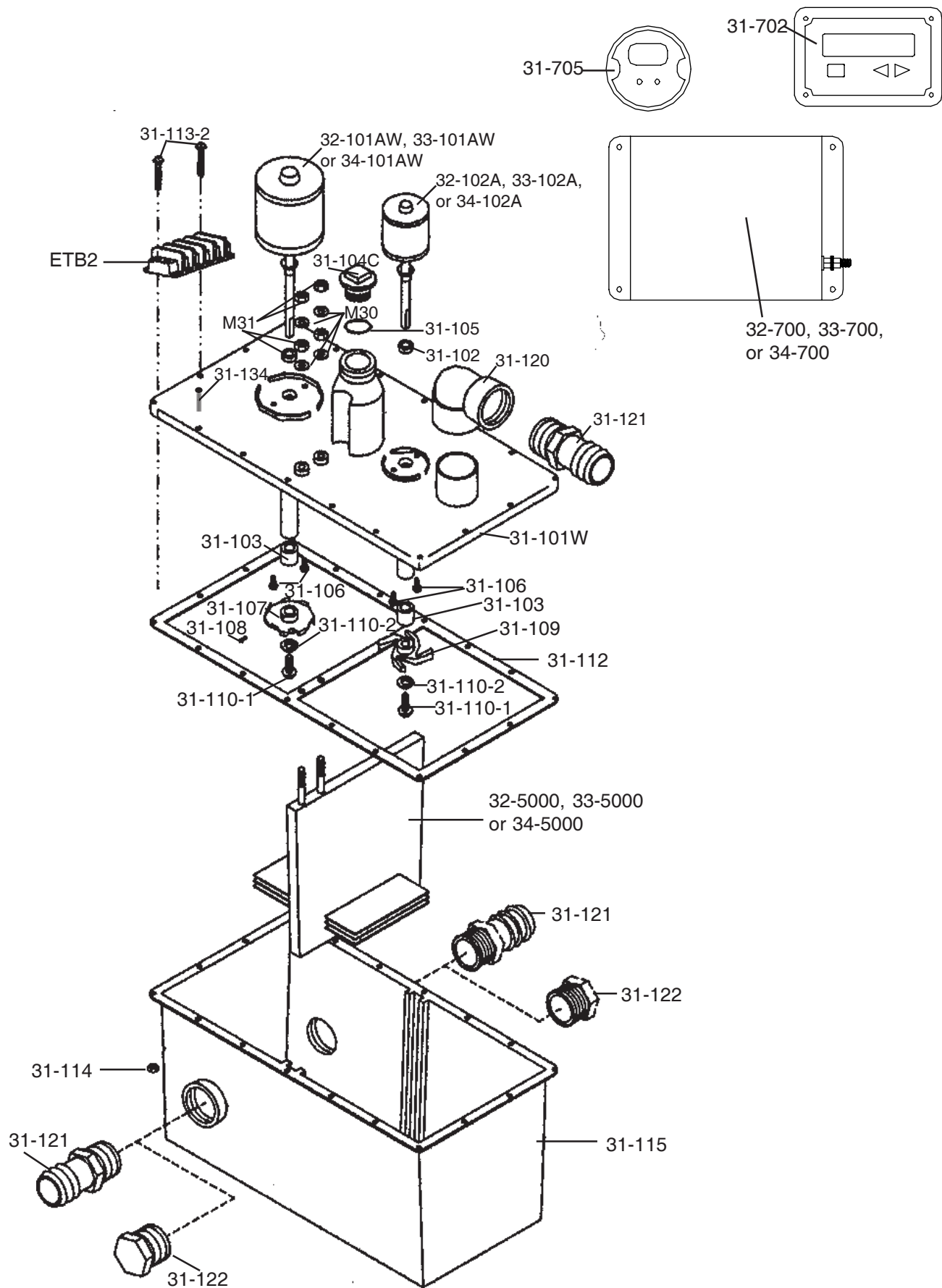
- **Odor permeating through hose or connections**
Rub damp rag on hose, if odor transfers to rag hose needs to be replaced with high quality sanitation hose Raritan part # SH
- **Treatment unit is leaking**
Follow discharge hose from toilet to tank, check area around motors too
- **Electrode not functioning properly**
Check readings on LCD Display for error or warning
- **Electro Scan not being activated with each flush**
System must be activated with each flush
- **Treatment unit not being stored properly**
See Storage under Maintenance

How to remove microprocessor board



- Turn off power
- Open control unit cover
- Microprocessor board can be pulled out without disconnecting any wires
- Install replacement board
- Use anti-static bag to pack board for return to dealer/factory
- **NOTE:** Static electricity will damage the board, use precaution and proper grounding to avoid static build-up while working with the microprocessor board.

EXPLODED PARTS VIEW



EXPLODED PARTS LIST

TREATMENT UNIT

<u>Part No.</u>	<u>Description</u>
32-102A**	Mixer Motor 2 1/2" Dia. 12 VDC
33-102A**	Mixer Motor 2 1/2" Dia. 24 VDC
34-102A**	Mixer Motor 2 1/2" Dia. 32 VDC
31-121	Hose Fitting (2)
31-120	Discharge Elbow 90°
M30	Electrode Nut 1/4-20 Brass (4)
M31	Electrode #14 Brass flat washer (4)
31-103	Motor Shaft Bushing (2)
31-106	10-32x7/8"RHMS,S/S (4)
31-109	Mixer Impeller
31-110-1	Impeller Bolt, 12-24x5/8", S/S (2)
31-110-2	Impeller Lock Washer, #12, S/S (2)
31-113-2	Terminal Block Bolt
31-134	Cover Hold Down Screw 10-32 x 1 Hex(16)
31-114	Cover Hold Down Nut, 10-32 (18)
31-115	Treatment Tank
31-122	Intake Plug
32-5000	Electrode Pack 12 VDC
33-5000	Electrode Pack 24 VDC
34-5000	Electrode Pack 32 VDC
31-112	Cover Gasket
31-108	Macerator Set Screw, 8-32x3/16", S/S
31-107	Macerator Impeller
31-101W	Treatment Cover
31-104C	Crossover Plug
31-105	O-Ring
31-102	Motor Shaft Seal (2)
32-101AW**	Macerator Motor 3" Dia. 12 VDC
33-101AW**	Macerator Motor 3" Dia. 24 VDC
34-101AW**	Macerator Motor 3" Dia. 32 VDC
ETB2	Terminal Block

31-3001	Salt tank unit complete, two gallon (not shown)
31-3002	Four gallon salt feed tank (not shown)
32-3003	Four gallon salt feed tank w/12 volt pump (not shown)
33-3003	Four gallon salt feed tankw/24 volt pump (not shown)
32-7000	12 V DC Treatment Unit - No Control Unit, System Status Panel or LCD Display
33-7000	24 V DC Treatment Unit - No Control Unit, System Status Panel or LCD Display
34-7000	32 V DC Treatment Unit - No Control Unit, System Status Panel or LCD Display

CONTROL

<u>Part No.</u>	<u>Description</u>
31-618	Cable for LCD and System Status Panel (not shown)
31-702	LCD Display
31-705	System Status Panel
32-700	Control Unit 12V
33-700	Control Unit 24V
34-700	Control Unit 32V
WAES01T	Wire Harness (not shown)

() Indicates Total pieces required

INSTALLATION OPTIONS FOR THE electro scan SYSTEM

The electro scan has a variety of installation options including:

- 1) Installation on Inspected Vessels
- 2) Connection to the Sealand VacuFlush®
- 3) Automatic activation from a manual toilet

All of the above options are covered by Technical bulletins available from Raritan by calling: 856-825-4900 or faxing in a request at: 856-825-4409 or on our website at: www.raritaneng.com

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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.
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