

# Hold n' Treat System

Model 21SR

## 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, trouble shooting, repairs to or operation of this product.*



**WARNING: HAZARD OF SHOCK AND FIRE** - Always use recommended fuse/circuit breaker and wire size. The components are not ignition protected and must not be installed in a gas engine room or exposed to the possibility of spark.



### MODEL NUMBERS:

**21SR1512** Hold n treat system with electro scan , 12 volt

**21SR1524** Hold n treat system with electro scan , 24 volt

**21R151201** Hold n treat system without EST,12 volt

**21RS152401** Hold n treat system without electro scan , 24 v

The 'Hold n' Treat System' 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. The Hold n' Treat System combines Electro Scan (USCG Type I MSD) and a holding tank into one convenient system.

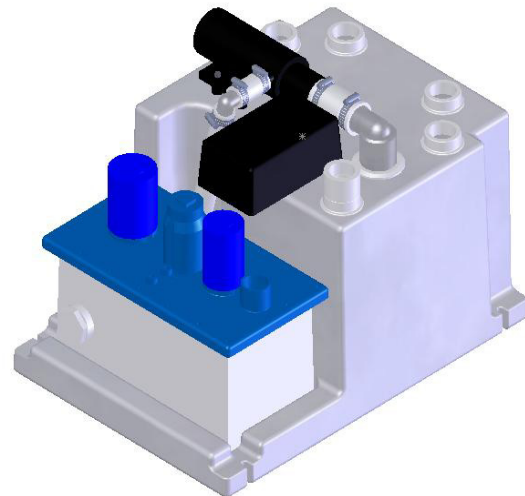
All waste is stored in a 15 gallon holding tank with Electro Scan mode determining how the waste is processed. This system eliminates the need for pump-out stations in most areas.

### OVERVIEW

When Hold n' Treat Electro Scan mode is set to AUTOMATIC the level of waste in the holding tank is monitored . Once the waste level is above low level the Electro Scan Control Unit activates a macerator pump which moves waste (approximately 1 gallon) from the holding tank to the Electro Scan. This cycle is repeated continuously for five cycles. After the fifth cycle, the system enters a *cool down* cycle. It will remain in the *cool down* cycle for approximately fifteen minutes. After *cool down*, the process will resume until the waste in the tank drops below low level.

When system mode is set to NO DISCHARGE , processing is inactive and waste is collected in the holding tank.

When mode is set to MANUAL, waste can be processed cycle by cycle by pressing Start/stop status panel.



***Operation in EPA designated "No Discharge Zones" affects the MSD installation on every vessel that enters or stays in those waters. Flow-through devices are permitted if adequately secured to prevent discharge of any sewage, treated or untreated.***

# OPERATION

## Important

- Ensure the Electro Scan is operating properly. Refer to the Electro Scan Manual for proper operation.
- Use of certain chemicals in toilet or holding tank will cause damage to the Electro Scan. We recommend ONLY Raritan C.P. Cleans Potties and Raritan K.O. Kills Odors.
- Select "NO DISCHARGE" mode to prevent activation of the 'Hold n' Treat when in No Discharge Zones.

## TO SET MODE:

**There is a 5 second delay for changed mode to be effective. Mode can only be set when unit is not in a cycle.**

Scroll to "MODE" screen using ">" key.  
 use MODE key to toggle between AUTOMATIC, MANUAL or NO DISCHARGE mode.  
 Use "<" key to return to home screen or control will return to home screen after few seconds.

**Note : Default mode after powering up is mode in which unit was last run. In case of loss of power unit will go to back to mode it was running. Units are shipped with nodischarge mode**

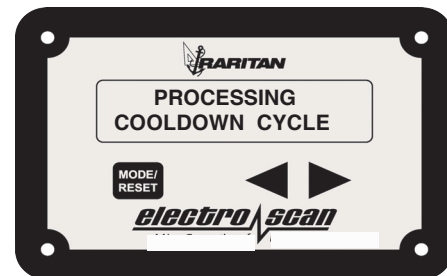
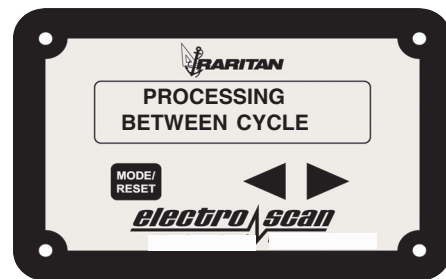
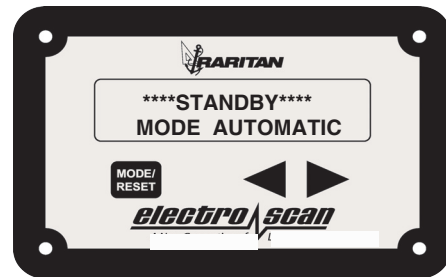
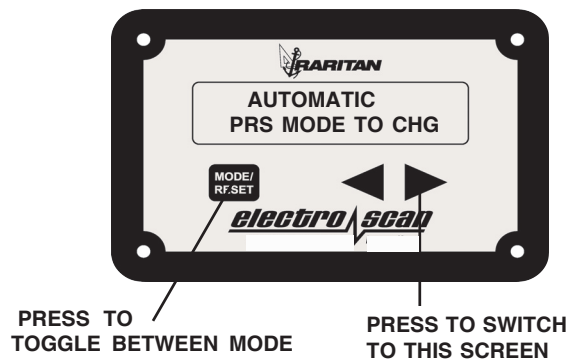
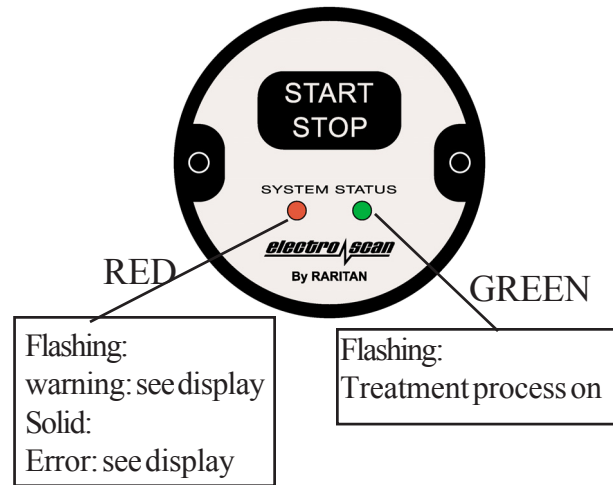
## DISPLAY STATUS

### AUTOMATIC MODE:

Treatment starts when level is higher than the low level in the tank and continues till level is lower than low level. Display indicates one of the following status

- Pretreatment or treatment cycle  
 Electroscan treatment cycle is running, see electroscan manual for details on display
- Processing: between cycles  
 Treatment is between cycles, there is a 30 second wait before next cycle starts. Green LED will flash on system status panel during this time
- Processing: cooldown cycle  
 Treatment has processed five cycle and system is in cooldown cycle for 15 minutes. System status green LED will flash during this time.
- Standby mode: tank is near empty

**NOTE:** if start/stop button is pressed to stop electroscan treatment cycle, mode will change to MANUAL.

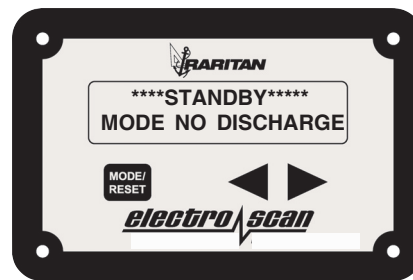


## NO DISCHARGE MODE:

Treatment is on hold and treatment inactive to prevent any discharge.

Display indicates :

- Standby mode nodischarge



## MANUAL MODE:

Single treatment starts when start/stop button is pressed. This mode can be used to completely drain the tank ( even below low level )before entering a no discharge area or for maintenence purposes.

Display indicates one of the following status

- Pretreatment or treatment cycle
- Standby (press) Start to empty

## ALL MODES:

Display shows

**\*\*Warning\*\*\*** Tank near full

if tank level is higher than high level switch. System status panel red LED will be blinking

## OPTIONAL ALARM

First time when level reaches full level a 10 second beep will sound if optional alarm is connected to head2 output terminal (see wiring diagram)

Time for alarm is adjustable on "alarm time" screen

## Adjusting ALARM on time

Time for optional alarm can be adjusted between one to twenty seconds as follow:

- Change to MANUAL mode (see set mode section)
- Scroll to "ALARM TIME" screen using < or > keys when unit is not in a cycle
- Hold 'MODE' button until digits flash
- Use arrows keys (< >) to adjust time
- press 'MODE ' again to stop flashing
- Change back to desired mode

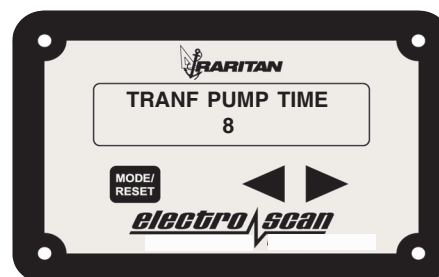
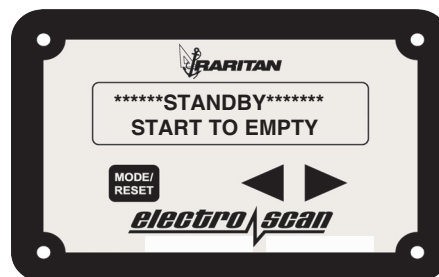
## Adjusting Tranfer/Macerator pump On Time

The Tranfer/Macerator pump on time is factory set to eight seconds. If the on time requires adjustment, follow steps below.

- Change to MANUAL mode

From the Electro Scan LCD Display

- Scroll to "TRANF PUMP TIME" screen using < and > keys when unit is not in a cycle.
- Hold 'mode' button until digits flash
- Use < or > keys to set on time in seconds for pump
- Change back to desired mode



## General System Specifications

### Treatment Capacity

- 'Hold n' Treat System' processes approximately ten gallons (37 liter) per hour.
- 140 Gallons( 530 liters) per week treatment
- Model 21SR15\* - 15 gallon(55 liter) holding tank (\*specify voltage 12 or 24 v DC)
- Maximum Pitch and Roll Angle 15 degrees
- Black Water Requirements - salt water, Salt content of water not to exceed 4% (40 PPT).

### Weight

Dry - 71 lbs (32.2kg)  
Wet - 221 lbs (100kg)

### Electrical

12VDC 32 amps  
24VDC 24 Amps

### Plumbing

Pressure max. 3 psi (21 kPa) (7 ft H2O)

*Refer to Electro Scan and Macerator Pump Manuals for component Specifications*

## MAINTENANCE

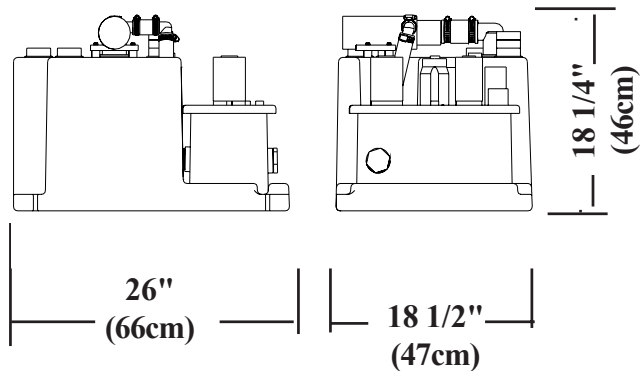
Refer to Electro Scan and Macerator Pump Manuals for Maintenance Instruction

**Important:** Use of certain chemicals in toilet or holding tank will cause damage to Electro Scan. Please refer to the proper manual concerning their use.

## WINTERIZING

Disconnect or shut down power to unit. Refer to Electro Scan and Macerator Pump Manuals for Winterizing Instruction

**Important:** Remove antifreeze, if used, from holding tank before activating 'Hold n' Treat'.



### 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)

### Website for a current list of No Discharge Zones:

[http://www.epa.gov/owow/oceans/regulatory/vessel\\_sewage/vsdnozone.html](http://www.epa.gov/owow/oceans/regulatory/vessel_sewage/vsdnozone.html)

**IMPORTANT:** Read all instructions before proceeding with installation.

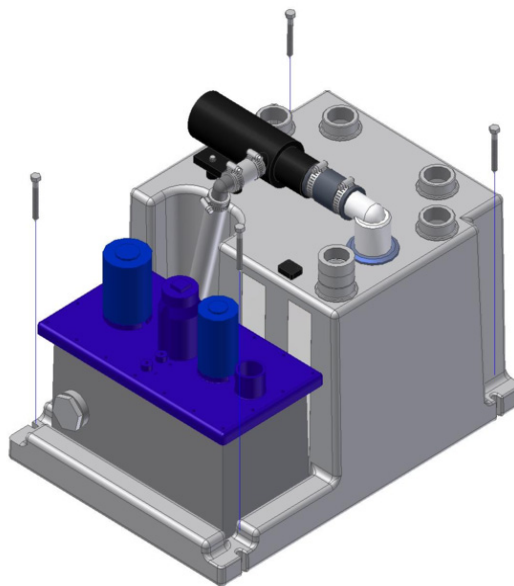
*Hold n' Treat System instructions describe installation of the complete system . For specific instructions regarding installation of Electro Scan components refer to the Electro Scan manual.*

**WARNING:** Not certified for use in areas requiring ignition protection.

### Location

- Install on a flat and level surface.
- Mounting surface must support weight of unit when filled with water (221 lbs (100kg)).
- Mounting area must be well ventilated
- Temperatures must not exceed 120° F(49°C).
- Must have access for maintenance  
*TIP: Mount where macerator pump and treatment system are accessible for maintenance*

Tank Assembly



### Mounting Tank Assembly

1. Secure Tank Assembly to deck using 3/8” Bolts or Screws. Note: type of fasteners will depend on the deck material, thickness and access.

### Mounting Control Units

#### Important

- The Control Units must be mounted near the Tank Assembly dictated by their respective wiring cable lengths.  
*Electro Scan Control Unit Cable Length  
2' (61cm)*
  - Locate in a dry area.
  - Locate in an accessible area
1. Secure to wall with proper fasteners using the mounting holes provided.

Electro Scan Control Unit



## Mounting Electro Scan System Status Panel

### Note:

As certified by USCG, Status panel must be installed to indicate proper operation of Hold N' Treat system.

- Locate where system status lights can be observed.
- Note: Cables supplied are 16 feet (5 m)

1. Drill 1 1/2" (38mm) hole for back of panel.
2. Route cable between panel and Electro Scan Control Unit.
3. Plug cable into back of panel.
4. Mount panel using 2 screws provided.

## Mounting Electro Scan System LCD Display

### Note:

- Locate where display can be read if needed.
- Cables supplied are 16 feet (5 m)

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 Electro Scan Control Unit.

## PLUMBING

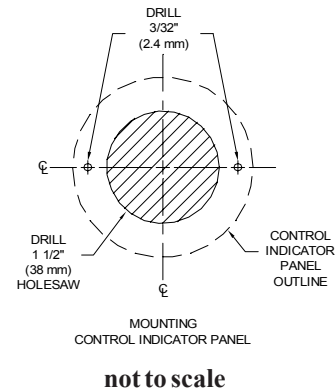
### WARNING:

- 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

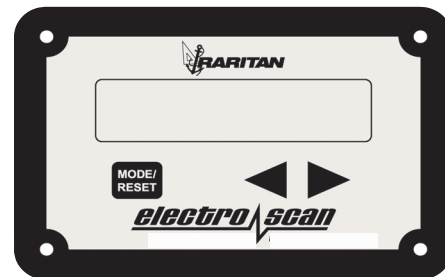
### NOTE:

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

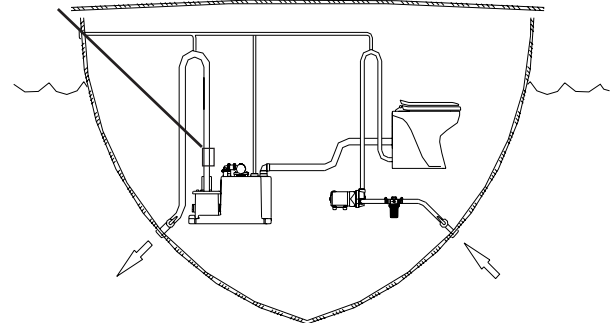
## Electro Scan System Status Panel



## Electro Scan LCD Display



## Plumbing Example

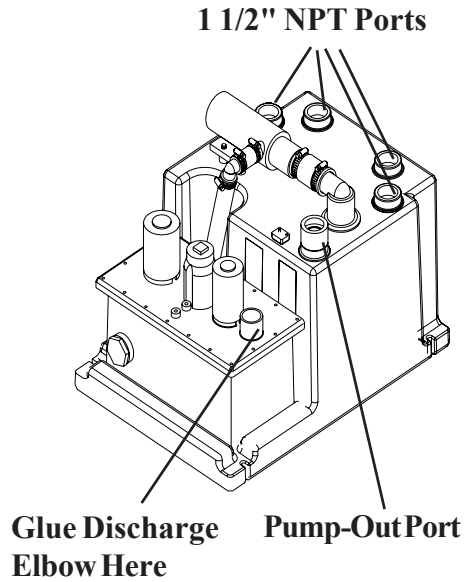




## PLUMBING:

The Tank Assembly has four 1 1/2" NPT female ports available for connecting toilet(s) and vent line(s). Tank Assembly also has a port dedicated for Pump-Out Plumbing. Unused port(s) MUST be plugged.

1. Connect discharge of toilet to one port on tank
2. Other ports are for a second toilet, vent line and pump-out fitting. (See Installing Vents below)
3. Plug unused ports.
4. Connect pump-out plumbing to port Pump-Out Port.
5. Determine position and glue Discharge Elbow to top of Treatment Tank using PVC cement. (refer to the Electro Scan manual)
6. An adapter fitting is provided for connecting Discharge Elbow to hose. Connect hose from Discharge Elbow fitting to INLINE CHECK VALVE (part # RHT4 included) close to Discharge Elbow. Connect hose from inline check valve to thru hull fitting thru vented loop if needed.



**Note: Inline check valve prevents cycling of macerator pump due to backflow.**

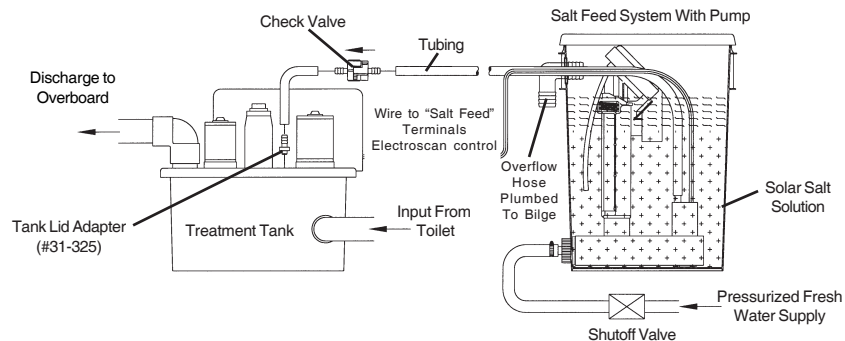
## Installing Vents

### IMPORTANT

- Do not vent into a confined space onboard.
- Vents must not have sags, loops or obstructions where water can collect, restricting air flow.
- Vent lines should be sloped to allow condensation to drain from vents into tanks.
- Do not locate vent through-hull fittings near galley, sleeping or high use areas.

## INSTALLING SALT FEED SYSTEM:

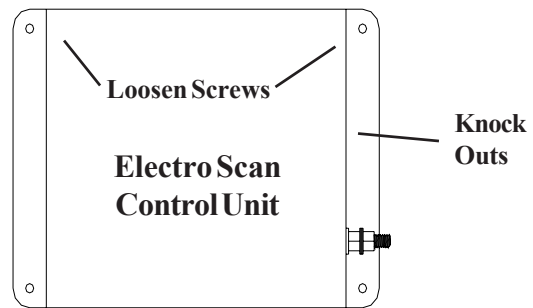
Fresh water toilets requires a salt feed systems with the pump. See detail instructions enclosed in salt feed system.



## 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 battery NEG to Negative (NEG) terminal on Treatment tank.

**NOTE: Do not connect supply POS to treatment tank, connect to control unit.**

### Control Box

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.

1. Run supply Positive (POS) to control unit
2. Fuse or circuit breaker must be installed between source and electro scan on positive wire.
3. Connect wiring harness between treatment tank and control box. Control box side is marked with wire identification and colors.
4. Connect wiring harness from level sensor/ macerator pump as per wiring diagram to I/O board on the control unit. Connect Red wire w / fuse to positive terminal on the control unit. Feed wires thru side holes (knockout) and connect to ext trig, man in, and Aux terminal per color marked on wiring diagram.

### System Status Panel

1. Connect cable from System Status Panel to panel 1 jack on Control Unit.
2. Secure cable strain relief.

### LCD Display

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

**Before turning on power, make sure that treatment tank is full of salt water.**

### START UP

1. Start with empty holding tank. If tank is not empty, power up macerator motor to empty tank.
  - To run macerator/transfer pump only*
  - 1 Set the mode to MANUAL
  - 2 Press start stop button to start system with pump
  - 3 After macerator pump stops, press start/ stop again to stop system
  - 4 Repeat steps 2 & 3 several times to empty tank
2. For system used with fresh water only: Remove cross over cap from Electro Scan treatment tank and add seawater salinity salt water to the Electro Scan treatment tank. Each gallon of water must contain 4 oz. by weight of salt for seawater salinity. or
3. Turn on power, check the mode and change if needed
4. Use status panel start button to run one cycle (MANUAL MODE) without error or warnings. If any error or warning refer to Electro Scan manual troubleshooting section.
 

Note: if salt is not added in step 2, unit will give error for low amps for two or three cycles before salt feed system feed enough salt in the system.
5. Start using toilets





# TROUBLE SHOOTING

## CALIBRATION

Sensor is factory calibrated for the hold and treat system tank.

Use following instructions only if factory calibration does not work or you need to do the calibration for other reasons.

Pressure switches are factory set to operate on low and high level.

To recalibrate, empty out tank by:

1. Powering macerator pump with positive and negative directly or

To run macerator/transfer pump only

1 Set the mode to MANUAL

2 Press start stop button to start system with pump

3 After macerator pump stops, press start/stop again to stop system

4 Repeat steps 2 & 3 several times to empty tank

2. Run the system in MANUAL mode.

When tank is empty start using system and system will auto calibrate.

## TROUBLE SHOOTING:

### \*\*WARNING\*\* TANK NEAR FULL

\* If tank is not full

1. Check wiring, level switch wires may have been switched
2. Check high level switch with a meter, switch must be open if tank is not full

\* If system is in AUTOMATIC mode

1. check macerator pump
2. check low level switch

\* if system is in NO DISCHARGE or MANUAL mode

1. pump out holding tank
2. Switch to AUTOMATIC mode if treated discharge is allowed

FOR ALL OTHER WARNINGS AND ERRORS

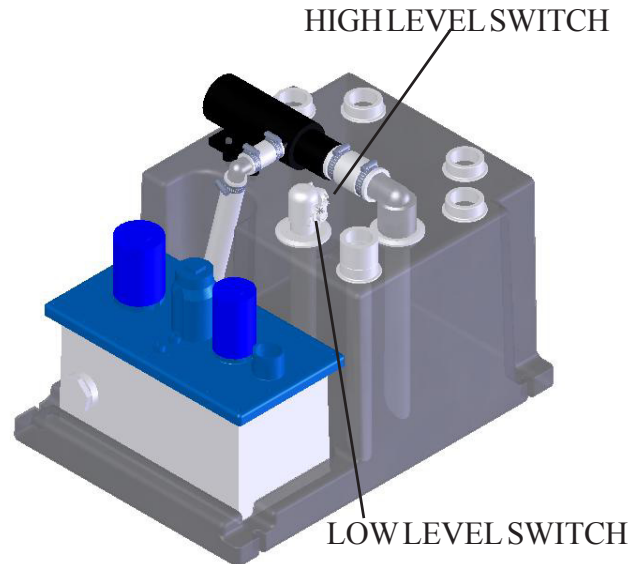
see electro scan manual.

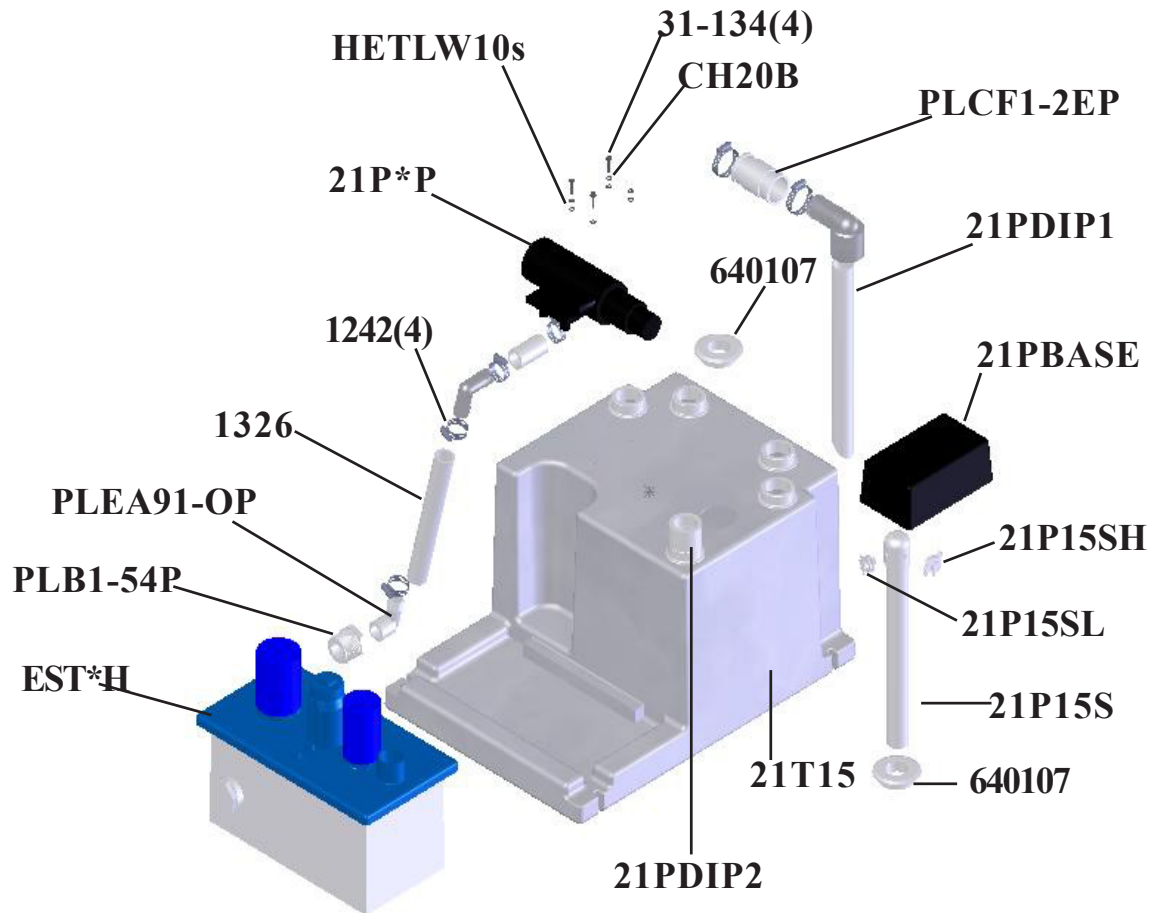
## WINTERIZATION

**Caution:** Do not energize Electro Scan or Lectra San with glycol in the tank to avoid severe overheating or explosion.

Tank: Pump out holding tank using pump out fitting

Electro Scan: see Electro Scan manual for winterization instructions.





### Parts included

|          |                                  |            |                                 |
|----------|----------------------------------|------------|---------------------------------|
| 21T15    | Holding tank 15 Gallons          | 640107     | 1 1/2 IN. seal                  |
| EST *    | Electro scan, xx voltage         | CH20B      | # 10 S/S Flat washer (4)        |
| 21P*P    | Macerator pump                   | HETLW10S   | # 10 ext tooth lock washer      |
| 214*     | Macerator Pump Relay (not shown) | PLCF1-2EP  | Coupling Flex 1 1/4" EPDM       |
| 21P15S   | Sensor tube assembly             | 21PDIP1    | Dip tube assembly               |
| 21P15SH  | Sensor high level                | 21PDIP2    | pump out dip tube assembly      |
| 21P15SL  | Sensor low level                 | PLB1-54P   | 1 1/2" X 1"bushing, MIPT X FIPT |
| ETB4     | Terminal block (not shown)       | PLEA91-0P  | 1" Elbow, Combo, INSERT X MIPT  |
| 21PBASE  | cover for sensor                 | NOT SHOWN: |                                 |
| 1242     | # 14 Hose clamps for 1" hose     | PLE91-0P   | 1" Elbow INS X INS              |
| 1326     | 1" hose                          | 21PSTRAP   | Hold down strap assembly (NS)   |
| 31-120   | Elbow: 1 1/2 PVC 90 (NOT SHOWN)  | PLP1-504P  | 1 1/2" PVC PIPE WITH ADPT.      |
| 31-122   | 1 1/2 Inlet plug(not shown)      | PLEA91-54P | 1 1/2 Inch elbow                |
| 31-134   | screw 10-32 x 1 hex hd(4)        | EFH01      | InLin fuse holder               |
| EETLW10s | spring washer (4)                | EF5        | 5 amp Fuse                      |
|          |                                  | EF30       | 30 AMP, ATC, fuse               |

\*specify voltage

## 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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