SMART TOILET CONTROL
Installation and Operation Instructions
Part# STC

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, injury or death to personnel that may result from improper installation or operation of this product.*

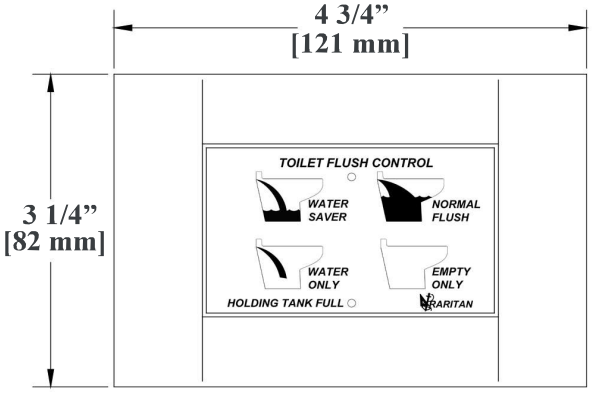
WARNING: **HAZARD OF SHOCK OR FIRE**

Always use recommended fuse, circuit breaker and wire size.

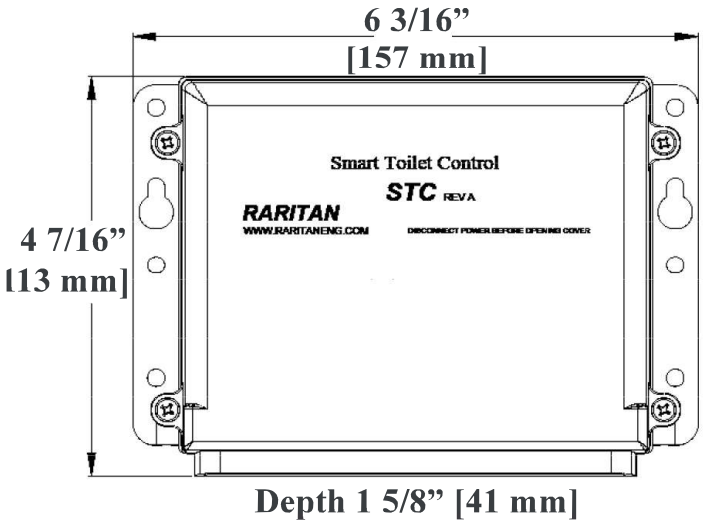
Motors used with this product are "Ignition Protected". They are not however, explosion-proof.

DO NOT run continuously for more than 30 seconds.

Wall Panel



Control Box



Description:
Smart Toilet Control (STC) is a toilet flush controller that optimizes water use without compromising the quality of flush.

STC includes control box, wall panel and 7' of cable.

WATER SAVER		**Timed Flush**
NORMAL FLUSH		**Timed Flush**
WATER ONLY		**Adds Water to Toilet**
EMPTY ONLY		**Empties Toilet**

Pressing **NORMAL FLUSH** or **WATER SAVER** starts a timed flush.

Pressing **WATER ONLY** adds water to toilet bowl.

Pressing **EMPTY ONLY** empties the toilet bowl.

NOTE: WATER ONLY and **EMPTY ONLY** have 8 second time limits.

Flush timing of initial fill, discharge and final fill are fully programmable from the wall panel.
Control is reverse polarity protected. In case of reverse polarity, motors and solenoid will activate as soon as power is connected. After reverse polarity is corrected (within 10 minutes), unit will work as normal.

RARITAN
The Most Dependable Name on the Water
856-825-4900
www.raritaneng.com

IMPORTANT: For most installations factory default settings will work. To make changes to timing to optimize the flushing, follow Programming Smart Toilet Control instructions.

Smart Toilet Control

IMPORTANT: Discharge and Inlet Water Valve/ Pump MUST BE wired for proper operation and programming.

NOTE: If a tank sensor is connected to the STC, the Holding Tank Light LED will illuminate when the tank is full.
Contact Raritan for information about our optional "Holding Tank Full" sensor.

1. **WATER SAVER** 
   Press to start water saver cycle. This cycle has 1 cycle of inlet and discharge to clear liquid waste. Last fill is to leave water in the bowl for next use. This button is disabled if Holding Tank Full LED is on.

2. **NORMAL FLUSH** 
   Press to start timed flushing cycle. There are 3 cycles of inlet and discharge. First cycle removes most of the waste. Second cycle removes remaining waste if any left after first cycle. Third cycle clears discharge housing and lines with clean water. Last fill is to leave water in the bowl for next use. This button is disabled if Holding Tank Full LED is on.

3. **WATER ONLY** 
   Press to add water in the bowl. Inlet Water Valve/ pump runs as long as button is pressed with a 8 second limit. If limit is reached, this button is disabled to prevent overflow of the bowl. To enable again, press EMPTY ONLY. This button still works if Holding Tank LED is on.

4. **EMPTY ONLY** 
   Press to empty the bowl. Discharge pump runs as long as this button is held with a 8 second limit. This button still works if Holding Tank LED is on.

Programming Smart Toilet Control

NOTE: If programming fails, try pushing buttons at a quicker pace.

The Smart Toilet Control has two different flush modes:

Sequential Flush (Factory Default Setting): In this mode, the toilet will add water and discharge waste separately. This fill/empty cycle will repeat once in WATER SAVER and three times during the NORMAL FLUSH cycle. At the end of this sequence cycle, a short pause will be followed by a final fill to leave water in the bowl.
This mode is designed to provide the most efficient flush possible while using the least amount of water.

Continuous Flush: In this mode, the toilet will add water to wet the bowl first and then the inlet and discharge run together for the remainder of the cycle. At the end of this continuous cycle, a short pause will be followed by a final fill to leave water in the bowl.

This mode may be more suitable for installations in which a continuous flow of water is desired and water use is not a great concern.

Changing flush mode from Sequential to Continuous or vice versa:

1. Hold the WATER ONLY and EMPTY ONLY buttons down together for three seconds. The Holding Tank Full LED will flash 3 times indicating you have entered program mode.
2. Push the WATER SAVER button once.
3. Push the EMPTY ONLY button. Flush mode will switch from Sequential to Continuous or vice versa. The Holding Tank Full LED will flash 3 times indication you have left program mode.

Programming Smart Toilet Control:

The Raritan Smart Toilet Control is factory set to work in most installations and no programming is required. The following instructions can be used to modify timings if desired:

All flush cycles have an initial fill time **(T1)**, Discharge/Empty time **(T2)** and water retention fill time **(T3)**.

Factory default settings for the NORMAL FLUSH are as follows:

Sequential mode: T1= 3 sec, T2= 3 sec, T3= 2 sec

Continuous mode: T1= 3 sec, T2= 12 sec, T3= 2 sec

Step 1 - Entering program mode:
Hold the WATER ONLY and EMPTY ONLY buttons down together for 3 seconds. The Holding Tank Full LED will flash 3 times indicating you have entered program mode-release both button.

Setting T1 initial fill time:
After entering program mode (Step 1 above) push the NORMAL FLUSH button once. Continue to press the NORMAL FLUSH button for each second you wish water to enter the bowl:
(1 push = 1 second, 2 pushes= 2 seconds, etc.). The Tank LED will flash after each valid key push. The maximum inlet time is 20 seconds. When finished, push the EMPTY ONLY button to store this value and exit. The Holding Tank Full LED will flash 3 times indicating you have left program mode.

Setting T2 Discharge Pump Time:
After entering program mode (Step 1 above) push the EMPTY ONLY button once. Continue to press EMPTY ONLY button for each second you wish water to exit the bowl:
(1 push = 1 second, 2 pushes = 2 seconds, etc.). The Tank LED will flash after each valid key push. The maximum empty time is 20 seconds. When finished, push the NORMAL FLUSH button to store this value and exit. The Holding Tank Full LED will flash 3 times indicating you have left program mode.

NOTE: When in Continuous mode, the WATER SAVER empty time will operate at half of the NORMAL FLUSH time setting (Wall switch models only).

Setting T3 Water Retention Fill Time:
After entering program mode (Step 1) push the WATER ONLY button once. Continue to press the WATER ONLY button as follows to leave water in the bowl:
(1 push = ZERO seconds, 3 pushes = 2 seconds, 4 pushes = 3 seconds, etc).

The Tank LED will flash once indicating a valid key push. The maximum water retention time is 10 seconds. When finished, push the NORMAL FLUSH button to store this value and exit. The Holding Tank Full LED will flash 3 times indication you have left program mode.

Disabling the WATER ONLY and EMPTY ONLY buttons (Wall Panel model only):

The WATER ONLY and EMPTY ONLY buttons will only operate for maximum of 8 seconds. The procedure below will enable/disable these buttons completely if desired:

1. Enter program mode (Step 1).
2. Push the WATER SAVER button. This will disable/enable this feature.
3. Push the WATER ONLY button. The Holding Tank Full LED will flash 3 times indicating you have left program mode.

Extending pause for water retention:
If water siphons out of the bowl after the flush sequence is complete, some installations may need a longer pause before retention fill. The factory set pause is for 2 seconds, but can be changed to 10 seconds. The following procedure will enable/disable extended pause time:

1. Enter program mode (Step 1).
2. Push the WATER SAVER button. This will disable/enable the 10 second pause mode.
3. Push the WATER SAVER button again to exit program mode. The Holding Tank Full LED will flash THREE times indicating you have left program mode.

MOUNTING

TROUBLESHOOTING

WIRING

Mounting Smart Toilet Control

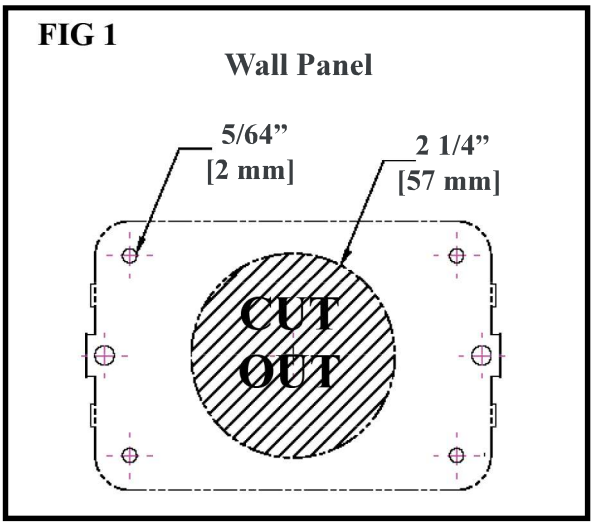
Smart Toilet Control Wall Panel:

1. Cut out a hole per FIG 1, mark mounting holes using wall panel as guide.
2. Route cable from Control Box to Wall Panel.
3. Secure wall panel using mounting screws

Smart Toilet Control Box:

1. Locate Control Box near toilet in a dry and accessible area.
2. Using two screws, fasten the Control Box to wall with wiring connections at the bottom.
3. Open cover to acess wiring connections.
4. Choose one of the wiring diagrams (FIG 2, 3, 4, 5 or 6) to route all wires.
5. Replace cover.

FIG 1



Observation or Issue	Action
Water does not empty all the way in the first cycle	Increase discharge time (T2)
Water empties, but discharge pump runs more than a second after all water is gone in first cycle	Decrease discharge time (T2)
Solids and toilet paper remain in the bowl after first cycle	Increase initial fill time (T1)
Water level in too high after initial fill cycle	Decrease water retention time (T3)
There is no water or little water left in the bowl	Increase water retention time (T3)
Water siphons out (of bowl) after 10 to 15 minutes	Enable longer pause before retention fill

WIRING:

NOTES: for Wiring

1. Distances are from source to STC Control Box and back to source.
2. Distance from power source to remote intake pump MUST be included when determining total distance.
3. Recommended conductor wire minimum AWG [mm²] for 3% voltage drop.
4. Recommended conductor sizes are based on 105°C rated insulation. Single conductor (not bundled), refer to ABYC Standards for sizes with other insulation ratings.
5. For 120/240 VAC units, use 12VDC specifications from transformer to unit.

CONVERSIONS

Wire - AWG to mm²

AWG	16	14	12	10	8	6	4	2
mm²	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

Recommended Wire and Fuse/Circuit Breaker Sizes

ATLANTES FREEDOM VORTEX VAC AND MARINE ELEGANCE

Table 1-Raw Water Model

(sizes based on both remote intake and discharge pumps amps added together)

Units Voltage	Circuit Breaker/ fuse size (amps)	Toilet Discharge Pump Amp draw	Remote Intake Pump Amp draw	10 feet	15 feet	20 feet	30 feet	40 feet	50 feet
12 VDC	30	18	10	10 AWG	8 AWG	6 AWG	4 AWG	4 AWG	2 AWG
24 VDC	20	10	5	16 AWG	14 AWG	12 AWG	10 AWG	10 AWG	8 AWG

Table 2- Pressurized Fresh Water Model

Units Voltage	Circuit Breaker/fuse size (amps)	Amp draw	10 feet	15 feet	20 feet	30 feet	40 feet	50 feet
12 VDC	25	18	10 AWG	10 AWG	8 AWG	6 AWG	6 AWG	4 AWG
24 VDC	15	10	16 AWG	16 AWG	14 AWG	12 AWG	10 AWG	10 AWG

SEAERA QC MODEL 162

Table 3- Raw Water Model

(sizes based on both remote intake and discharge pumps amps added together)

Units Voltage	Circuit Breaker/ fuse size (amps)	Toilet Discharge Pump Amp draw	Remote Intake Pump Amp draw	10 feet	15 feet	20 feet	30 feet	40 feet	50 feet
12 VDC	25	13	10	10 AWG	8 AWG	6 AWG	6 AWG	4 AWG	4 AWG
24VDC	15	7.5	5	16 AWG	14 AWG	12 AWG	10 AWG	10 AWG	8 AWG

Table 4- Pressurized Fresh Water Model

Units Voltage	Circuit Breaker/fuse size (amps)	Amp draw	10 feet	15 feet	20 feet	30 feet	40 feet	50 feet
12 VDC	25	13	12 AWG	10 AWG	10 AWG	8 AWG	6 AWG	6 AWG
24 VDC	15	7.5	16 AWG	16 AWG	14 AWG	12 AWG	10 AWG	10 AWG

Table 5 - Remote Intake Pump Only (Raw Water and Seafresh Models)

Units Voltage	Circuit Breaker/fuse size (amps)	Amp draw	10 feet	15 feet	20 feet	30 feet	40 feet	50 feet
12 VDC	15	10	14 AWG	12 AWG	10 AWG	10 AWG	8 AWG	6 AWG
24 VDC	10	5	16 AWG	16 AWG	16 AWG	16 AWG	14 AWG	12 AWG

WIRING

WARNING: Hazard of Shock and Fire

- **Make sure power is off before proceeding.**
- **Always use proper wire, wire connectors and fuse/circuit breaker. See Specification Chart.**
- **Secure wire properly.**
- **Do not connect appliances to toilet circuit.**
- **Use proper wire terminals for all wire connections.**

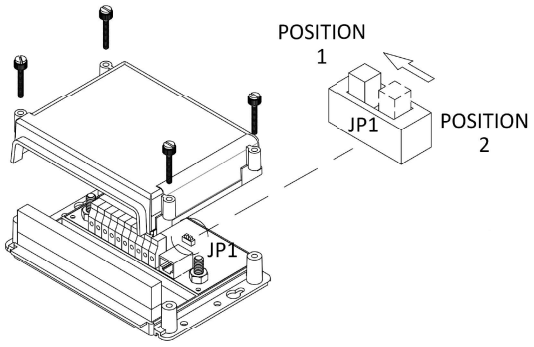
1. Determine proper wire size by measuring distance from:
   - Power Source to control box and back to power source.
   - Remote pump units - determine proper wire size for remote pump (table 5).
2. Select proper wire and fuse/circuit breaker size from Specifications on Table 1.
3. Install fuse/circuit breaker in positive line at source.
4. Wire Control Box to the toilet and battery using one of the following wiring diagrams.

IMPORTANT: Discharge and Inlet Water Valve/ Pump MUST BE wired for proper operation and programming.

Marine Sanitation Device (MSD) Operation

- To start Electroscan® or Purasan® EX2 from Smart Toilet Control (STC), wire per FIG 6.
- To start/flush toilet by activating the Electroscan® or Purasan® EX2, wire per FIG 7.

For Lectra/San MC, EC or Purasan call Raritan Customer Service



JP1 IS FACTORY PRESET TO POSITION 2 (WALL PANEL MODELS).
TOILETS UTILIZING A FLUSH HANDLE MUST SLIDE JP1 TO POSITION 1.

FIG 2 **WIRING SMART TOILET CONTROL PRESSURIZED FRESH WATER TOILETS**

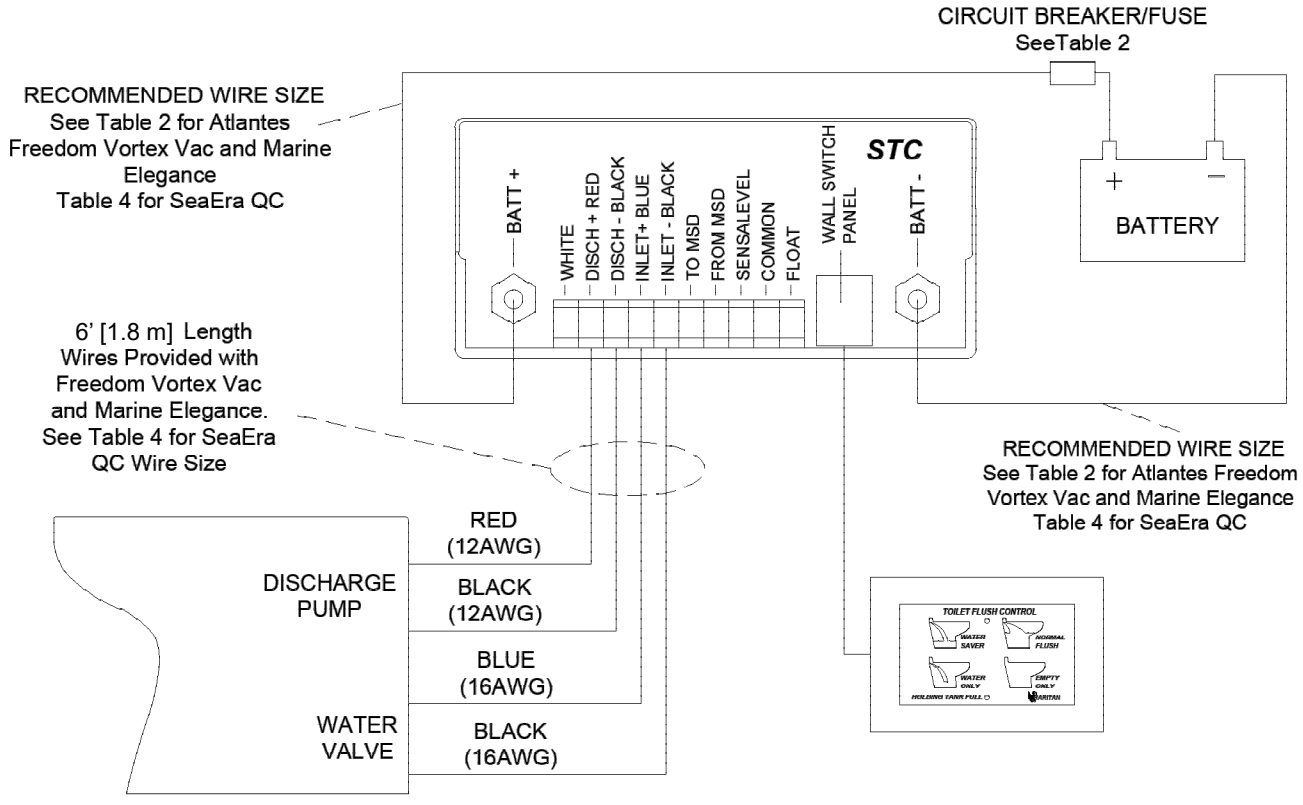


FIG 3

WIRING SMART TOILET CONTROL
REMOTE INLET PUMP TOILETS

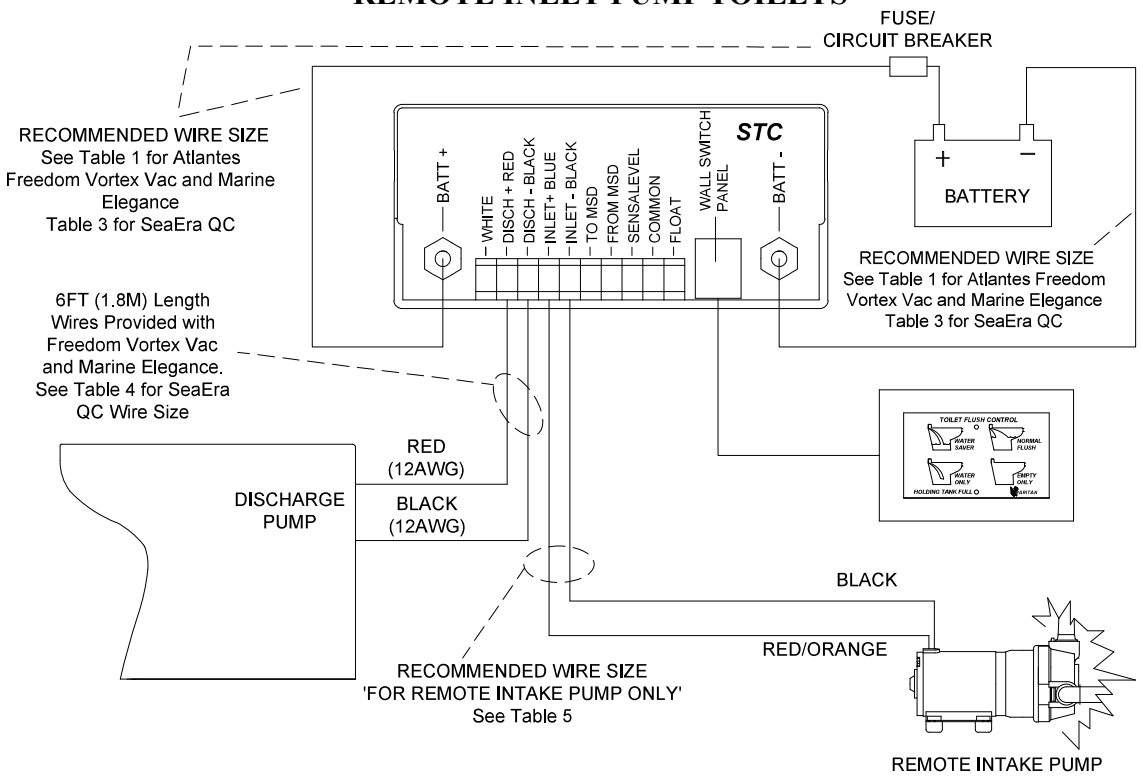


FIG 4

WIRING SMART TOILET CONTROL SEA/FRESH TOILETS

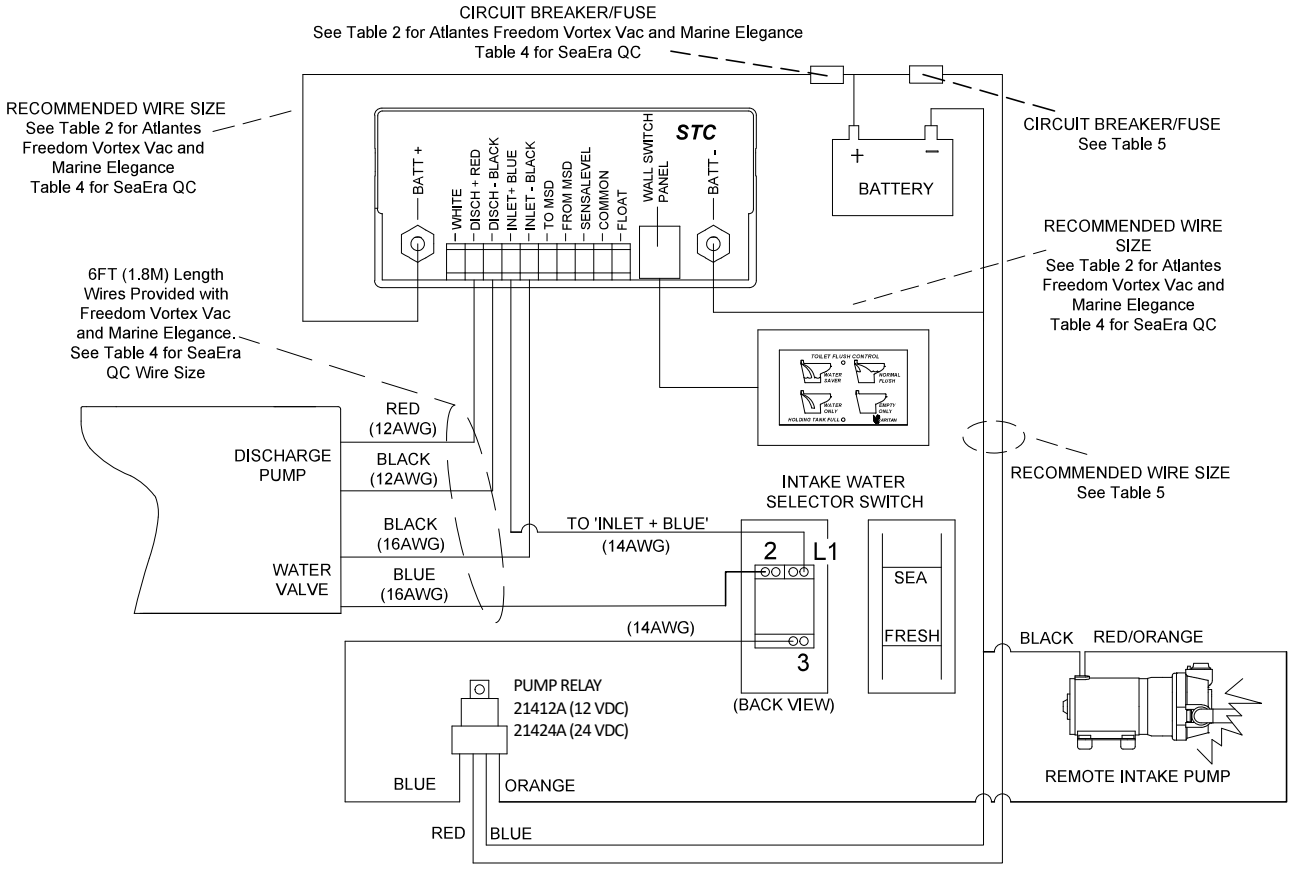
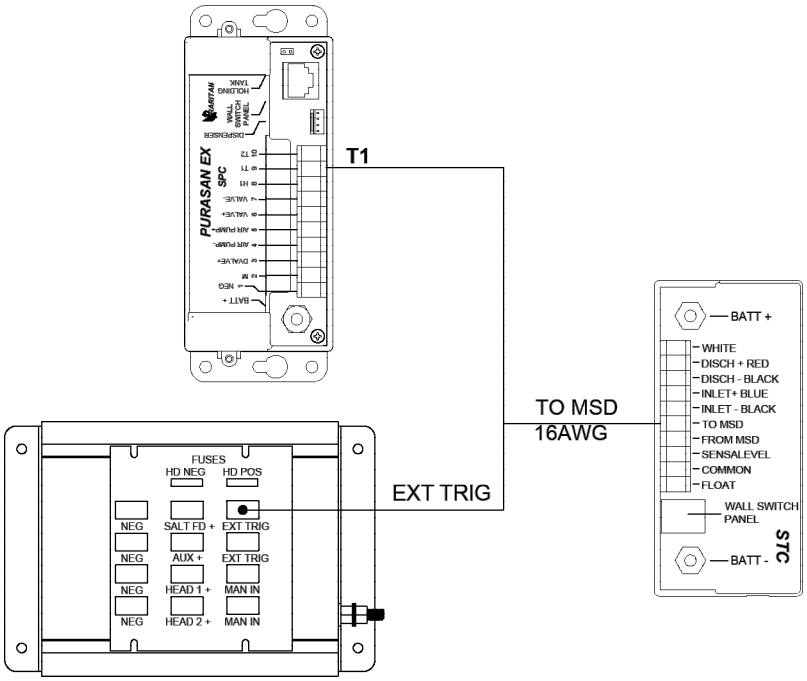


FIG 5

WIRING SMART TOILET CONTROL: TOILET CONTROL ACTIVATES MSD

PURASAN® EX / PURASAN®EX2

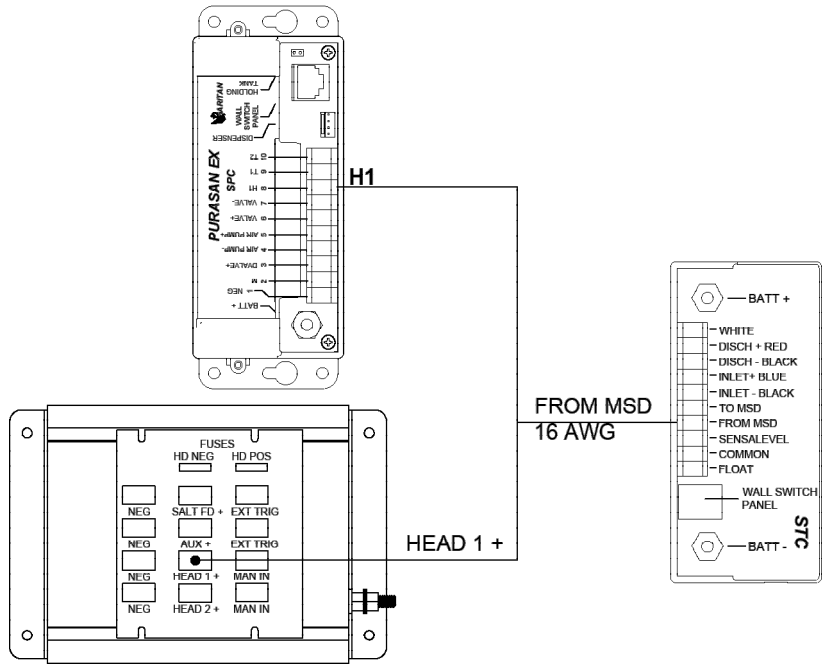


ELECTROSCAN®

FIG 6

WIRING SMART TOILET CONTROL: MSD CONTROL ACTIVATES TOILET

PURASAN® EX / PURASAN®EX2



ELECTROSCAN®

FOR LIMITED WARRANTY TERMS AND CONDITION
PLEASE REFER TO TOILET MANUAL

RARITAN
The Most Dependable Name on the Water
856-825-4900
www.raritaneng.com