

SMART TOILET CONTROL

Installation and Maintenance 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 as defined in 46CFR 110.15-65(e), Subchapter J-Electrical Engineering.



DO NOT run continuously for more than 30 seconds.

Description:

Smart Toilet Control (STC) is a controller for flushing toilet to optimize water use without compromising the quality of flush.

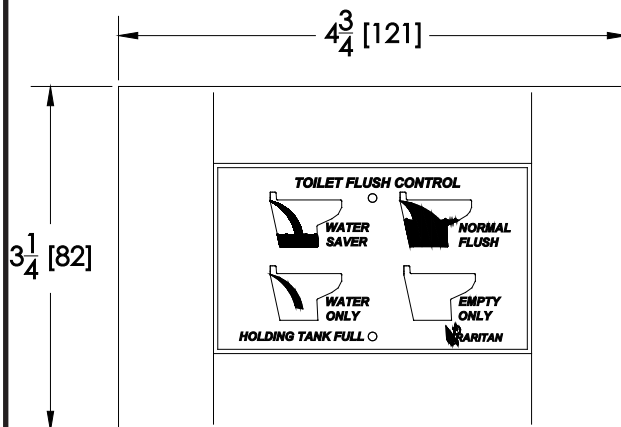
Control consists of a controller, panel and 7' of cable.

STC is designed to automatically start a flushing cycle if **normal** or **water saver** buttons are pressed.

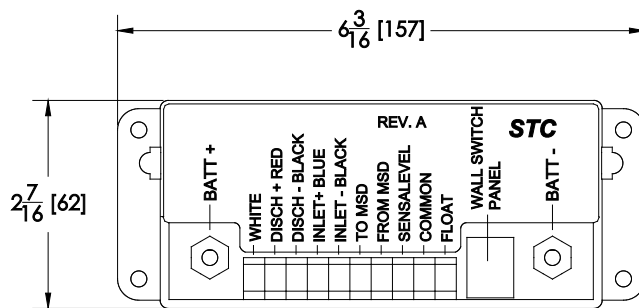
Water only button brings inlet water to the bowl when pressed and **empty only** button evacuates the bowl. Both water only and empty button have a time limit of eight seconds.

Flush timing of initial fill, discharge and final fill are fully programmable from panel.

If wired, panel also shows holding tank full status. When holding tank full LED is lit, normal and water saver button are disabled. Water only and empty button continue to function. 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.



Panel



DEPTH 1 5/8 [41]

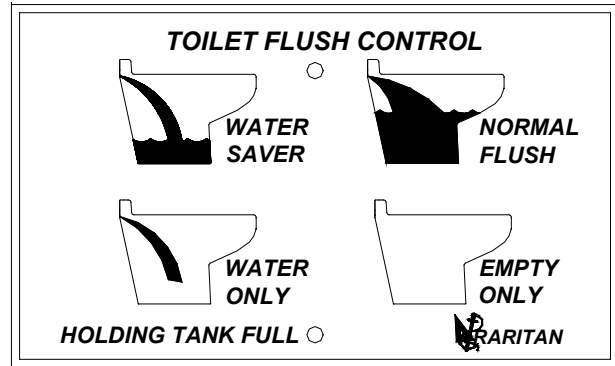
Control box

Multifunction Smart Toilet Control:

1. **Press Empty Only:** to evacuate the bowl. Discharge pump runs as long as this button is held with an eight second limit. If holding tank full LED is on this button still works.
2. **Press Water Only:** to add water in the bowl. Inlet water solenoid/pump runs as long as button is pressed with an eight second limit. After limit is reached Water Only button is disabled to prevent overflow of the bowl. To enable again, Empty Only button must be pressed. If holding tank full LED is on this button still works.
3. **Press Normal:** once and timed flushing cycle starts. If holding tank full LED is on this button is disabled. There are three 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 all discharge housing and lines with clean water. Last fill is to retain water in the bowl for next use. This button is disabled if holding tank full LED is on.

4. **Press Water saver:** a water saver cycle starts. If holding tank full LED is on this button does not work. This cycle has only one cycle of inlet and discharge to clear liquid waste. Last fill is to retain water in the bowl for next use. This button is disabled if holding tank full LED is on.

NOTE: Holding tank full light will only illuminate if the tank sensor has been added to the control.



Programming of Toilet Flush Control

NOTE: Flush control is set at factory to work in most installations and no additional programming is needed. Use following instructions to re-program if adjustment on water levels and timings are needed.

Programming timing for “NORMAL” flush cycle:

Normal cycle has initial fill time (T1), Discharge pump time (T2), and water retention fill time (T3). All three times (T1, T2 and T3) are programmable. Factory setting : T1= 3sec, T2= 3sec, T3= 2 sec, To change any of the above settings re-programming is needed

Step 1 – Placing the unit in program mode:

Hold the WATER ONLY & EMPTY buttons down together for three seconds. The Holding Tank Full LED will give three quick flashes indicating you have entered program mode - release both buttons.

Setting T1 initial fill time:

After placing the unit in program mode (Step 1

above) push the “Normal Flush” button the number of times required for the Water Valve/ Inlet Pump time (one push = 2 sec’s, two = 2 sec’s., three= 3 sec’s etc.) the Tank LED will flash once indicating a valid key push.

Note: If the button is pushed 9 times or more it will limit at 8 secs. Once this is done, push the EMPTY button to store this value (the unit will flash three times indicating the time has been set and you have left program mode).

Setting T2 Discharge Pump Time:

After placing the unit in program mode (Step 1 above) push the EMPTY button the number of times required for the Discharge Pump time (one push = 2 seconds, two= 2 secs, three =3 secs etc.) the Tank LED will flash once indicating a valid key push.

Note: If the button is pushed 9 times it will limits to 8 seconds . Once this is done push the NORMAL button to store this value (the unit will flash three times indicating the time has been set and you have left program mode).

Setting T3 Water retention fill Time:

After placing the unit in program mode (Step 1 above) push the WATER ONLY button the number of times required for the Water Valve/Inlet Pump time (one push = ZERO sec's, two = 2 secs. three = 3 sec's., etc.) the Tank LED will flash once indicating a valid limit to 8 seconds.

Once this is done push the "NORMAL" button to store this value (the unit will flash three times indicating the time has been set and you have left program mode).

Programming the WATER ONLY Disable Features:

1. Hold the WATER ONLY & EMPTY buttons down together for three seconds. The holding tank full LED will give THREE flashes indicating you have entered program mode .
2. Push the WATER SAVER button. The WATER ONLY and EMPTY buttons now can be disabled or enabled:
3. Pushing the WATER ONLY button will disable both WATER ONLY and EMPTY buttons. The holding tank full LED will give THREE flashes indicating you have left program mode.

Repeat steps 1 to 3 to re-enable these buttons.

Mounting control Panel:

Smart Toilet Control panel:

1. Cut out a hole per Fig. 1, mark mounting holes using wall plate as guide.
2. Route wire to the toilet and control.
3. Secure control using mounting screws

Smart Toilet Control Box;

1. Locate box near toilet in a dry and accessible area
2. Using two screws fasten the control to wall with connectors at the bottom.
3. Using one of the wiring diagram route all wires.

Install the Warning Label (L322) where it can be easily seen.

Programming the WATER ONLY button to only work after Empty button is pushed

1. Repeat step 1 & 2 above
2. Pushing the EMPTY ONLY button will enable this feature. The holding tank full LED will give THREE flashes indicating you have left program mode.

Repeat 1 &2 above to disable this feature.

Extending pause before water retention:

Some installations require longer pause between discharge pump and final retention water fill to avoid siphoning:

1. Hold the WATER ONLY & EMPTY buttons down together for three seconds. The holding tank full LED will give THREE flashes indicating you have entered program mode .
2. Push the WATER SAVER button. This will place control in disable/enable mode
3. Pushing the WATER SAVER button again. The holding tank full LED will give THREE flashes indicating you have left program mode.

Repeat steps 1 to 3 to shorten the pause.

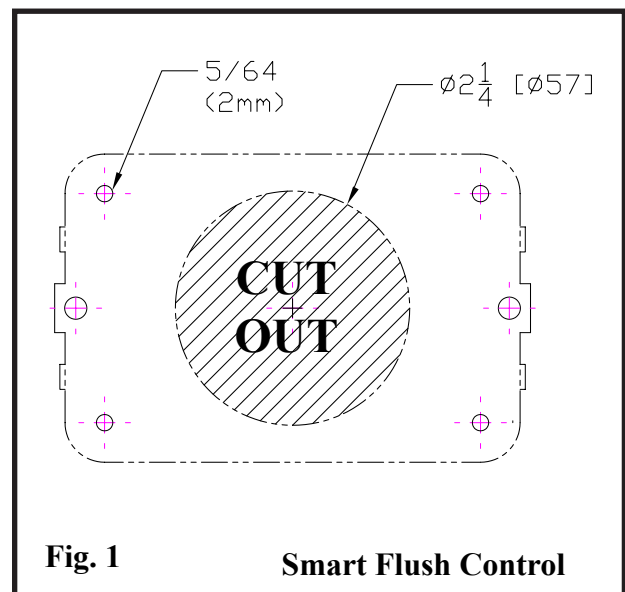


Fig. 1

Smart Flush Control

For most installation factory settings will work without making any changes to timing. To make changes to timing or after installation to optimize the flushing follow guidelines below

Observation or Issue	Action
Water does not empty all the way in the first cycle	Increase discharge timing (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	Reduce water retention time (T3)
There is no water or little water left in the bowl	Increase water retention time (T3)
Water siphons out after 10 or 15 minutes from the bowl	Enable longer pause before retention fill

WIRING

NOTES: for Wiring

- Distances are from source to unit and back to source.
- Distance from power source to remote intake pump **MUST** be included when determining total distance. Same wire size **MUST** be used for lower base and remote intake pump.
- Recommended conductor wire minimum AWG (mm²) for 3% voltage drop.
- Recommended conductor sizes are based on 105°C rated insulation. Single conductor (not bundled), refer to ABYC Standards for sizes with other insulation ratings.
- 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-Sea Water Model (sizes based on both inlet and discharge amps added)

Units Voltage	Circuit Breaker/ fuse size (amps)	Toilet Discharge Amps draw	Remote Pump Only 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
24VDC	20	10	5	16 AWG	14 AWG	12 AWG	12 AWG	10 AWG	8 AWG

Table 2- Pressurized Freshwater 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- Sea Water Model(sizes based on both inlet and discharge amps added)

Units Voltage	Circuit Breaker/ fuse size (amps)	Toilet Discharge Amps draw	Remote Pump Only 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 Freshwater 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

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

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 appliances to toilet circuit.
- Make sure power is off before proceeding.
- 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 from wiring diagram.
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 to the toilet and battery using one of the following wiring diagrams.

MSD OPERATION

To start Electrosan from toilet control, run a wire from “to MSD “ to terminal marked “EXT TRIG” inside Electrosan control module (black box) (See Fig 5).

To start toilet equipped with Smart toilet control from Electrosan, connect “Head1” to “FROM MSD” (See Fig 6).

For Lectra/San MC, EC call Raritan Customer Service

Fig. 2 WIRING FOR SMART TOILET CONTROL , FRESHWATER MODEL

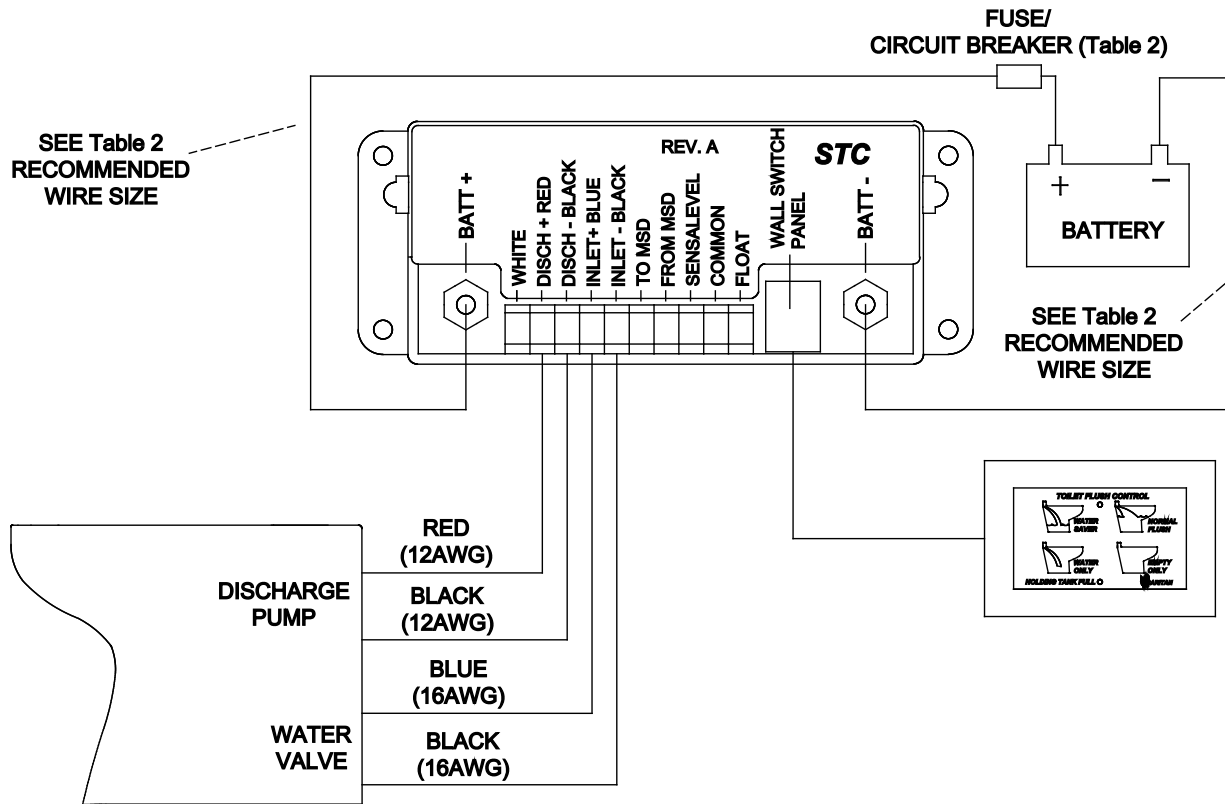


Fig. 3 WIRING FOR SMART TOILET CONTROL REMOTE PUMP MODEL

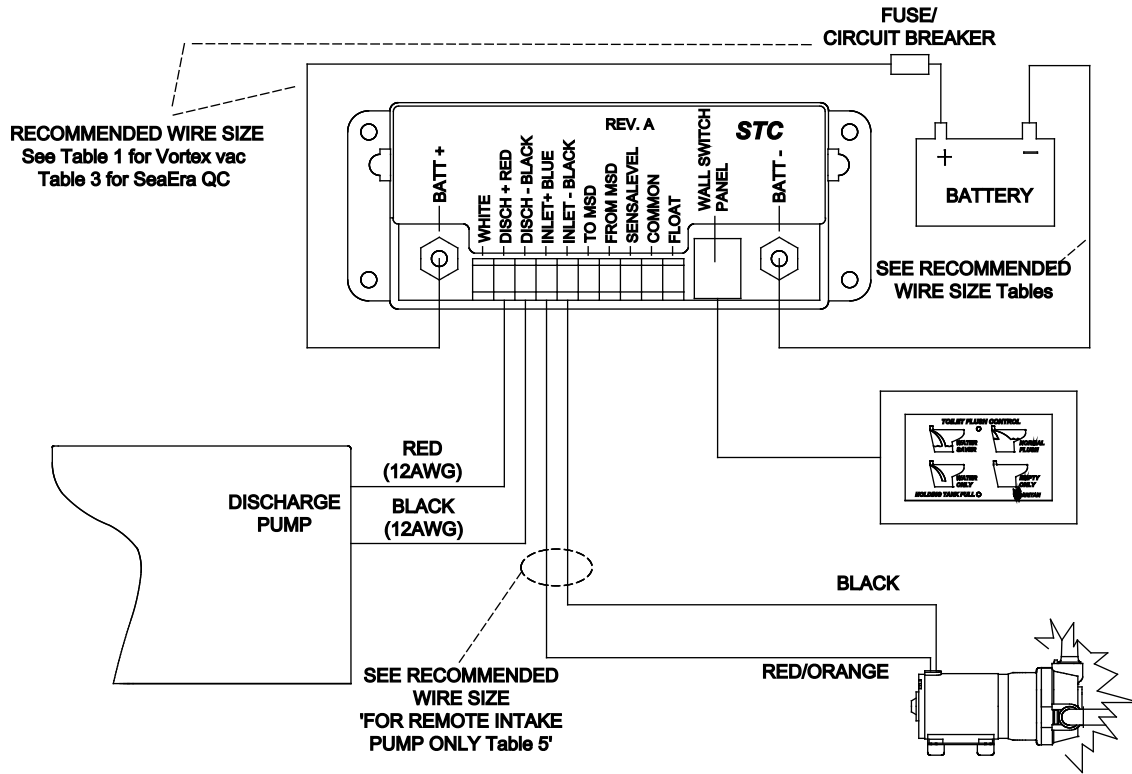


Fig. 4 WIRING FOR SMART TOILET CONTROL SEA/FRESH MODEL

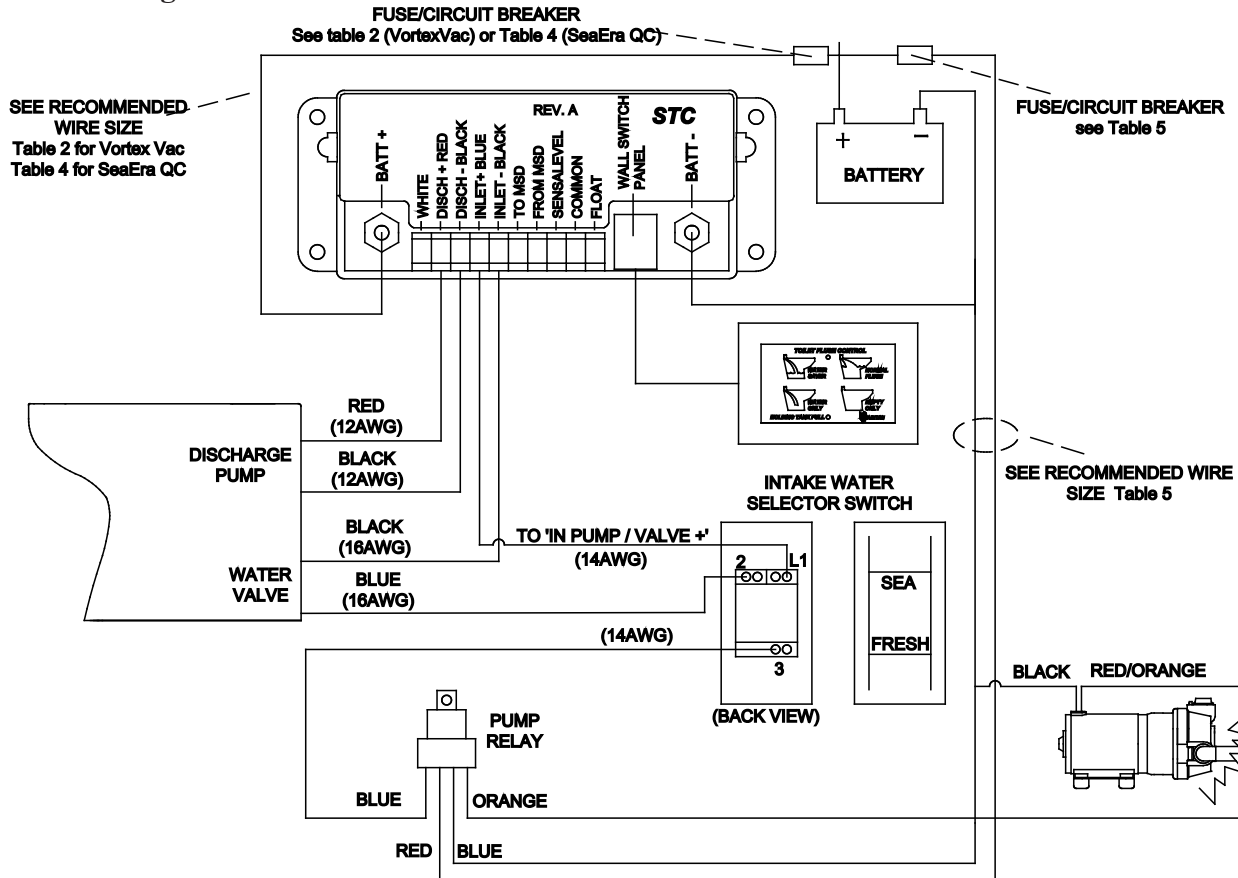


Fig. 5
WIRING FOR SMART TOILET CONTROL WITH MSD

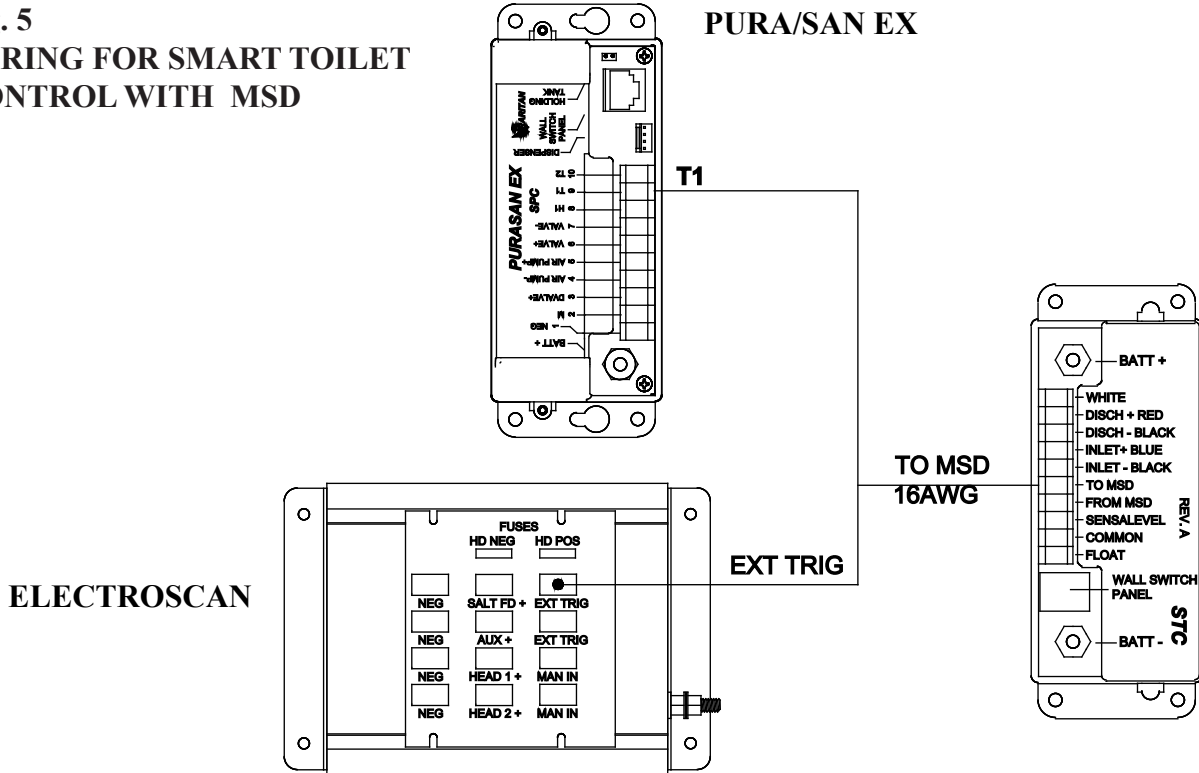
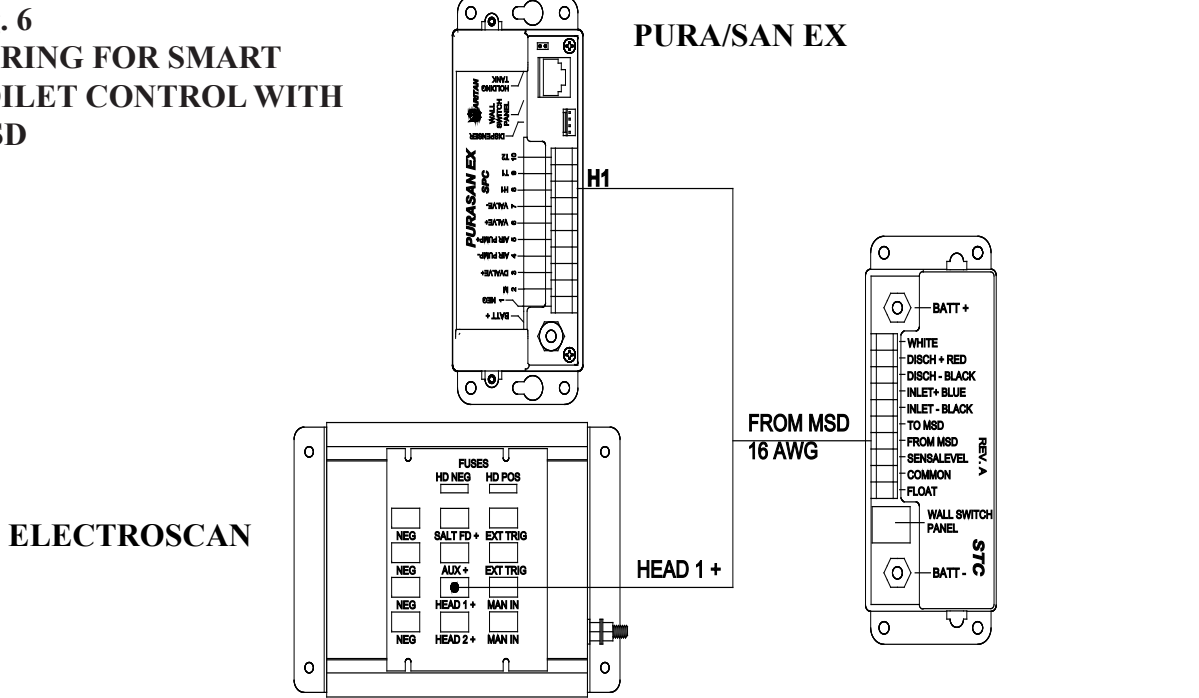


Fig. 6
WIRING FOR SMART TOILET CONTROL WITH MSD



FOR LIMITED WARRANTY TERMS AND CONDITION PLEASE REFER TO TOILET MANUAL



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