

# AQUA-SAN SBS II

## Sewage Treatment System

### The 12 Most Common Installation Problems

*(Please read this before commencing installation of the system)*

**1. Incorrect Wiring of the Control Module.** The power supply to the Control Module must be protected from significant power 'drops' which may occur such as when starting an engine or **flushing a toilet**. Directly connecting the toilet/s to the Control Module's power supply, or connecting the Control Module to the power supply to the toilets, will result in significant voltage drops to the Control Module that will cause erratic operation of the system and of the Treatment Tank discharge pump. It may also result in the system re-booting unnecessarily if the voltage **at the Control Module** momentarily drops below 7.2 volts. **Solution: Provide a 'clean' source of power from the battery or electrical panel to the Control Module, and do not connect any other electrical equipment to the positive side of this circuit.**

**2. Incorrectly installing the integrated Treatment/Holding Tank parallel to the centreline of the boat, but with the Treatment Tank (the cut-away section) towards the stern.** With a planing or semi-displacement hull, this will result in the waste in a partially-full tank flowing away from the fluid height level sensors (located in the Holding Tank) and into the Treatment Tank, when the vessel's bow rises. This may allow waste to flow back into the toilet (if the toilet is below the height of the top of the Treatment Tank) or into the Treatment Tank breather tube. Alternatively, it may allow both Tanks to be over-filled i.e. the toilet will continue to pump waste into the tank until the cut-off level is reached in the Holding Tank; when the vessel is at rest, the waste will flow into the Holding Tank submerging the titanium probes and possibly causing an extended disabling of the toilet. **Solution: Install the Tanks with the Treatment Tank (i.e. the cut-away section) towards the bow.**

**3. Incorrectly installing the two-way Aqua-Valve:** The two-way valve is provided to allow emptying of both the Holding and Treatment Tanks. The opening marked 'Inlet' must connect to the macerator discharge pump; the other two openings are connected to the lower tank outlets. The red arrow on the pump handle points towards the hose connection that is CLOSED. **Solution: Install the valve with the opening marked 'Inlet' connected to the discharge pump and the "arrow" facing towards the tank that is closed off i.e. usually the Treatment Tank.**

**4. Incorrectly connecting the Macerator Discharge Pump:** The negative return from the macerator discharge pump is used by the system electronics to detect when the tank is empty and the check the operating status of the pump. Connecting the negative from the macerator discharge pump to a 'common earth' and then to the negative connection shown on the circuit board (or not connecting the pump to the negative connection shown on the circuit board at all) will prevent the pump from operating correctly and will lead to erratic behaviour of the system. **Solution: Connect the macerator discharge pump, the dosing pump, and the electrode cell, exactly as shown on the wiring diagram. A 'common earth' can be used for the toilet cut-out relay, the deck/pressure pump relay, and the negative power connection to the circuit board, if preferred.**

**Note:** Some installers have recommended installing a 'ball valve' (not supplied) between the two-way valve and the macerator discharge pump to completely shut off the tank when replacing or repairing the macerator discharge pump.

**5. Incorrectly installing the Pressure Sensor Tube:** The Pressure Sensor Tube and its reducing bush must be installed as far as possible into the Holding Tank, preferably until both nuts and the tank are in contact. Leaving the Pressure Sensor Tube raised prevents the air within the tube 'triggering' the air pressure switch at the correct height and may prevent the 'Learning Phase' from being undertaken. The system will not commence the Learning Phase if the maximum level height sensor has been triggered (flashing Hi-level LED) without the 80% full height sensor having been triggered previously (steady Hi-level LED). **Solution: Screw the reducing bush and Pressure Sensor Tube as far as possible into the tank, preferably with the nuts in contact with each other and the top of the tank.**

**6. Incorrectly attaching/positioning the toilet 'trigger' connections:** The toilet 'trigger' connection must connect to the number 8 pin in the 8 pin array only i.e. the far left hand pin in the array with the cable glands facing towards you. Connecting this wire to any other pin in this array e.g. pin 7 or pin 1, and flushing the toilet will result in an immediate short circuit, severely damaging the main circuit board. **This is not a warranty issue**, and a replacement Control Module will need to be purchased. **Solution: Insert the toilet trigger connection correctly. The existing wiring should be left in place (essential if connecting two toilets) or if connecting only one toilet, ensure that the new wire is inserted correctly into the plug and that the one-way plug is inserted correctly into the socket.**

**7. Incorrectly installing the Cell Tank in too low a position or badly positioning/supporting the hose line:** The flow from the Cell Tank to the Treatment Tank is via a gravity feed. Saltwater is forced into the Cell Tank by the peristaltic dosing pump and hypochlorous acid solution 'flows' from the Cell Tank into the Treatment Tank via the black polypropylene hose line. Any loops, bends or dips in this hose line will potentially cause an air lock resulting in the correct amount of solution not being added to the Treatment Tank. **Solution :Install this hose line as vertical as possible with a constant 'fall' from the Cell Tank to the Treatment Tank. Check the flow at the Treatment Tank end of this hose to ensure that a reasonable amount of solution is being provided (150-200ml) per flush.**

**Note:** Some installers have recommended installing a small 'one-way' valve in the hose line between the inlet filter and the dosing pump to ensure that any other pumps connected to this line do not 'pull' the water away from the dosing pump.

**8. Incorrectly installing the Nut & Hose Tail Connections:** The rubber washers supplied with the nut & hose tails occasionally become dislodged during transit and fall out of the nut. Installing the nut & hose tails without the corresponding washer will result in a persistent leak. **Solution: Check that the rubber washer is in place within the nut of each nut & hose tail prior to connecting the nut & hose tails to the nipple or other fitting.**

**9. Incorrectly installing the Fluid Level Sensor Cap:** The Fluid Level Sensor Cap uses two ceramic/titanium probes to detect when the Holding Tank is 95% full. Once the tips of both probes are continuously immersed in water for one (1) second, the system will immediately 'open' the toilet control relay, disabling the toilet/s and preventing the toilet/s from over-filling the tank. The tolerance on this function is very small. Failing to screw the Fluid Level Sensor Cap completely onto the Holding Tank will raise the level at which the ceramic/titanium probes come into contact with the effluent and will potentially result in treated effluent being forced into the breather tubes. **Solution: Screw the Fluid Level Sensor Cap fully onto the thread on top of the Holding Tank.**

**10. Incorrectly installing the air breather tubes:** The air breather hoses must have a constant rise from the tank outlet to the external breather outlet. Allowing the hose/s to run horizontally or 'sag', will potentially allow fluid to collect in the hoses, forming an air-lock, resulting in the first of the high level alarms 'triggering' briefly each time that a toilet is flushed. **Solution: Install all air breather hoses with a suitable rise from the tank to the external outlet.**

**11. Using detergent to lubricate the piping:** Several installers have used liberal amounts of detergent to assist the installation of the piping. When testing the system after installation, this may result in excessive foaming occurring within the holding tank, resulting in the foam coming into contact with and staying in contact with the titanium probes until the foam evaporates. This will trigger the '95% full' alarm and will disable the toilet/s. **Solution: If using detergent, apply it sparingly, or use an alternative lubricant.**

**12. Mounting the tanks below the waterline:** When installing tanks below the waterline of a vessel, special precautions must be taken to prevent unintentional filling of the tanks. The siphon breaker supplied must be installed between the through-hull outlet and the macerator discharge pump, particularly if the outlet is below the waterline or only slightly above the waterline. A 13mm siphon breaker must also be fitted between the pressure pump and the cleansing rotor, if the top of the treatment tank is below the waterline. The Cell Tank should **always** be mounted above the waterline; however, if this is definitely not possible, a manual valve or a solenoid valve **must** be inserted in the piping from the seawater inlet to the peristaltic pump so that this pump is completely isolated from the seawater inlet when the vessel is not in use. **Solution: Mount the Treatment Tank above the waterline if possible and/or use siphon breakers to prevent filling of the tank. Always mount the Cell Tank above the waterline and/or use valves to turn off the water supply to this pump when the vessel is not in use.**