clivus multrum

WATERLESS COMPOSTING TOILETS

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Manufacturers of Australia's Leading Commercial Environmental Toilet Systems

INSTALLATION MANUAL FOR CLIVUS MULTRUM ZERO-DISCHARGE SYSTEM

p 1300 13 81 82

www.clivusmultrum.com.au

f 07 3889 6149

TABLE OF CONTENTS

1. OVERVIEW

The Clivus Multrum Zero Discharge System is a liquid storage tank that collects discharge from Clivus Multrum composting tanks . This system is implemented in areas where absorption trenches are not permitted by local authority.

2.HOW IT WORKS?

- Liquid from the Clivus Multrum composting tank drains into the Zero Discharge storage tank via gravity feed.
- When the liquid reaches certain level, a float switch will trigger a 12V pump to transfer excess liquid from the Zero Discharge storage tank back to the Clivus Multrum composting tank, discharging in the vicinity under the chute.
- This system of recirculation will assist the evaporative process and control the level of excess liquid in the toilet system.

3. INSTALLATION INSTRUCTIONS

a. Float switches inside the pump-well have been secured for transport. Remove the access cover from the pump well and remove the tape and packing materials from the float switches and ensure there is free movement of the rocker floats. Check that the control wires come out through the hole in the tank lid and there is enough slack at each switch for free movement of the float.

b. After installing the compost tank, set the pump-well tank into the ground nearby at a level that ensures drainage slope on the pipe running from the compost tank to the inlet of the well. The top of the well can protrude above ground, but should not be higher than the front lip of the compost tank (at the compost removal hatch) - refer to Diagram 1–Typical Pump-Well Installation on page 5.

c. Install drain pipe from compost tank to the pump well.

d. Back-fill around the pump well and drain pipe using bedding sand against any plastic components to avoid any long term damage from rocks etc. if concrete is to be poured around the plastic pump-well. First place enough water in the pump-well to avoid buoyancy or collapse when concrete is placed.

e. Mount the recirculation pump and control box in a suitable positon near the pump-well. The control box should in position protected from weather, but readily accessible to check the warning lamp. The pump can be installed vertically or horizontally, but the motor must not be vertically below the pump head.

f. Locate the outlet for liquid return in suitable position on the top or upper side of the compost tank. Preferred position is aimed towards the toilet chute(s), so that the spray will cover most of the compost pile but not directed towards the compost tank inspection door.

g. Check the return hose is clamped to the Tank Outlet Fitting in the side of the pump-well . The bottom end of the hose should finish 80-100mm above the floor of the pump-well [for In-Line Pump] to avoid sucking up any solids. Route the hose to the pump and secure in permanent position with clips or ties. Clamp hose to the Tank Inlet Fitting(s) on the CM tank. All hose connections must be Hose Clamped.

h. Before connecting the solar panel or battery to the Power Control Box, connect cabling from the Pump Control Box to the pump and the float switches as per the labels and the wiring diagram supplied. Trim off excess cable lengths and use the crimp connectors provided.

i. Refer to Commissioning Instructions for testing the system.

4. MAINTENANCE & TROUBLE SHOOTING

4.1 MAINTENANCE

The pump and control system does not need any regular maintenance, but should be checked at least monthly for proper operation. The Alarm [audio/visual] on the Control Box will indicate failure of the pump or bottom float switch before the liquid level builds up and causes other toilet operation problems. The operation of the pump should be checked monthly by briefly using the manual override switch.

4.2 TROUBLESHOOTING

1. No functions work.	• Check that the Low Voltage Disconnect light on the solar controller is not on if lit the battery will need charging until this light goes off. • Check battery fuse , switch panel fuse, pump fuse and connections from power supply.
2. Lights work, pump won't run.	• Check fuse in pump switch panel and in the cable to pump. • Check operation of bottom float switch and its wiring.
3. "High Level" light is on.	• Check pump operates. • Check hoses and spray nozzle/s are not blocked. • Remove cover from pump-well and check operation of the top float switch. • Check toilet system is not getting excessive use and that vent fan is functioning. • If the hand basin is connected to the composting tank, check for
4. Pump motor runs but it won't pump.	• Check suction hose is below liquid level in well. • Check for hose/nozzle blockages. Or air leakage into the suction hose. • Check pump diaphragm for damage–refer pump maintenance
5. Pump-well has overfilled with liquid (normal liquid level is within the tilt range of the bottom float switch)	• Check if this is due to an extended power failure; check the solar power system is charging correctly and the battery is functional and charged to at least 12V. • Check items 1-4 above. • If system has been functioning correctly check that toilets are not being over-used or too much water used for cleaning the pedestals. • If volume of extra liquid is excessive it will cause the pump to run continuously and drain the battery. This may also over-wet the compost pile–check the pile is not too wet. If necessary remove excessive liquid from the pump-well and dispose of appropriately before restarting automatic operation of the pump. • If problem recurs contact Clivus Multrum.

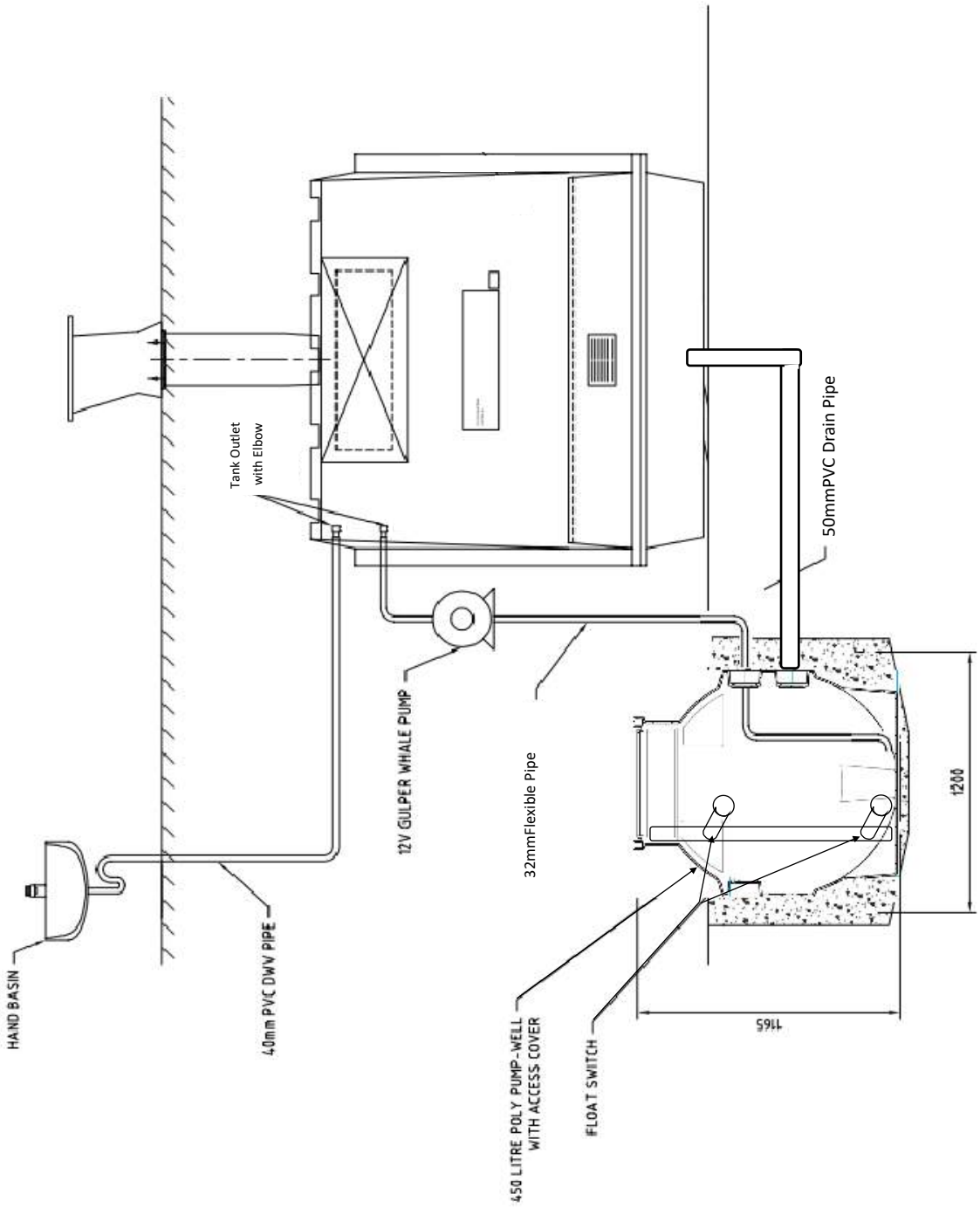
5. COMMISSIONING INSTRUCTION

1. Re-check all installation instructions are correctly completed.
2. Check pump function switch is in "OFF" position, and Pump Control Panel is connected to the solar power controller. Now connect the solar panel, battery and toilet vent fan as per the instructions supplied with the solar charge controller.
3. Dry-test operation of the pump system as follows. The pump will not be damaged by short periods of dry running.

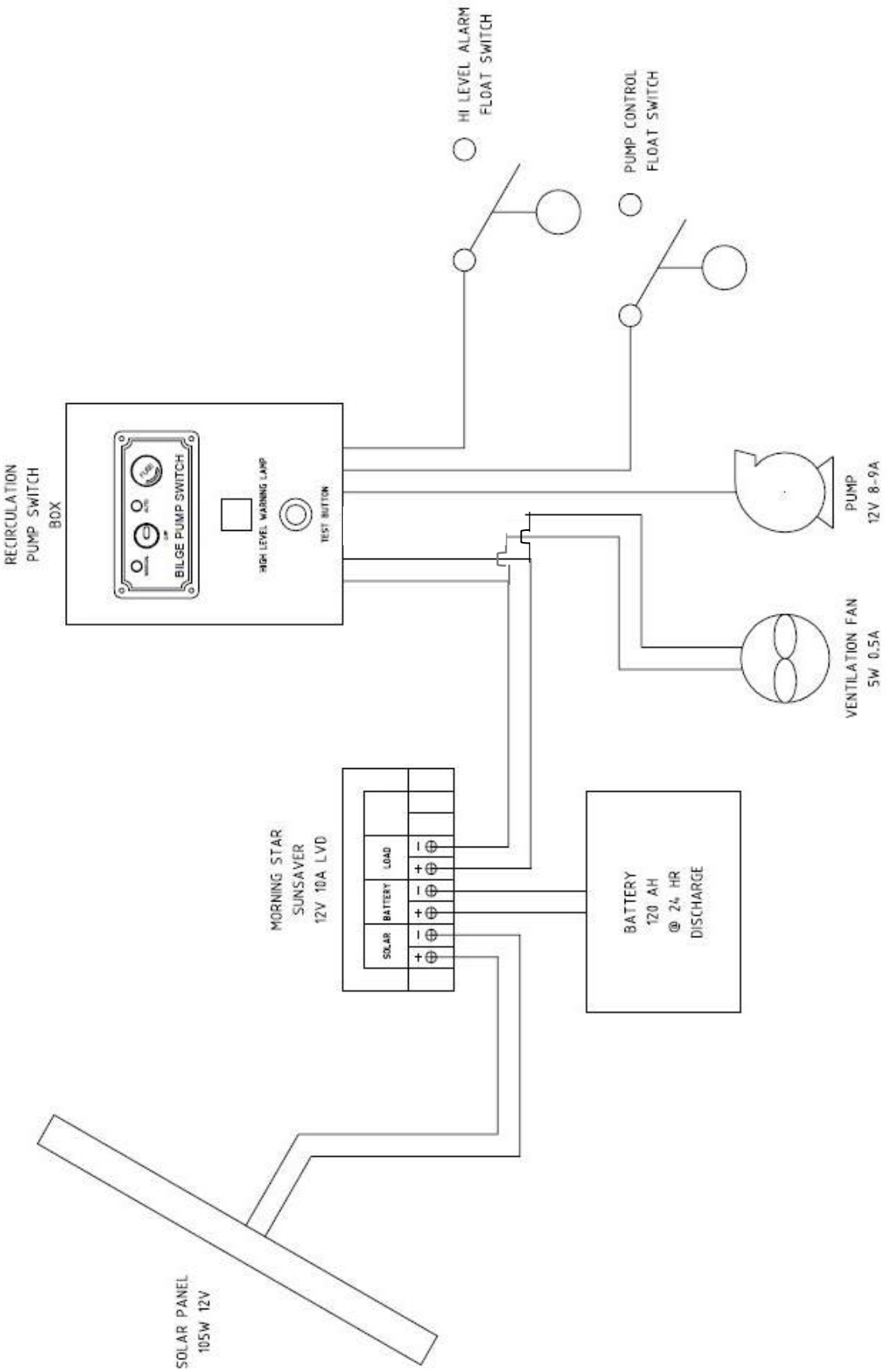
A. Switch pump control briefly to MANUAL	The pump will run continuously
B. Switch pump control to AUTO, then raise the tilt arm of the bottom float switch in the pump-well.	Pump motor will switch on and off, controlled by the float switch.
C. Raise the tilt arm of the top float switch in the pump-well	The "Alarm" lamp & pump will come on and off, controlled by the float switch.

4. Wet-test the system by adding clean water to the pump well up to the suction hose level. Switch pump to MANUAL and it will run, self-priming after a few seconds and pumping water to the compost tank.
5. Check the spray pattern in the compost tank. Spray should cover the maximum surface area possible of the compost pile, but *Not* spray towards the inspection door or into the vent-pipe connection.
6. Check hoses for security and fix any leaks.
7. Replace the access cover on the pump-well.

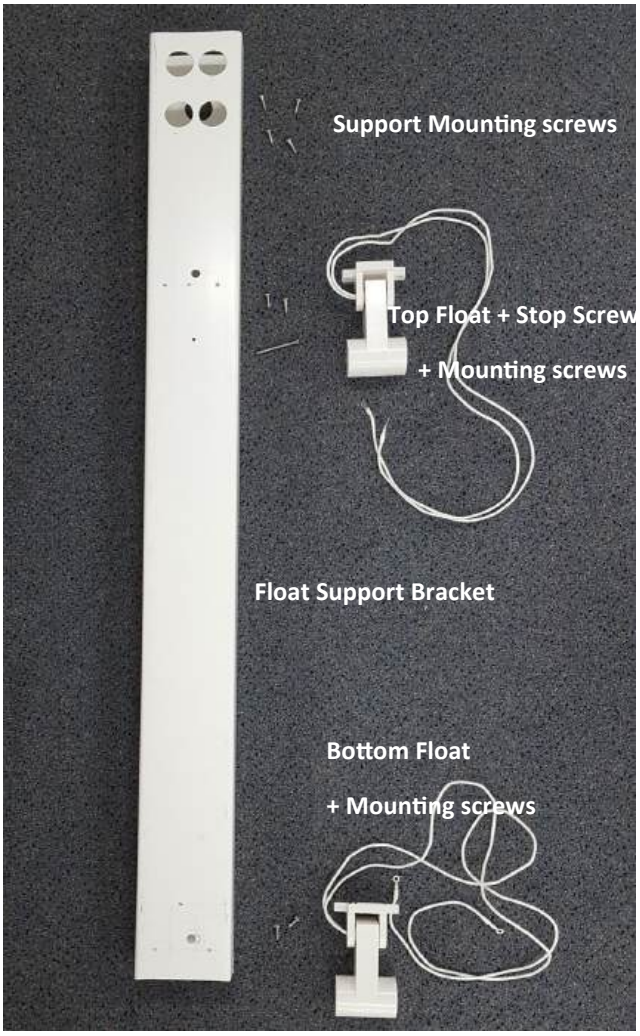
6. DIAGRAM 1–TYPICAL PUMP-WELL INSTALLATION



7. DIAGRAM 2–POWER & CONTROL ELECTRICAL DIAGRAM



7. DIAGRAM 2–Float Support



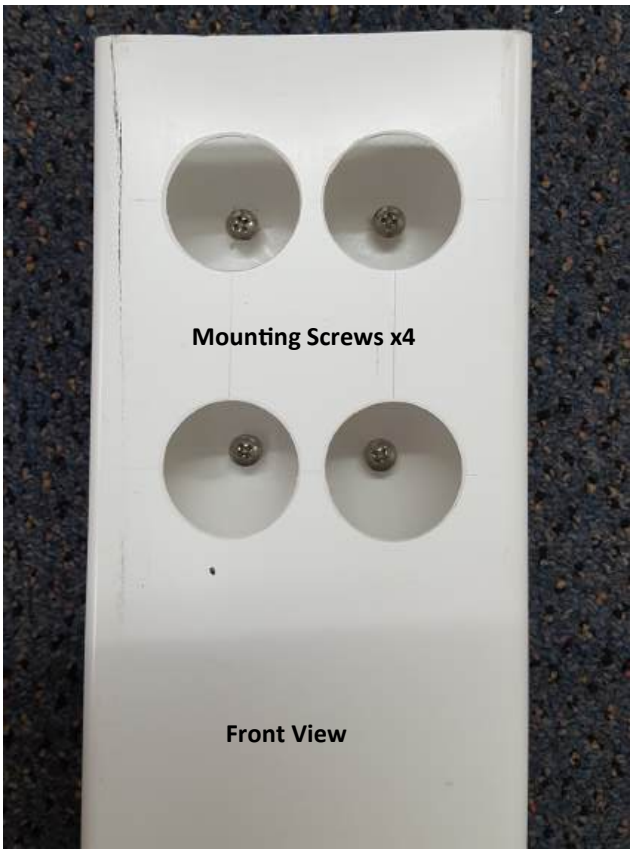
Thread Bottom Float wires through hole provided.

Guide wires through the Float Switch Base; as shown & tighten screws.

Check operation is unimpeded - Check wire position.

7. DIAGRAM 2–Float Support

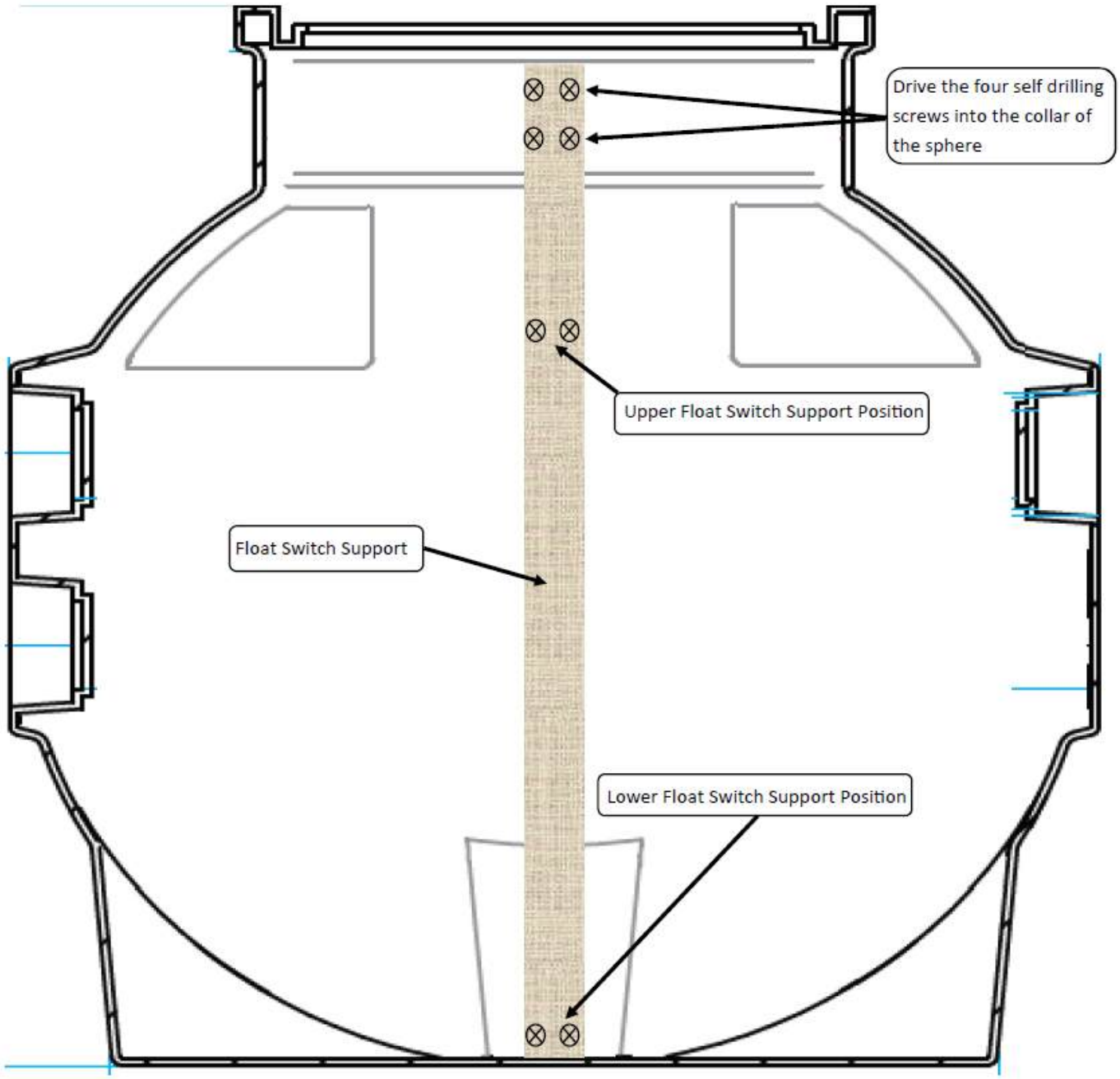
7. DIAGRAM 2–Float



Insert the Float Support into Zero Discharge Chamber - it should be vertical & rest on the floor within one of the legs with the Floats facing towards the centre of the Chamber.

Once the support is in position; accurately mark the location of the wiring hole on the Chamber collar & drill a 25mm hole to accommodate the Grommet.

Guide all wiring through the Support & Grommet & then Secure the support with the four mounting screws.



1. Before assembling the Float Support, insert the support into the Zero Discharge Unit & check the height is correct - it should sit on the bottom of the chamber with the top just under the top lip. ***Trim the Top*** if needs be.
2. Assemble the Float Support from the images included in the Installation Manual.
3. Insert the assembled support into the Chamber & drive the four screws through the support into the collar of the chamber.
4. Make all electrical connection as shown in Installation Manual.
5. Perform Operational test; as shown in Installation Manual, to prove Floats & Alarms are wired & functioning correctly