AQUA ADVANCED
WASTEWATER & IRRIGATION SYSTEM

INSTALLATION MANUAL

Applicable models:
80700D, 80700E, 10700D

*** This installation manual is for installation of the above AQ models (manufactured from November 2024) This is for the units that have the auto-skimmer removed. Please speak to your Everhard Account Manager if you are unsure of which manual to use.**

Aqua Advanced Wastewater & Irrigation System Installation Manual

SITE PREPARATION

Aqua Advanced may be installed above ground or in ground. In areas where the groundwater level is high or where soil drainage is poor, special consideration should be given to anchoring the system in place. The same considerations are present if there is a risk of flooding at the point of installation of the system.

Consider ensuring that the base of the system when in ground is at or above the expected water table level. These considerations need to be made with the required invert level in mind. Above ground installations must be on a level area that has been lined with 50mm of sand or gravel. The area must be appropriately shored to prevent the scarification of any supporting materials.

Similarly, an AQ Advanced installation may be installed partially above ground or in sloped areas. In both instances the area must be levelled after installation so that the tank cannot be displaced by soil movement. The highest risk environment is severely sloped areas (<30%). In these environments the system must be supported by using appropriate shoring materials to allow backfilling so that the side of the installed tank is not visible.

In all instances hold down anchors do not need to be installed if they are exposed.

Areas where the soil may be aggressive (e.g. acid sulphate soils) some consideration should be given to the possibility of corrosion and other issues. The polymer tank anchors / fixings are designed to withstand attack from acid sulphates, however if there is any doubt seek advice from Everhard Industries.

The hole depth required to install the system depends on the fall of pipe due to the distance of the tank installation from the wastewater source. The excavated hole must not be so deep that Tank Top Covers will be completely covered. Tank Inspection and Access Covers MUST be above final ground level.

Key excavation dimensions for the single tank polymer system are:

Surface to floor of inlet pipe trench 651 mm

Inlet trench to base of excavated hole 1,800 mm

Total maximum depth required 2,451 mm

Excavation diameter (single tank system) 2,200 mm

Depth to discharge pipe connection 348 mm

Key excavation dimensions for the single tank Concrete system are:

Surface to floor of inlet pipe trench	781 mm
Inlet trench to base of excavated hole	1,764 mm
Total maximum depth required	2,545 mm
Excavation diameter (single tank system)	2,200 mm
Depth to discharge pipe connection	517 mm

The hole should have no matter projecting inwards. No roots or foreign material should be present. The finished excavation must allow four anchors for the tank, from 100 mm uPVC Sewer grade pipe not less than 1250mm long. Polymer rope is provided to secure the anchors to the Everhard Tank. This anchorage system will meet the minimum normal requirements. Extra anchorage may be needed in adverse or difficult conditions.

The hole should be finished with clean bedding sand, to a depth of 50 mm when compacted. The base of the hole must be even, flat and level.

JOB PREPARATION

No special tools are required for the installation of the AQ Advanced system by the installing plumber or electrician. Standard ranges of tooling typically carried by these trades should be sufficient.

Lifting operations need to be considered where the system is not placed directly into the hole by the delivery vehicle and driver. Make sure that a suitable crane is available with appropriate lifting slings, including a spreader bar to eliminate the risk of side loads being applied to the tank.

The system should only be installed by licensed trades people, who must follow these instructions precisely in order to ensure the correct method of installation for the system is achieved.

DELIVERY OF THE SYSTEM

Please ensure that the following parts are included in the delivery of the system:

- Water treatment system assembly, comprising a 4,000 litre polymer tank with welded in riser, polymer lid and polymer access cover (1 of)
- Anchor pipes (4 of)
- uPVC non-return valve DN25
- Polymer anchor rope (28m)
- Aerator Pump (inside control box)
- Effluent Water Sign (2 of)
- Pump outlet pipes & fittings

The specified irrigation package should also be included. Several packages are available, each comprising a number of sprinklers or discharge nozzles, and the appropriate hoses, control valve, and fittings to allow them to be correctly installed. Some packages may include an In-Line Filter for the treated discharge. Refer to the selection list for details.

IMPORTANT: Advise the householder NEVER to alter any part of, or add to, the irrigation system supplied without the manufacturer's advice. Otherwise, alterations may overload the Treatment Tank Discharge Pump, contravening the terms of the operating licence and / or Warranty.

INSTALLATION OF THE SYSTEM

If it is possible to do so, the delivery vehicle may be able to lift the system directly into a properly prepared excavation to prevent the need for double handling and extra lifting operations. If this is not possible, the system will need to be lifted using approved lifting methods that include the use of spreader bars to ensure that the system is not damaged when it is lifted. Make sure that when you are ready to lower the system into place, the inlet is aligned with the sewer pipe that will be feeding into the system.

Installation of the system must be completed according to AS/NZS 3500.1 and AS/NZS 3500.2 (or any standards that may supersede them).

Once installed, all surface water and stormwater must drain away from the system, with no pooling or ponding of surface water allowed around the installation.

Follow this process to complete the installation.

GROUND ANCHOR PREPARATION

Fill Ground Anchors (100mm uPVC Sewer pipe not less than 1250 mm long) with sand, and cap ends. Attach to the Tank. Four Anchors is the absolute MINIMUM. More Anchors will be necessary if the soil can saturate with water or cannot form a homogenous mass to hold the Tank in place, or if required by Local Authority. Four Anchors should form a square around each Tank.

Cut the length of the Polymer anchor rope provided into 8 equal lengths (approx. 3.5m each). Pass one end of each anchor rope through the pre-drilled holes in the vertical ribs of the tank. Tie them off with secure knots to make 8 loops.

Suspend each of the 4 anchor pipes using 2 adjacent rope loops

All anchor pipes must hang at the level beside the tank and be about 150mm off the bottom of the excavation, with cables fully secure. Sand-fill and cap Anchors to help tighten cables and ensure maximum effect. If sand is not available, then use material from site providing it can be adequately compacted inside the anchor tube. Ropes MUST NOT be run through the anchor pipes as they may cut through the pipe when under load.

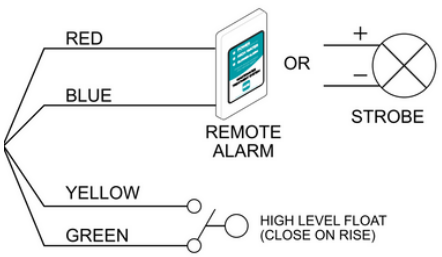
SYSTEM INSTALLATION

- Lift system into excavated hole, aligning the inlet with the plumbing
- Use a spirit level across and along the flat sections of Tank Top Covers to ensure the Tank is level and firmly seated. Pipe Anchors should hang horizontal beside Tanks with NO SLACK in the ropes.
- Natural Tank buoyancy tends to allow flotation in wet soil. Ground anchorage is needed to ensure that partially empty Tanks remain in the ground. Where backfill may not provide a homogenous mass able to overcome the uplift effect on Pipe Anchors, extra anchorage is essential - for example where the water table is very high and/or the soil is stony. Typical examples are precast Reinforced Concrete Slabs placed over Anchor ends, or several bags of pre-mixed Concrete over the ends of Pipe Anchors. Quantities of concrete may also be poured at equal intervals around the base of the Tank so that the lower ribs of the Tank wall are covered. When set, these will help secure the Tank and prevent movement.

- The tank lid should be screwed into place, ensuring the screws are driven into the securing rib moulded into the side of the tank.
- Do NOT complete backfill operations at this point. Backfill should be carried out AFTER final connections etc.
- Connect inlet piping to the tank connection fitting. This accepts standard 100mm uPVC SWV pipe with socket, rubber ring joint or rubber sleeves with stainless steel clips. Possible minor misalignment of pipes due to ground movement must be allowed for. DO NOT use a Pan Connector or rely on Solvent Cement for pipe connection.
- Select the correct threaded pump fitting for your pump. Use PVC solvent to glue the pump fitting and the non-return valve to each end of the straight discharge pipe. Screw the discharge pipe assembly to the outlet of the pump.
- Place the pump into the irrigation chamber so that it sits on the pump shelf about half-way down in the chamber. Use the remaining discharge pipe pieces and elbows to connect the pump to the outlet fitting on the side of the tank.
- Feed the power cable from the pump up into the control box through the bung with the float switch cable. Plug the pump into the power outlet of the control panel marked “EFFLUENT PUMP”. Be sure to replace both the bung for the power cord and the bung for the aerator piping if they have been dislodged in this process. The seal between control box and the chambers is critical to avoid corrosion and early failure of electrical equipment.

ELECTRICAL CONNECTIONS

- Electrical connections must be made by a qualified and licensed Electrician, and must be completed to the relevant Standards, Codes of Practice, Legislation etc.
- Connect Control Box to power supply. Cables must be installed by a qualified electrician and protected by suitable conduit. Rigid conduit from supply should connect to underground flexible conduit at Control Box allowing a free loop of cable at the side of the Tank for ground movement etc.
- Power cable should be a minimum 1.5mm² for each Active, Neutral and Earth conductor, fed from a domestic switchboard, on a dedicated circuit protected by a combined 16 amp 8kV circuit breaker - Earth Leakage Control device.
- Power cable is to be terminated in the Control Box with a General-Purpose Outlet (GPO) and mounting box. Ensure GPO and mounting box is located in a position that avoids obstructing the aerator and pipework. Plug the Control Panel power lead into the GPO.
- A junction box fitted with WAGO™ connectors is provided for the simple connection between the house panel or strobe and the controller. The two-core monitor cable is to be used to connect the junction box shown below to the terminal on the back of the House Warning Panel. Extension of the two-core monitor cable lead will be required if the house panel is used.
- If the strobe option is used instead, the wiring provided should be of sufficient length to mount the strobe on top of the control box.



- The house Warning panel should be mounted in the residence and be in a prominent position where it can be seen and heard by the homeowners / occupants. The house alarm panel has and on/off jumper on the back. This needs to be moved to the on position to work.
- The muting button on the alarm only mutes the audible alarm, and only for 24 hours. It will not cancel the visual alarm. The system will remain in alarm mode until the cause of the alarm is rectified.

DISCHARGE TO OUTLETS

- Attach the screwed Connector on the 25mm heavy flexible tube to the Discharge Outlet in the sidewall of the Tank and run the tubing in a prepared trench to the approved disposal area.
- Attach the secondary lines from the heavy tubing to the chosen sub-surface irrigation devices, or aboveground sprays using the barbed connector and clips supplied.
- Where Rotary Sprinklers are used, an In-Line Filter should be fitted into the discharge pipe before the first Sprinkler.
- The disposal area should be clearly marked at each end with Caution signs. The area must not be open to general traffic.
- Irrigation area access must be restricted to maintenance personnel. Do not disturb the ground once suitable vegetation is planted.
- Failure to display Caution signs is an offence. Altering any part of standard discharge systems may affect contracts.
- Note: if power is not yet available on site (due to the progress of a new build for example) a suitable generator set may be used for the purposes of setting up and commissioning the system.

COMPLETING THE INSTALLATION

Note: When filling the tank with water, the sequence below MUST be followed to prevent flotation of the inner chambers. Failure to adhere to this sequence will result in damage to the system.

First, use fresh water to fill the pump out chamber to approximately two thirds full. This is the point at which the float switch on the pump would activate if power was connected.

- Next, fill the clarification chamber with clean fresh water until water enters the aeration chamber.
- Next, fill the aeration chamber until the water reaches the same level as in the clarification chamber.
- Finally, fill the secondary and primary chambers to the same level as the inner chambers. Approximately 3,000 litres of water will be required in total.
- Check for leaks around the Inlet and Outlet Fitting and pipe connections. Apply silicone sealant and tighten the Screws if the Fitting Gaskets leak. It may be necessary to remove and reseat the rubber ring if the Inlet connection is leaking.
- Switch on electrical power to the system. The aerator should begin operating immediately. The Submersible Pump should switch itself on and off depending on the water level in the irrigation chamber. The Pump must leave sufficient water in the Chamber to submerge the Pump inlet.
- Check the position of the air valves – these were set at the factory and should not need adjusting. Firstly, check the blue air lift valve is set to 40%, then check that the red sludge return valve is between 10-15%. There are two valves to balance the output of the aerators – throttle the most vigorous aerator back until it matches the performance of the other aerator.
- Fill the irrigation chamber and switch the Submersible Pump off to test the High-Water Level Alarm. This will require another 100 litres of fresh water. When the water level in the irrigation chamber is near the top, the alarm light on the control panel will flash. After 60 seconds, the alarm light will remain on, and the house alarm light and buzzer will sound. Stop filling the system.
- Switch the Submersible Pump on. The Pump should start. If it does not, check the Pump Float is free.

- The air-lifter will pass water from the clarifier to the pump out chamber. When the water level in the clarifier falls, the Warning Light and Buzzer should switch off. If they do not, check the High-Level Float is not jammed.
- Pressing the Panel “Mute” Button only cancels the Buzzer and does not cancel the light. Alarm conditions will remain until the system is back within design and operation parameters.
- The aerator should produce bubbles in the Media Space water. Switch aerator off to test the low air supply alarm. It may take a few seconds before the Warning Light and Buzzer activate as pressure in the system dissipates. Switch the aerator on. The alarm should go off automatically.
- At this point, check all connections, inlets and outlets for any signs of leaks. If leaks are present, repair as necessary.
- Check again that the graduated valve that supplies air to the air lift pump is set at 40%. A setting higher than this will reduce final effluent quality and setting lower than this will reduce system capacity. It is important to get this setting right to make sure the system runs as specified.
- Place the required number of Chlorine Tablets in the Dispenser Unit. Chlorine cannot legally be transported with the system. Ensure the correct specification for Chlorine Tablets is used.
- Fit the Tank Vent (100 mm cap with mosquito proof vent) to the Inspection Opening above the Inlet and lock down.
- Fit Tank Access Cover and secure with six Stainless Steel Screws. DO NOT OVER-TIGHTEN. If sealing is required, use a good quality adhesive backed foam sealing tape, as this is a cleaner, quicker and more environmentally friendly seal as it is re-usable and does not involve the mess/waste associated with caulked sealing products.
- Ensure that all lids, covers and access holes are secure and will prevent the unauthorised or accidental access of persons or other creatures.

BACKFILLING

- Commence backfilling operations only when the system is filled with water AND the lid has been firmly screwed into position.
- **DO NOT BACKFILL WITH SAND.**
- Stabilise dense soil with cement and backfill to 300mm over Anchors.
- LIGHTLY compact around the Tank.
- Complete backfill and fill the irrigation trench with clean soil.
- Clay smeared around the top of the excavation will help prevent stormwater penetration.
- **AVOID SOIL WITH SHARP ITEMS, GRAVEL, ROCK, RUBBLE, OR FOREIGN MATTER.**
- If you wish, you can cover the sloped upper surfaces of the Tank Top Covers with lightweight material such as pine bark or mulch. DO NOT cover with soil.

RISK & SAFETY CONDITIONS

Before starting any work, ensure that adequate provisions are made for any reasonably foreseeable elements of risk, including risk to personal safety and the safety of others, risk of damage to the system and components, and any risk of impact on the environment where the system is being installed. Aim to leave the site clean and tidy, and ensure that all waste / excess materials are removed or disposed of in a responsible manner. Some considerations may include (but are not limited to);

- The lid to the AQ system is not designed to take pedestrian or vehicular traffic. Do not allow traffic to pass over the system or serious damage and/or injury may occur.
- The movement of vehicles around the site, including delivery vehicles, plant and equipment.
- Excavating holes for the system, consider depth and the risk to people, animals and wildlife falling into the hole. Also consider if shoring is needed for unstable ground or soil types.
- Trenching for power and sewer lines – use services such as Dial Before You Dig to ensure that the excavation path is clear of obstacles.
- Electrical safety when making connections and modifications.
- Overhead power lines may need to be considered when lifting operations are completed.
- Lifting of the system from the transportation vehicle and lifting the system into the excavated hole. Use approved lifting equipment that is rated for the job and safe to use. Do not work under slung loads.
- Using plant, equipment and associated attachments (e.g. rock breaker) as part of the installation. Consider the size and type of access, whether the machines will fit, is there a licensed operator, start up and shut down of plant and equipment.
- Operation of power tools, such as drills, demolition hammers / rock breakers, concrete cutting equipment (silica awareness), angle grinders, reciprocating and circular saws, battery chargers etc. It may not be safe to use electrical power tools around a wet environment.
- Consider the noise generated as part of the installation. Adhere to local legislation, laws etc.
- Handling of water needed to fill the system for commissioning. Ensure that persons (particularly children) and animals cannot fall into a partially filled system and drown.
- Potential of site runoff entering creeks or other waterways.
- Manual handling and lifting of heavy, large or bulky items.
- Safe handling of chemicals (pipe adhesive, solvents, chlorine, fuels and oil etc).
- Safe delivery, storage and transportation on site of any materials delivered in bulk.

SYSTEM DESIGN SPECIFICATIONS

The Aqua Advanced Wastewater & Irrigation System is designed to conform with the following specifications:

SPECIFICATION	DETAILS OF CONFORMANCE
Legislative Requirements	Certified to conform with the requirements of AS 1546.3:2017 and any amendments – Onsite Domestic Wastewater Treatment Units Part 3: Secondary Treatment Systems
Power Consumption	1.22 kWh per 1000 litres processed
System Performance	Complies with the requirements for Advanced Secondary Treatment
Hydraulic Loading	System is rated for 0 to 1,200 L/day Equivalent to 8 Persons consuming up to 150 litres per day.
Organic Loading (average)	Suspended Solids and BOD5 - 70 g per person per day
Organic Loading (range)	Suspended Solids and BOD5 - 150 mg/L to 750 mg/L per day
Nitrogen Load (average)	15g per person (100 mg/L)
Phosphorous Load (average)	2.5 g per person (17mg/L)
Filter Media	Type 1: Polymer Bio Mesh Type 2: Polymer tube segments Type 3: Polymer Bio Balls
System Capacity	8EP, or a household of 8 persons
pH of Influent	pH 6 to pH 10
Wastewater Temperature	The system operates at air temperatures between -2 and 45 degrees C. Wastewater between 13.1 and 28.3 degrees C
Disinfection Equipment	Chlorine Tablet dispenser, min 30 minute contact time @ max flow
Typical Sludge Pump Out Interval	Two Person Household: **13.2 years** Four Person Household: **6.6 years** Six Person Household: **4.4 years** Eight Person Household: **3.3 years**
Emergency Storage Capacity	Minimum 1,086 Litres

All AQ Systems must be installed according to AS/NZS 3500.1 and AS/NZS 3500.2 (or any standards that may supersede them).

MANUFACTURER'S DETAILS

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