
015700

**Envirosafe Treatment Plant
Set Up & Commissioning**



Kingspan Environmental Service Contact Numbers:

UK: 0844 846 0500

NI: 028 3025 4077

IRL: 048 3025 4077

Issue	Description	Date
01	Initial Issue	April 2012
02	CC1076	September 2012

Commissioning Kingspan Envirosafe Biological Treatment Plants Generic Guidelines

On arrival:

- Is the installation pack, electrical and mechanical drawings, instructions and Owners pack on site and readable?
- Do the above information packs refer to the installed treatment plant?
- Is the tank correctly installed and backfilled to permit safe access?
- Are the electrical connections to the panel complete?
- Is the mains power wired in to the panel isolator?
- Is there suitable access to switch on the mains power at the customer's supply?
- Are the air connections between the blower and the treatment plant terminated correctly?
- Are the cable/air hose ducts sealed at one end to prevent foul air being drawn from the treatment plant to the air blower or the electrical control panel?
- Are the ventilation ducts installed and run to suitable external vent positions?
- Is the sample chamber installed, or other means of obtaining a final effluent sample to set up forward flow rates?

Remove the covers from the Treatment plant

- Are the plant internals correctly located, they may have moved in transit?
- Is there any obvious debris which has entered the tank during installation which requires removal?
- Does the tank, access necks and extensions show any signs of distortion as a result of ground pressure?
- Are the air hoses correctly terminated with hose tails and the worm drive clips tightened such that the hoses are not able to be turned on the hose tails? Are the hoses neatly tied back?
- Are the air valves on the air manifolds to the diffusers all open?
- Is the forward feed air lift green air tap closed? There are twin forward feed air lifts on larger plant!
- Is the green air tap accessible, it may be necessary to tie it up in a suitable position to enable adjustment without stretching into the tank,
- Is the water level in the tank within approximately 300mm of the outlet invert? If NOT, arrange for more water in order to enable the treatment plant to be turned on and commissioned.
- Are the internal pumps (final settlement tank and final biozone) wired up to the internal junction boxes? On 1.5m and 2m inverts these pumps must be fitted with the extension pipework, then the extension shafts are fitted, and finally the pumps are wired in to the junction boxes.

- Is the high level alarm float switch at a high level in the tank? (To avoid early alarm whilst the tank is at a normal operating level). On 1.5m and 2m inverts the high level alarm needs to be fitted and wired into the junction box after the extension shafts have been fitted.
- Is sewage flowing into the tank?

Deep invert installations

- The air diffuser extensions and the pump discharge pipework extensions should be built up before fitting the extension necks.
- Ensure that the diffusers are lined up “front to back” otherwise they will rest on the curved tank wall and may not fit on the manifold.
- Only position diffusers when there is sufficient water in the tank to cause the media to float.
- The internal wiring on deep invert plants should be completed on site with the junction boxes mounted high in the necks to enable reasonable access.
- The internal pumps require wiring in to the junction boxes.
- The high level alarm needs wiring in to the junction box, normally open in the down position, cores brown and black.

Separate primary/balance tank, external pipework

- The return sludge pipe from the final settlement tank will terminate in a 50mm MDPE connector on the outside of the neck.
- The MDPE pipe (not supplied) should be connected and run to the first neck on the primary/Balance tank, or to a manhole of the sewer upstream. Connections to suit (not supplied)
- The recirculation pipe will terminate in a 50mm MDPE connector on the outside of the last biozone neck.
- The MDPE pipe (not supplied) should be connected and run to the second neck on the primary/Balance tank. Connections to suit (not supplied)

Chemical Dosing for phosphorus control, when fitted

- The chemical to be used is potentially dangerous.
- The supplier will provide a Material Safety Data Sheet (MSDS) for the product. A copy of this must be kept with the other drawings provided with the plant (ideally kept adjacent to the electrical control panel) and also a copy should be given to the person in control of the premises.
- The dosing system should be wired in to the junction box with the pump box mounted high in the neck. The delivery hose should be run to the dosing position, typically into the cap of the forward feed air lift, but other locations are possible.
- The suction hose should be run back through the ductwork to the location of the chemical store.
- The chemical store must be able to be locked to prevent any unauthorised access, especially where children might be present.
- The level of the chemical in the chemical store needs to be below the dosing point to prevent siphoning, resulting in over dosing.

- If the levels are such that siphoning will occur, then the pump must be changed for a peristaltic unit which can be located close to the chemical store and wired in from the same junction box. This may require a change in the fuse rating in the electrical control panel.
- Test the chemical dosing settings with water to ensure correct performance.
- Wearing appropriate personal protection equipment, open the chemical dosing container and insert the suction hose. Cutting the hose on the angle and tying the end to a stainless steel nut or bolt will keep the end of the suction pipe at the bottom of the container and prevent the hose from “sealing” onto the base of the container.

The Electrical Control Panel, all checks should be made by a suitably qualified competent person

- Is the panel mounted in a suitable location which is protected from the environment? Is access to the panel restricted to prevent unauthorised operation?
- Are the cables correctly and safely terminated?
- Is the earthing protection suitable for the installation, has it been checked?
- Are the wiring diagrams available inside the panel?
- Are the motor overloads set to the run position; they are delivered in the tripped position?
- Has the PPFDS impulse tube been run to the panel, when supplied?
- If there is a green SCP unit within the panel enclosure, remove the covers and check the cable terminations and dip switch settings to suit the treatment plant installed, refer to the Guidelines for particular settings.
- In the green SCP unit, plug in the battery pack to the board.
- Replace the internal covers and turn on the mains switch on the green SCP unit. Replace the lid on the green SCP unit.
- Is the remote alarm beacon wired in, when supplied?
- Replace any wiring diagrams
- Refit the cover to the panel enclosure.

Going Live

- Is there any reason that the power should not be turned on? (Is there sufficient water in the plant?)
- If safe to do so, turn on the mains electricity supply at the customer’s end.
- Turn on the mains isolator on the control panel.
 - The motors will start immediately unless there is a delay timer.
 - The panel display will illuminate, is it showing any alarms? Refer to the Guidelines for the Alarm display explanations.
- Check the first manhole on the plant (Primary tank first stage), is the sludge return discharging?
- Check the second manhole on the plant (Primary tank second stage), is the recirculation pump discharging?
- Check the 3rd, 4th and in some cases the 5th manhole (the biozones), is the liquid and media being agitated and having the appearance of a vigorous boiling? Is the mixing similar in all biozones?

- When the plant is reasonably full, set the forward flow air lifts, the green taps in biozone 2 or 3, to give an average forward flow equal to the expected daily flow of sewage. Flow measurement is taken at the sample chamber or other suitable point where a container can collect the flow over a short period of time measured with a watch with a second sweep or a stop watch.
- On some plants it is possible to remove the forward feed air lifts and to turn them around so they discharge back into the biozone. This enables the forward flow rate to be set in the event that access to a suitable sampling point is not available. Once the forward flow rate has been set, the forward feed air lifts should be remounted in their normal operating position without moving the green air taps.
- The green air taps will be almost shut in most cases, if the air taps are left fully open they will starve the biozones of air, reducing or even stopping any mixing, resulting in no biological treatment.
- Check the blower operating temperature and ensure adequate cooling is available. Increase the cooling ventilation if required, natural or forced ventilation as necessary. Ventilation selection may need to take account of local noise restrictions.
- If all satisfactory, replace the manhole covers and screw down as appropriate.
- Replace all documentation and hand the Owner's Pack to the installer/customer
- Close the Kiosk/room where the electrical panel is situated.

Optimising performance

- Once the plant has seeded itself biologically there will be a visible growth on the media circulating around the biozones. This can be light or dark brown if the plant is operating normally.
- During biological start up there may be quite a lot of foam in the biozones. This usually subsides quite quickly as the population of bacteria on the media increases.
- The internal recirculation can be adjusted to modify the treatment operation, this changes the amount of nitrate returned as well as the dilution rate on the incoming sewage. In the absence of any analytical data we do not recommend making any changes to plant settings other than the forward flow air lifts.
- In general, the "slower" the plant the better the performance.
- Air blowers should not be restricted, either by operating with dirty inlet air filters or by closing the diffuser air valves on the air manifolds in the biozones.
- After a period of normal operation, the plant will require de-sludging/tankering. The Guidelines give the procedure and suggested interval for de-sludging. However, if the load on the plant is significantly different then the interval may be adjusted to suit. The procedure should always be the same.
- If the load is seasonal, then the de-sludging can also be adjusted to a seasonal cycle.
- If the biozones appearance changes from a dark to a more milky liquid, it is usually a sign that the plant is ready for de-sludging. It can also be a sign of excessive fat in the sewage, or a high proportion of detergent (laundry), or even an overload due to a change from the nature of the source and/or magnitude of the incoming sewage!