# BURNHAM ENVIRONMENTAL SERVICES LTD

## BIODIGESTER PA SEWAGE TREATMENT PLANTS

## INSTALLATION INSTRUCTIONS

DESCRIPTION

The Biodigester PA Unit comprises a single tank containing all the components required for the sewage treatment process.

The Biodigester PA tank is manufactured in high grade Polypropylene and is supplied in a standard black colour. It is completely impervious to water and sewage and has been designed and independently tested to ensure a robust construction and a long service life. The tank is provided with a locking manhole cover(s), providing access to all parts of the unit.

The submerged filter bed(s) is made up of plastic pieces of special filter media, randomly packed into the tank. The media is made from UV stable polypropylene and provides a large surface area on which the bacteria, required for the purification process, can grow. The media is supported on an open mesh panel fixed above the base of the tank.

A fine bubble air diffuser(s) are located underneath the filter bed(s) these are connected to the external air supply (blower) by uPVC pipework and braided hose airlines.

Most Biodigester PA units incorporate recirculation systems which are a uPVC pipe running from the final settlement and media sections back to the primary settlement section. The pipework has a tapping at its top where tubing is inserted down the uPVC pipe which is connected to the blower. On models which incorporate a media section continuous recycle (Biodigester PA30 - Biodigester PA300) a control tap in the 8mm air line inside the treatment plant ensures a correctly balanced air flow between the air lift recirculation pipe and the diffusers in the submerged filter zone. On models Biodigester PA18 - Biodigester PA300 there is a timed recirculation system from the final tank back to the primary settlement section. This is factory set, do not alter.

Air Blower

The air blower is mounted along with its associated electrical controls inside a separate weatherproof enclosure. The electrical controls comprise an isolator and a loss of air alarm connected to an external beacon which will provide a visual warning that the blower is not operational. On models with a pumped discharge fitted there is also a high level/pump failure alarm and beacon.

NOTE : The manufacturers operate a policy of continuous product and process development and reserve the right to change specifications without prior notification.

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Note: The Biodigester PA tank should be stored with access covers in place to prevent accumulation of rainwater within the unit.

IMPORTANT The siting of a treatment plant must be agreed with the Building Regulation or Planning Department of the appropriate local authority prior to installation. It may be possible to deal with a private company for Building Regulations only.

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The discharge from a treatment plant may require a 'Permit' or 'Consent' from the relevant environmental regulator whether discharging into a watercourse or soakaway / drainage field. This must be obtained before installation. Check with the local regulator for guidance or ask BES for advice (01278 786104). Consideration must also be given to the need for access for desludging the unit by tanker.

**MECHANICAL INSTALLATION**
Note: Please refer to specific diagram for each size of Biodigester.

The following instructions are offered for guidance only. It is for the customer/contractor to satisfy themselves that installation is in accordance with the prevailing ground conditions and regulatory requirements. Burnham Environmental Services Ltd can accept no responsibility for incorrect offloading or installation.

**The contractor is responsible for offloading all items of equipment with due regard to the following:**
DO NOT use chains or wire ropes.
DO NOT lift the tank if it contains any water.
DO NOT subject the tank to sharp impacts.
DO check that all items delivered correspond with the packing note.

The Biodigester PA unit is provided with lifting eyes or lifting slings on the outside of the tank. These are not intended for transportation of the units. The lifting hook should be connected to the tank lifting eyes by separate slings of equal length. **Ensure that the slinging angle does not exceed 60° at the hook in order to eliminate excessive compressive loads on the side of the unit**.

When working in a deep excavation, make sure that all necessary safety precautions are taken to ensure the stability of the excavation and provide safe working conditions for site personnel. The only time anyone needs to be working at the bottom of the excavation is when levelling the base and ensuring that the first backfill is correctly placed after it has been poured.

It is the responsibility of the installer to determine the thickness and strength of concrete required to suit the ground conditions, taking into account the buoyancy of the unit when being desludged, external forces exerted by the water table, backfill, traffic loading and any other relevant factors.

The installation should be carried out in accordance with the requirements of the Construction and Building Regulations. An inspection chamber should be installed upstream of the Biodigester PA unit.
During the course of the installation, the following minimum equipment will be required:
Normal construction equipment and plant.
Concrete to C20P and semi dry to 30mm slump.
An adequate supply of water to fill the unit at the same rate as backfilling.
Dewatering equipment as necessary.
Set of lifting straps of correct length and adequate SWL.

**Note :** The foul drain to the treatment plant MUST have a traditional open soil/vent pipe at the head of the drain run. Air admittance valves, tile or ridge vents are NOT acceptable.



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Excavate to the Biodigester PA tank dimensions allowing a minimum clearance of 150mm between the unit and the excavation sides. Excavate to the appropriate depth for the installation ie. depth of the unit plus 150mm minimum concrete thickness (actual thickness to suit ground conditions). NOTE : The standard inlet invert depth of all Biodigester PA units is 600mm (unless a deeper inlet invert has been requested at time of order). If the invert of the inlet drain is deeper than this Burnham Environmental Services Ltd must be made aware at time of order so that the unit can be manufactured to suit, this may include strengthening the tank itself for deeper installations.

Lay and level the concrete base for the tank to a minimum of 150mm thickness.
Lift the tank into position using slings, taking care not to damage any external flanges or pipework. Ensure correct orientation of the inlet and outlet pipework. Check that the tank is level in all directions. Commence backfilling with concrete in 500mm lifts, and at the same time, fill each tank compartment with water starting with the media bay section, ensuring that the progressive concrete and water levels are approximately equal ( never exceed a difference of 200mm max ). The concrete must be evenly distributed around the unit, ensuring spigot connections are not covered at this stage. Never partly or wholly fill the tank with water before surrounding it in concrete.
**Note: Do not use vibrating pokers to compact the concrete.**

Make all interconnecting pipework connections, ensuring a correct pipe gradients.

Continue placing the concrete in 500mm lifts, terminating at the shoulder of the unit. Allow an initial set of the concrete between lifts and wait at least 24 hours for the concrete to harden.

Ensure a duct (usually standard 110mm drain pipe) is laid from the 110mm 'Air Inlet Duct' connection on the neck of the treatment plant, to the desired position of the Blower unit. This is for the air line only (and discharge pump cables if fitted) and is to ensure complete protection of the airline. On models PA6 – PA25 a single 110mm airline duct connection is provided, directly facing the diffuser pipework connection inside the treatment plant, to allow the airline to be connected in a straight line.

The air line MUST be cut to length. **Do not** leave excess airline curled up in the treatment plant, this can be detrimental to efficient blower operation and will invalidate blower warranty.

On models PA30 – PA300 we provide a choice of airline duct connections (either side of the access upstand) to ensure the shortest and most direct connection of the airline from the blower to the diffuser connection. The airline duct connections are set back from the diffuser pipework connection to allow for a 'long radius' arc of the airline, which again MUST be cut to length.
**Do not use short radius 90° bends on the airline duct**. There are NO electrical components within the treatment plant unless you have requested the option of a pumped discharge, you have a PA30 or larger with a pumped sludge return and recycle., or a high level alarm for a pumped effluent discharge.
Ensure the blanking cap (supplied) is fitted to the unused airline duct connection.

On all Biodigester PA treatment plants which have a pumped discharge, a pump failure alarm is supplied as standard. On the 6, 9 and 12 person systems this consists of a high level alarm float in the final chamber which must be connected to the alarm box provided.



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The alarm float and pump float have been factory set, DO NOT, under any circumstances, alter the position or length of these float switches.
On all other Biodigester PA models the pumped discharge consists of a full duty/standby twin pump set-up and the failure alarm is built into the auto changeover panel (with external beacon) supplied with the system.

NOTES:
a) If the treatment plant is to be installed in a trafficked area, guidance should be sought from Burnham Environmental Services Ltd before the treatment plant is ordered as an alternative method of manufacture may be required.
b) Standard Biodigester PA Treatment Systems are NOT suitable for vehicular applications, without the construction of a re-inforced concrete slab only supported by the tank's suitable concrete surround designed for the purpose.

The blower housings for models PA6 – PA30 should be positioned on 'soft landscaping' not paving slabs or hardstanding areas.
All other units will require a properly constructed housing plinth.

**ELECTRICAL INSTALLATION** (Blower Unit)
In order that you achieve a safe and cost effective installation, it is not possible to state a specific installation configuration that would suit all sites. The selection of current protection devices must remain the responsibility of the installer. The electrical installation must be undertaken or approved by a qualified electrician.

The blower unit can be positioned wherever is most convenient bearing in mind the need to get a power supply to it and the air line from it to the treatment plant.

If a pumped discharge has been requested for the treatment plant, the cable from the pump can be fed back up the air line duct to the blower unit within which is the electrical connection for the pump. Most pumps come complete with 10 metres of cable. The blower unit is supplied with 10 metres of air line as standard.

The airline duct MUST be sealed with expanding foam when installation is complete or the blower warranty will be invalidated.

When installing the electrical supply to the PA blower unit, the following points should be considered:
a) The supply to the PA unit should be by means of a dedicated circuit with isolation and protection devices consistent with the requirements for fixed equipment and in accordance with the latest regulations of the Institute of Electrical Engineers.
b) The supply to the PA unit should be independent of all protection devices other than the supply authority's fuse and that provided specifically for the PA power supply. In particular, earth leakage devices provided for normal domestic protection must not form part of the supply circuit to the PA Unit.



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