BIOGAS Products Ltd

Why consider a Membrane Biogas Holder?

Biogas holders are an essential part of an anaerobic digestion system providing a biogas storage buffer and a constant system pressure.

The traditional methods of biogas storage on wastewater treatment sites where anaerobic digestion is used have been:-

- A steel fabricated floating roof located on top a concrete digester tank
- A stand alone biogas holder comprising of a concrete tank filled with water, to provide a gas seal, and a steel fabricated floating 'bell'

Both the roof/bell rise and fall as biogas is produced and used with the weight of the structure providing a constant pressure in the biogas pipework collection and delivery system. The movement of the roof/ bell is monitored by an ultrasonic level sensor which is used to control the operation of gas utilisation plant such as boilers, CHP engines and flares.

These traditional designs are a proven, reliable solution for the storage and pressurisation of biogas. The new build of anaerobic digesters on wastewater treatment sites has been minimal during the last 25 years and therefore a need for an alternative solution for biogas storage has attracted little interest. That is until now.

The Government says:-

"By 2020 anaerobic digestion will be an established technology in this country, making a significant and measurable contribution to our climate change and wider environmental objectives. It will produce renewable energy in the form of biogas that will be used locally or injected into the grid for heat and power and for transport fuel"

The monetary incentives to produce biogas will not only galvanise the wastewater industry but will encompass other sectors of industry such as food and drink, retailers, local authorities, energy and transport. This in turn will drive the need for improved anaerobic digester designs to maximise gas production from various feedstocks.

Membrane biogas holders have been available since the 1980's being used widely in Europe. The membrane biogas holder offers the designer and end user a very flexible and economical alternative to a steel roof/bell structure. Why?

- The capital cost outlay is substantially reduced
- No need for expensive concrete structures or steel fabrications
- Simple flat concrete bases required only for stand alone gas holders
- Can be fitted to any size or shape of tank as a gas holder dome
- Procurement and build times substantially reduced
- Operating pressures up to 50mbar depending on size
- Volumes up to 16000m3 (Ankara, Turkey)
- Steel Corrosion due to H2S is not an issue.
- Easy to maintain and repair any leaks

The interest in membrane biogas holders is attracting a lot of interest due to the above benefits and the drive for sustainable fuels.

Biogas Products Ltd are the UK and Ireland partner of Ecomembrane SrL (Italy) who have been manufacturing and installing membrane biogas holders since 1990. They have recently installed the World's largest membrane biogas holders in Ankara, Turkey at 16000m3.

Biogas products Ltd are able to offer two designs of membrane biogas holders i.e. the more commonly known 2 membrane standard system and the higher specification 3 membrane system. The design common to both systems is:-

- The half sphere shape of the membrane biogas holder which provides for a constant measureable and repeatable deflation of the inner biogas chamber.
- A 'patented' accurate biogas chamber level sensor and support mechanism that allows the full capacity of the biogas chamber to be used and reliably controls auxiliary equipment.
- Simple flat concrete bases required for installation of the membrane biogas holder
- Above ground connections for the biogas inlet / outlet pipework.
- H2S resistant membrane materials.
- Welding procedures that allow system pressures up to 50mbar.

The 3 membrane system offers enhanced safety and environmental benefits:-

- **Safety** - The system completely divides the biogas from the air avoiding any potential explosive atmospheres and sealing of the biogas membrane to the concrete base is not required.
- **Power failure** - The system design enables the outer air membrane to remain inflated at all times avoiding possible collapse onto surrounding equipment.
- **Low energy usage** – The air blower only runs when gas is being discharged from the biogas holder requiring a fractional kW motor to maintain pressure.

The membrane biogas holder requires no maintenance other than visual inspection. Port holes in the outer air chamber allow for viewing of the inner biogas membrane. An over pressure relief valve protects the inner biogas membrane and possible leakage of biogas into the air chamber is constantly monitored. Lightning protection is provided having been be assessed in accordance with BSEN 63205.

3 membrane biogas holder

16000m³ – Ankara, Turkey

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