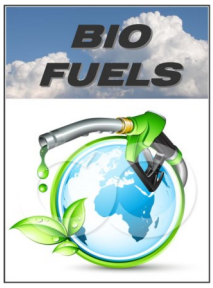
MEMBRANE TECHNOLOGY

Biogas Systems

During anaerobic digestion or degradation in the absence of oxygen, organic material is decomposed by bacteria forming biogas, a mixture of CO_2 and CH_4 with trace amounts of H_2S and H_2O. The biogas can be used as vehicle fuel, in industrial processes or injected into the gas distribution grid, but first needs to be treated.

GENERON® membrane systems are used to reduce the CO_2 and improve the heating value of the gas. The systems also reduce the H_2S and H_2O content. The customized biogas membrane systems (which can also include the feed compressor) are manufactured in our ISO 9000 Certified facilities in Houston, TX while the membrane is manufactured in our Pittsburg, CA facility.

GENERON works directly with clients to provide the most efficient and cost effective solutions. Contact our professional engineering team at 713.937.5200 or www.generon.com for more information.



The GENERON® Advantage

- **Extensive Experience** - custom designed skids
- **State-of-the-art Membrane** - high recoveries
- **Simple Solution** - no moving parts, minimal maintenance
- **Remote Operation** - Minimal attention required, fully automated systems
- **Minimal Losses** - low HC losses
- **No Chemicals** - environmentally friendly
- **Small Footprint -** easily meet footprint

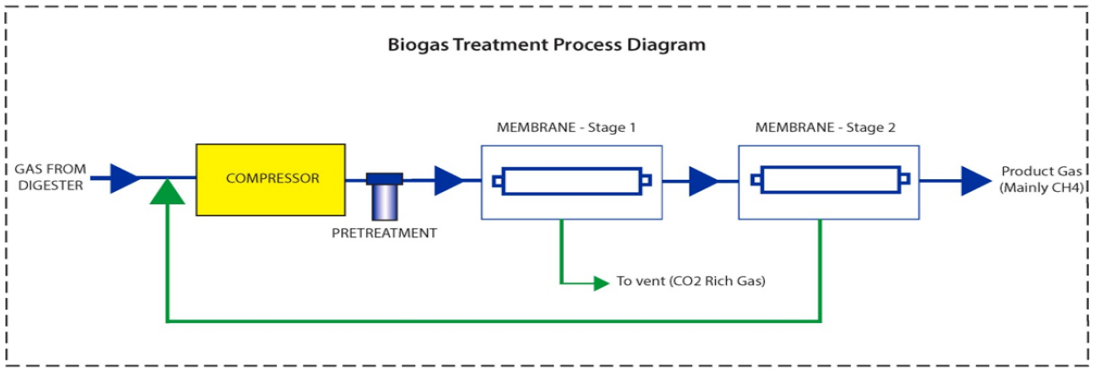
RELATED GENERON PROCUCTS:

- PSA systems
- Instrument air packages
- Air and gas compression packages
- Blowers
- On-site oilfield services—operating personnel and rental equipment

Nitrogen Membrane® Systems

Biogas Treatment

In a typical GENERON® biogas membrane system the feed gas is filtered to remove any entrained aerosols and liquids. The gas then enters the GENERON® membrane modules. The CO_2 as well as any H_2S and H_2O permeate through the membrane. The non-permeated gas, mainly CH_4, remains at pressure and is the product gas.



SYSTEM PERFORMANCE:

- **Feed gas pressures up to 1,000 psi (69 bar)**
- **> 60 vol % CO2 in feed**
- **< 2% CO2 content in product**
- **>98% recovery of hydrocarbon gas**
- **> 90% removal of CO_2**
- **Flow rates from 0.01 to 500 MMscfd**

Biogas Fans

ADVANTAGES:

- **No moving parts**, and designed for **remote** unmanned **operation**
- **Treat a wide range of flow rates**
- **Efficient packaging minimizes space and weight** — ideal for offshore applications
- **Custom designed systems** - maximize total hydrocarbon recovery
- **System flexibility** - Can operate at wide range of flow rates and CO_2 Content
- **Quick deployment** & **quick Installation** - skidded system can be installed in hours

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GENERON

QUALITY SYSTEM CERTIFICATION DNV·GL ISO 9001

C-PS/GC- BIOGAS-0617