

During anaerobic digestion, i.e. degradation in the absence of oxygen, organic material is decomposed by bacteria forming biogas, a mixture of CO₂ and CH₄ with trace amounts of H₂S and H₂O. 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 CO₂ and improve the heating value of the gas. The systems also reduce the H₂S and H₂O content. The customized biogas membrane systems (which can also include the feed compressor) are fabricated in our ISO 9000 Certified facilities in Houston, TX while the membrane is fabricated in our Pittsburg, CA facility. GENERON works directly with the client to provide the most efficient and cost effective solution.

The other alternatives for biogas treatment are absorption (water wash) or adsorption (PSA) systems. These systems are complex and have high capital, operating and installation cost compared to membranes.

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 requirements

RELATED GENERON PRODUCTS:

PSA systems

Instrument air packages

Air and gas compression packages

Blowers

On-site oilfield services—operating personnel and rental equipment

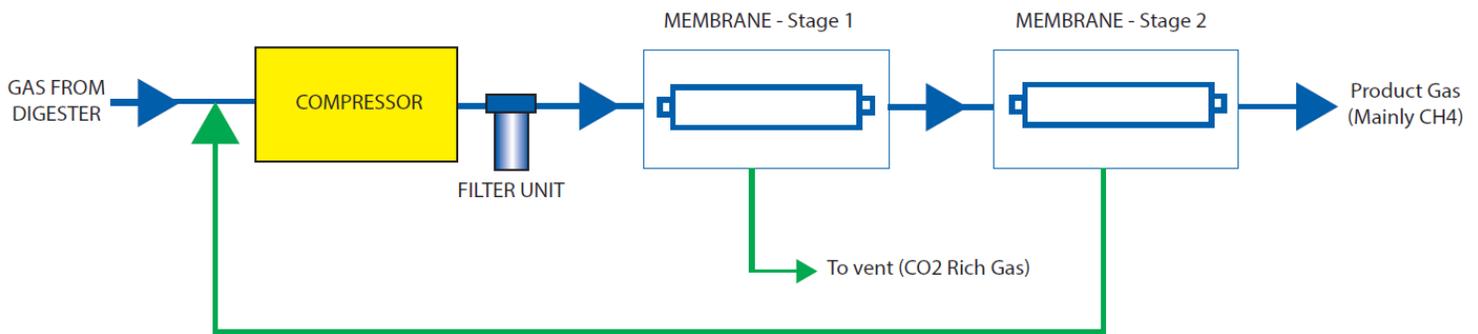
Custom Integrated Skid Packages



Biogas Treatment

GENERON® Membrane Technology

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 CO₂ as well as any H₂S and H₂O permeate through the membrane. The non-permeated gas, mainly CH₄, remains at pressure and is the product gas.



Advantages of MEMBRANE Systems:

- **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 CO₂ Content

The System Performance:

- Feed gas pressures up to 2,000 psi (138 bar)
- > 60 vol% CO₂ in feed
- < 2% CO₂ content in product
- > 98% recovery of hydrocarbon gas
- > 90% removal of CO₂
- Flow rates from 0.01 to 500 MMscfd

GENERON

16250 Tomball Parkway
Houston, Texas 77086

713-937-5200

Sales@Generon.com

GENERON



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