

GENERON[®] MEMBRANE TECHNOLOGY

Hydrogen Recovery Packages

The demand for cleaner and higher-value fuels, chemical products and production of electronics are growing worldwide due to the increased use of hydro-treating and hydro-cracking. The processes used for generating hydrogen typically create residual gas streams or by-products, that still contain a significant amount of valuable pressurized hydrogen.

Alternate technologies to recover and purify hydrogen rich gas streams include PSA (pressure swing adsorption) technology. **GENERON**[®] PSA technology is used when ultra-pure hydrogen (99.9% to 99.999+%) is required. **GENERON**[®] membrane modules are applied to more economically recover hydrogen from hydrogen rich gas streams with minimal losses of 1 to 10% of your valuable hydrogen. Using **GENERON**[®] membrane modules in such separations will achieve hydrogen product purities from 90 to 99.9%.

GENERON[®] membrane modules are applied to economically recover hydrogen from gas streams with only 1 to 10% of your valuable hydrogen. Using **GENERON**[®] membrane modules will deliver hydrogen product purities from 90 to 99.9%.



The **GENERON**[®] Advantage

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

TYPICAL APPLICATIONS:

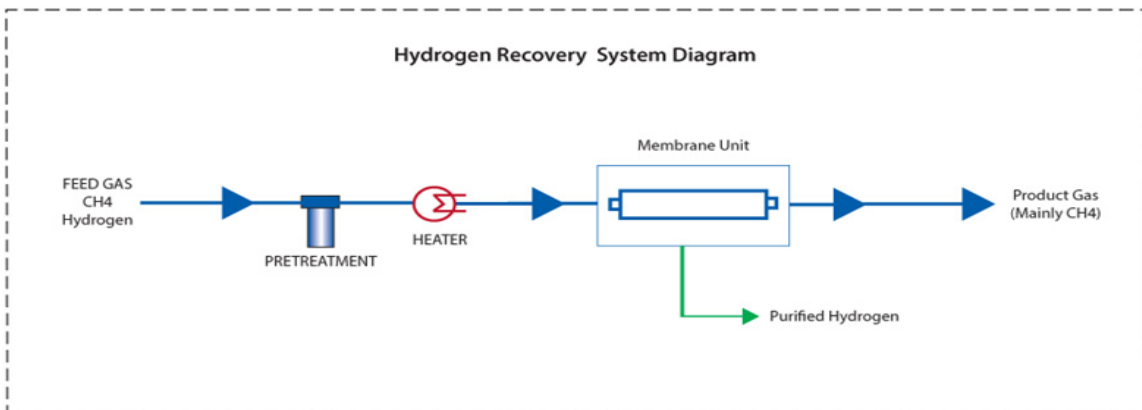
- Amine Production off-gas
- Ammonia purge gas
- CO purification
- Cold box down-stream
- Desulphurization purge gas
- FCC overhead gas
- Gas-to-liquid fuel production
- H₂ PSA purge gas
- H₂ :CO ratio adjustment in syngas
- Hydro-cracker purge
- Methanol production



Nitrogen Membrane® Systems

Hydrogen Recovery

In a **GENERON**® membrane system for hydrogen recovery, the feed gas is cooled to remove the higher hydro-carbons that condense inside the membrane fibers during the separation process. After subsequent particle and condensate removal steps, the feed gas is then heated to an optimum operation temperature and ready to enter the **GENERON**® membrane modules. Hydrogen gas permeates through the membrane walls. The permeated gas becomes a purified hydrogen product. The “slower” permeating gases are collected in the non-permeate (“retentate”).



SYSTEM PERFORMANCE:

- Feed gas pressures up to 1,000 psi (69 bar)
- 90%-99% Hydrogen Recovery
- Purities to 99.9%
- 99.9%-99.999+% with PSA technology
- Flow rates from 0.01 to 100 MMscfd
- Lower maintenance cost



GENERON

16250 Tomball Parkway
Houston, Texas 77086
O - +1 .713. 937.5200
F - +1 .713. 937.5250
www.generon.com

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