CLEAN METHANE SYSTEMS LLC

IonPack

GAS CONDITIONING AND PRETREATMENT SOLUTION

ULTRA EFFICIENT BIOGAS TREATMENT

IonPack is a comprehensive gas conditioning and pretreatment solution developed by Clean Methane Systems. It leverages the innovative **SULKAN™ technology** at its core to efficiently purify biogas and address the critical challenge of contaminant removal. **SULKAN™,** developed by Clairion (based in Israel), is a one-stage solution that uses a proprietary catalytic liquid (CL) platform and a wet scrubbing mechanism to remove harmful pollutants such as hydrogen sulfide (H2S), siloxanes, and volatile organic compounds (VOCs).

The Power of SULKAN™ Technology

SULKAN™ technology is the heart of the IonPack system. It is based on a unique catalytic liquid (CL) that acts as both a solvent and catalyst. Key features of SULKAN™ include:

CONTINUOUS PROCESS
SULKAN™ operates continuously, effectively absorbing contaminants in a wet scrubber using the proprietary CL.

SELF-REGENERATION
A side stream of the CL is continuously circulated to the liquid regeneration unit, where it is renewed by separating contaminants and adding hydrogen peroxide (H_2O_2).

SIMULTANEOUS REMOVAL
SULKAN™ removes H2S, siloxanes, and VOCs in a single process, simplifying the purification process.

CONSISTENT REMOVAL
No degradation over time as with media solutions.

The SULKAN™ system is **COMPACT AND SCALABLE.**

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IonPack: A Complete Solution

IonPack offers a complete solution from Clean Methane Systems, going beyond the capabilities of the stand-alone SULKAN™ system. It incorporates various components customized to each project's specific needs, ensuring optimal gas treatment.

This package is delivered with CMS' experienced project delivery team. These components may include:

PARTICULATE FILTER(S) Filters are placed at the inlet of the system to remove heavy water droplets and solid particles, ensuring a gentler gas flow for downstream processes.

PRESSURE BOOSTER(S) We will provide compression if digester pressure is low to accommodate downstream pressure loss and equipment needs.

DRYING SKID After the SULKAN™ system, drying skids are used to remove residual moisture from the biogas.

POLISHING VESSEL(S) These vessels contain carbon media and act as a final purification step to achieve the highest purity levels required for specific applications.

INSTRUMENTATION & CONTROLS We enhance and streamline your operations with our autonomous or SCADA-integrated controls and instrumentation.

Advantages

IonPack with SULKAN™ Technology affords several advantages over conventional biogas purification methods, including those dependent on media or biological systems. Benefits include:

LOWER TOTAL COST OF OWNERSHIP (TCO) This innovative technology boasts much lower CAPEX and OPEX compared to activated carbon systems. This is achieved through the elimination of media changeouts, reduced consumable usage, and lower maintenance requirements.

OPERATIONAL No downtime for media replacement: Unlike activated carbon systems, SULKAN™ does not require media replacement, enabling continuous energy production.

SINGLE-STEP SYSTEM SULKAN™ removes H2S, siloxanes, and VOCs in a single step, simplifying the process and reducing equipment requirements.

TOLERANCE TO FLUCTUATIONS The system uniquely handles wide fluctuations in gas flow rate and contaminant concentrations, ensuring consistent performance under varying conditions.

OPERATES UNDER ALL HUMIDITY LEVELS IonPack can operate effectively under all humidity levels, providing versatility and reliability.

CLOSED-LOOP SYSTEM The CL is reactivated and reused in a closed-loop system, minimizing waste generation and environmental impact.

ENVIRONMENTAL — NO DISPOSAL OF SOLID HAZARDOUS WASTE SULKAN eliminates the need for hazardous waste disposal associated with activated carbon systems, contributing to a cleaner environment.

COMPLETE REMOVAL OF SILOXANES IonPack achieves near 100% removal of all types of siloxanes, surpassing the capabilities of activated carbon systems, which usually cannot remove trimethylsilanol (TMS).

SUSTAINABLE SOLUTION The system contributes to cleaner energy production by providing a sustainable and environmentally friendly biogas treatment solution for contaminant removal.

IonPack, powered by SULKAN™ technology, is a comprehensive and innovative solution for biogas purification. By combining the advanced capabilities of SULKAN™ with customized components, IonPack from Clean Methane Systems delivers superior performance, cost-effectiveness, and environmental benefits. You get a customizable, reliable, and sustainable way to purify biogas, making it suitable for use in virtually any application.

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