

NASH Vacuum Pumps for Wastewater Treatment Plants



The average American generates 80-100 gallons of wastewater each day and Nash Liquid Ring Pumps and Compressors play an integral role in treating wastewater and keeping our environment clean.

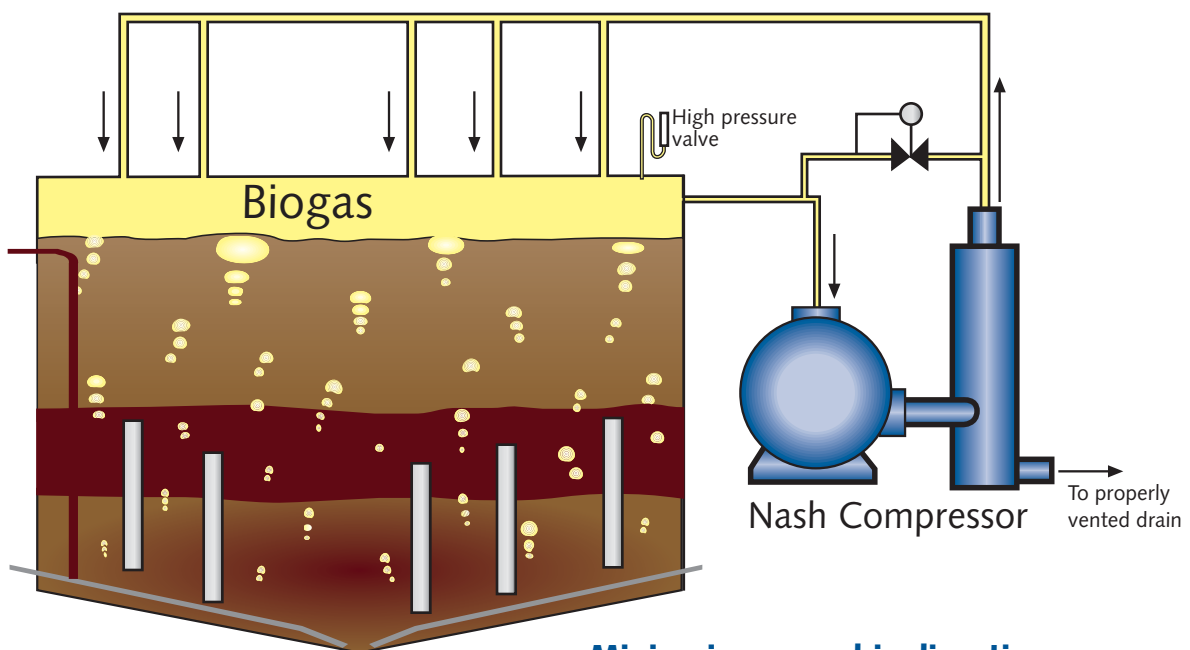
High-Rate Digestion Boosts Plant Capacity

Many larger wastewater treatment plants use Anaerobic Digestion, a bacterial process that is carried out in the absence of oxygen. Compared to the conventional activated sludge process, Anaerobic Digestion is more energy efficient, reduces dewatered biosolids by 7-12 times (as compared to conventional processes) and produces useful methane gas (biogas). Gardner Denver Nash liquid ring pumps and compressors are used for three applications in this process:



NASH Vectra XL

- **Mixing** - Gas is taken from inside the reactor vessel, and re-circulated to keep the thickened sludge mixed. Mixing and heating in proper proportions are critical to the acceleration of the process, preventing stratification, and ensuring proper contact with the microorganisms. This is crucial to reducing the amount of biosolids, which is a key advantage of using this process.
- **Gas Boosting** - Methane gas can be scrubbed and collected for use as a fuel for a boiler, to power other plant equipment (pumps, blowers), or to produce electricity.
- **Filtration** - Sludge dewatering takes place once it leaves the secondary digester. In this application, a liquid ring pump applies vacuum to a rotary vacuum drum filter. As the drum rotates, the liquid is drawn through cloth filter media on the drum surface. The solids are retained on the inside wall, and are discharged as a dry cake through various methods.



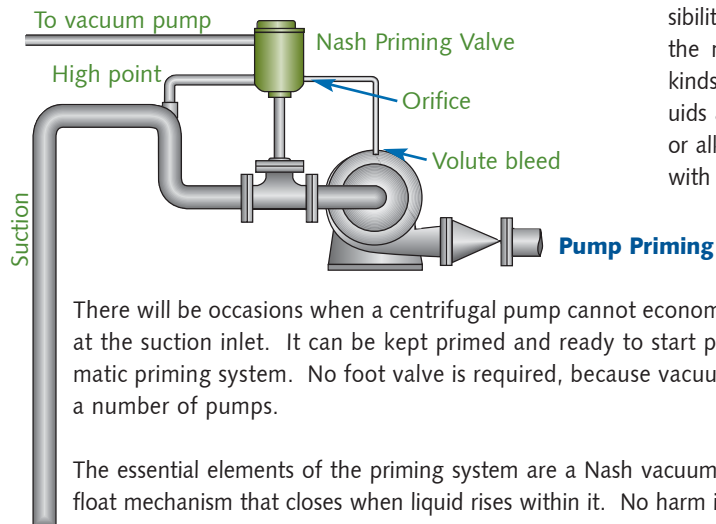
Mixing in anaerobic digestion process

Nash compressors are used for digester gas recirculation, because this process includes several conditions that create problems with other types of compressors. There is always a possibility of scum carryover, but this will not harm the Nash unit. Digester gas is wet, dirty and corrosive and it usually contains hydrogen sulfide. A Nash compressor stands up under these harsh conditions.

Digester gas is explosive if oxygen gets into the system. The Nash machine adds an element of safety, because it cools the gas instead of heating it during the compression process. Action of the liquid compressant is to snub flash propagation from the discharge line.

Gas mixing and boosting applications are among the most demanding in a wastewater treatment plant, considering the corrosive nature and solids content of the gas. While many different methods have been tried, Gardner Denver Nash pumps and compressors have long been recognized for their rugged construction and outstanding service life in the most challenging situations.

Gardner Denver offers the highest quality products for compressed air and gas, from the plant headworks to the final stages of treatment. Our global network of representatives bring added value to our customers, with their expertise in plant processes and their ability to offer package solutions.



There will be occasions when a centrifugal pump cannot economically be located low enough to provide a positive head at the suction inlet. It can be kept primed and ready to start pumping at any time if it is equipped with a Nash automatic priming system. No foot valve is required, because vacuum keeps the pump full of water. One system can serve a number of pumps.

The essential elements of the priming system are a Nash vacuum pump and a Nash priming valve. This valve is a simple float mechanism that closes when liquid rises within it. No harm is done if liquid carries over into the Nash vacuum pump.

Nash Products Compress Gas for Storage

Demands for digester gas use in fuel heaters or engines cannot be expected to coincide at all times with the rate at which it is being produced. To buffer the discrepancies between demand and production, gas is usually stored under pressure in spherical tanks. Storage pressures are in the order of 35 to 50 psig. This is well within the range of Nash double-lobe compressors.

Dirty digester gas is scrubbed clean while it is being compressed for storage and traces of hydrogen sulfide are removed. The gas is also cooled and partly dried if relatively cool, clean water is available for use as the liquid compressant. Performing the cleaning and drying operations in the compressor contributes to reduced maintenance in piping, valves and storage system. It prolongs the life of engines or burners that utilize the gas as fuel, and it greatly reduces their maintenance costs.

Circulating Gases for pH Control

At municipal wastewater treatment plants, carbon-dioxide-rich flue gas from sludge incinerators is often bubbled through alkaline liquids for pH control. While this gas is useful for recarbonation, it can be difficult to handle with conventional compressors. It is wet, corrosive and dirty. However, the contaminants in incinerator flue gas pass harmlessly through a Nash compressor.

Industrial wastewater treatment brings a wider variety of possibilities. Depending on the conditions to be corrected and the materials readily available at low cost, many different kinds of gases may be bubbled through different kinds of liquids and sludges. The purpose may be to neutralize an acid or alkaline condition or it may be to react the gas chemically with some pollutant in the liquid.

NASH
A Div. of Gardner Denver
9 Trefoil Drive
Trumbull, CT 06611 U.S.A.
tel: 800 553 NASH
+ 203 459 3900
fax: + 203 459 3988
nash@gardnerdenver.com
www.GDNash.com

NASH
A Gardner Denver Product