

Compressor Systems for Offshore Oil & Gas Production



NASH Liquid Ring Compressors

Proven Technology

Built From Experience

For over 50 years, Gardner Denver Nash has been providing the most reliable compressors and vacuum pumps designed for the oil & gas industry's requirements. *Why are we successful?* Because we make you successful by eliminating unscheduled down time.

Our liquid ring vacuum pumps and compressors are renowned for:

- rugged design construction - making them tolerant to carryover from process upsets
- low maintenance requirements - best up-time in the industry
- cool-running - making them ideal for handling the explosive gases found in refinery applications, with pressures up to 215 PSIA (14.8 bar)
- the largest and most experienced technical staff in the industry
- comprehensive value-added centers throughout the world.



Gjøa Platform, North Sea

Built by K-Lund, Norway, featuring a NASH NAB 1500 two stage liquid ring compressor. Designed for a flow rate of 1500 m³/h and a discharge pressure of 6 to 9 bar absolute



NASH 2BG Compressor used for vent gas compression on an offshore rig

Offshore oil rigs:

On offshore rigs, Nash pumps and compressors are used for gas compression, vapor recovery, and glycol recovery systems.

Engineering Expertise

Gardner Denver Nash has years of experience and expertise in designing compressor systems for refinery applications. As a result, we understand the impact of handling various hydrocarbons and their effect on liquid ring compressors. Nash is one of the few companies that has the knowledge, including consideration of external factors, to design, support and troubleshoot liquid ring compressor systems. Nash scrutinizes every detail of the system to make sure it will operate continuously and to the customer's desired expectations.



Our ISO 9001 certified value added centers, located in the Americas, Europe and Asia, provide:

- experienced engineering staff
- optimum solutions for your process
- compliance with industry standards such as API681, NEMA, IEEE, ATEX

The result is a custom NASH system that provides:

- unparalleled RELIABILITY
- lower operating costs
- lower maintenance costs
- environmental compliance

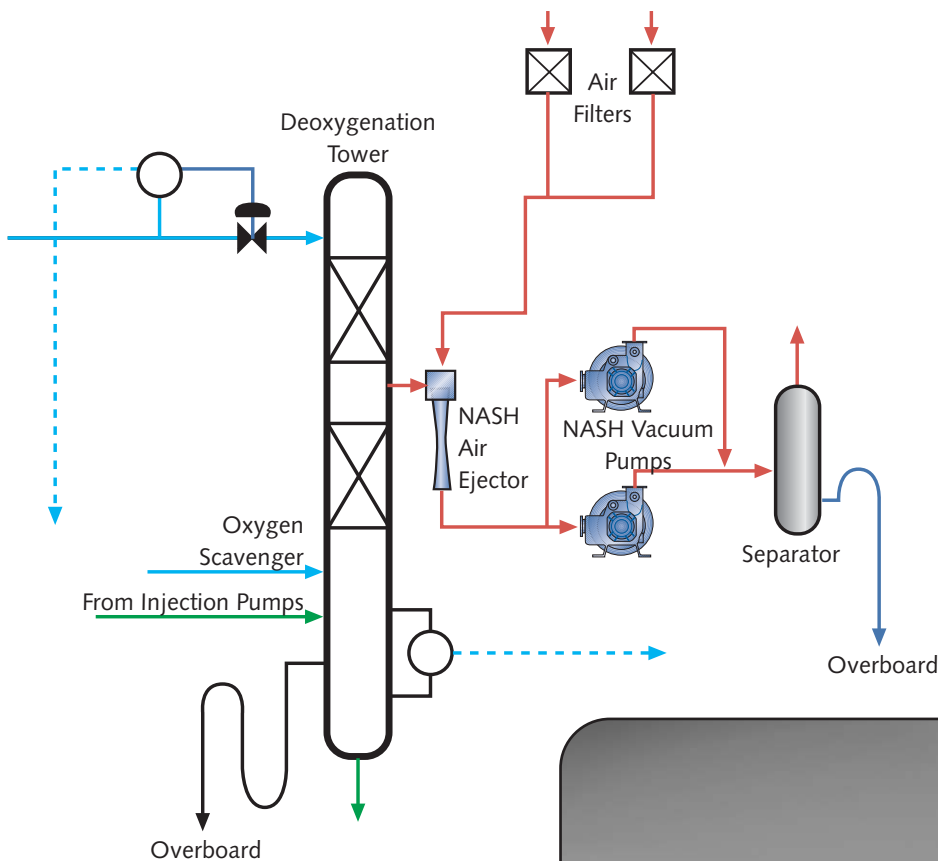
NASH Liquid Ring Pumps

Deaeration/Deoxygenation

Deaeration of Injection Water

Removal of oxygen from well injection water helps to prevent corrosion and sub-surface solids build-up. This also prevents the formation of aerobic bacterial colonies (sulfur reducing bacteria) in the water injection flow lines. Incoming water is filtered and then sent to Deoxygenation Towers for the removal of oxygen. This process is facilitated by NASH vacuum pumps and an atmospheric air ejector.

These pumps and air ejectors are available in Stainless Steel, Aluminum Bronze and Hasteloy for the harsh conditions found offshore.



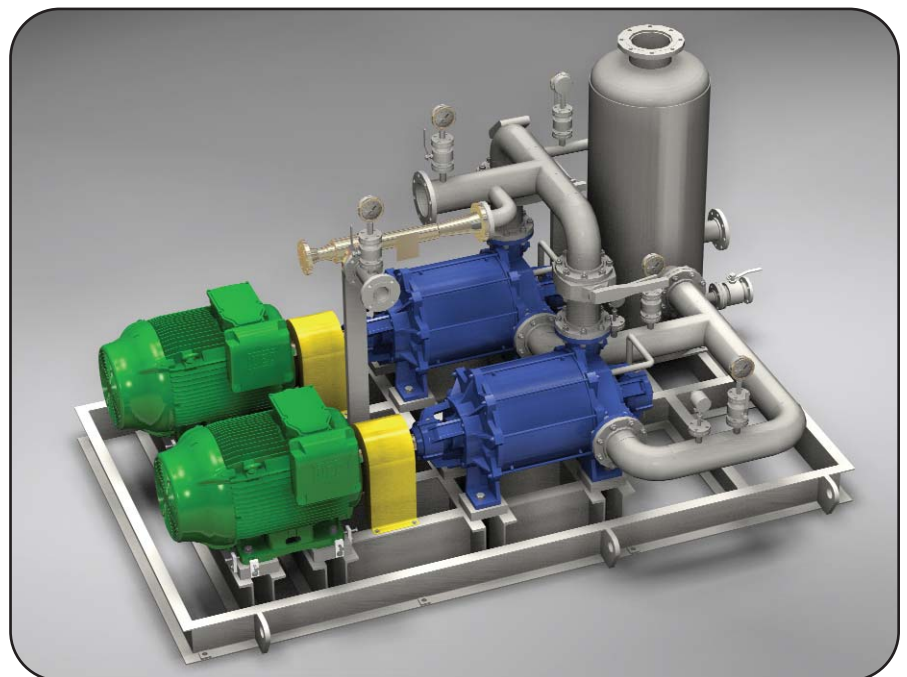
There are two kinds of liquid ring vacuum pumps

- Flat sided rotor porting
- Conical rotor porting

When liquid ring pumps were invented, they were all flat sided. Nash introduced conical porting in the 1940's.

Although conical porting requires more expensive construction, it allows for a tremendous increase in port size. Flow paths into and out of the rotor are more direct. Operating efficiency, liquid handling ability and the vapor condensation capacity of conical ported vacuum pumps all surpass what is possible in flat-sided pumps by such wide margins that Nash now supplies only conical pumps for this application, as the **improved water handling capability ensures improved reliability.**

NASH Vectra XL250
deaeration package



NASH Liquid Ring Compressors

Compressors for Offshore Applications

Flare Gas Recovery

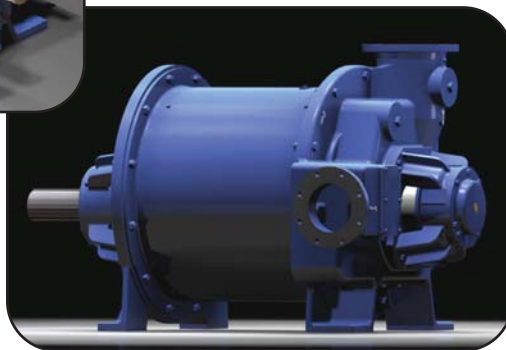
Vent Gas Recovery

Glycol Recovery

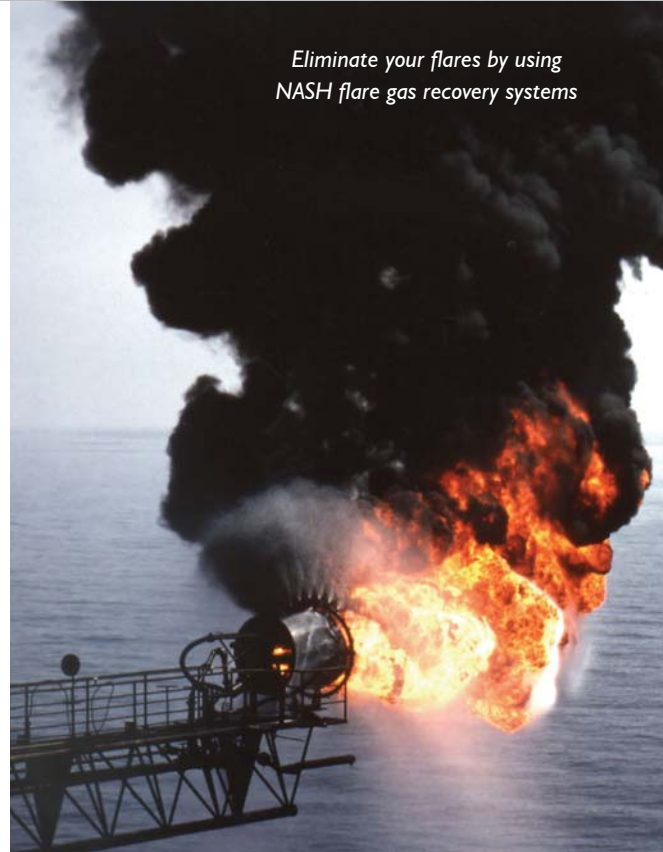
Gardner Denver Nash is committed to helping you meet the stringent environmental legislation which prohibits the flaring of waste gas. Our HP and NAB compressors are the ideal choice for recovering fuel gas and condensing valuable hydrocarbons, making more money for your company.

When reviewing the total life cycle cost of a flare gas compressor system, the NASH liquid ring system provides more value and better reliability than any other technology, hands down.

Liquid ring compressors run cool and they clean the gas as they compress it - eliminating the need for downstream aftercondensers and scrubbers. The result is a simpler, more reliable system.



NASH HP-9, Vectra and NAB/NAM Compressors are tireless workhorses, ideal for your offshore applications



Eliminate your flares by using NASH flare gas recovery systems

Features	Benefits
Ability to handle carryover	Minimal process problems resulting in more uptime; Intended for severe applications
Long design life of 40+ years	Highest reliability
No internal lubrication required	Less maintenance required; less downtime
No metal-to-metal contact	Constant wear-free performance
Cool Running, Minimal temperature rise between inlet and discharge	Ideal for explosive gases and vapor recovery applications
Only one moving part	Simple and reliable operation

Other NASH Products

TC/TCM

Integral 2 stage liquid ring pumps with improved performance at vacuum levels down to 0.8" HgA (27 mbar)
Designed to handle large amounts of liquid carryover without difficulty
Capacity of 100 to 2,240 CFM with vacuum to 0.8" HgA
Capacity of 170 to 3,740 m³/h with vacuum to 27 mbar abs



Service

We have the know-how, the expertise and the specialists. We provide professional service to make your pumps run for decades. Our service centers are located in:

- Australia
- Brazil
- China
- Germany
- Korea
- Netherlands
- Singapore
- South Africa
- Sweden
- UK
- USA



2BE3/P2620

Large liquid ring vacuum pumps with superior corrosion resistance
Top discharge capability which eliminates need for trench
Self-recirculating seal water, reducing need for external seal water source
Capacity of 4,000 to 23,000 CFM with vacuum to 24" HgV
Capacity of 6,800 to 39,000 m³/h with vacuum to 200 mbar abs



Vectra

Liquid ring vacuum pumps and compressors
Available in feature rich budget designs (SX, XL or GL)
Designed to handle high back pressure requirements
Capacity of 20 to 4,000 CFM with vacuum to 29+ HgV
Capacity of 34 to 6,796 m³/h with vacuum to 33 mbar abs



Compressors

Wide range of liquid ring compressors designed for many applications. Rugged and reliable, they can handle highly toxic, explosive and corrosive gases
Specifically developed for applications such as flare-gas, Chlorine and Vinyl Chloride Monomer (VCM) recovery
Capacity of 60 to 2,200 SCFM with pressure to 200 PSIG
Capacity of 100 to 3,740 m³/h with pressure to 15 bar abs
Single and two stage models available



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