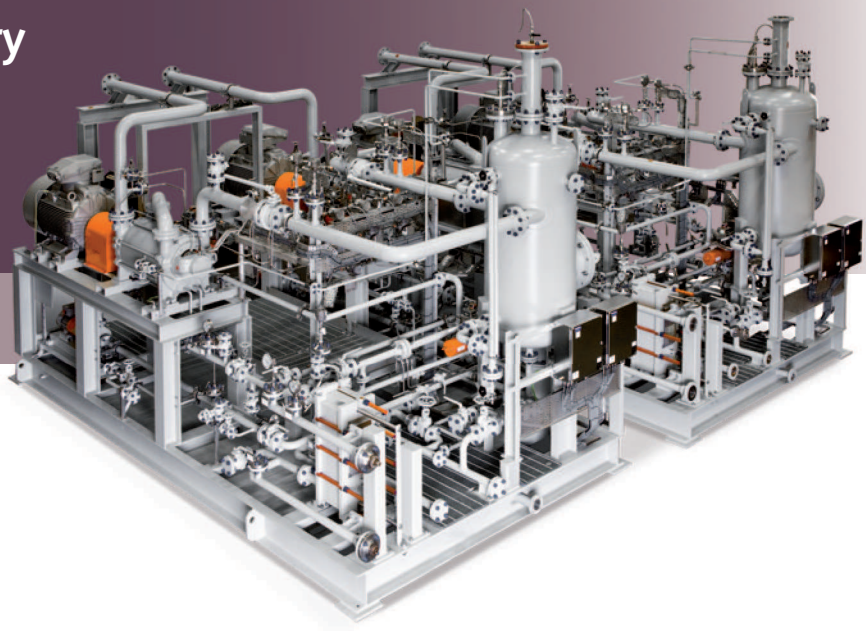
BUSCH
Vacuum Pumps and Systems

Vacuum Technology

for the Oil and Gas Industry



Over 50 Years of Vacuum Solutions for the Oil and Gas Industry

With more than 50 years of experience in the varied vacuum applications of the oil and gas industry, Busch offers proven solutions which can be tailored precisely to customer requirements. We have vacuum systems installed in all areas of oil and gas exploration, extraction, refinement and distribution, right across the globe.

Seawater De-Aeration

In offshore applications, the injection of seawater into the oil well is a common procedure used to increase production. To achieve levels of less than 50 ppb of oxygen present in seawater, Dolphin liquid ring vacuum pumps in combination with air ejectors provide a highly effective solution when specified and installed.

MEG Regeneration

Mono-ethylene glycol (MEG) is used to prevent hydrate formation in unprocessed gas transportation and avoid problems with restricting flow or causing blockages. To ensure that using MEG is a cost-effective solution for hydrate inhibition, it is recovered, regenerated and re-used via vacuum technology from Busch.

VOC Vapour Recovery

The importance of reducing volatile organic compound (VOC) emissions during loading and unloading operations involving crude oil cannot be underestimated. Busch's tailor-made vacuum systems are designed to recover vapour as well as providing benefits such as the reduction of environmentally hazardous substance discharge, while also minimizing significant loss of potentially valuable energy represented by the evaporation of oil.

Crude Oil Distillation

Crude oil production is carried out via atmospheric and / or vacuum distillation in a crude oil distillation column. Heat and vacuum are applied to the column which allows the various components of crude oil to separate based on their boiling temperature. The condensed liquid fractions are collected at various points up the distillation column and recovered. By designing and building vacuum systems to meet the specific needs of each customer, the effectiveness and efficiency of these processes are increased.

Flare Gas and Vent Gas Recovery

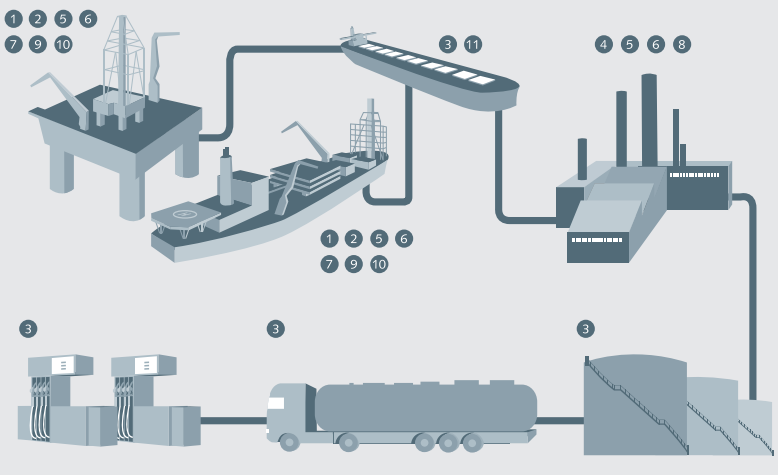
Recent changes in environmental philosophy and policy within many organizations has increased the use of flare gas recovery systems to reclaim gases that can then be used as fuel elsewhere. In addition to reducing emissions, flare gas recovery also generates significant cost savings for the user, and Dolphin liquid ring compressors are frequently used as part of this process.

Gas Boosting

When low pressure gas is produced from a well head it is typically at a pressure just below atmospheric or at a relatively low positive pressure. Dolphin liquid ring vacuum pumps are used to boost the gas pressure, enabling the gas to be delivered to a high pressure pipeline.

Other Applications

Busch also provides vacuum and overpressure solutions for other associated applications, such as mud transfer and drying, filtration or air scour. Our skilled and highly knowledgeable team of system engineers is available to discuss your requirements and assist you with finding the right solution.



1. Seawater de-aeration
2. MEG regeneration
3. VOC vapour recovery
4. Crude oil distillation
5. Flare gas and vent gas recovery
6. Gas boosting
7. Mud transfer and drying
8. Filtration
9. Air scour
10. Central vacuum cleaning units for offshore platform accommodation
11. Cargo oil pump priming

Vacuum Systems Tailored to Your Needs

Finding the best vacuum solution for each application requires a good understanding of all potential influencing factors. Busch process engineers analyze every requirement based upon their experience with literally hundreds of installations worldwide. Variables within a process, from specific measures or legislative regulations as well as from environmental factors such as local climate conditions, are taken into consideration during the design process of each individual system, thereby ensuring optimum performance.

All Busch vacuum systems are based on reliable and proven designs and can be tailored to deliver the perfect solution for each application. This is how Busch guarantees the required performance. Other important characteristics such as energy efficiency and longevity are optimized by combining the right selection of materials with different operating and construction principles. Busch has a proven track record of providing vacuum systems with the required durability and safety parameters, particularly with oil and gas industry applications involving harsh environments and explosive conditions – all produced in line with the requirements of the defined industry standards. These include PED, API 681, ATEX, IEEE and NEMA.

Busch has many years of experience in the supply of highly specified vacuum pumps and systems to oil and gas customers. In addition, we are able to build systems for use in different locations which will comply with any local requirements and to suit specific project demands. Besides, we offer performance and fully functional testing.

With over 60 companies in more than 40 countries and a global service network we are able to provide a rapid response service for all installed vacuum systems worldwide. The Busch service team has all the necessary certifications and specially trained staff to maintain all vacuum systems on oil and gas rigs, including any particular sensitive areas of activity.

Applications	**Vacuum Systems** Dolphin and ejector	**Vacuum Systems** COBRA and Panda / Puma	**Dolphin** liquid ring vacuum pumps	**Dolphin** liquid ring compressors	**COBRA** screw vacuum pumps	**Mink** claw compressors	**Tyr** rotary lobe blowers	**Vacuum Systems** R 5 and Panda / Puma
Seawater de-aereration	✔		✔					
MEG regeneration			✔		●			
VOC vapour recovery			✔		✔			✔
Crude oil distillation	✔	✔			●			
Flare gas and vent gas recovery			✔	✔				
Gas boosting			✔	✔				
Mud transfer and drying			✔	●		●	●	
Filtration							✔	
Air scour						✔	✔	
Pipeline drying		✔			✔			✔
Cargo oil pump priming			✔		●			


BUSCH

From Standard Products to Customized Oil and Gas Solutions

Busch offers a wide range of tried and tested vacuum pumps and compressors as key components of our system solutions for varied oil and gas industry applications.

Dolphin Liquid Ring Vacuum Pumps and Compressors

Dolphin is a series of robust single- and two-stage liquid ring vacuum pumps and compressors. Dolphin's proven operating principle allows them to be used in all kinds of industrial sectors. Even critical applications, such as evacuating saturated gases and vapours, are possible without difficulty. The various models and accessories allow for easy adaptation for use with any process.

COBRA Screw Vacuum Pumps

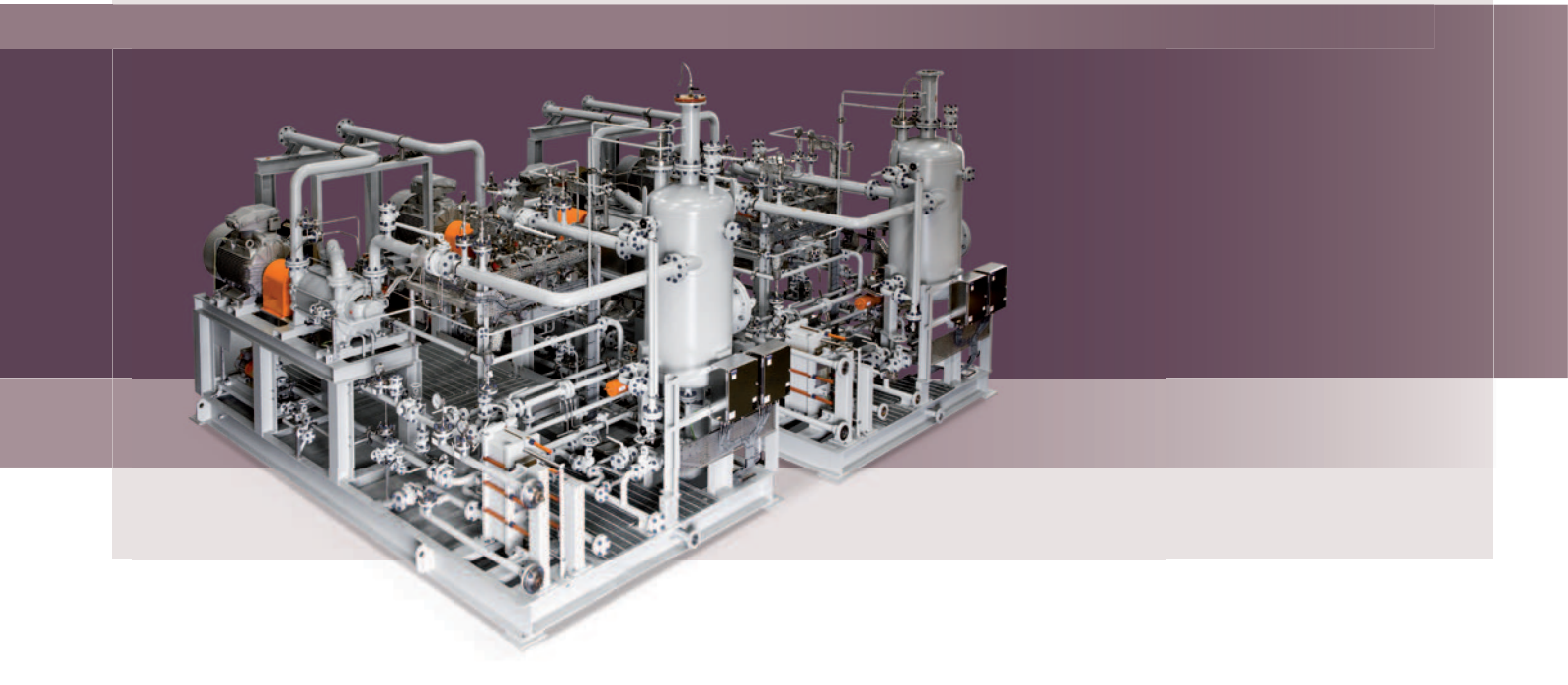
COBRA is a series of highly efficient dry screw vacuum pumps available for use in a wide variety of applications. These models encompass many years of experience in dry vacuum technology. Important features are a robust design, the ability to handle the vast majority of process gases, liquid and dust carry over and high corrosion resistance. COBRA dry screw vacuum pumps are also available as ATEX certified versions.

Tyr Rotary Lobe Blowers

Tyr rotary lobe blowers may be used for both vacuum and overpressure generation. Their design sets new standards in performance, compactness and low noise levels. Several sizes are available, allowing an energy-saving motor to be selected to match demand precisely. This exact configuration and the high efficiency of these blowers allow extremely energy efficient operation. The output may be adjusted by V-belt drive to suit the conveying system. A frequency converter is additionally available.

Vacuum Systems

We design vacuum systems to meet our customers' specific needs and requirements. More than 50 years of experience and the combined know-how from thousands of installations in numerous applications enable us to provide our customers with the best possible custom-built vacuum solutions. Our systems are built by dedicated teams and undergo performance and functional tests before delivery and after installation. All concept development, planning, design, materials procurement and manufacturing activities are performed specifically for each project. Projects are streamlined to permit the design and implementation to be carried out as rapidly as possible.



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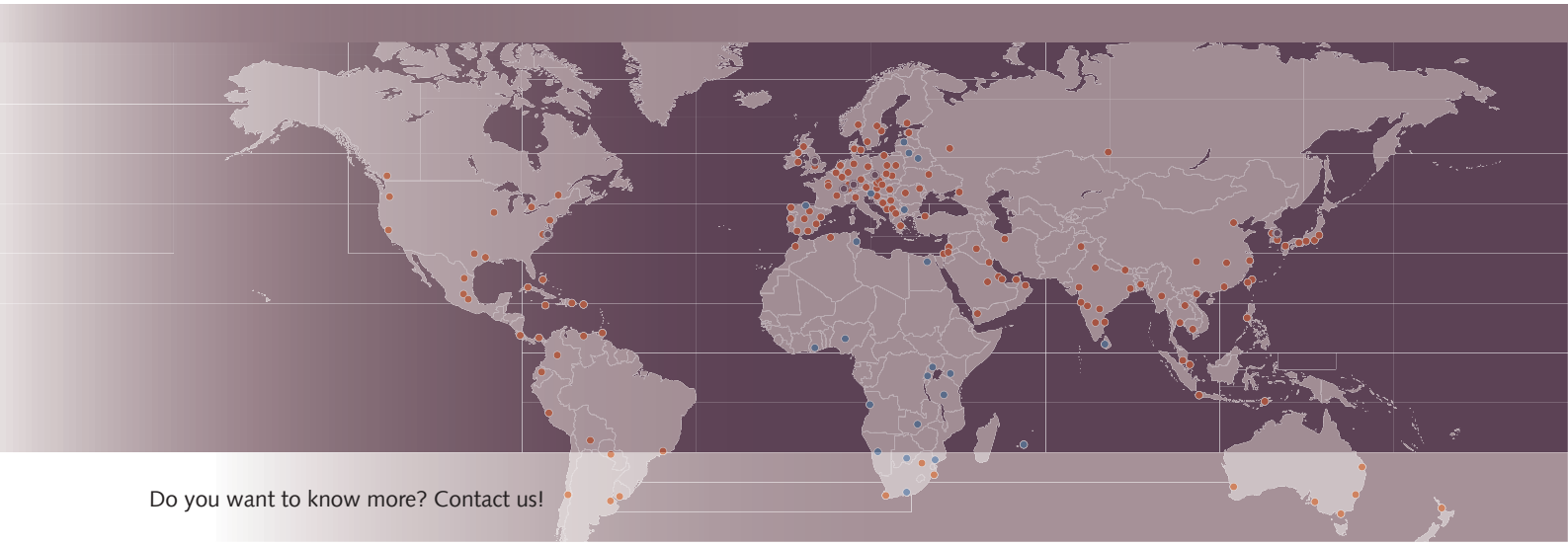

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