

# OFFSHORE

Safe, reliable, compact, efficient and compliant production.

**SUNDYNE** is the global leader in **LOW FLOW, HIGH HEAD** pumps and compressors for onshore and offshore oil and gas production.



Proven Pumps  
and Compressors  
For Offshore Applications



  
**Sundyne**

## Engineering Rugged Reliability For The High Seas

Considering our decades' worth of experience in the fluid handling and gas compression industries, it should come as no surprise that Sundyne pump and compressor packages present an ideal solution for your offshore application.

We know that crew safety and protecting the environment are of paramount importance to every offshore platform, which is why we design our products from the frame up to meet stringent API guidelines to eliminate process fluid leaks and maximize uptime reliability.

Every unit shipped is extensively tested to ensure smooth on-site start-up and long, trouble-free service cycles; additionally, Sundyne pumps and compressors are built around a streamlined, modular design philosophy that allows for fast, self-contained preventative maintenance, thus minimizing downtime and keeping your fixed or floating platform at peak productivity.



Four Sundyne OH6 pumps installed on two Indonesian production platforms.





*Offshore technology has undergone immense change over the decades. Sundyne has been providing solutions on the high seas every step of the way.*

## Deep Experience In Offshore Application Engineering

With oil fields becoming increasingly difficult to access due to their remote locations and extreme depths, the challenges associated with offshore production are constantly evolving. Sundyne has provided pumps and compressors for use in offshore applications for over 30 years, delivering rugged reliability in the Gulf Coast, the North Sea, the Mid-East, Africa and the waters of Asia. Following is a \*representative sampling of Sundyne offshore application success stories and engineering milestones:

**1982** – Sundyne sealless magnetic drive pump sold for **FPSO** service in crude oil sampling.

**1996** – Sundyne in-line vertical integrally geared compressors find success handling **offshore pipeline** boost service in the Gulf of Mexico.

**1997** – Sundyne OH2 sealless magnetic drive pumps are sold into **FPSO** services around the world, handling crude sampling processes, diethylene glycol and processed water.

**1999** – Sundyne VS6 installed on **FPSO** for hydrocarbon transfer off the coast of Angola.

**2000** – Sundyne API 617 low flow integrally geared compressor selected for use in **offshore regeneration** service.

**2002** – Sundyne provides API 685 OH2 sealless magnetic drive pumps for **offshore** use in Indonesia, fulfilling de-ethanizer feed, de-propanizer feed and de-butanizer reflux applications.

**2005** – Multiple OH2 centrifugal pumps installed on **FPSO** in crude oil transfer and produced water applications off the coast of Brazil.

**2006** – Sundyne provides multiple standard API 610 pumps for **FPSO** service in Australia and Norway. Sundyne API 614 integrally geared compressors installed on offshore platforms, primarily focusing on gas separation applications.

**2009** – Sundyne delivers NACE compliant API 617 multi-stage integrally geared compressor for waste gas recovery service on **FPSO** off the coast of Abu Dhabi.

**2010** – Sundyne debuts API 685 OH4 vertical inline sealless magnetic drive pump. First units installed on **FPSO** for hydrocarbon condensate service in the North Sea.

**2011** – VS4 and VS6 pumps installed on **FPSO** for methane and hydrocarbon transfer services off the Angolan coast.

*\*NOTE: the Sundyne timeline of events and product installation represent an abbreviated snapshot of our comprehensive offshore project experience.*

# Drilling/Production Platform

WELLHEAD PRODUCTION

SEPARATION

PROCESS

OFFLOADING / TRANSFER

FLARE, VENT, REINJECTION

PRODUCED WATER

FUEL GAS



**SUNDYNE IS THE GLOBAL LEADER IN LOW FLOW, HIGH HEAD PUMPS AND COMPRESSORS**

## Proven Solutions for Offshore Applications.

**VS1, 2, 4, 6**



- Transfer
- Offloading
- Produced Water

**BB1, 2, 3, 5**



- Separation
- Process
- Injection
- Transfer
- Offloading
- Produced Water

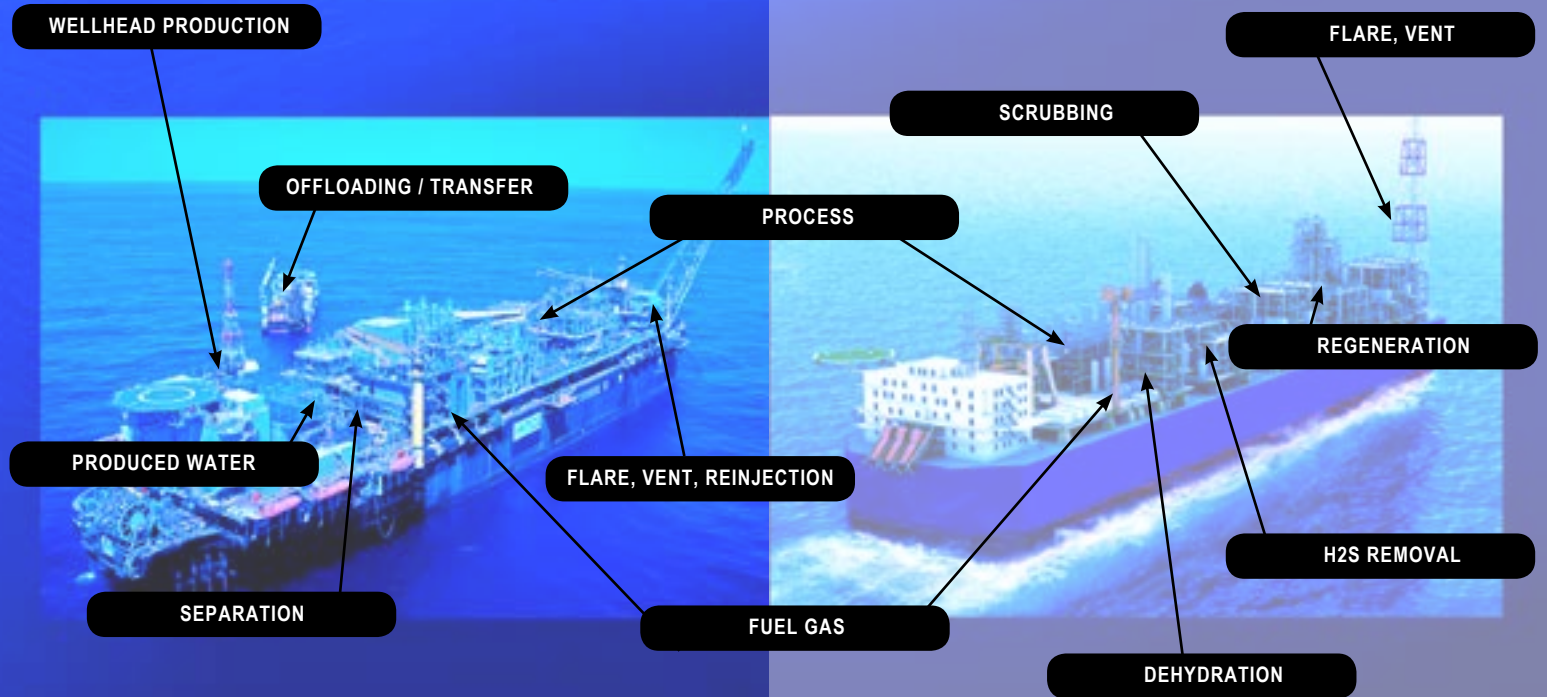
**Centrifugal, Reciprocating, LMC/BMC**



- H<sub>2</sub>S Removal
- Off Gas / Vent Gas
- Injection
- Transfer
- Offloading
- Produced Water
- Scrubbing
- Process
- Dehydration
- Regeneration
- Flare, Vent
- Fuel Gas

# FPSO

# FLNG



◀ Sundyne OH2 Sealless API 685 pumps and Sundyne LMC compressors were installed on this FPSO in Indonesia.

## HMP



- Injection

## OH2, 3, 4, 5, 6



- Scrubbing
- Process
- Dehydration
- H2S Removal
- Injection
- Separation

## High Pressure



- Seawater Reverse Osmosis
- Boiler Feed
- Fire Water

## ANSI / ISO



- Process



▲ Sundyne centrifugal BMC compressors were installed on this floating production platform in waste gas service off the coast of Abu Dhabi.

### Wellhead Production



As wellheads hit ever more extreme depths, the need for pumps that can reliably deliver flexible pressures and flows has become key. Capable of running continuously for up to 5 years without the need for service, our BB series integrally geared pumps are among the most dependable pumps on the market today for use in injection applications.

### Separation



Offshore wells produce a mixture of gas, condensate and water, along with various other contaminants that must be separated and processed. Sundyne BB and OH series pumps are ideally suited to execute this process without risk of fugitive emissions or flash vaporization.

### Process



Offshore facilities rely critically on the performance of dozens of pumps and compressors operating in varying conditions and rigorous environments. Built to comply with the latest API 685 and 610 (ISO 13709) standards – as well as ASME / ANSI requirements – Sundyne pumps and compressors can stand up to virtually any offshore application.

### Offloading & Transfer



Many FPSO facility types require a booster pump as a means for transferring product from the platform to a tanker or pipeline. Sundyne manufactures a range of solutions for such applications, such as our VS and BB series pumps, and LMC / BMC compressors, which leverage our decades of experience designing fluid and gas handling technology for use in the refining, storage and transport sectors.

### Produced Water



Water is an essential component of offshore production. Whether it's desalination or reverse osmosis for providing fresh water to the facility itself, handling seawater for compressor coolers, gas coolers or HVAC applications, or simply providing water at a moment's notice to fight a platform fire, Sundyne can provide a fluid handling solution tailored to the task.

**Sundyne rotating equipment is proven to be the most dependable on the market today for use in a variety of onshore and offshore applications.**

**Resulting in maximized uptime, reduced maintenance costs and optimized productivity over the lifecycle of the units.**

### Flare, Vent, Reinjection



Sundyne integrally geared compressors generate high pressures and can safely handle contaminants without risk of exposure to the atmosphere, making them a perfect choice for moving gas for flare, vent or reinjection.

### Fuel Gas



After separation, raw gas is moved to the LNG processing plant. There, H<sub>2</sub>S is removed and sulfur is processed for commercial use. The purified gas is then moved to production in dehydration, where Sundyne compressors are used for amine regeneration and to move the gas to NGL recovery systems where sealless pumps handle the distilled byproducts, including ethane, propane, butane and other gases. Our API 685 sealless pumps are also used to move the leftover processed water. Ultimately, the final product is liquefied for transport utilizing Sundyne integrally geared cryogenic compressors.

We build our compressors to API specification, meaning that they can run for up to 5 years at a stretch without the need for maintenance or service; and when your operation is far from shore, downtime can lead to lost revenue or worse. Choose Sundyne for the rugged reliability your floating or fixed platform requires.



## **Reciprocating Sealless Diaphragm Compressors**

Sundyne diaphragm compressors boast a leak tight mechanism, which features static seals that do not need to be purged or vented. Built to meet stringent API 618 standards, these machines are available in a variety of configurations and sizes, making them customizable for use in many offshore applications; such as H<sub>2</sub>S removal.

## **Centrifugal Integrally Geared Compressors**

These API 617 / ISO 10439 and API 614 standard compressors deliver oil-free process gas with zero emissions. Their innovative design allows for maximized flexibility, including the operation of up to four stages from a single gearbox. Sundyne centrifugal compressors are perfect for injection, scrubbing, process, dehydration, regeneration, H<sub>2</sub>S removal, flare / vent and fuel gas applications on offshore installations.



## **Low Flow, High Head Centrifugal Integrally Geared Compressors include: LMC Line Mounted, BMC Base Mounted or LF Low Flow Series Compressors**

Featuring a modular design that includes an independent wet-end and proprietary gearbox design, our technology allows for maximized uptime, reduced maintenance costs and optimized productivity over the lifecycle of the units.

OFFSHORE



Heavy duty fluid handling performance for offshore applications, including separation, process, injection, transfer and offloading, as well as produced water.



**BB1 Axial Split Process Pumps**

Designed to heavy API 610 11th Edition BB1 standards, this pump features an axially split case with a single or double suction impeller.



**BB2 Medium Duty Process Pumps**

This is our API 610 / ISO 13709 11th Edition BB2 radially split, centerline mounted, double volute, between-bearings centrifugal process pump, which is available in one or two stage configurations.

Another Sundyne BMC compressor sets sail on a floating production platform, built by one of the largest ship-building companies in the world.





## BB Series Process Pumps



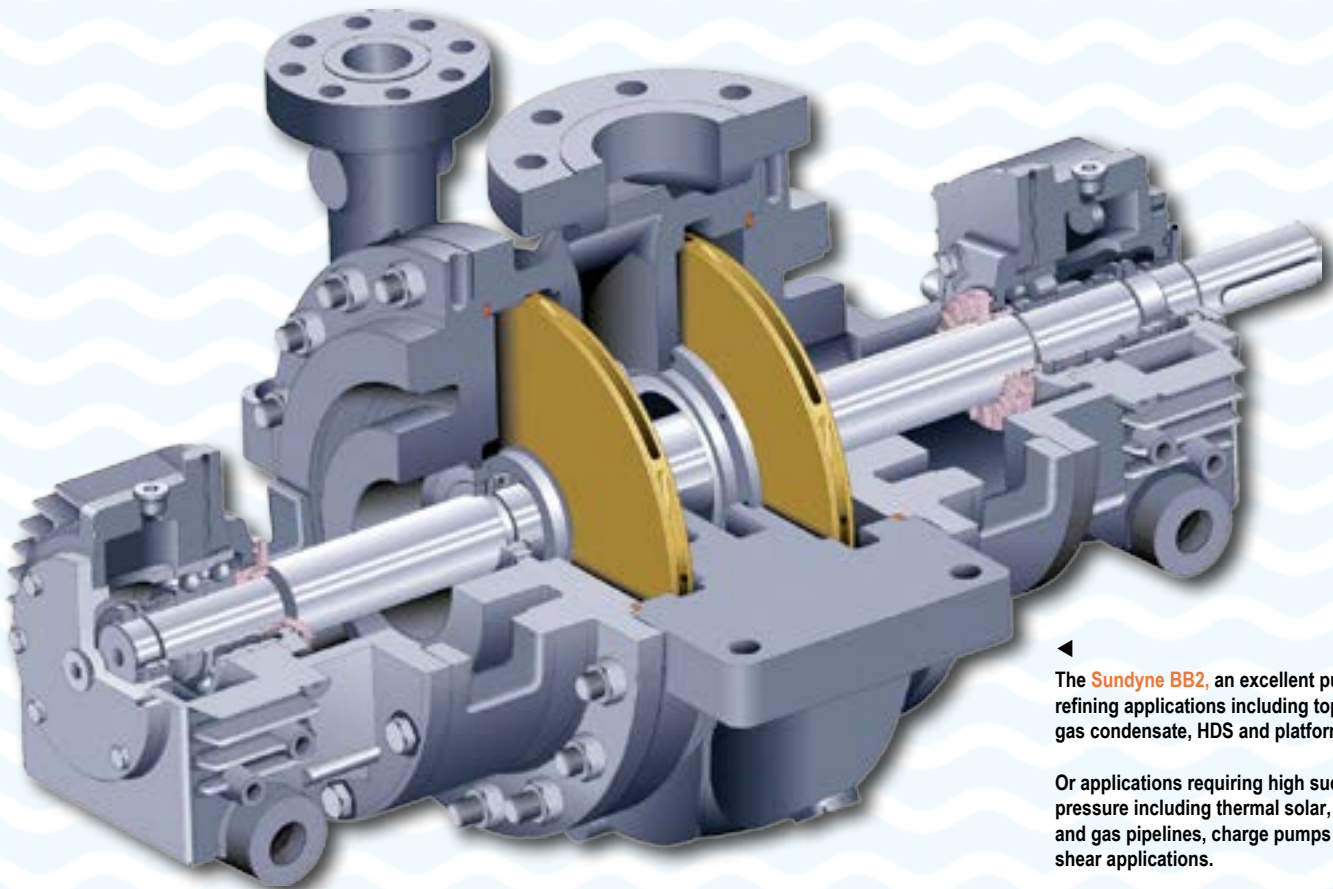
### BB3 Heavy Duty Process Pumps

A perfect high flow, high head complement to Sundyne low flow, high head integrally geared LMV and BMP centrifugal pumps, this model is a fully compliant API 610 11th edition BB3 and ISO 13709 multi-stage process pump. Available in 1-4 stages.



### BB5 Sealless Magnetic Drive, Multi-stage Pumps

This magnetic drive pump is a multi-stage, API 685, BB5 design, which utilizes between bearings design for the second and third stage impellers. This pump is great for offshore injection applications.



◀ The Sundyne BB2, an excellent pump for refining applications including toppings, gas condensate, HDS and platforming.

Or applications requiring high suction pressure including thermal solar, crude oil and gas pipelines, charge pumps and low shear applications.



### **OH2 Modular Process Pumps**

Sundyne OH2 process pumps are end-suction, full centerline mounted, radial split, overhung horizontal single- and double-volute centrifugal pumps. Fully compliant with API 610 11th edition and ISO 13709 standards, these pumps feature full centerline mounting and cooling options that make this design very suitable for high temperature services. Perfect for offshore service in separation and process applications.

OFFSHORE



### **OH2 Sealless Magnetic Drive Centrifugal Pumps**

The OH2 sealless magnetic drive model is available in eleven hydraulic sizes and two basic frame sizes to suit power requirements. These API 685 compliant pumps are a perfect fit for offshore service in separation, process, scrubbing and H<sub>2</sub>S removal applications.

Sundyne vertical pumps are suitable for many offshore applications, such as separation, process, scrubbing and H<sub>2</sub>S removal. The Sundyne GSPV was towed to sea as a component of this floating module for a major global energy producer.



## OH Series Process Pumps



### OH3 & 5 Direct Drive Centrifugal Pumps

Sundyne API 610 OH series pumps are standard direct drive vertical in-line single-stage overhung pumps. Equipped with a separate, rugged bearing box support, the driver is mounted directly on either the bearing box support or the driver shaft and is flexibly coupled with the pump. These pumps are ideal for use in process applications on offshore installations.



### OH4 Sealless Magnetic Drive Centrifugal Pumps

Combines our API 685 expertise with all the benefits of a magnetic drive pump in a compact, vertical package. Suitable for separation, process and scrubbing applications in the offshore environment.



### OH6 Integrally Geared Centrifugal Pumps

These API 610 / ISO 13709 compliant pumps deliver rugged reliability in a compact footprint; equating to maximized uptime, reduced maintenance costs and optimized productivity over the lifecycle of the unit. Sundyne OH6 vertical centrifugal pumps deliver multi-stage performance in a single-stage design, making these an excellent option for use in offshore injection applications.



**In 2004, the Sundyne UK facility – responsible for manufacturing many of our HMD Kontro products – received the Gold Award, recognizing excellent performance in delivering equipment for a major offshore project in Indonesia.**

#### Contributing factors included:

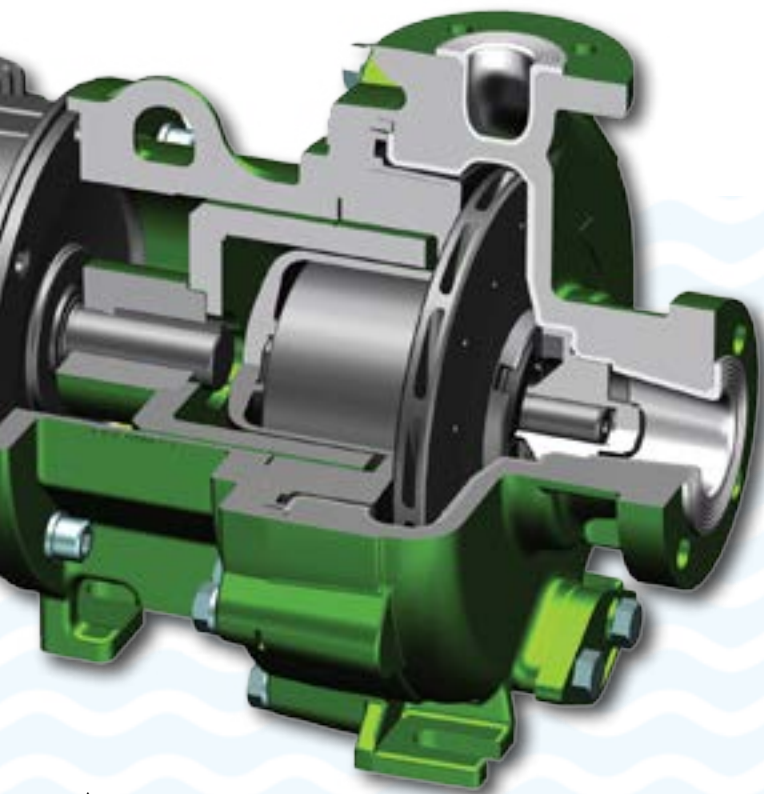
- Excellent international team work
- Unique product offerings
- Prompt and excellent responses
- Technical expertise
- Very good relationship with customers
- Localized support, technical and aftermarket service

OFFSHORE



ASME / ANSI process and transfer pumps are available in horizontal and vertical configurations, but they all boast a rugged construction that makes them ideal for moving caustic or hazardous substances. Their sealless design also ensure leak-free fluid handling, completely eliminating the risk of vapor emissions. They deliver rugged reliability in a compact and economic footprint, helping you maximize valuable space on offshore installations.

**Sealless magnetic drive process pumps are ideal for offshore transfer and process services.**



**ANSI B73.2, ISO 2858 Vertical, Plastic-lined, Sealless Magnetic Drive Process Pumps**



**ANSI B73.3, ISO 2858 Horizontal, Plastic-lined Sealless Magnetic Drive Process Pumps**

▲ Our highly reliable sealless magnetic pump line covers a wide range of sizes and includes standard external dimensions so that they can easily replace other sealless and sealed pumps without changing piping or baseplates.

They also meet standard design specifications and materials of construction. Our innovative rear casing generates no eddy currents thus eliminating heat generation and reducing energy costs.



**ANSI B73.3, ISO 2858 Horizontal, Sealless Magnetic Drive Process Pumps**

## High Pressure Pumps



As the original high head, low flow experts, Sundyne has developed a variety of fluid handling solutions that are perfect for heavy pressure applications on offshore installations. For more information on our most robust pump offerings, visit [www.sundyne.com](http://www.sundyne.com).



### **HMP Multi-Stage Integrally Geared, Centrifugal Pumps**

The HMP series of integrally geared centrifugal pumps continues the Sundyne tradition of engineering excellence, delivering exceptional power and rugged reliability in a compact footprint. Available in scalable configurations – you can run up to three stages from a single gearbox – each pump is engineered to meet the application's unique Best Efficiency Point, in order to maximize performance and output. Additionally, HMP pumps run continuously for 5 years, as specified by API 610 / ISO 13709 standards. These designs are ideal for use in offshore injection applications.



### **HIGH PRESSURE non-API Gear Driven Centrifugal Pumps**

Sundyne non-API high pressure pumps harness our high head, low flow technology and leverage it for use in offshore service. Available in close-coupled, frame-mount or base plate configurations, these robust pumps are ideal for injection, fire water, reverse osmosis and boiler feed applications.



Sundyne API 610 vertically suspended designs are perfect for submersible applications. Rugged construction, advanced parts metallurgy and a variety of flexible configurations make these models a superior choice for use as offshore transfer, offloading and produced water pumps.



**VS2** Vertical Mounted, Double Suction Impeller Pumps

**VS4** Vertical Inline Shaft (Sealed and Sealless) Pumps



**VS6** Multiple Stages Vertical Can Pumps



## Environmental, Health & Safety (EH&S)

Due to the extreme nature of offshore applications, EH&S considerations are of paramount importance for FPSOs. Regulated under API RP 2FPS guidelines – which outline recommended practices for planning, design and construction of floating production systems – these installations are among the most highly engineered facilities on the planet.

Safe operation, minimal environmental impact and crew safety are the primary objectives taken under consideration when planning an offshore installation.

These considerations mean that long, failure-free service cycles and pump / compressor redundancy provision are absolute requirements for FPSOs and other offshore installations, along with the need for in-situ serviceability and ease of repair. This reality is compounded by the fact that a pump or compressor breakdown in an offshore environment will have an adverse impact upon production and offloading, since dock facilities are unavailable and replacement components can take hours – or even days – to arrive from the mainland.



**Sundyne utilizes a range of special metallurgies to help prevent leaks and deliver the safest, most reliable fluid handling solution on the market today, including:**

- ✓ Simplified monitoring
- ✓ Secondary containment
- ✓ Precision antifriction bearings
- ✓ Shaft couplings and guards
- ✓ Maintenance-free gas seals
- ✓ Expert commissioning

**SAFETY MATTERS**

Sundyne vertical submersible pumps are ideal for transfer and offloading in offshore services.





### Backed By Global Support

Sundyne is more than just a manufacturer of high quality compressors and pumps...much more. Not only do we offer some of the fastest delivery times in the industry via our new FastLane program, we also back each and every product shipped with a full range of aftermarket support services, extending the value of our highly engineered machines well beyond the point of sale.

The Sundyne service team is here to help you protect your investment and provide a trouble-free customer experience.

### Our Aftermarket Programs Include:

- Expedite Programs
- Maintenance Kits
- Conversion Programs
- Gearbox Exchanges
- Service Schools
- On-Site Service
- Overhaul and Repair Services



Plus, our new Reliability Assurance Kits deliver trouble free maintenance at regular intervals. To learn more about this convenient new service program, visit [www.sundyne.com](http://www.sundyne.com).

### Sundyne: An OSHA VPP Star Site

At Sundyne, Environmental Health and Safety (EH&S) is integral to our culture of excellence, and providing a 100% safe work environment through the manufacturing and installation phases of a project is a core priority.

### COMPRESSORS

### PUMPS

### GENUINE PARTS

### SERVICE



Sundyne Headquarters:  
**Sundyne, LLC**  
14845 West 64th Avenue  
Arvada, Colorado 80007  
USA  
1-866-Sundyne  
Phone: 1 303 425 0800  
Fax: 1 303 425 0896  
[www.sundyne.com](http://www.sundyne.com)

Sundyne Pennsylvania:  
**Sundyne PPI**  
201 Ivyland Rd.  
Ivyland, Pennsylvania 18974  
USA  
Phone: 1 215 675 1600

Sundyne United Kingdom:  
**Sundyne HMD/Kontro Sealless Pumps, Ltd.**  
Marshall Road  
Hampden Park Industrial Estate  
Eastbourne East Sussex, BN22 9AN  
United Kingdom  
Phone: +44 1323 452000  
Fax: +44 1323 503369

Sundyne Spain:  
**Sundyne Marelli Bombas, S.R.L.**  
Ctra. Madrid-Toledo, Km.30.8  
45200 Illescas  
Toledo, Spain  
Phone: +34 925 53 45 00  
Fax: +34 925 51 16 00

Sundyne China:  
Building 1, No. 879 Shen Fu Road  
XinZhuang Industrial Zone  
Min Hang District  
Shanghai, China 201108  
Phone: +86 21 50555005  
Fax: +86 21 54425265

Sundyne France:  
**Sundyne International S.A.**  
13-15, Bld. Eiffel - B.P. 30  
21604 Longvic Cedex  
France  
Phone: +33 (0)3 80 38 33 00  
Fax: +33 (0)3 80 38 33 66



All information provided is subject to change without notice.

© 2015 Sundyne, LLC  
All Rights Reserved. Other logos and trade names are property of their respective owners.

Sundyne Offshore Brochure\_042415:  
A4 (v.1) POD