



SPX POWER+ENERGY

INNOVATION, DESIGN,
MANUFACTURE + AFTERMARKET:
PUMPING SOLUTIONS FOR
A BETTER WORLD

Pumping Solutions for the Oil + Gas Industry



> ClydeUnion Pumps



SPX - An introduction

SPX is a Fortune 500 multi-industry manufacturing leader, headquartered in Charlotte, North Carolina. SPX manufactures and markets products, components, services and technologies that are integral to meeting today's challenges and tomorrow's needs. We are a place where innovation is fostered, and the real needs of business are understood. We transform ideas into powerful solutions to help our customers meet their goals, overcome business challenges and thrive in a complex, always changing marketplace.

SPX's Flow Technology segment designs, manufactures and markets engineering solutions and products used to process, blend, meter and transport fluids. We also offer equipment for air and gas filtration and dehydration. Our leading brands have global operations which service the food + beverage, power + energy, and industrial processes.

SPX POWER+ENERGY

CLYDEUNION PUMPS, AN SPX BRAND - GENERATIONS OF EXPERIENCE

Whilst the name is relatively new, the ClydeUnion Pumps brand is known worldwide for supplying reliable and robust engineered pumping solutions stemming from over 140 years of industry expertise. Our experience spans across several complex industries including oil and gas, nuclear and conventional power generation, desalination and other key markets relevant to our product portfolio.

› ClydeUnion Pumps

CLYDEUNION PUMPS

Weir Pumps - Clyde Pumps - Mather & Platt -
Drysdale - WH Allen - Girdlestone -
Allen Gwynnes - Harland

S&N PUMP CO.

UNION Pump

Union Pump - David Brown Pumps
DB Guinard Pumps - American Pump - Pumpline

SPX

› ClydeUnion Pumps



OIL + GAS - DRIVEN BY CUSTOMER SERVICE

At ClydeUnion Pumps, an SPX Brand, we understand the needs of the oil and gas industry. We have brought engineering expertise and experience throughout our global organisation to create a specialist team focused solely on serving the oil and gas industry and meeting its specific requirements.

We are strategically aligned with customers' requirements and fully committed to the working practices and the demands of scheduling, efficiency and reliability, prevailing within the industry. This allows us to build considerable advantages into the services offered.

In essence, we understand the paramount importance of reliability, and the only path to robust continuous long-term performance is engineering of the highest standard. ClydeUnion Pumps engineering sets a benchmark for the industry and our products are quality assured by our comprehensive quality system and full-scale pump test facilities. Through a culture of innovations and a customer-centred approach, we have positioned ourselves at the leading edge of pump design. We remain there by constant investment in research and development, and the use of the most modern design techniques.

Wherever you are operating you will be able to contact a local representative with access to, and expertise in our entire product range. We provide a local one-stop-shop, covering all pump equipment from centrifugal to reciprocating units, and a single point of contact with the ability to draw on global resources. Full aftermarket support and a flexible service aligned with your requirements is also available.





Exploration

The offshore drilling industries are subject to exceedingly harsh operating conditions and rely on quality products and engineered solutions. At ClydeUnion S&N Pumps our mission is to be the leading provider of design, service, testing and repair of seawater pumping equipment to the offshore industry by offering safe, cost effective, reliable, single-source solutions for global seawater needs.

ClydeUnion S&N Pumps comprehensive range of submersible pumps and pump products are used in various applications for the offshore and marine sector. These include seawater lift, firewater, pre-fill/ballast, deluge/water curtain, cooling water, and bio-fouling prevention pumps, general service pumps, process pumps, sump pumps and ancillary equipment.

FEATURED PRODUCT: E~Z LIFT SEAWATER LIFT REEL SYSTEMS

The E~Z Lift automated seawater lift reel systems are designed to meet the raw seawater supply requirements of a rig and serve as a replacement for well tower and leg installations of electric submersible pumps. Electric submersible pumps are attached to hoses on the reel system and deployed overboard to the rigs desired depth. Each system is operated by a single man, and allows for safe deployment and retraction of a rig's seawater lift pumps.

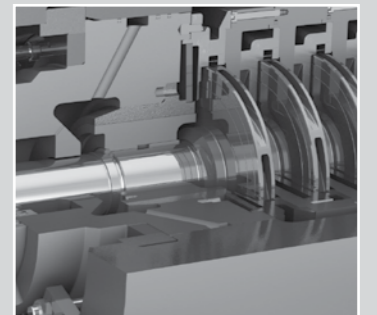
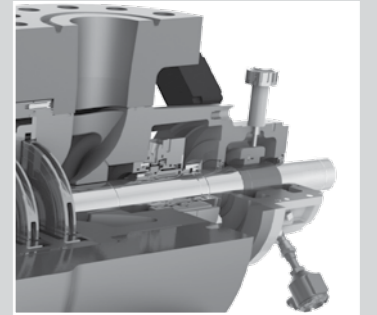
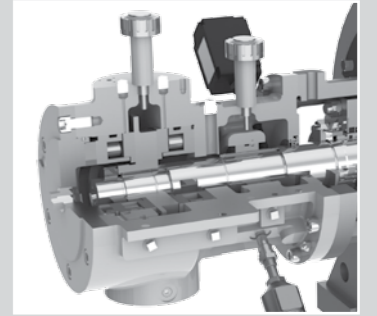




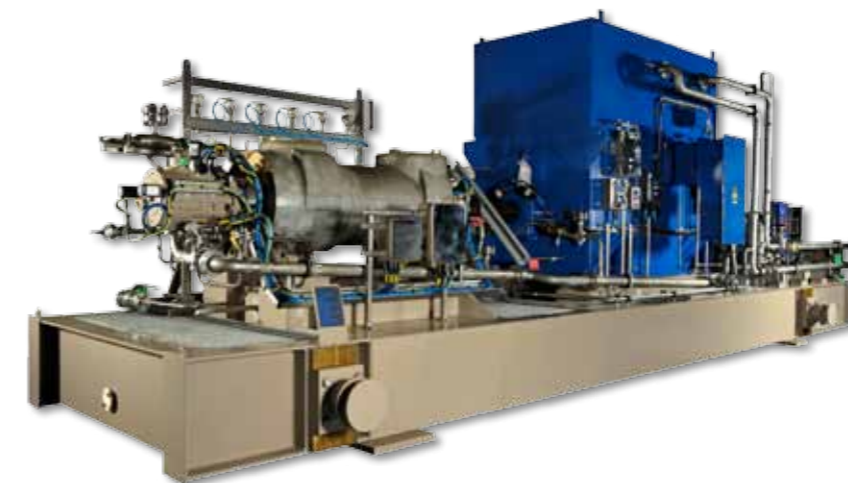
Production

Oil and gas is found in some of the most remote and inhospitable places on earth; the coldest seas, the deepest oceans and the hottest deserts. At ClydeUnion Pumps we have built a reputation in providing engineered pumping solutions for some of the most arduous applications in the most hostile environmental conditions imaginable.

ClydeUnion Pumps comprehensive range of API 610 centrifugal and API 674 reciprocating pumps are used in various applications for the exploration and production sector. These include water injection, main oil line, crude oil and condensate export, pipeline pumps, seawater lift, firewater pumps, general service pumps, process pumps, sump pumps; hydraulic drive downhole pumps for artificial lift and multiphase pumping applications; subsea pumps, and ancillary equipment.



FEATURED PRODUCT: CUP-BB5HP



The CUP-BB5HP range encompasses radially split, diffuser type multi-stage pumps specifically designed for the high pressure and high speed service needs of the market.

The pump encompasses proven design history, evolving from our legacy Weir Pumps 'OK' and Union Pumps 'HMBS' machines. Both contribute to an enviable heritage of sound engineering, with hundreds of CUP-BB5HP pumps operating worldwide, both onshore and offshore.

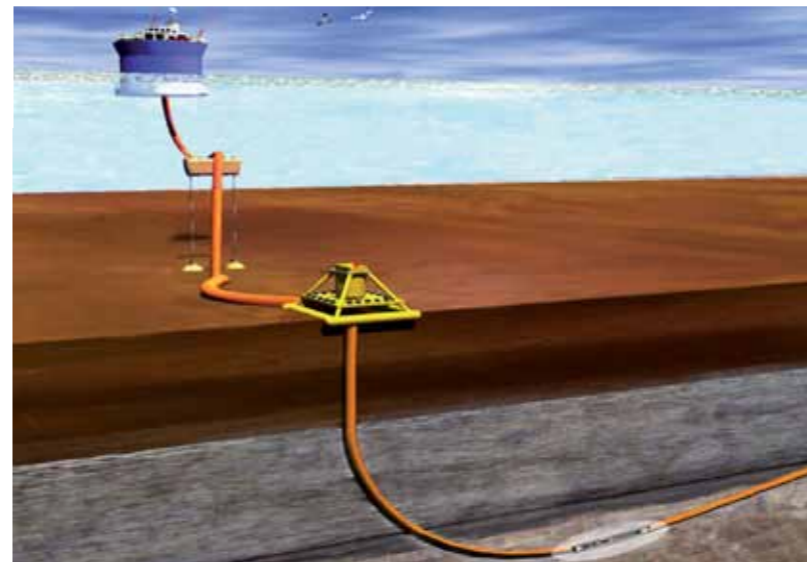


Downhole + Subsea

In the offshore production environment, downhole and subsea applications present some of the greatest challenges for pumping equipment. ClydeUnion Pumps has a long and successful track record in the development and manufacture of products for such applications and has championed the use of hydraulic turbine driven pumps for maximum flexibility, availability and reliability. This technology is used to boost single or multiphase fluids in the well bore or on the seabed.

Production of hydrocarbons has become increasingly reliant on pump technology to recover fluids from low pressure reserves. Oil lift and boosting applications are at the very front end of the production process and often encounter aggressive fluids and highly variable operating conditions.

The ClydeUnion Pumps turbine driven Hydraulic Submersible Pump (HSP) has been specially engineered to operate effectively in this environment and to eliminate the failure modes associated with conventional downhole pumps. The multiphase variant of the HSP has over ten years successful operation as the primary means of production in subsea wells and has demonstrated run lives around three times longer than the industry average for electric submersible pumps.

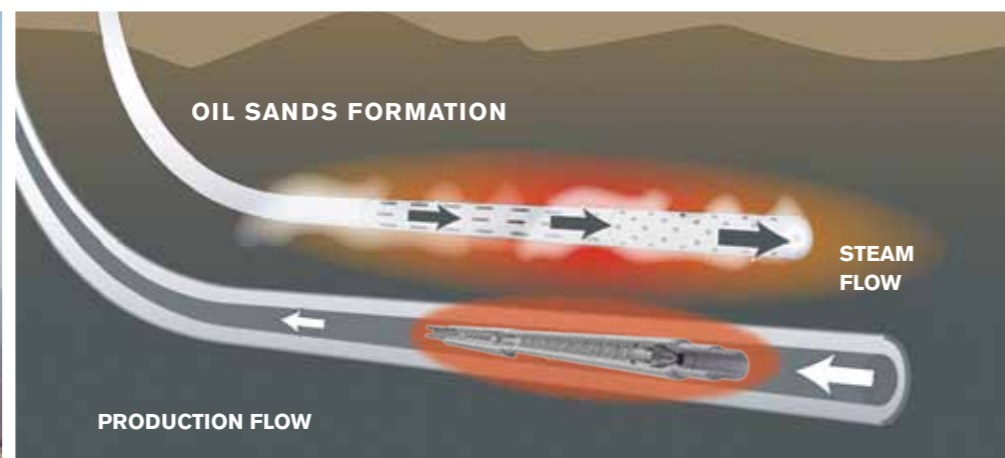


FEATURED PRODUCT: HSP



Hydraulic Turbine Driven Submersible Pumps (HSPs) offer a simple and robust solution for well or seabed boosting. The ClydeUnion Pumps HSP was specifically designed to provide maximum reliability and flexibility under varying operating duty conditions in challenging well environments. Typical applications include oil well production, both offshore + onshore, and multiphase downhole + subsea boosting.





In-situ Oil Sands

In-situ oil sands extraction - Requirements to meet the global demand for energy, coupled with the growing need for diversity of supply, has seen the oil and gas industry increasingly having to move towards challenging "unconventional" oil reserves such as bitumen (heavy oil) extracted from oil sands deposits.

Whilst some of these deposits can be accessed by surface mining techniques, the vast majority of reserves are accessed by advanced in-situ thermal technologies; with SAGD (Steam Assisted Gravity Drainage) leading the way as the method of choice for many current and future oil sands development projects.

ClydeUnion Pumps has extensive experience in SAGD pump applications. From HP/LP boiler feed pumps, to hydrocarbon transfer and treatment pumps, water treatment pumps, emulsion pad pumps, or export/sales pumps; ClydeUnion Pumps offers a full suite of pumping solutions involved in SAGD central processing plants, well pad facilities and interconnecting pipeline networks.

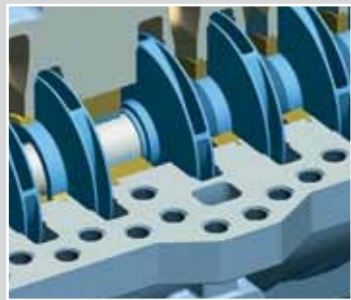
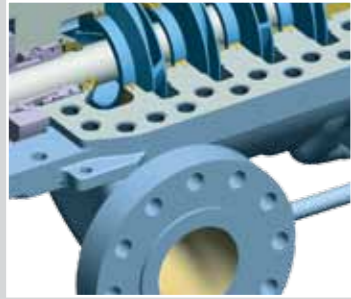
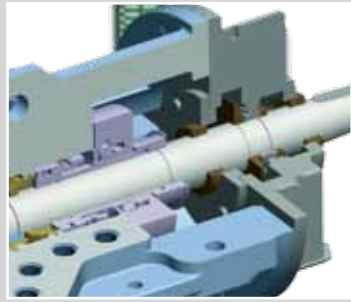
Further, we appreciate that SAGD operators are increasingly turning to lift pump technology to optimise production rates. ClydeUnion Pumps high reliability HSP hydraulic drive lift pump offers an alternative to often short lived ESP technology. Field experience shows that the water turbine driven HSP can achieve MTTFs around three times greater than the industry average for ESPs, which provides the opportunity for reductions in workover frequency, life-cycle costs, and deferred oil production.



FEATURED PRODUCT: CUP-BB1



The CUP-BB1 range are heavy duty, axially split single and two stage designs engineered to maximise efficiency, provide high reliability, and offer the widest performance flexibility over the pump's life-cycle. From short term to medium term adjustments to full hydraulic re-rates, the CUP-BB1 features are carefully selected to meet our customers' needs. Typically a combination of features such as volute insert designs, lip chipping, impeller blade and tip modifications, and varying capacity impellers, can be used to provide the highest versatility of pump operation.



Transportation + Storage

Wherever oil and gas are found they need to be transported to processing facilities around the world for refining into products we use every day. This is achieved using subsea and onshore pipelines, seagoing tankers and road and rail tankers, all of which use pumps to export, transfer and load or unload the unrefined product.

ClydeUnion Pumps technologies have been used in pipeline and export applications since the late 1800's. Today we supply a range of pumps from the smallest to the largest pipeline and export applications; from loading and unloading road tankers to the largest seagoing oil tankers.

The ClydeUnion Pumps vertical range has proved to be the right choice for high flow loading applications where NPSHA is limited. Also with the incorporation of high pressure volute construction the pump length can be dramatically reduced, limiting installation costs.



FEATURED PRODUCT: CUP-BB3

The CUP-BB3 pump is a heavy duty axially split, multi-stage, double volute horizontal pump with opposed impellers and either single or double suction first stage impeller options. They comply with the latest edition of API 610 and API 682 standards and are specifically designed for heavy duty, medium and high pressure applications.

With an ever increasing drive to reduce energy costs associated with distribution, maximising pump efficiency has been a focus of our attention for many years. Computer modelling, improved casting processes and the introduction of composite bearing materials have all contributed to the CUP-BB3 being one of the most efficient pumps in this industry.





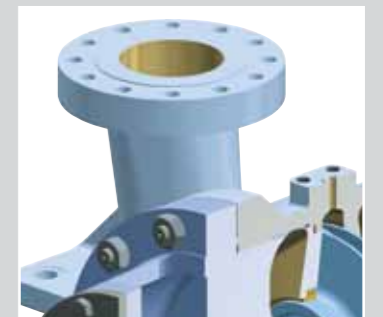
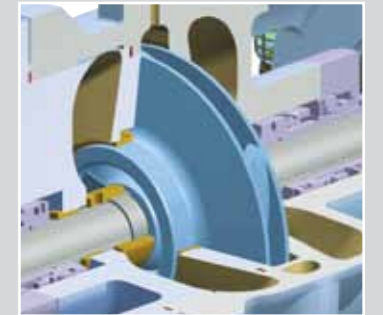
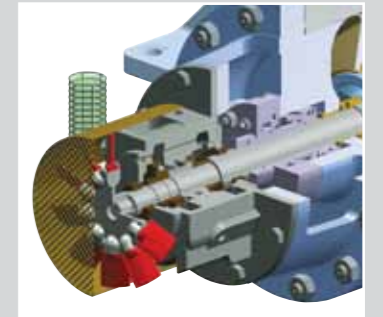
Refineries

Today's complex refinery processes demand specialised pumping solutions. Extremes of temperature, high-pressure and the ability to handle volatile fluids, calls for highly engineered pumps that can perform reliably in such arduous conditions. ClydeUnion Pumps has many years of worldwide experience in supplying process pumps to the refinery industry and is committed in providing its customers with solutions for the most complex of pumping requirements.

The broad range of refinery applications demand the widest spectrum of pump types of any industry. Due to the careful amalgamation of our heritage companies forming ClydeUnion Pumps, we have a pump product to meet every refinery process.

A recent intensive product review and product enhancement process has ensured that, not only does ClydeUnion Pumps have machines suitable for all refinery processes, but that our products also incorporate the latest advancements in materials, bearing and sealing technology.

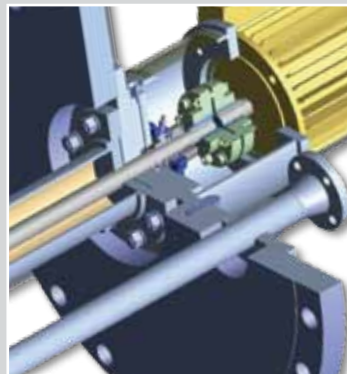
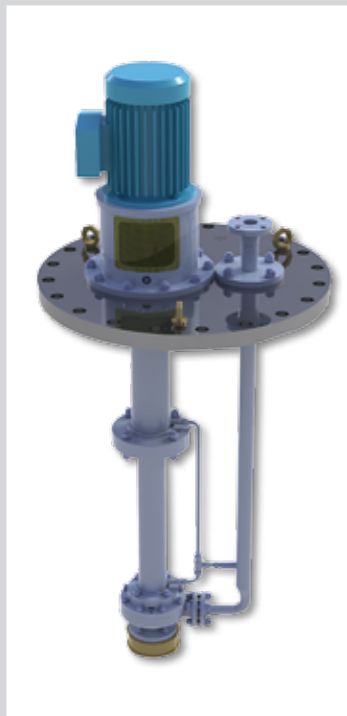
ClydeUnion Pumps has been extremely successful with its patented 'saphite' coating system in minimising pump erosion on the problematical catalytic cracker, considerably extending the period between overhaul.



FEATURED PRODUCT: CUP-BB2



The CUP-BB2 is a heavy duty, horizontal, single stage, radially split, between bearings, double suction pump. It is available with top-top or side-side suction and discharge connections. The CUP-BB2 is designed and manufactured to the latest edition of API 610. The pumps are employed for many oil and gas, power, and general industrial applications. Stringent API noise and vibration limits are met due to a rigid pump body with 360° bearing support and heavy centreline mounting.



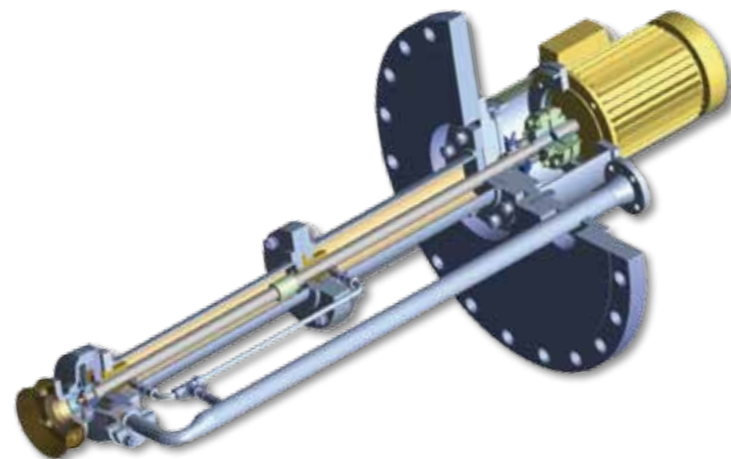
Petrochemicals

ClydeUnion Pumps has worldwide experience of engineered pumping systems for petrochemical applications. The process and transferring of petrochemicals demands a high level of pumping reliability. ClydeUnion Pumps has a reputation for supplying reliable pumps which are found working throughout the world in the most aggressive applications.

Reliability has always been a benchmark for ClydeUnion Pumps products and notable features have recently been introduced to enhance reliability well above market levels. One specific example is improved bearing arrangements extending bearing operating life beyond specification requirements and customer expectations. ClydeUnion Pumps is proving that 'attention to detail' in design and manufacture can extend mean time between failure (MTBF) above what has been recognised as acceptable in the past.

ClydeUnion Pumps recognises current environmental regulations limiting toxic emissions and has reacted positively by introducing the patented CP system. This system is capable of providing product pump sealing with 'zero' emissions to the atmosphere. The CP system also contributes to health and safety reducing the risk of contact with hazardous liquids.

FEATURED PRODUCT: CUP-VS4



The CUP-VS4 is a vertically suspended, single stage casing volute, line shaft driven sump pump developed from existing proven designs, using 'Finite Element Analysis' (FEA).

The pump comes in two design specifications. We offer pumps in accordance with the latest edition of API 610 and an industrial standard range, both of which offer ease of maintenance and reliability.



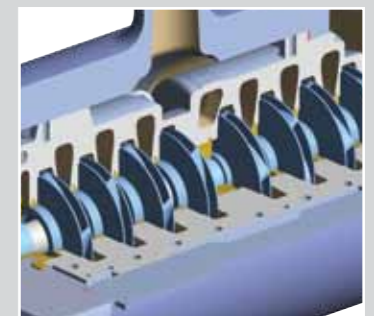
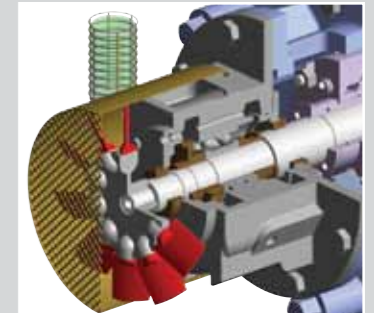
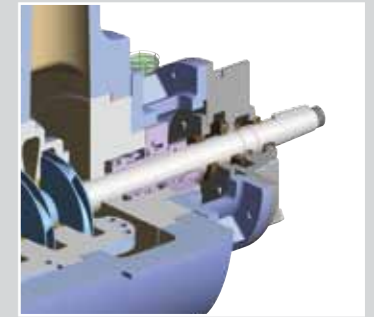


Gas Treatment + Processing

ClydeUnion Pumps has always been a leader in the supply of engineered pump solutions for both onshore and offshore gas processing and separation. Our product range covers simple Glycol Dehydration reciprocating pumps through to high powered CUP-BB3 and CUP-BB5 pumps used on gas scrubbing services.

ClydeUnion Pumps is at the forefront of product development for cryogenic applications. Our CUP-OH5 and CUP-VS6 ranges have the capability of operating down to minus 180°C with 'zero' emission to the atmosphere using our patented CP systems. Over 1,000 units are installed worldwide with safety and reliability being key factors when customers select our products for these highly demanding services.

The removal of CO₂ (carbon dioxide) and H₂S (hydrogen sulphide), commonly referred to as Amine gas sweetening, is a further area where ClydeUnion Pumps has 50 years of operational experience. The smaller process plants are equipped with our high pressure reciprocating pump range whilst our multi-stage CUP-BB3 and CUP-BB5 ranges are installed in major gas plants in the Middle East, Russia, China, South America and a number of floating production units. These pumps can be custom engineered with impellers designed for optimum NPSH performance, high integrity bearing arrangements and condition monitoring instrumentation.



FEATURED PRODUCT: CUP-BB5V



The CUP-BB5V is a horizontal, double casing, radially split, multi-stage pump with opposed impellers and between bearings design suitable for high pressure, high speed and high temperature applications. All units comply with API 610.

There are many ClydeUnion Pumps CUP-BB5V units operating worldwide on services as diverse as hot hydrocarbon refinery services and high suction pressure applications.



INSTALLATION + COMMISSIONING: TROUBLE FREE COMMISSIONING ANYWHERE IN THE WORLD



PARTS: ANY BRAND, ANY MATERIAL, ANYTIME

Lifetime worldwide support

Every product ClydeUnion Pumps supplies is supported by a full lifetime commitment. ClydeUnion Pumps provides a full aftermarket service, drawing on either its own engineers or fully trained and highly experienced service partners, depending on the location of the installation. ClydeUnion Pumps has service facilities in over 40 countries spread throughout Europe, America, Asia, the Middle East and Africa.

ClydeUnion Pumps after sales support extends across all of its legacy brands as well as new equipment, and provides full backup for obsolete products and for third party equipment. The parts ClydeUnion Pumps supply meet the original specification, or are upgraded where appropriate, and many components can be covered by a Rapid Response option which can have parts on site within 24 hours.

ClydeUnion Pumps after sales support is subject to the same supply chain management as the pump manufacturing. This provides customers with the lowest lead times and costs whilst meeting the highest standards of quality assurance.

In addition to spare parts, routine servicing, overhauls and inventory control, the aftermarket support covers upgrades and comprehensive technical advice about the potential refitting of existing installations for greater efficiency and reliability. ClydeUnion Pumps can work with your own engineers to carry out meticulous inspections and advise on maintenance schedules, carry out full vibration analysis, pressure and pulsation testing, and train your service personnel.

ClydeUnion Pumps history and breadth of experience, as well as its geographical coverage and expertise, make it the natural first choice for any pump related problem or enquiry, no matter what the location, the scale of the task or the original manufacturer.

We guarantee supply of parts for all heritage brands and/or obsolete products, including:

- Weir Pumps
- Clyde Pumps
- Union Pump
- Girdlestone
- Mather & Platt
- Harland
- Drysdale
- WH Allen
- Allen Gwynnes
- David Brown Pumps
- DB Guinard Pumps
- American Pump
- Pumpline





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SPX reserves the right to incorporate our latest design and material changes without notice or obligation.

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