CLYDEUNION PUMPS

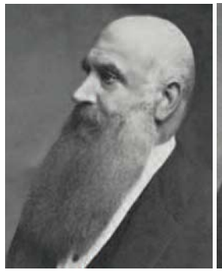
Innovation, Design, Manufacture & Aftermarket Services:
Pumping solutions for a better world

upstream oil

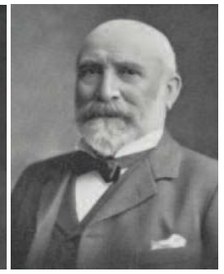
clydeunion.com/upstream-oil

Generations of experience

While the name is comparatively recent CLYDEUNION Pumps is one of the most experienced specialised engineering companies in the world. Formed through the acquisition and integration of a series of highly respected pump manufacturers and designers on both sides of the Atlantic, CLYDEUNION Pumps incorporates an accumulation of over 300 years of engineering expertise.



George Weir: The eldest of the brothers, George trained as a ships engineer.



James Weir: The second eldest, James began work at 15 in a consulting engineers in Glasgow. He was the inventor of the celebrated direct-acting feed pump.

Our Rich Heritage: An early factory tour of the Cathcart facility.

The history of CLYDEUNION Pumps begins with the formation, in 1871, of the engineering firm of G&J Weir. Founded by brothers George and James Weir in Glasgow, the company quickly prospered as a result of the improvements they introduced to pump machinery and valve technologies. Their work found applications across the world, from marine engines and power stations to desalination plants.

By the end of the twentieth century G&J Weir had acquired Drysdale Pumps, Harland, Mather and Platt, and WH Allen. They had also, under the name *Weir Pumps, grown into one of the most respected and iconic engineering enterprises in Scotland.

Meanwhile just 14 years after the establishment of G&J Weir, the Union Manufacturing Pump Company was incorporated in 1885 in Michigan USA. Specialising in the design and manufacturing of steam pumps they grew prosperous, adopted the name Union Pump and established a Canadian sister company.

In 2006, two other highly respected specialist companies, David Brown Pumps of England and DB Guinard Pumps of France, were brought under the Union Pump umbrella.

A new chapter in the development of both companies began in 2007, when *Weir Pumps was bought by Clyde Blowers, a company owned and run by Jim McColl (who had started his working life as an apprentice with Weir Pumps). At this time the name changed to Clyde Pumps. In 2008, Clyde Blowers bought Union Pump and amalgamated the two specialist engineering companies into CLYDEUNION Pumps.

CLYDE PUMPS Incorporating WEIR PUMPS Glasgow

*Weir Pumps, Mather & Platt, Drysdale, WH Allen, Girdlestone, Allen Gwynnes and Harland

UNION Pump

Union Pump, David Brown Pumps, DB Guinard Pumps, American Pump and Pumpline

CLYDEUNION PUMPS

*This is a heritage product acquired when the Weir Pumps business transferred to Clyde Pumps in May 2007.

Today, CLYDEUNION Pumps is recognised as a world-leading centre of excellence in pump technology and bespoke pumping solutions. We are active across many market sectors, with our main operations relating to highly critical areas throughout oil extraction and processing, nuclear power, conventional power, water treatment, desalination, minerals and mining and industrial applications.

Upstream Oil & Gas - driven by customer service

world class engineering

At CLYDEUNION Pumps we understand the needs of the Upstream oil & gas industry. After our formation in 2008, we brought together engineering expertise and experience from throughout our global organisation to create a specialist team focused solely on serving the oil & gas industry and meeting its specific requirements.

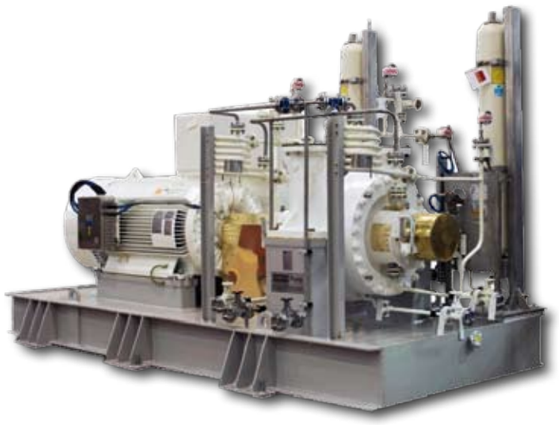
This team forms a discrete business unit, strategically aligned with customers' requirements and fully committed to the working practices, and the demands of scheduling, efficiency and reliability, prevailing within the industry. This allows us to build considerable advantages into the service we offer.

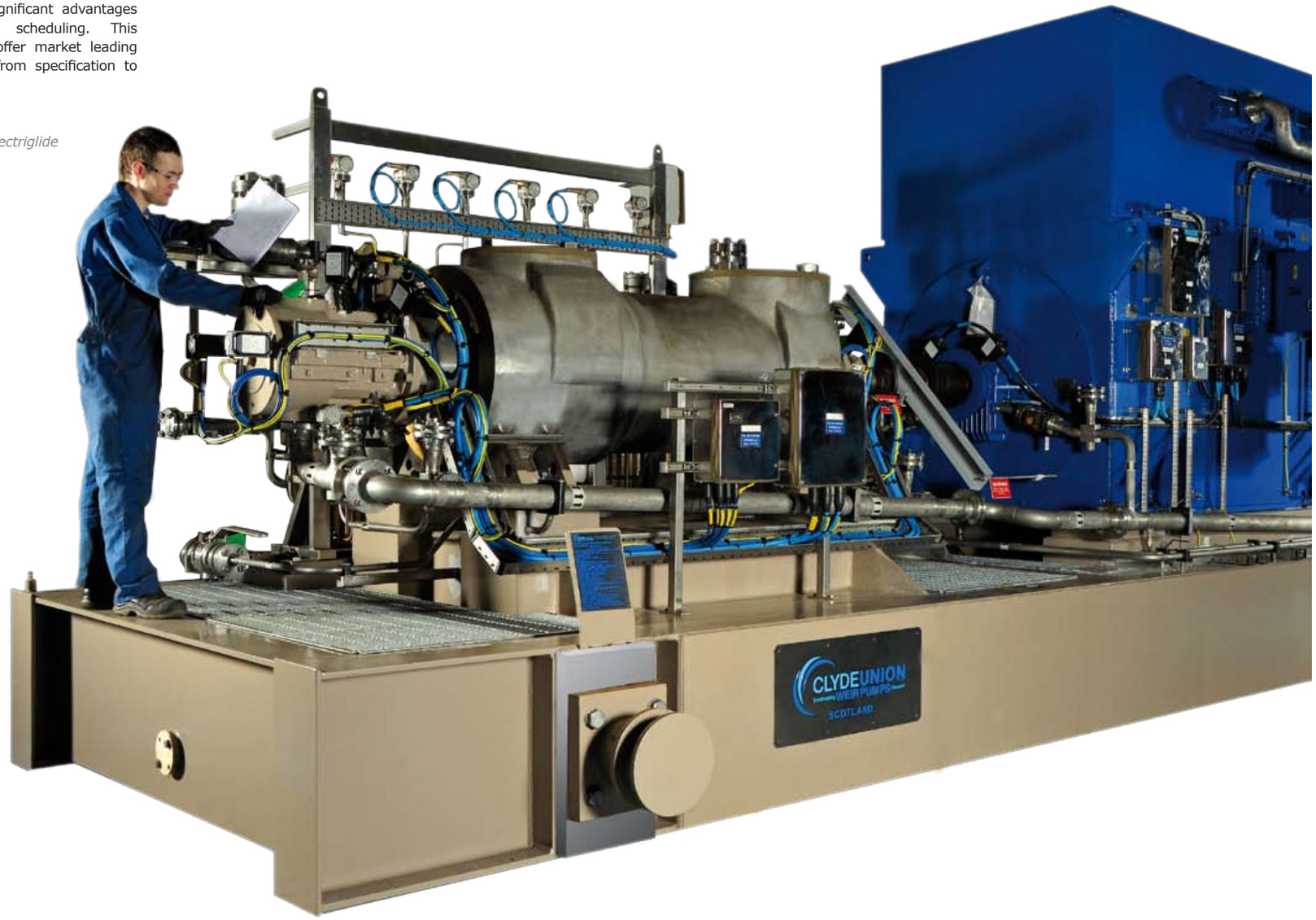
In essence we understand the paramount importance of reliability, and the only path to robust, continuous long-term performance is engineering of the highest standard. CLYDEUNION Pumps engineering sets the benchmark for the industry, and our products are quality assured by our comprehensive quality system and full-scale pump test facilities. Through a culture of innovation 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.

All of this capability is focused on satisfying the needs of our customers. And with our customers being spread throughout the world, we offer a truly global service. Wherever you are operating you will be able to contact a local representative with access to, and expertise in our entire product range. You will have 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. Our international structure has evolved ensuring you have the most expert and up to date advice possible and the most cost efficient and robust products available. Full aftermarket support and a flexible service aligned with your requirements is also available.

Our worldwide presence brings advantages in supply chain management allowing us to take advantage of fluctuating conditions and pass on significant advantages of cost and scheduling. This enables us to offer market leading delivery times from specification to commissioning.

Main Right: BB5
Below L to R: Ulectriglide & BB2 pumps





exploration & production

Oil & gas is found in some of the most inhospitable and remotest places on earth; the coldest seas, the deepest oceans and the hottest deserts. At CLYDEUNION Pumps we have built a reputation for 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 compliant centrifugal 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, API 674 compliant reciprocating pumps and ancillary equipment.

The company's main strengths are in engineered pumping solutions to satisfy onerous service requirements whilst meeting the latest industry and customer specifications. Highly experienced in-house engineers are employed to optimise pump design, driver and ancillary equipment for each application. All of which are focused towards reducing CAPEX and OPEX costs.

CLYDEUNION Pumps product ranges have been developed and refined to meet the requirements of today's demanding market. As the quest for oil and gas moves in to ever deeper waters the technology used to develop these fields has moved from platforms to TLP's, FPSO's and subsea. At CLYDEUNION Pumps we are continually adapting our product offering to meet the requirements of these new technical challenges such as ultra-high pressure injection pumps, CO_2 injection and subsea pumping.

Offshore Oil & Gas Exploration & Production
- Fixed Platform
- FPSO
- FSU/FSO
- Semi-submersible
- TLP
- SPAR
- FLNG

Onshore Oil Exploration & Production
- Water Injection Facilities
- Gathering Centre (GC)
- Primary Separation – Gas Oil Separation Plant (GOSP)
- Crude Oil & Gas Pre-treatment

Sand & Shale - Oil & Gas
- Extraction
- Separation
- Upgrading

BB5 Application
- Produced water injection
- Sea water injection
- Main oil line
- Steam generator feed

Technical Data

Capacity:	up to 2,800 m^3/hr / 12,350 USgpm
Delivery head:	up to 4,100 m / 13,600 feet
Temperature:	up to 425 °C / 800 °F
Speeds:	up to 7,000 rpm
Flange drilling:	BS or ANSI

Ulectriglide Application
- Seawater lift
- Firewater

Technical Data

Capacity:	up to 3,400 m^3/hr / 15,000 USgpm
Delivery head:	up to 600 m / 1,900 feet
Temperature:	up to 205 °C / 402 °F
Speeds:	up to 3,600 rpm
Flange drilling:	BS or ANSI

BB1 Application
(Single & two stage - low pressure)
- Booster
- General services
- Seawater lift
- Firewater

Technical Data

Capacity:	up to 4,000 m^3/hr / 17,600 USgpm
Delivery head:	up to 200 m / 670 feet
Temperature:	up to 80 °C / 180 °F
Speeds:	up to 1,760 rpm
Flange drilling:	BS or ANSI

OH2 Application
- Booster
- Gas processing
- General services
- Sulphate removal process

Technical Data

Capacity:	up to 1,700 m^3/hr / 7,500 USgpm
Delivery head:	up to 350 m / 1,148 feet
Temperature:	up to 425 °C / 800 °F
Speeds:	up to 4,000 rpm
Flange drilling:	BS or ANSI

BB2 Application
- Booster
- General services
- Gas processing
- Sulphate removal feed

Technical Data

Capacity:	up to 4,090 m^3/hr / 18,000 USgpm
Delivery head:	up to 500 m / 1,650 feet
Temperature:	up to 425 °C / 800 °F
Speeds:	up to 3,600 rpm
Flange drilling:	BS or ANSI

VS4 Application
- Sump and drains

Technical Data

Capacity:	up to 450 m^3/hr / 2,000 USgpm
Delivery head:	up to 160 m / 520 feet
Temperature:	up to 200 °C / 392 °F
Speeds:	up to 3,600 rpm
Flange drilling:	BS or ANSI

transportation & storage

Wherever oil & gas is found it needs transportation 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 have been used in pipeline and export applications since the late 1800's. Today we supply a range of pumps for the smallest to the largest pipeline and export applications; from loading and unloading road tankers to the largest seagoing oil tankers we have a pump for the application.

CLYDEUNION Pumps range of API 610 compliant centrifugal pumps and API 674 compliant reciprocating pumps are used in the pipeline, transportation and storage sector.

Applications include

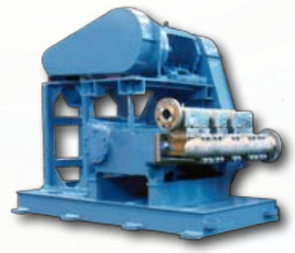
- Pipeline
- Crude Oil & Condensate Export
- Tank Farm Crude Oil Transfer & Boosting
- General Service Pumps
- Process Pumps
- Sump Pumps
- Ancillary Equipment

Reciprocating Pump Application

- Pipeline
- Blow out preventors
- Subsea controls
- Injection (Chemical, saltwater, lubrication)
- Hydrostatic testing
- Hydraulic systems

Technical Data

Capacity: up to 173 m^3/hr / 760 USgpm
Delivery head: up to 6,900 m / 23,000 feet
Temperature: up to 177 °C / 360 °F
Speeds: up to 440 rpm depending on model
Flange drilling: Flanges available on all models



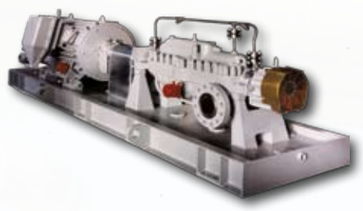
The CLYDEUNION Pumps reciprocating power pumps are designed with exceptional versatility to efficiently meet the requirements of a wide variety of pumping applications. These units are ruggedly designed for minimum maintenance and meet the heavy-duty requirements of continuous duty operation in general industry, as well as API 674 services.

BB1 Application

- Pipeline
- Gas treatment
- General services
- Booster

Technical Data

Capacity: up to 20,000 m^3/hr / 88,000 USgpm
Delivery head: up to 1,000 m / 3,300 feet
Temperature: up to 100 °C / 210 °F
Speeds: up to 3,600 rpm
Flange drilling: BS or ANSI



BB3 Application

- Pipeline
- Sea water injection
- Produced water injection
- Steam generator feed
- Sulphate removal feed

Technical Data

Capacity: up to 2,500 m^3/hr / 11,000 USgpm
Delivery head: up to 3,000 m / 9,960 feet
Temperature: up to 205 °C / 400 °F
Speeds: up to 6,200 rpm
Flange drilling: BS or ANSI

VS1 & VS6 Application

- Sea water intake and raw water intake
- Fire and seawater lift duties
- Oil transfer, boosting and extraction
- Crude oil transfer
- Cooling Circuit

Technical Data

Capacity: up to 5,000 m^3/hr / 22,000 USgpm
Delivery head: up to 300 m / 1,000 feet
Temperature: up to 180 °C / 350 °F
Speeds: up to 3,600 rpm
Flange drilling: BS or ANSI

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 have 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.

The CLYDEUNION Pumps turbine driven seabed multiphase pump, (MUTUP), was the first multiphase booster pump to be deployed on the seabed and now CLYDEUNION works to continually research and improve advanced helicoaxial multiphase pump technology.

Both the HSP and MUTUP products provide clients with simple, flexible, reliable, well proven means of production boosting, all of which add up to higher availability, lower operating costs and a direct bottom line benefit.

These products are the culmination of many years research and development covering advanced hydraulic design, application of advanced materials technology and engineering design and know-how; all delivered by state of the art manufacturing technologies.

SPECIALIST PUMPS FOR PRODUCTION OF HYDROCARBONS

HSP Application

- Turbine driven single and multiphase downhole pump
- Ultra high volume aquifer lift
- Pressurised flooding from aquifer to injection zone
- Combined production and water injection in a single well bore

Technical Data

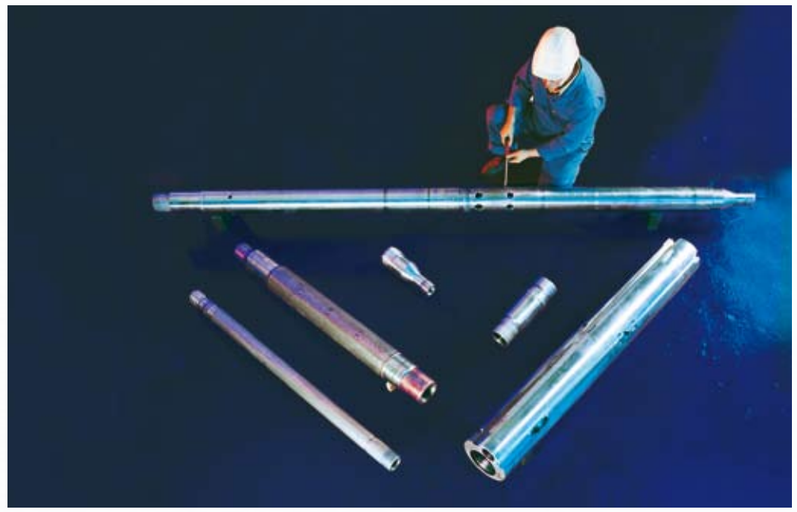
Capacity:	up to 590 m^3/hr / 2,600 USgpm/ 90,000 bpd
Generated head:	up to 1,500 m / 4,900 feet
Gas void:	75% continuously / 100% intermittent
Speeds:	up to 10,000 rpm
Temperature:	up to 220 °C / 425 °F *(as standard; higher temperatures available)*

MUTUP Application

- Turbine driven single and multiphase subsea boosting pumps

Technical Data

Capacity:	up to 568 m^3/hr / 2,500 USgpm/ 86,000 bpd
Generated head:	up to 816 m / 2,680 feet
Gas void:	60% continuously
Speeds:	up to 5,000 rpm
Temperature:	up to 65 °C / 150 °F



complete package supplier

At CLYDEUNION Pumps we pride ourselves on being a comprehensive pumping solutions provider from research and development to through life aftercare service and maintenance.

CLYDEUNION Pumps provides comprehensive engineering solutions to complex technical challenges in a wide range of pumping applications and environments. Our product lines have earned a reputation for robustness, efficiency and reliability. This product durability extends mean time between maintenance, increasing up-time and reducing overall life-cycle costs. As well as bespoke engineered pump packages, customised according to customer specifications and tailored perfectly meet their requirements, our general service products are also available as standard packages.

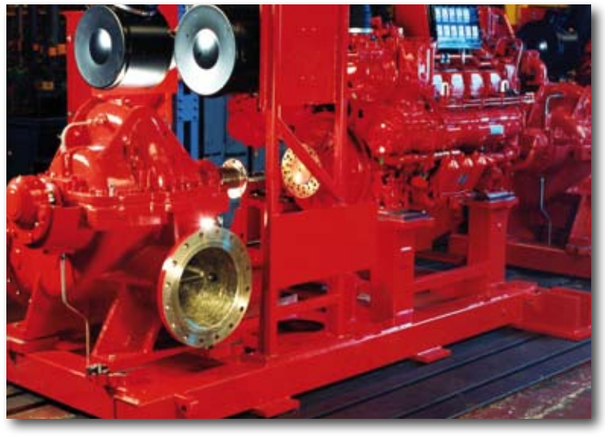
Where a pump is required for a new or unique application our in-house research and development laboratory is capable of providing a comprehensive service including model testing and prototype development.

CLYDEUNION Pumps has technological, design and engineering resources dedicated to enhancing our products and improving their competitiveness and performance. We configure products and model operational performance at the earliest design phase of a project. By simplifying design, we can reduce the number of components, reduce manufacturing lead times, take out cost and improve quality.

The Complete Package Supplier

- Research & Development
- Engineering & Design
- Manufacturing
- Assembly & Test Facilities
- Installation & Commissioning
- Aftermarket Service
- Spare Parts Management
- Total Vendor Maintenance

Main Above: BB5 Pump
Below L to R: Firewater Pump, BB3, Pipeline, OH4, Ulectriglide & BB1 Pump



Lifetime worldwide support

Parts: Any brand, any material, anytime. CLYDEUNION Pumps supplies parts for all of the heritage brands as well as upgrades and improvements.

Installation and commissioning: Trouble free commissioning anywhere in the world.

Every product CLYDEUNION Pumps supply 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 & 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

This is a heritage product acquired when the Weir Pumps business transferred to Clyde Pumps in May 2007

upstream oil

CLYDEUNION PUMPS

Worldwide sales contacts

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OUR EXTENSIVE BRAND HERITAGE :

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Upstream Oil

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