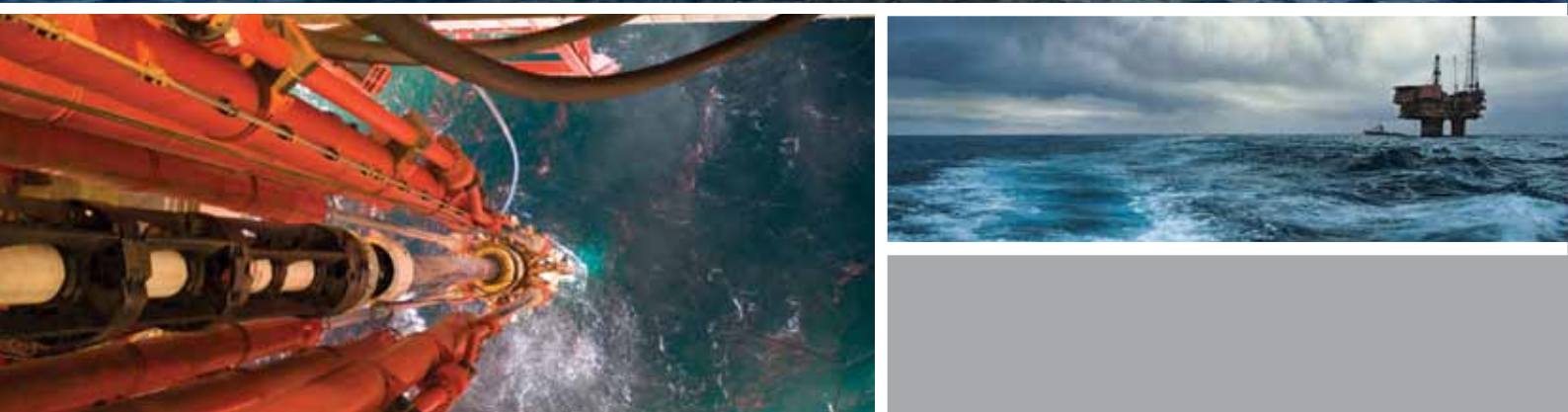


Electric Submersible Pump

SEAWATER LIFT PUMP



> ClydeUnion Pumps
S+N



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.



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



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



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



›ClydeUnion Pumps

High technology pumps for the most demanding services

The offshore and wind industries are subject to exceedingly harsh operating conditions and rely on quality products and engineered solutions.

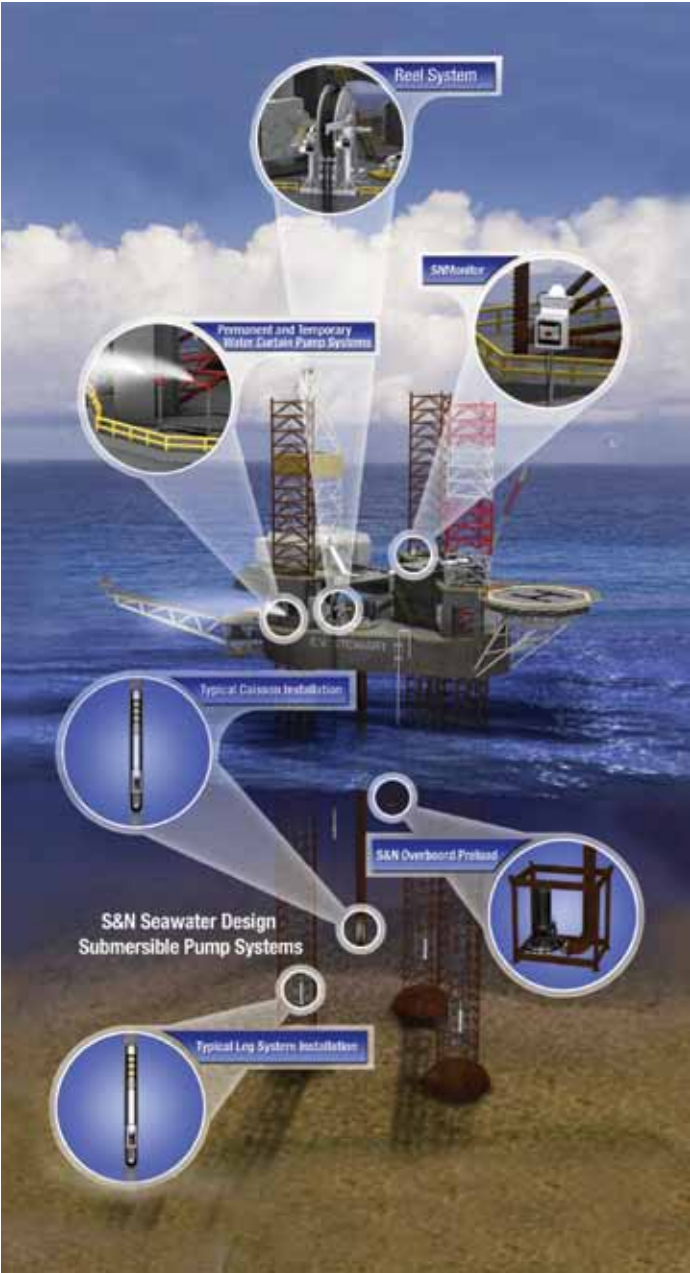
ClydeUnion S&N Pump product ranges have been developed and refined to meet the requirements of today's demanding market. As our client's needs grow and change we are dedicated to maintaining our technological edge in an effort to add longevity to service life and increase safety.

BIO-FOULING PREVENTION

Bio-fouling can be detrimental to the service life of a pump. ClydeUnion S&N Pumps offers the most comprehensive bio-fouling prevention solutions package in the market. Strategic implementation of our system increases service life and helps maintain flow throughout a rig/vessel.

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.



Seawater designed pumps for the most demanding operating conditions

ClydeUnion S&N Pumps seawater lift electric submersible pumps are specifically designed to surpass the corrosive characteristics of seawater. They are precision built, hydraulically and dynamically balanced, and the motors are water/propylene glycol filled. The corrosion resistant design of each submersible pump provides the offshore oil and gas industry secure, reliable, and long-lasting seawater handling capability.

The ClydeUnion S&N Pumps electric submersible pump is a pre-configured design that offers a broad range of features that save our clients both time and money.

PUMP CONSTRUCTION

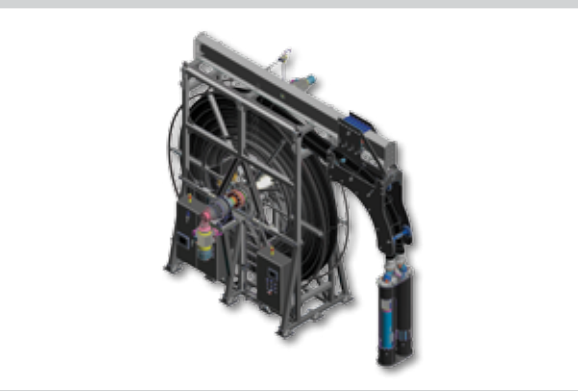
The electric submersible pump construction features:

- Zinc-free bronze and nickel-aluminium bronze as a standard (duplex and super duplex ss options available)
- Nickel-aluminium bronze impellers: The alloy element of Nickel-aluminium increases corrosion resistance of the impeller and increases resistance to cavitation and pitting
- Impellers are both hydraulically and dynamically balanced and are keyed to shaft in floating fashion, thus reducing axial loads
- The pump shafts are duplex stainless steel and are protected by replaceable wear sleeves

MOTOR CONSTRUCTION

The electric submersible motor construction features:

- The motors are constructed of high grade stainless steel stator and fitted with with zinc-free bronze end bells (Nickel-aluminium bronze and full duplex motors are available)
- There is a minimum service factor of 1:15 on all motors
- Each motor is designed for operation in seawater to 40°C (104°F) with zero fluid flow required to pass through the motor for cooling
- The submersible three phase re-windable wet stator motor is wound with PE2 high temperature, radiated winding wire insulation
- There are three motor shaft bearings (two upper and one lower) that are designed to stabilise motor vibration over the life of the equipment
- Pump mounted non-return valves are recommended to eliminate back-spinning of the pump/motor. Back spinning can cause etching of the motor thrust bearings and premature motor failure



Electric submersible pump - Features

- 1

DISCHARGE HEAD ASSEMBLY
 - Carbon steel
 - Stainless steel
 - Duplex stainless steel
- 2

JUNCTION BOX
 - NEMA 4X enclosure
 - Explosion proof
- 3

SUBMERSIBLE POWER CABLE
 - Heavy-duty seawater rated
 - Round
 - Flat
 - Armored
 - Single core
- 4

CABLE BAND
 - Heavy-duty seawater impervious nylon banding and buckle
- 5

COLUMN CENTRALISER
 - Stainless steel spring centraliser with polyurethane pads
- 6

COLUMN PIPE
 - Carbon steel
 - Fiberglass
 - Stainless steel
 - Duplex stainless steel
- 7

PUMP BOWL ASSEMBLY
 - Zinc-free-bronze with nickel-aluminum-bronze impellers and stainless steel shafting with an option for duplex
- 8

INTAKE SCREEN
 - 316 stainless steel hardware
- 9

MOTOR SHROUD
 - Zinc-free bronze
 - Stainless steel
- 10

SNSAFE™ SYSTEM
 - Pump mounted clamp-on
 - Suction screen mounted
 - Suction screen mounted on a vertical turbine installation
 - Multiple port tank system



Electric submersible pump motor construction

- 1

UPPER BEARING CASING
 - Zinc-free bronze
- 2

MOTOR SHROUD
 - 316 stainless steel
- 3

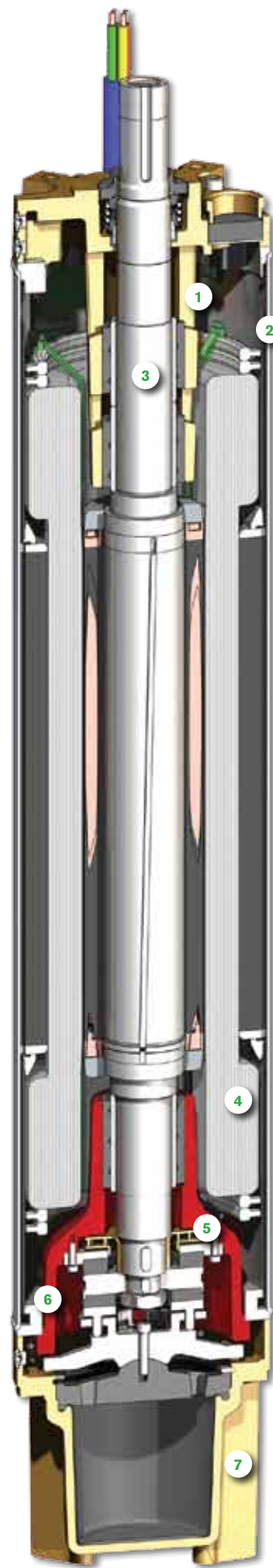
MOTOR SHAFT
 - Duplex stainless steel/carbon steel
- 4

MOTOR WINDINGS
 - PE2 winding wire
 - Rated for motor temperatures of 90°C (195°F)
- 5

INTERNAL ACTIVE COOLING SYSTEM
 - Cooling impeller
 - Eliminates hot spots
- 6

LOWER BEARING CASING
 - Zinc-free bronze
- 7

MOTOR END-BELL
 - Zinc-free bronze



Electric submersible pump benefits

GLOBAL INSTALLED BASE

- Vast experience with equipment installed on 60% of the global jack-up rig fleet

WIDE RANGE OF FLOW RATES

- Low to high flow rates that meet industry demands around the world

TOTAL COST OF OWNERSHIP

- Specifically engineered for seawater service
- Construction materials are designed to make the pump and motor repairable and reduce the cost of ownership during service life

CONFIGURATION

- The electric submersible pump is designed for both vertical and horizontal applications

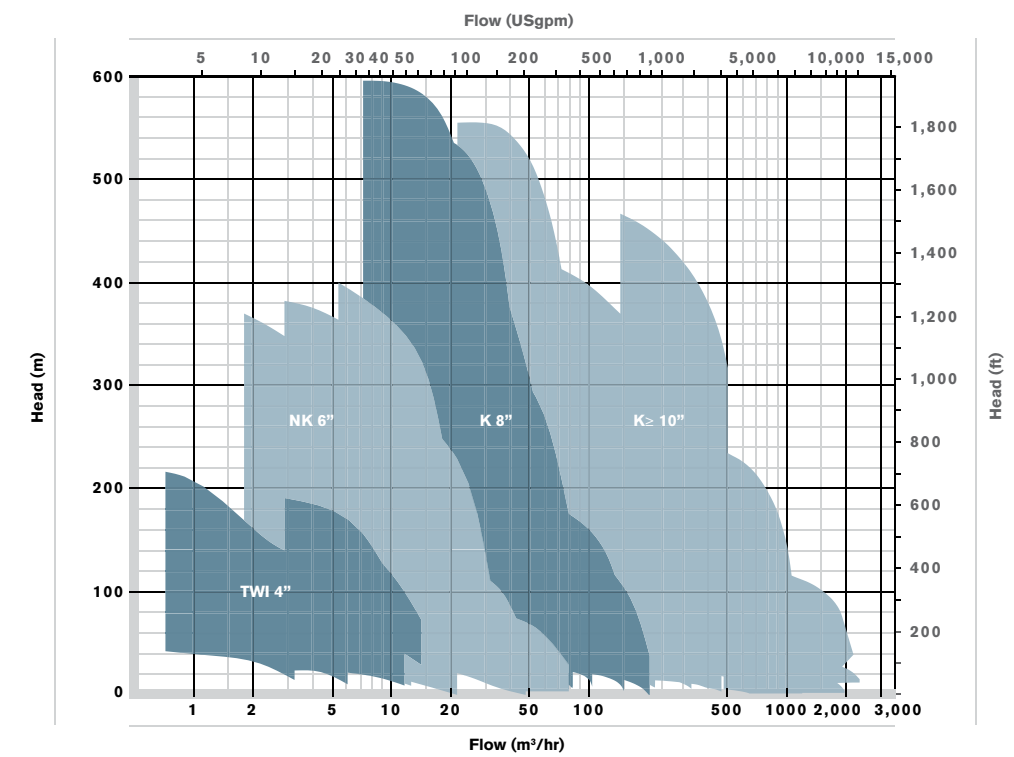
HIGH AVAILABILITY

- Global stocking programs support high demand in strategic locations

INDUSTRY EXPERIENCE

- ClydeUnion S&N Pumps has over 55 years of experience in the offshore seawater lift industry
- Our designs, engineering, fabrication, worldwide customer support and 24/7 service technicians make us the seawater authority

Standard hydraulic range - coverage chart



TYPICAL APPLICATIONS

- Pre-fill water
- Drill water
- Potable + sanitary water
- Wash down water
- Water curtains
- Cooling water
- Fire water
- Ballast water
- Mud mixing water

OPERATING PARAMETERS

- **Capacities** - up to 455 m³/hr / 2,000 USgpm
- **Delivery heads** - up to 548 m / 1,800 ft (related to application flow/speed)
- **Speeds** - 50Hz to 60Hz
- **Temperature** - no flow required past the motor up to 40°C / 104°F



Global aftermarket capability best in service + response

Our customer focused aftermarket organisation is positioned to provide comprehensive care for our varied and diverse product lines. Heritage and obsolete products benefit from the same level of attention and expertise ensuring that reliability and availability is maximised irrespective of a pump's length of service.

GENUINE HIGH QUALITY

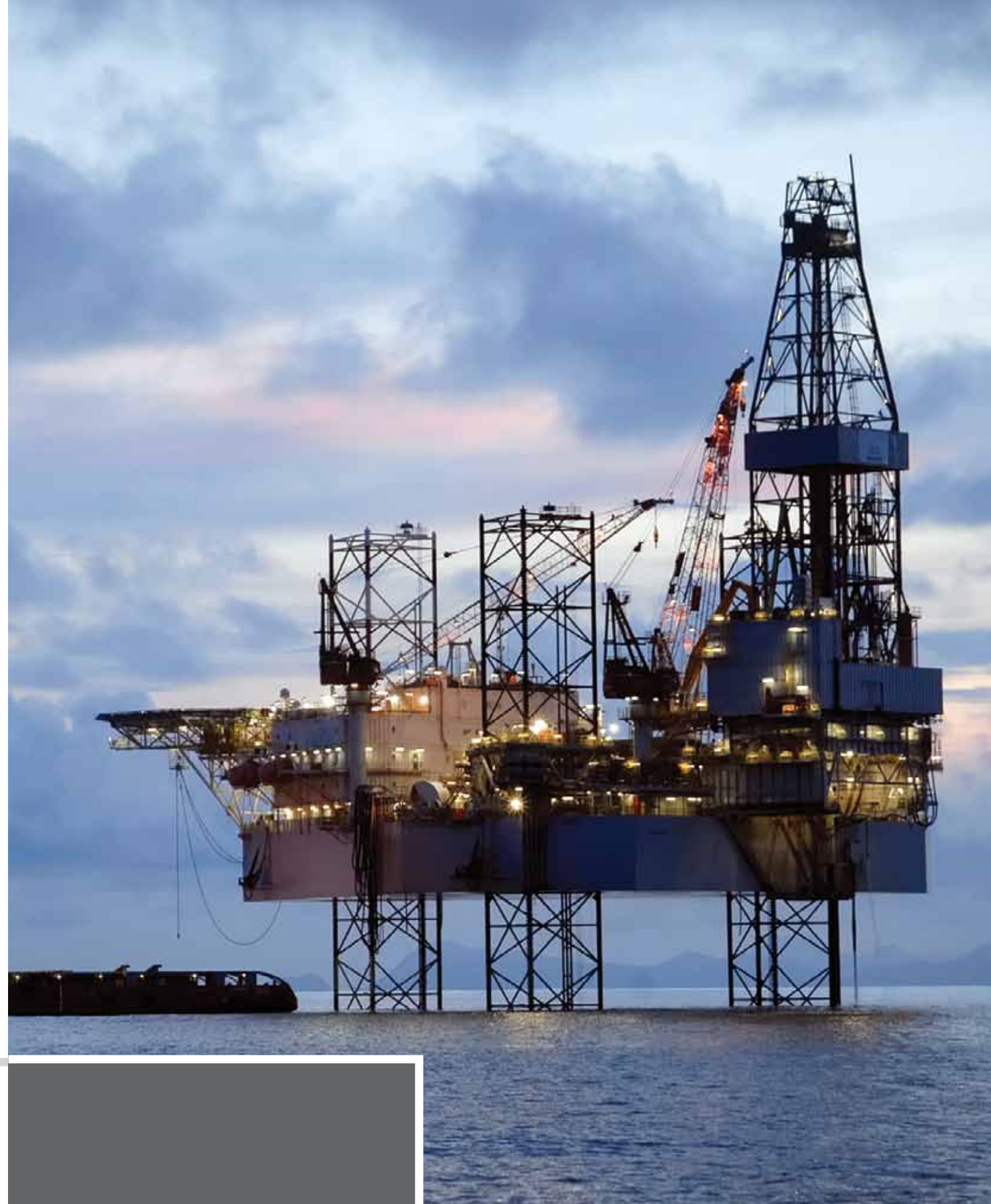
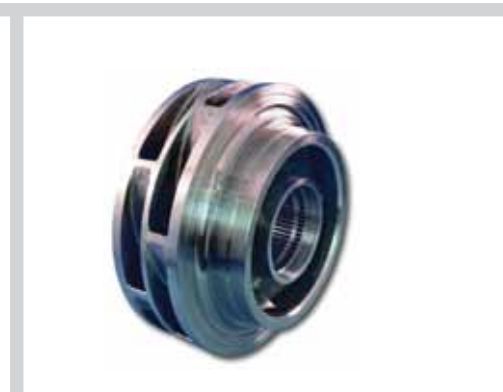
Original or upgraded specification spare parts, coupled with full engineering design capability, enables longevity of reliable operation. Highly skilled and experienced service engineers ensure accuracy in build and optimised performance. The worldwide presence of ClydeUnion Pumps offers local service facilities in over 40 countries.

SERVICE SOLUTIONS

ClydeUnion Pumps is committed to supporting our installed base wherever it may be. Depending on your location we will provide either direct service support or support via our local authorised service partners. Whichever option is provided, you can be assured of the best attention from fully qualified and experienced engineers.

- Upgrades + re-rates
- Service + overhaul
- Installation + commissioning
- Technical support
- Inventory management
- 3rd party equipment

Parts + maintenance:
Any brand, any material,
anytime. Heritage products,
upgrades + improvements



ELECTRIC SUBMERSIBLE PUMP

SEAWATER LIFT PUMP



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