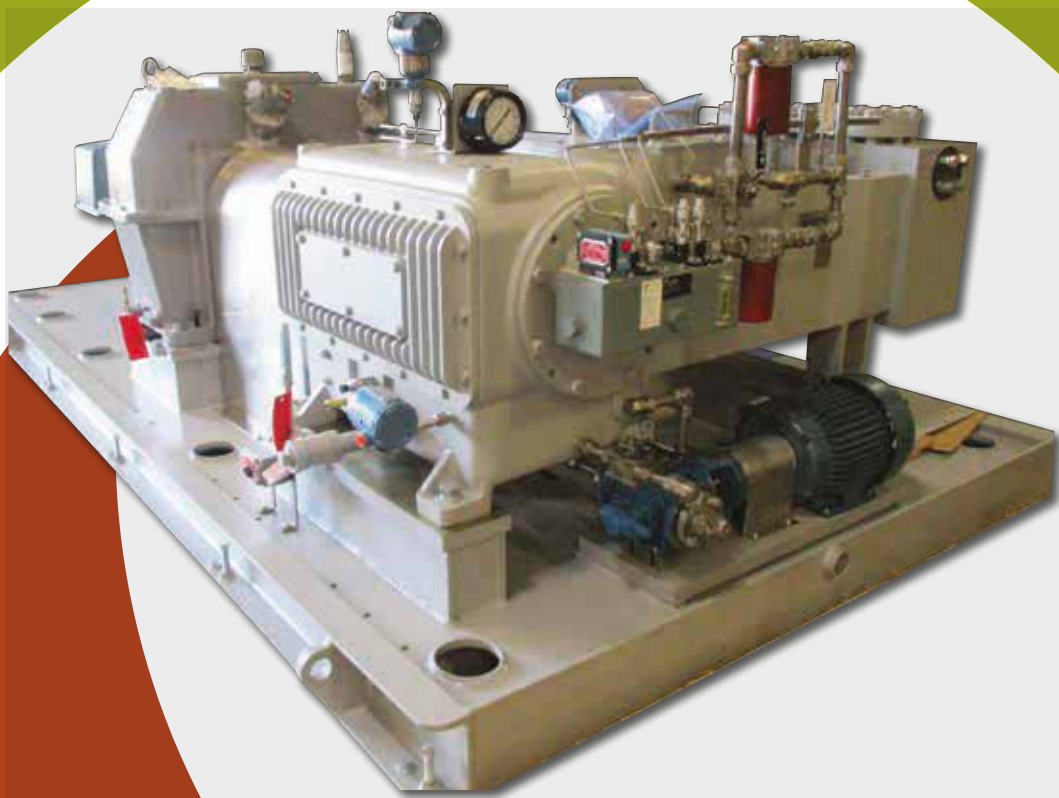


RECIPROCATING PUMPS

HEAVY DUTY, HORIZONTAL, SIMPLEX,
DUPLEX, TRIPLEX, QUINTUPLEX, API 674 &
ASME STANDARDS

CLYDEUNION®
PUMP





CLYDEUNION PUMPS - AN INTRODUCTION

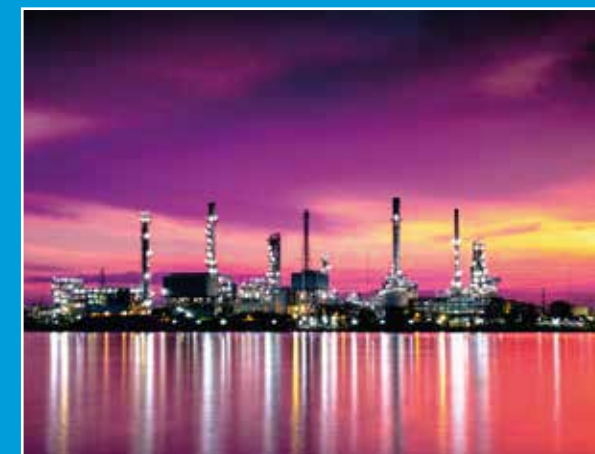
The ClydeUnion Pumps brand is the culmination of a long and eventful 140-year engineering legacy. In fact, most nuclear power plants currently in operation around the world employ our reactor feed pumps. We play an instrumental role in securing the vital energy and water resources that a sustainable society will rely on in the future.

Not only servicing the Nuclear market we are also a valued flow control engineering partner to the oil/gas industry - supporting upstream, downstream, transportation and offshore exploration activities. Other key areas we address include seawater desalination, waste water treatment, mining and steel production.

Combining a wealth of pump and system design knowledge, latest design, analytical and pump testing equipment, we are confident we can boost efficiency and ensure prolonged operation of our products.

WHY CHOOSE CUP RECIPROCATING PUMPS?

The streamlined reciprocating pump portfolio represents reduced complexity and improved parts interchangeability, offering easier product selection and faster turnaround.



HIGH TECHNOLOGY PUMPS FOR THE MOST DEMANDING SERVICES

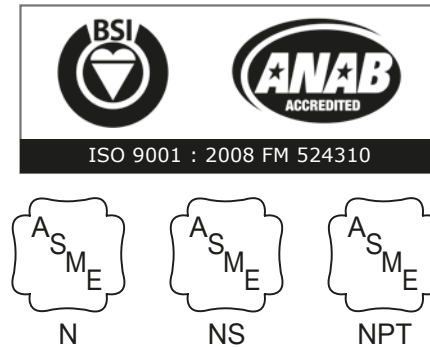
Celeros Flow Technology's ClydeUnion Pumps brand specializes in the design and manufacture of API 674 reciprocating pumps and pumping packages. At Celeros FT you will find a commitment to quality throughout the company. Our Quality Management System is fully approved to ISO 9001:2008 and independently verified to comply with the latest quality standards. The ClydeUnion Pumps brand has a worldwide reputation for providing optimized reliability in the most severe duty applications.

SEAWATER REVERSE OSMOSIS

Worldwide demand for clean water continues to increase. With very high efficiency and reliability, our reciprocating power pumps are ideally suited for seawater reverse osmosis. ClydeUnion Pumps reciprocating pumps, combined with energy recovery systems, provide the industry's most efficient solution for your high pressure reverse osmosis pumping needs. They also offer the added benefit of delivering filtered seawater at constant flow to the membranes at varying system pressures.

GENERAL INDUSTRY

Celeros supply ClydeUnion Pumps reciprocating power pumps for a wide range of industrial services including high pressure water blasting, cleaning and cutting, metals descale, mine dewatering, hydraulic charge, hydrostatic test, chemical processing and high pressure mixing. The experience gained in these segments enable us to offer our customers engineered products tailored to their specific requirements.



OIL & GAS PRODUCTION

Our pumps can be found operating wherever there are oil fields, both onshore and offshore. High efficiency and reliability are major benefits of ClydeUnion Pumps equipment - both of which are vital considerations in the oil and gas industry. Pumps have been supplied to satisfy a wide range of pumping services including: high pressure seawater injection and disposal, methanol injection, blowout preventer charge pumps, subsea hydraulic systems, gas processing systems for dehydration and gas sweetening. ClydeUnion Pumps reciprocating pumps are designed to handle all types of industry related fluids.

REFINERIES

Today's complex refinery processes demand specialized 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. Celeros FT has many years of worldwide experience in the supply of ClydeUnion Pumps special reciprocating pumps to the refinery industry and for nuclear applications, and is committed to providing its customers with solutions for the most complex of pumping requirements.

RECIPROCATING PUMPS - HEAVY DUTY HORIZONTAL PUMPS

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

These units are driven via electric motors or diesel engines through V-belt or gear reducers. Stuffing boxes are specifically designed for applications to maximize packing life and minimize maintenance. Equipment can be packaged to meet the most stringent requirements of API 674.

There are thousands of ClydeUnion Pumps reciprocating power pumps operating worldwide on services as diverse as:

- HVGO high temperature charge at 800°F (426°C) and at 4,500 psig (310 barg) discharge pressure complex engineered system
- High pressure carbamate and ammonia pumps for fertiliser service
- High pressure salt water or produced injection - high salinity, high pressure with sand, oil and H₂S

PROVEN PRODUCT INTEGRITY

The ClydeUnion Pumps reciprocating power pump encompasses a proven design history for excellence in reliability. ClydeUnion Pumps simplex, duplex, triplex and quintuplex pumps all have an enviable history of sound engineering, designed to exceed the rigorous requirements of API 674 and customer satisfaction.

EASE OF MAINTENANCE

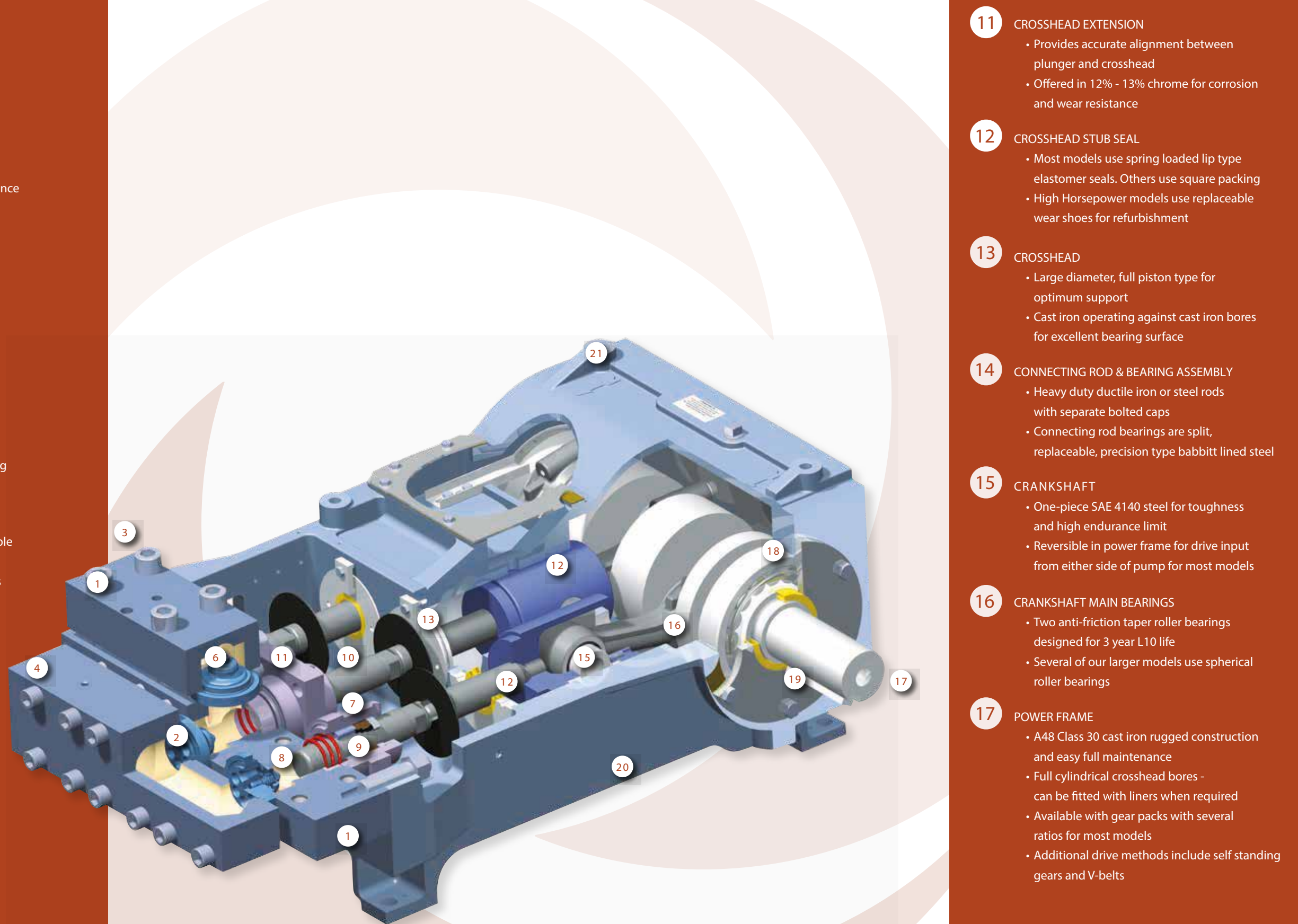
The simple modular construction of the reciprocating power pump offers ease of maintenance and reliability. A complete fluid end change-out can be completed in under eight hours. Routine packing, plunger and valve assembly changes are made easier either on site or at our service locations by our skilled service engineers.

PUMPSETS & PACKAGES

Celeros FT has extensive experience in providing complex pumpsets including electric motors, gearboxes, special auxiliary lube oil systems, steam turbines, diesel engines, control panels and instrumentation.



RECIPROCATING PUMP - FEATURES



- 1 BOLT ON FLANGES
 - Adapts to various system connections
 - Both suction and discharge can be located on either end of pump

- 2 VALVE ASSEMBLY
 - Vertical assembly stack designed for ease of maintenance
 - Reduced C/D ratio for improved performance with compressible fluids
 - Tapered seat, guided valve design for reliable operation
 - High strength materials for longevity of operation

- 3 STUFFING BOX ASSEMBLY
 - All API 674 material options
 - Standard self-adjusting spring loaded
 - Adjustable stuffing box for more critical services

- 4 STUFFING BOX SPRING
 - Standardized in design to improve packing life and reduce maintenance adjustments

- 5 PACKING
 - Square and V-ring design packings available
 - Wide assortment of packing material to accommodate a multitude of applications

- 6 PLUNGER
 - Standard plungers are hard surfaced for long service life
 - Various coatings available to meet various application requirements – thermal spray, rod welding, and other processes available

- 11 CROSSHEAD EXTENSION
 - Provides accurate alignment between plunger and crosshead
 - Offered in 12% - 13% chrome for corrosion and wear resistance

- 12 CROSSHEAD STUB SEAL
 - Most models use spring loaded lip type elastomer seals. Others use square packing
 - High Horsepower models use replaceable wear shoes for refurbishment

- 13 CROSSHEAD
 - Large diameter, full piston type for optimum support
 - Cast iron operating against cast iron bores for excellent bearing surface

- 14 CONNECTING ROD & BEARING ASSEMBLY
 - Heavy duty ductile iron or steel rods with separate bolted caps
 - Connecting rod bearings are split, replaceable, precision type babbitt lined steel

- 15 CRANKSHAFT
 - One-piece SAE 4140 steel for toughness and high endurance limit
 - Reversible in power frame for drive input from either side of pump for most models

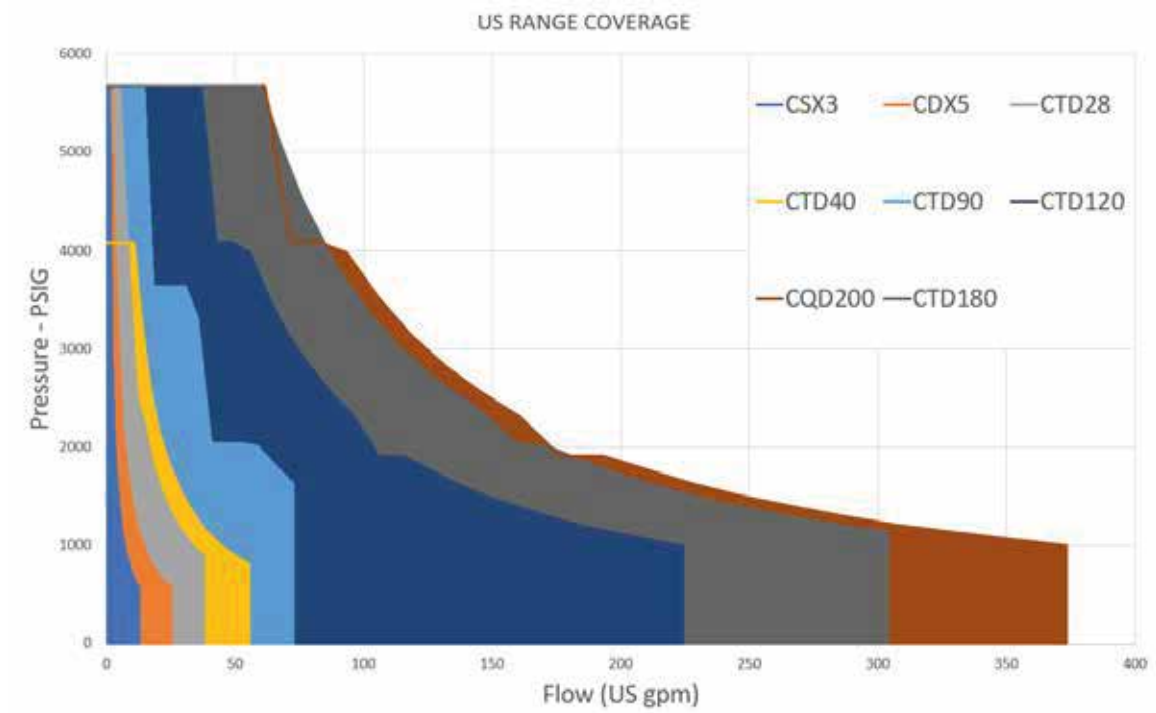
- 16 CRANKSHAFT MAIN BEARINGS
 - Two anti-friction taper roller bearings designed for 3 year L10 life
 - Several of our larger models use spherical roller bearings

- 17 POWER FRAME
 - A48 Class 30 cast iron rugged construction and easy full maintenance
 - Full cylindrical crosshead bores - can be fitted with liners when required
 - Available with gear packs with several ratios for most models
 - Additional drive methods include self standing gears and V-belts

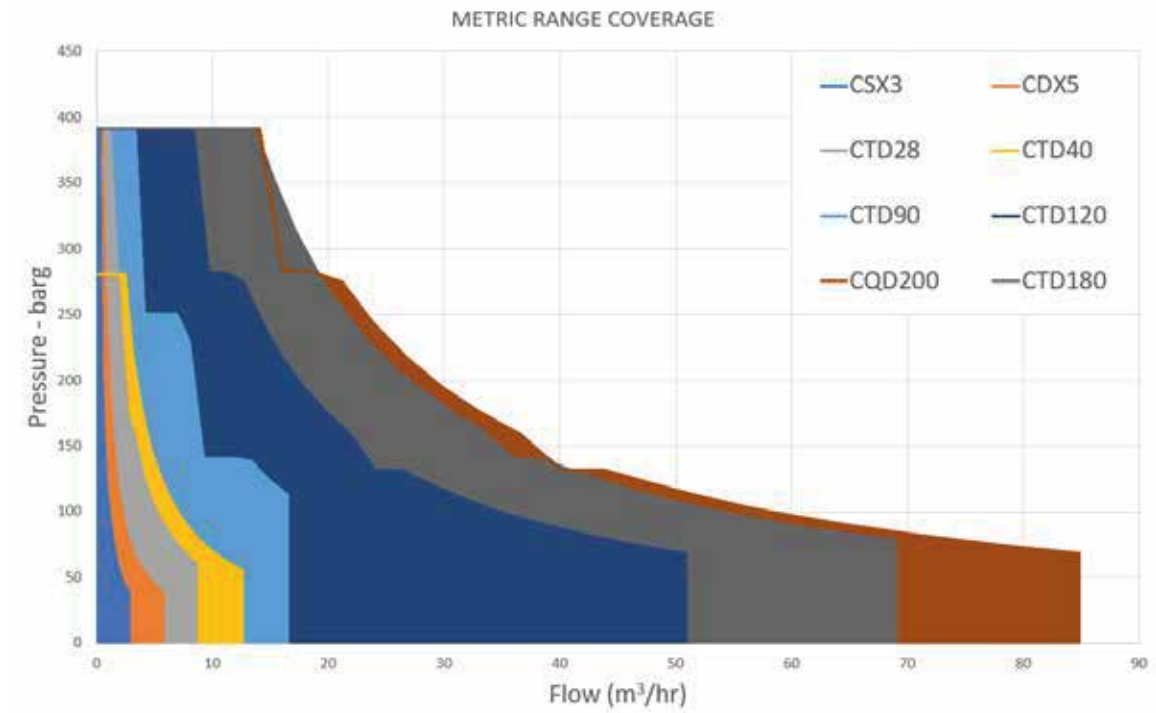


PRESSURE VS FLOW RATE

US RANGE COVERAGE CHART



GB RANGE COVERAGE CHART



This chart covers the reciprocating pump standard range. Other engineering designs exist for extreme applications



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 Celeros FT offers local service facilities in over 40 countries.

SERVICE SOLUTIONS

Celeros FT 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





| SPEED
| EXCELLENCE
| PARTNERSHIP

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