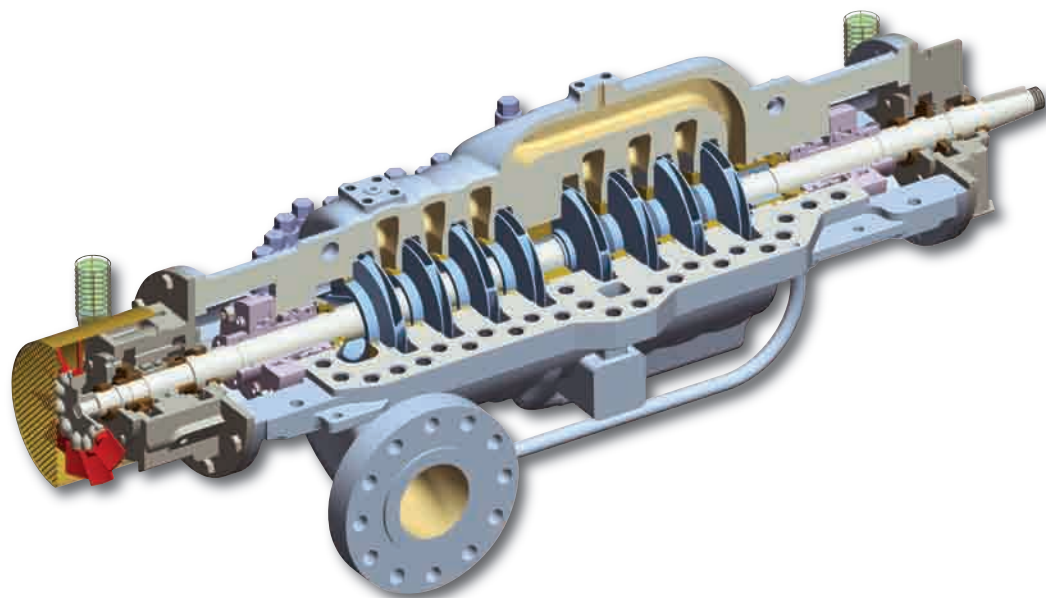


# CUP-BB3

Heavy Duty, Axially Split, Multistage Pumps

API 610 / ISO 13709



 **CLYDEUNION  
PUMPS**

# CLYDEUNION Pumps

a leading provider of pumping solutions

## 300 years of pumping experience

CLYDEUNION Pumps is one of the world's leading providers of pumping solutions. We were formed in November 2008 from the joining of Clyde Pumps and Union Pump, which brought together some of the most respected products, people and heritage brands in the business.

The two companies that form CLYDEUNION Pumps have a rich heritage and combined history of over 300 years of pump production and development. Clyde Pumps was formed in May 2007 when the Weir Pumps (Glasgow) business was acquired from The Weir Group plc, but its roots go back to 1871 when brothers, George and James Weir, founded the engineering company of G. & J. Weir. Union Pump has an equally impressive pedigree and had been producing high technology pumps since its formation in 1885 in Michigan, USA.



*David Brown employees producing gears in the 1890s*



*The 'early days' at Union Pump Company, moving a boiler*

Today, CLYDEUNION Pumps is structured into six customer focused business units. Our business units are at the heart of everything we do and provide their expertise across the [upstream oil](#), [downstream oil](#), [nuclear power](#), [conventional power](#) and [water and industrial sectors](#). In addition, our truly global [aftermarket](#) capability ensures our customers are fully supported and receive exceptional care.

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



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

**UNION Pump**



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

# High Technology Pumps

## for the most demanding services

CLYDEUNION Pumps specializes in the design and manufacture of API 610 centrifugal pumps and pumping packages. At CLYDEUNION Pumps 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. CLYDEUNION Pumps has a worldwide reputation for providing optimized reliability in the most severe duty applications.

### PIPELINES

CLYDEUNION Pumps has worldwide experience of engineered pumping systems for pipeline applications. Transfer of crude and refined products, often in remote locations, demands a high level of pumping reliability. CLYDEUNION Pumps has a reputation for supplying reliable pipeline pumps which can be found working throughout the world in the most hostile environments.



### REVERSE OSMOSIS

Worldwide demand for clean water continues to increase. With high efficiency and reliability, our multistage pumps are ideally suited for Seawater Reverse Osmosis. The CLYDEUNION Pumps CUP-BB3, combined with energy recovery systems, provides a very efficient solution for your high pressure reverse osmosis pumping needs.

### BOILER FEED

At CLYDEUNION Pumps we have supplied boiler feed pumps for a wide range of generating plants over many years. The experience gained in this field enables us to offer our customers engineered products, tailored to their specific requirements.



### OIL & GAS PRODUCTION

Our pumps can be found operating wherever there are oilfields, 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, crude oil transfer and pumps for handling 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. CLYDEUNION Pumps has many years of worldwide experience in the supply of process pumps to the refinery industry and is committed to providing its customers with solutions to the most complex of pumping requirements.

# CUP-BB3 heavy duty axially split multistage pumps

The CLYDEUNION Pumps CUP-BB3 is an axially split, multistage, double volute design for high pressure and high speed service. All units comply with API 610.

There are thousands of CLYDEUNION CUP-BB3 pumps operating worldwide on services as diverse as:

- Seawater injection at 295 Bar (4280psi) discharge pressure and 6,200 rpm.
- Light hydrocarbon refinery services with a specific gravity of 0.45.
- Sand laden crude oil where the CUP-BB3 running at 4 pole speeds has been used to replace traditional screw pumps.



*Change-out complete rotor in under eight hours.*



## PROVEN PRODUCT INTEGRITY

The CLYDEUNION Pumps CUP-BB3 encompasses proven design history. The David Brown DB34, DB Guinard Pump DVMX, Union Pump Class M and the Mather & Platt FH all have an enviable history of sound engineering, designed to exceed the rigorous requirements of API 610.

## EASE OF MAINTENANCE

The simple construction of the CUP-BB3 pump offers ease of maintenance and reliability. A complete rotor change-out can be completed in under eight hours. On arduous seawater injection services the CUP-BB3 pump is only opened every four years for internal inspection and overhaul.

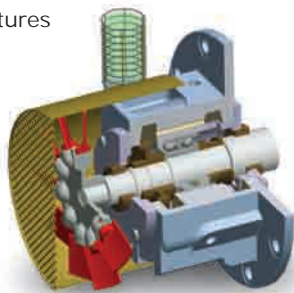
## PUMP SETS & PACKAGES

CLYDEUNION Pumps has extensive experience in providing complex pump sets including electric motors, gearboxes, lube oil systems, steam turbines, diesel engines, control panels and instrumentation.

# Bearing Arrangements and optional features

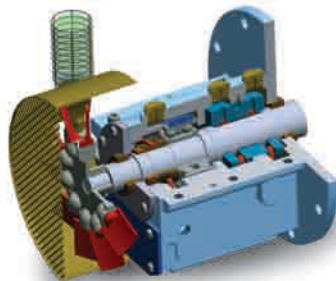
## Standard Ball/Ball Bearing Assembly

- Designed for minimum 40,000 hour  $L_{10}$  life.
- Surpasses the API limits for oil sump temperature and bearing temperature rise.
- Angular contact bearings with machined brass cages.
- Rapid bearing stabilisation achieves operating temperatures well within API limits.
- INPRO™ bearing isolators throughout, give reduced contamination for improved bearing life.
- Proven reliability in a wide range of applications, speeds and environments.



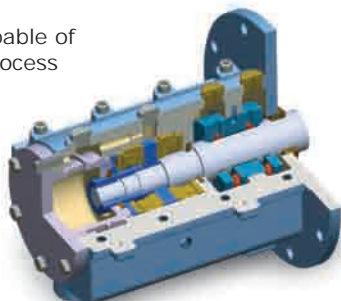
## Optional Sleeve/Ball Bearing Assembly

- Energy density applications beyond ball/ball bearing limits.
- Available for applications up to and beyond API limits.
- Hydrodynamic radial bearing and optimally sized angular contact thrust bearings designed for 100,000 hour  $L_{10}$  life, under stable operating conditions.
- Proven reliability on unattended pipeline pumping stations.



## Optional Sleeve/Tilting Pad Bearing Assembly

- High speed pumps up to 6500 rpm.
- High power pumps up to 6.75 MW.
- Designed for infinite life.
- Standard designs are capable of withstanding transient process conditions.
- Optimized designs available to withstand extreme transients in high energy applications.
- Proven reliability in the most demanding service conditions.



## CP Seal System

- All CUP-BB3 pumps are designed for use with our patented CP System (Plan 53C).
- CP System technology offers a proven history in improving seal life, particularly under varying suction pressures.
- The unique CP System design provides an excellent mechanical sealing environment in the most demanding process conditions.



## Cartridge Bearing Design

- "Maintenance Friendly" design alternative, requiring a concession when used on an API pump.
- Allows bearing removal and refit within an hour.
- Cartridge can be pre-assembled in clean environment prior to transportation to the field.
- Contains all the advanced features of the standard design.

## Split Wear Rings

- Available for ease of maintenance.

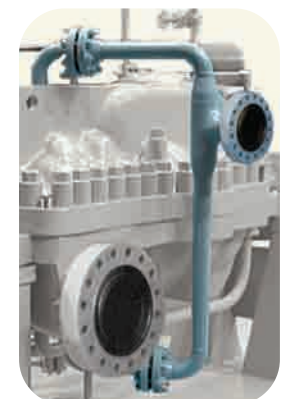


## Non Metallic Wear Parts

- Improved operation and performance efficiencies.

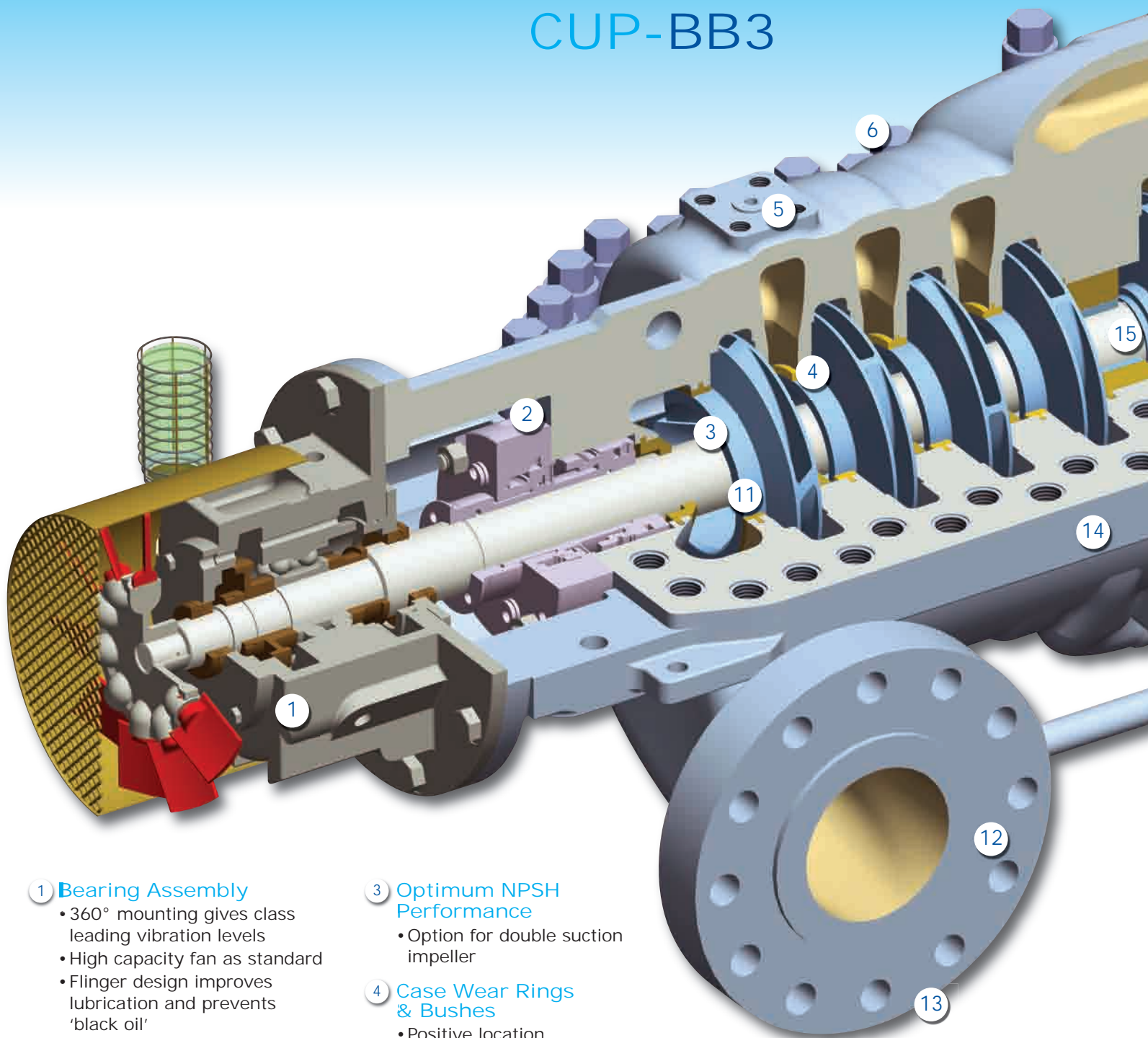
## Inter-Stage Take-Off

- Secondary fluid take-off line available for intermediate pressure and process flow requirements.



# CLYDEUNION Pumps

## features of the CUP-BB3



### 1 Bearing Assembly

- 360° mounting gives class leading vibration levels
- High capacity fan as standard
- Flinger design improves lubrication and prevents 'black oil'
- Pure or purge mist options

### 2 Seal Chamber

- API 682 compliant
- Space for dual seals
- Easy access for maintenance
- Locking collar arrangement as standard

### 3 Optimum NPSH Performance

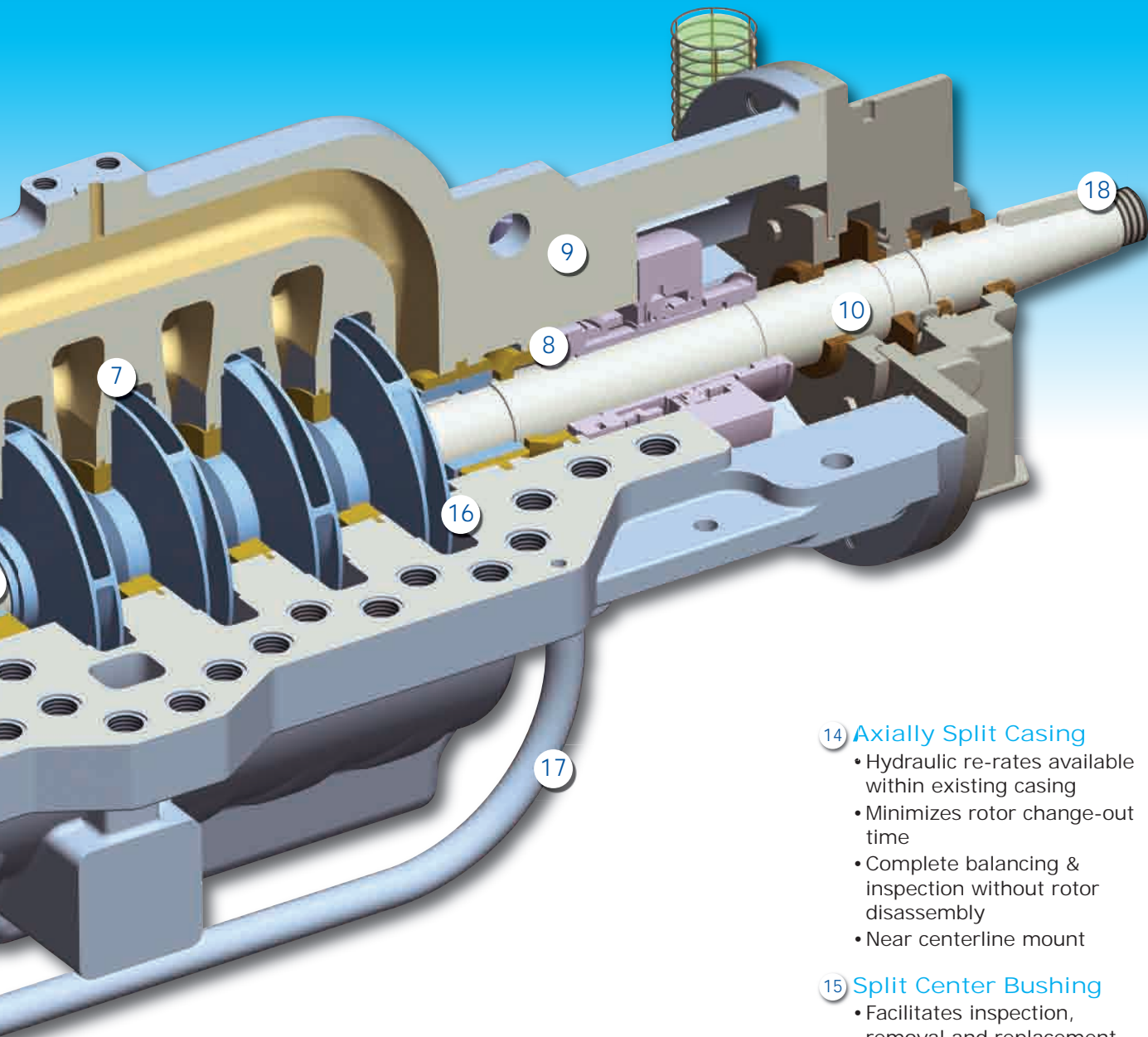
- Option for double suction impeller

### 4 Case Wear Rings & Bushes

- Positive location
- Pinned for anti-rotation at split line

### 5 Integrally Flanged Auxilliary Connections

- Eliminates weld connection
- Eliminates need for bracing
- Conventional options available



**6 Top Bolted Capnuts**  
 • Easy access and removal

**7 Double Volute Design**  
 • Minimizes radial thrust loads for optimized bearing and seal life

**8 Single Piece Throttle Bushing**  
 • Designed for pressure breakdown  
 • Sized to balance axial thrust

**9 Heavy Duty Lugs**  
 • Rated for full pump weight

**10 Robust Rotor Design**  
 • Stepped shaft for ease of assembly  
 • Optimized rotor dynamics & power transmission capability

**11 Integral Wear Rings**  
 • Reduced risk of failure due to wear part displacement  
 • Retrofit with conventional rings when necessary  
 • Conventional options available

**12 Flange Finishes and Rating**  
 • Heavy duty class 900 as standard  
 • Higher pressure options available  
 • Raised face and ring type joint options available

**13 Nozzles Integral in Bottom Half Case**  
 • No need to remove pipework  
 • Handles API 610 nozzle loads

**14 Axially Split Casing**  
 • Hydraulic re-rates available within existing casing  
 • Minimizes rotor change-out time  
 • Complete balancing & inspection without rotor disassembly  
 • Near centerline mount

**15 Split Center Bushing**  
 • Facilitates inspection, removal and replacement  
 • Maximises rotor support and damping

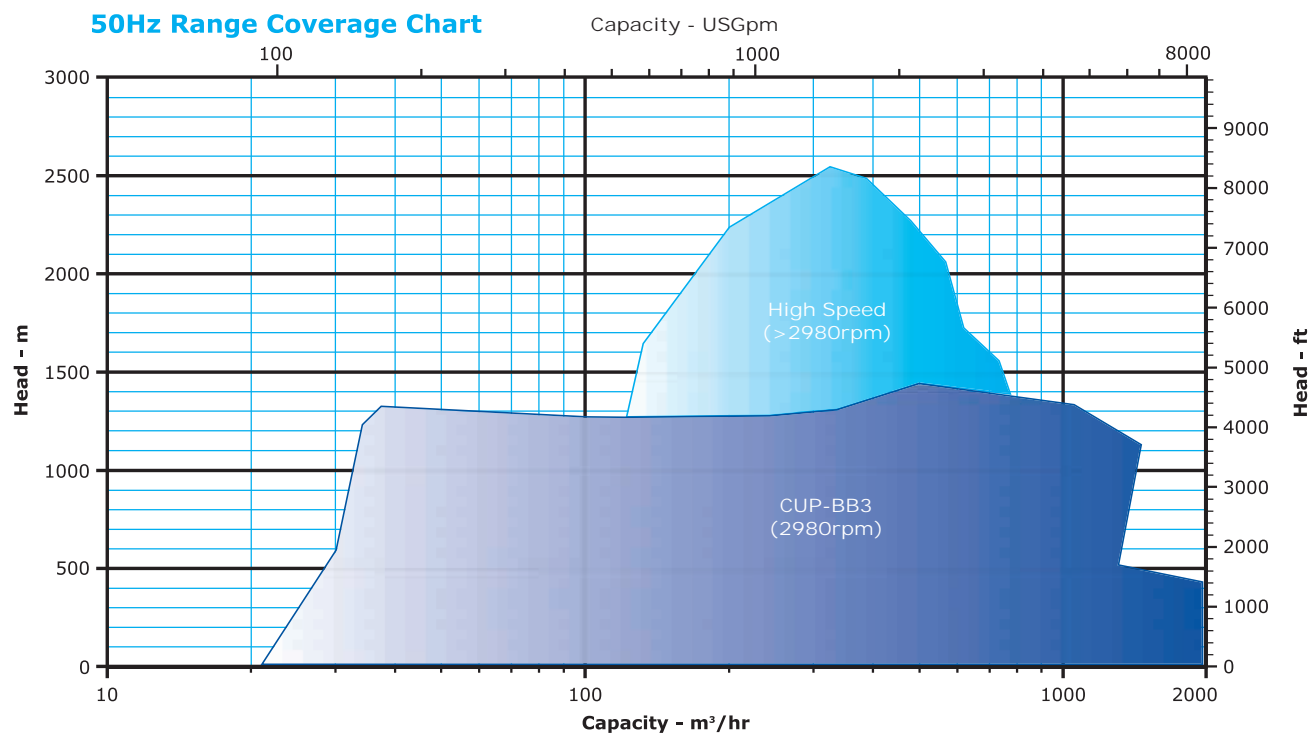
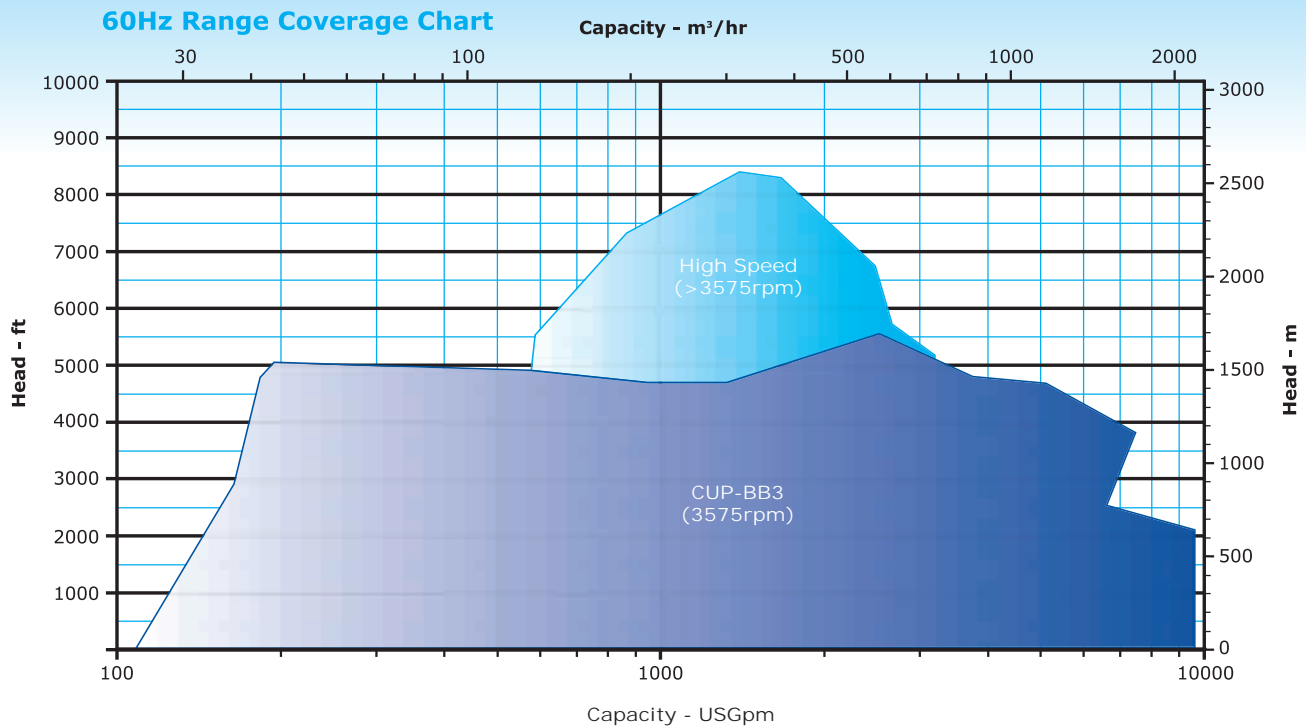
**16 Impellers**  
 • Back-to-back design to minimise axial thrust  
 • Individually secured  
 • Precision cast

**17 Integral Balance Line**  
 • Equalizes pressure in seal cavities

**18 API Shaft Taper**  
 • For easy coupling removal

**19 Material Options**  
 • All API 610 material options  
 • Other material options available  
 • NACE compatible  
 • Non metallic wear parts

# Standard Hydraulic Range coverage charts



These charts cover the CUP-BB3 standard pump range. Other engineering designs exist for extreme applications.

# Global Aftermarket Capability

## best in service and response

Our customer focused aftermarket organization 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 maximized irrespective of a pump's length of service.

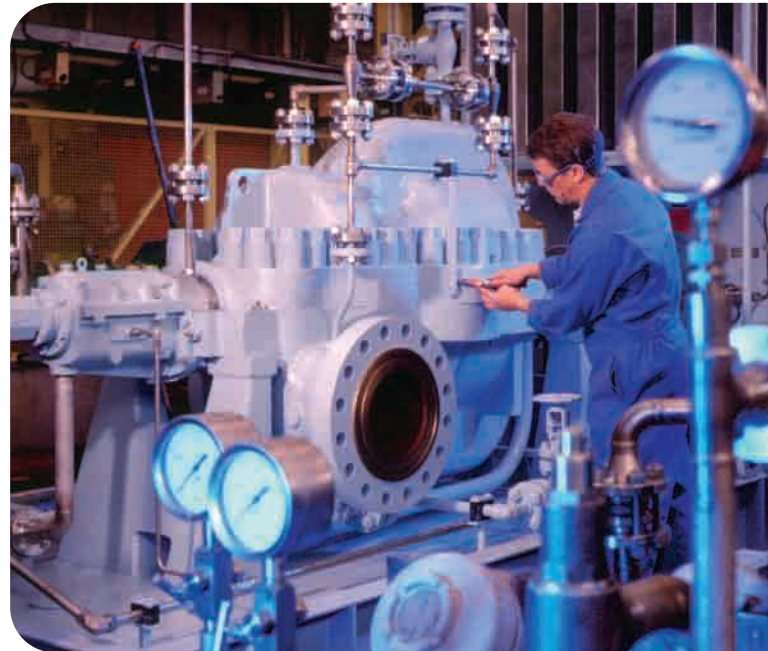
### GENUINE HIGH QUALITY

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 optimized 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 authorized 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





| Sales:                      | Amermarket: | Manufacturing: |                     |                          |                          |                                   |
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**OUR EXTENSIVE BRAND HERITAGE :**



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