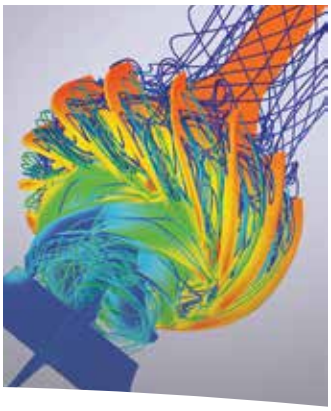
FLOWSERVE

CVP
Concrete Volute Pump



Experience In Motion






Pump Supplier to the World

Flowserve is the driving force in the global industrial pump marketplace. No other pump company in the world has the depth or breadth of expertise in the successful application of pre-engineered, engineered, and special purpose pumps and systems.

Life Cycle Cost Solutions

Flowserve provides pumping solutions that permit customers to reduce total life cycle costs and improve productivity, profitability and pumping system reliability.

Market-Focused Customer Support

Product and industry specialists develop effective proposals and solutions directed toward market and customer preferences. They offer technical advice and assistance throughout each stage of the product life cycle, beginning with the initial inquiry.

Broad Product Lines

Flowserve offers a wide range of complementary pump types, from pre-engineered process pumps to highly engineered and special purpose pumps and systems. Pumps are built to recognized global standards and customer specifications.

Pump designs include:
- Single-stage process
- Between bearings single-stage
- Between bearings multistage
- Vertical
- Submersible motor
- Positive displacement
- Nuclear
- Specialty

Product Brands of Distinction

ACEC™ Centrifugal Pumps

Aldrich™ Pumps

Byron Jackson® Pumps

Calder™ Energy Recovery Devices

Cameron™ Pumps

Durco® Process Pumps

Flowserve® Pumps

IDP® Pumps

INNOMAG™ Sealless Pumps

Lawrence Pumps®

Niigata Worthington™ Pumps

Pacific® Pumps

Pleuger® Pumps

Scienco™ Pumps

Sier-Bath® Rotary Pumps

TKL™ Pumps

United Centrifugal® Pumps

Western Land Roller™ Irrigation Pumps

Wilson-Snyder® Pumps

Worthington® Pumps

Worthington Simpson™ Pumps

CVP

Concrete Volute Pump



Proven Design

Having developed the first concrete volute pump in the 1930s, Flowserve is a global leader in the design and manufacture of concrete volute pumps. Made of prefabricated concrete segments for the volute housing and intake suction bell, the pump assembly is integrated into the civil construction to reduce installation costs. These pumps also have a well-earned reputation for trouble-free operation with minimal maintenance. A testament to their reliability is the years of continuous operation reported by customers worldwide.

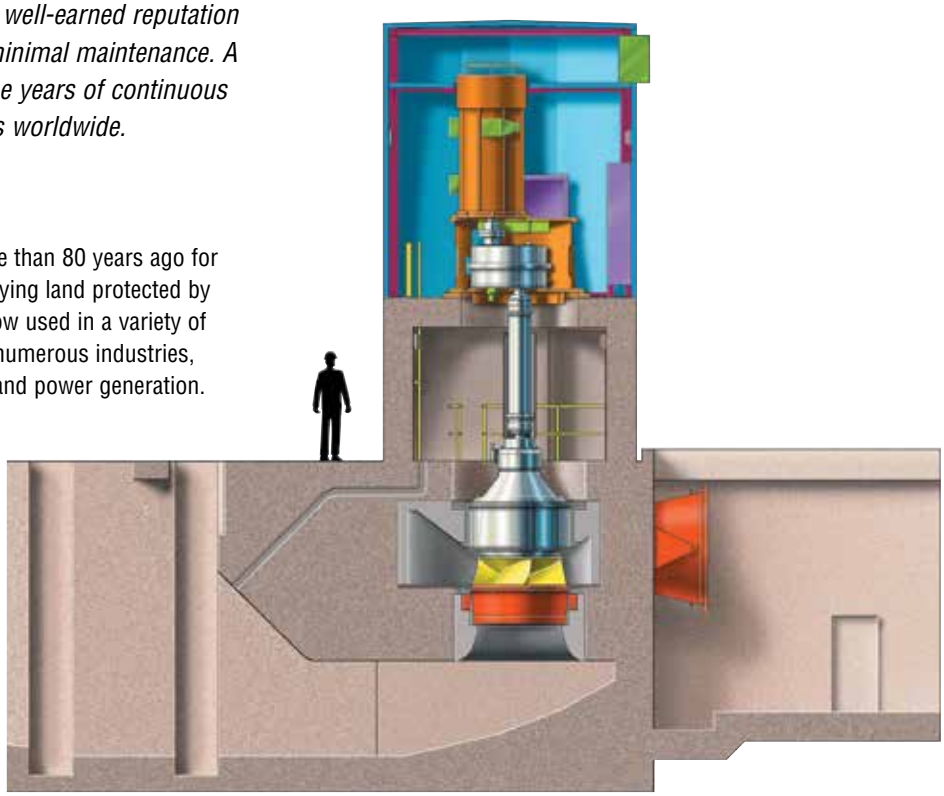
Typical Applications

Originally developed in Holland more than 80 years ago for drainage of polders, reclaimed low-lying land protected by dikes, concrete volute pumps are now used in a variety of high-capacity water applications in numerous industries, including desalination, oil and gas, and power generation. Typical applications include:

- Drainage
- Irrigation
- Flood control
- Dry dock dewatering
- Cooling water
- Seawater intake

Complementary Pump Designs

- Wet-pit and dry-pit vertical pumps
- Axial and mixed-flow vertical pumps
- Single-stage, double-suction, axially split case pumps



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CVP
Concrete Volute Pump



Features and Benefits

Concrete Volute Casing and Suction Bell substantially reduce vibration, provide excellent corrosion and erosion resistance, and significantly increase pump life, while lowering materials costs and minimizing maintenance.

Prefabricated Elements significantly reduce on-site construction time and costs.

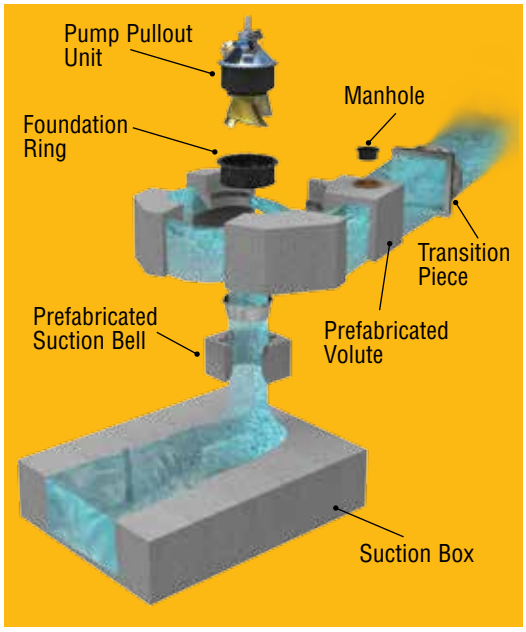
Metallic, Rotating Pullout Unit consists of the shaft, impeller, cover, wear ring and bearings. Only the impeller, wear ring and cover are wetted. Materials of construction vary to suit application requirements. Options range from cast iron for drainage applications to super duplex stainless steel for seawater services.

Compact Design of the prefabricated elements and the pullout unit reduces excavation work as well as lifting heights and weights.

Statically Balanced Impeller is clog resistant. Impeller is flanged to the impeller hub, which is shrink fitted to the shaft.

Short, Sturdy Pump Shaft is not wetted and does not require intermediate bearings.

Shaft Sealing System is leak-free, provides long life and requires very little maintenance, so pump reliability is increased. An inflatable static seal guarantees replacement of the radial bearing and lip or mechanical seal without removal of the pump unit.



Construction

- A removable, metallic pump pull-out unit is located within a concrete volute.
- Below the volute, the suction bell is connected to a preformed intake suction box. All are prefabricated concrete elements.
- A manhole permits impeller inspection without removal of the pump unit.
- The bearings and sealing systems are easily accessible via the space under the motor-gear support.
- The square volute discharge connection is designed into the discharge channel or connected to a discharge pipeline through a transition piece.
- The transition piece is grouted into the surrounding concrete of the pumping station.
- The pump pullout unit is installed when civil work is completed.





High-Quality Prefabricated Concrete

At a minimum, the prefabricated concrete elements of the volute and suction bell are made of grade C45/55, environmental class XS2 of NEN-EN 206-1 concrete and reinforced with FEB 500 HWL/HKN weldable steel rods. Blast furnace slag cement is used to resist against sulfate attack, alkali aggregate reactions and chloride penetration in tropical seawater services.

The prefabricated elements are poured around a steel form to ensure a smooth surface which meets the criteria of VBU-2002 Class A (NEN EN 13770-1 highest class).

Benefits of Prefabricating

- Pump quality control is improved. Prefabricated elements have optimal hydraulic shape, excellent surface smoothness, and a high degree of water tightness, due to controlled manufacturing conditions and thorough inspections.
- On-site construction is greatly simplified and made more efficient in terms of both time and cost.
- Prefabricated elements serve as shuttering during the construction phase.
- Delivery dates are met.



Cost Savings Over Wet-Pit Pumps

Concrete volute pumps offer these cost-saving benefits when compared with wet-pit pumps:

- Lower initial purchase price
- Less excavation depth is required, due to the compact size and optimal hydraulics of the intake suction box design.
- The pump casing volute is integrated with the civil construction of the pumping station.
- The prefabricated concrete elements do not require shuttering. Just-in-time delivery reduces on-site construction time.
- Simple outdoor assembly is possible, thereby avoiding costly roof constructions.
- Due to low cranage height and weight of the pump pullout unit, a mobile crane easily handles maintenance chores.
- Corrosion-resistant concrete construction. The only metallic components in contact with water are the impeller, wear ring and cover.
- Easy inspection access through manholes; no dismantling necessary
- There are no vortexes, dead water areas, or sand or silt deposits.







Advanced Bearing Design

The bearing design of the CVP consists of a spherical roller thrust bearing and a radial roller bearing. The spherical roller thrust bearing is oil lubricated and is provided with an oil level gauge; if necessary, an oil-water or oil-air cooler can be applied. Both radial bearings are grease lubricated.

Pump Drive

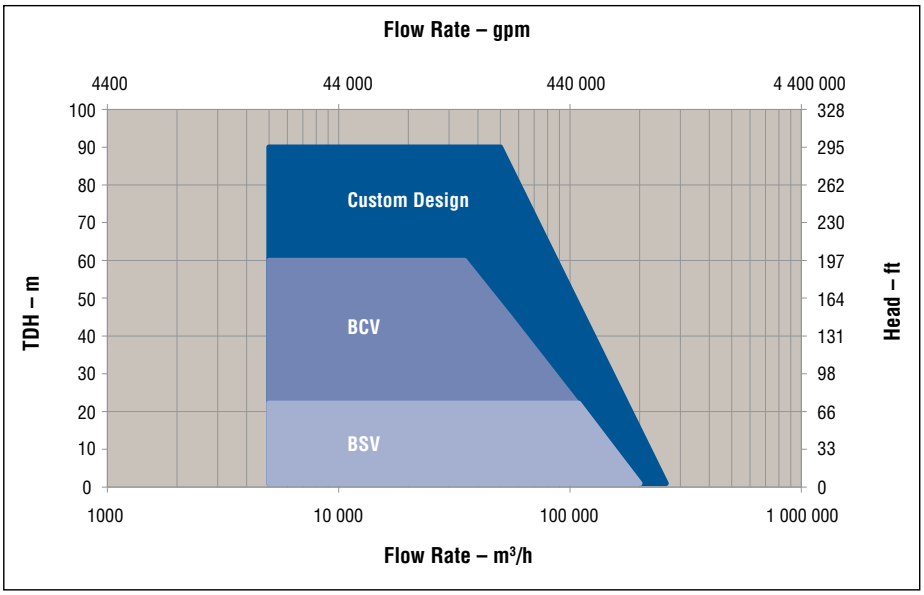
Pumps may be driven directly or through a gearbox. In the latter case, the pump shaft is connected via two spacer type teeth couplings to the driver, thereby avoiding misalignment. The electric motor and the pump each has an axial thrust bearing.

Standard Operating Parameters*

Pump Type	Head	Capacity
BSV (open mixed flow impeller) Standard impeller diameter range from 100 cm (39.5 in) up to 450 cm (177 in)	Up to 22 m (72 ft)	Up to 200 000 m³/h (880 000 gpm)
BCV (closed mixed flow impeller) Standard impeller diameter range from 100 cm (39.5 in) up to 380 cm (150 in)	Up to 60 m (197 ft)	Up to 115 000 m³/h (500 000 gpm)

*Custom designs are available, with heads up to 90 m (295 ft).

CVP Range Chart



Global Service and Technical Support







Life Cycle Cost Solutions

Typically, 90% of the total life cycle cost (LCC) of a pumping system is accumulated after the equipment is purchased and installed. Flowserve has developed a comprehensive suite of solutions aimed at providing customers with unprecedented value and cost savings throughout the life span of the pumping system. These solutions account for every facet of life cycle cost, including:

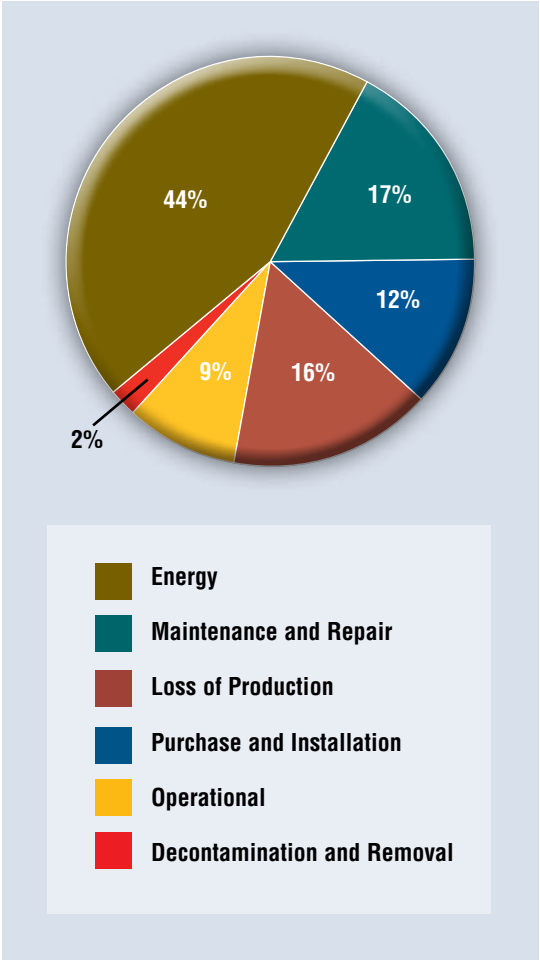
Capital Expenses
- Initial purchase
- Installation

Operating Expenses
- Energy consumption
- Maintenance
- Production losses
- Environmental
- Inventory
- Operating
- Removal

Innovative Life Cycle Cost Solutions

- New Pump Selection
- Turnkey Engineering and Field Service
- Energy Management
- Pump Availability
- Proactive Maintenance
- Inventory Management

Typical Pump Life Cycle Costs[1]



[1] While exact values may differ, these percentages are consistent with those published by leading pump manufacturers and end users, as well as industry associations and government agencies worldwide.



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