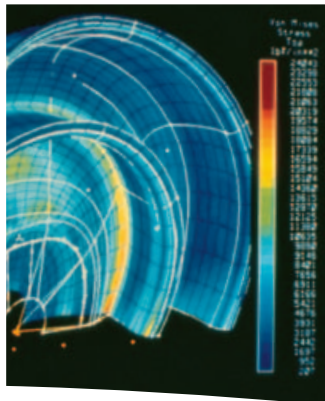




AFV
Vertical Axial Flow Pumps



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 is providing pumping solutions which 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 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 bearing single stage
- Between bearing multistage
- Vertical
- Submersible motor
- Rotary
- Reciprocating
- 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

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

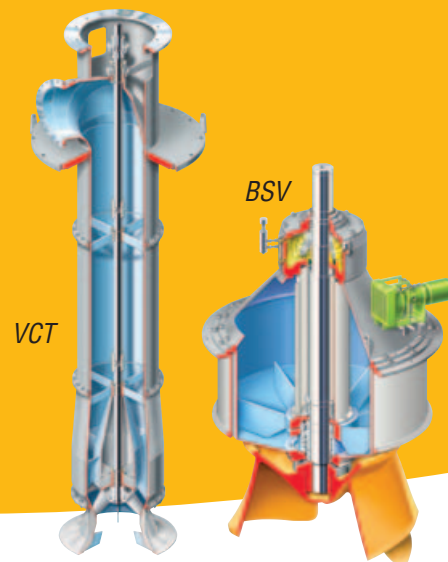
Worthington® Pumps

Worthington Simpson™ Pumps

**AFV
Vertical Axial
Flow Pumps**



Complementary Pumps



**Unsurpassed Hydraulic Coverage
and Design Flexibility**

The AFV line of axial flow wet pit vertical pumps combines the proven hydraulics and wide array of mechanical features long provided under the Byron Jackson and IDP heritage names. Available in sizes from 200 mm (8 in) to 3.1 m (123 in), these single-stage, propeller type, axial flow pumps are designed in accordance with Hydraulic Institute and AWWA standards.

Typical Applications

- Irrigation
- Land drainage
- Flood control
- Recirculation
- River intake
- Cofferdams
- Dry docks
- Water treatment
- Pollution effluent control
- Storm water disposal
- Dewatering
- Industrial service

Complementary Pump Designs

Depending upon application requirements, Flowserve can also provide these designs:

- Horizontal, double-suction
- Single-stage vertical
- Double-casing
- Concrete volute type
- Submersible motor



AFV
Vertical Axial
Flow Pumps

The AFV axial flow suspended shaft vertical pump is a single-stage, propeller type machine. This family of pumps is specifically designed for low-head movement of water for a multitude of municipal, agricultural and industrial services. Their simple but heavy construction, multiple hydraulic combinations and available design features provide trouble-free, continuous capabilities with high operating efficiency.

Operating Parameters

- Flows to 180 000 m³/h (800 000 gpm)
- Heads to 11 m (35 ft)
- Speeds to 1770 rpm
- Sizes 200 mm (8 in) to 3.1 m (123 in)
- Settings to 8 m (25 ft)

Three- or Four-Vane Axial Flow Propeller is hydraulically balanced via pressure equalizing balance holes and a top propeller hub wear ring to reduced axial down thrust. The propeller is located on the shaft with a split ring and key to efficiently transfer torque to the shaft

Outer Flanged Columns are bolted together with through bolts for ease in assembly. Alignment is maintained via centering fits on all parts

Flared Suction Bell provides a smooth waterway entrance to the impeller and has integral splitters to reduce inlet swirl and entrance losses

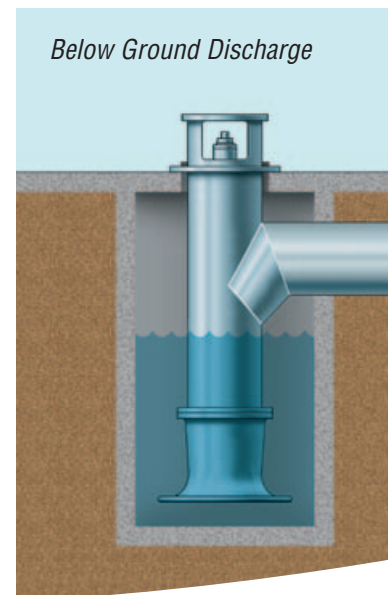
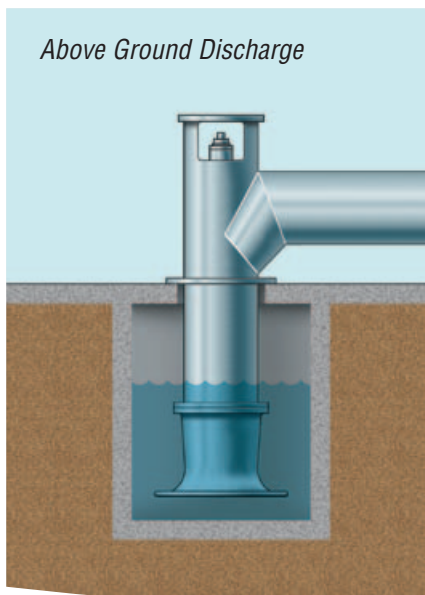
Stator Case With Integral Diffuser Vanes may be either a single-piece casting or a fabrication (sizes 27 in and larger)

Discharge Elbow and Column Pipe are fabricated into a single component. The discharge elbow may be located above or below ground and at any outlet orientation

Seal Chamber accepts packing or mechanical seal to suit service requirements



Fabricated
Discharge Head
and Wet End



AFV Advantages Over Horizontal Units

The AFV offers numerous advantages over horizontal centrifugal pumps, including:

- Self-priming operation
- Minimal floor space requirements
- Simple, low-cost foundation design and installation
- Above or below grade discharge to suit site conditions
- Inherent self-alignment resulting from tight tolerance machining of shoulders and recesses

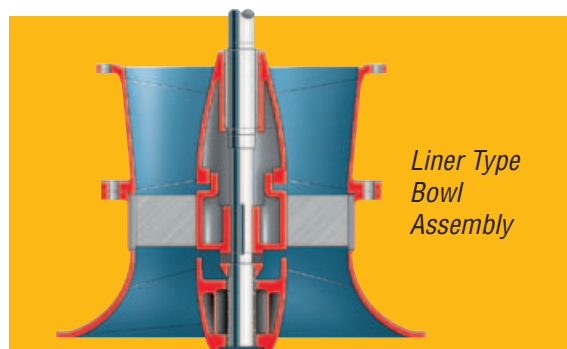
Construction Details

- Discharge Head
 - Cast for sizes to 500 mm (20 in)
 - Fabricated for sizes over 500 mm (20 in)
- Bowl Assembly
 - Cast for sizes 200 mm (8 in) to 685 mm (27 in)
 - Propeller liner type standard
 - Propeller case type optional
 - Fabricated for sizes over 685 mm (27 in) optional
- Propeller Casing
 - Integral with suction bell, one-piece casting or fabricated, depending on specifications and pump size
- Line Shaft Coupling
 - Threaded type for shaft diameters to 75 mm (3 in)
 - Split-ring type for shaft diameters over 75 mm (3 in)
- Pump-to-Motor Coupling
 - Threaded type for shaft diameters to 75 mm (3 in)
 - Two-piece type for shaft diameters larger than 75 mm (3 in)

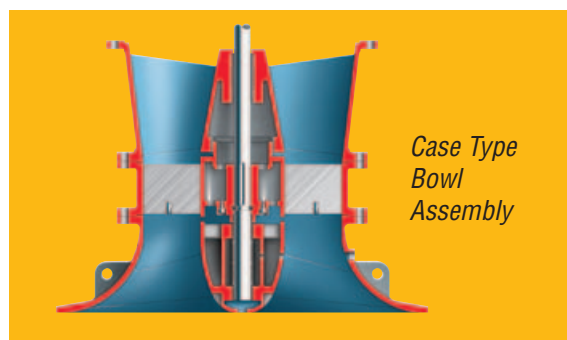
Discharge Configurations

AFV pumps are available in four configurations to suit site specific needs:

- Above or below ground
- Plain or flanged end

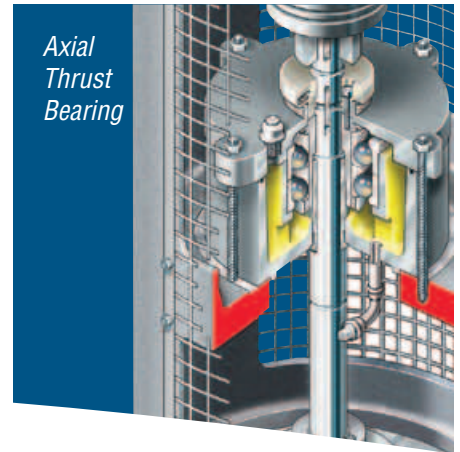
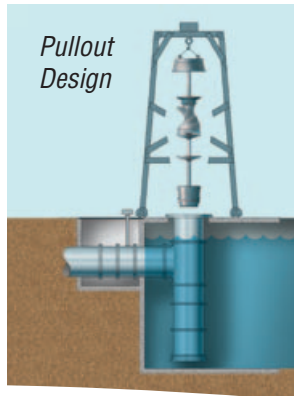
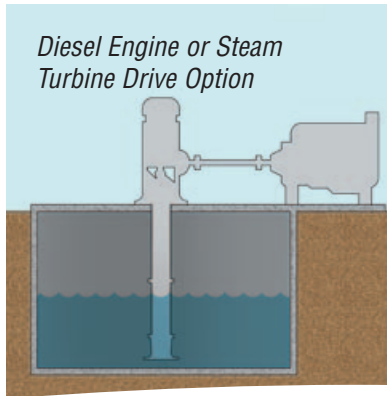


Liner Type Bowl Assembly



Case Type Bowl Assembly

Options and Technical Data



Drive Options

- Engine or steam turbine drive
 - Pump package supplied with base-mounted right angle solid shaft gear
 - Watson type drive shaft supplied between pump and driver
- Vertical hollow shaft motor
 - Allows pump headshaft to extend through the motor, providing easy access for propeller clearance adjustment
 - Adjusting nut located at the top of motor
 - Two-piece headshaft with motor stand available where overhead clearance is insufficient to remove motor
- Vertical solid shaft motor
 - Supplied by customer specification or preference
 - Rigid coupling provided between motor and pump for shaft diameters greater than 75 mm (3 in)

Optional Pullout Design

This option allows the rotating element and the critical non-rotating wear components to be quickly and easily removed for inspection without removing the complete pump.

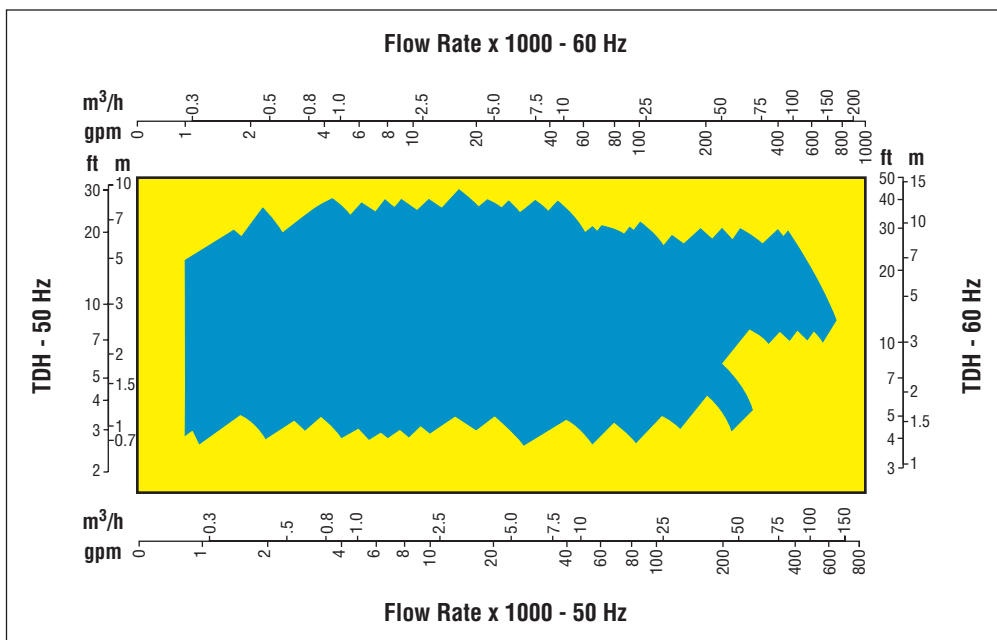
Axial Thrust Bearing Assembly

The axial thrust bearing assembly can be integral to the motor or installed in the pump head. The bearing assembly withstands the total hydraulic thrust as well as the rotor weight. Self-lubricated anti-friction or tilting pad bearings can be utilized.

Additional Options

- Enclosed lineshaft with oil or fresh water lubrication
- Bowl liner (casing wear ring)

AFV 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

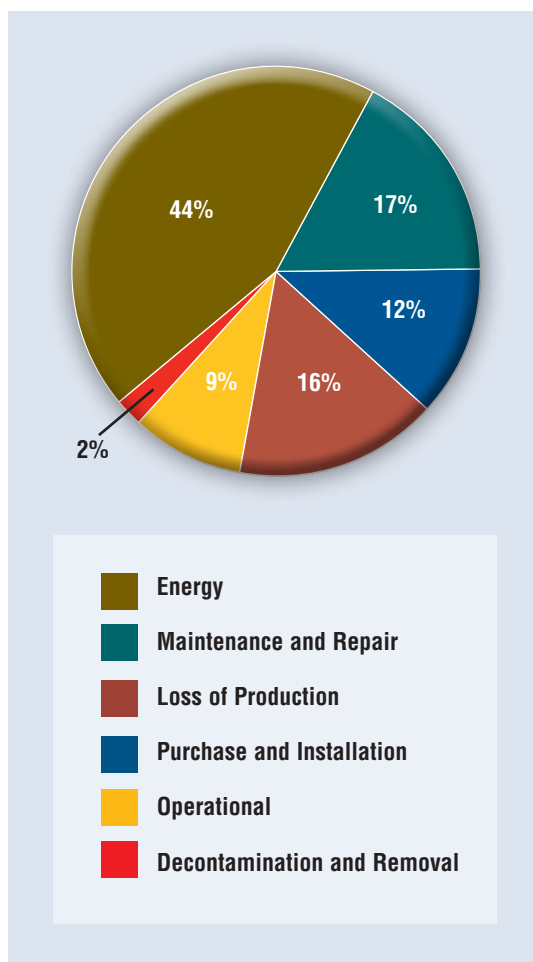
Operating Expenses

- 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 Costs¹



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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