



Pump Division



***AFV***  
***Vertical***  
***Axial Flow***  
***Pumps***

## 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.*

### Pumping Solutions

Flowserve is providing pumping solutions which permit customers to continuously 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.



### Dynamic Technologies

Flowserve is without peer in the development and application of pump technology, including:

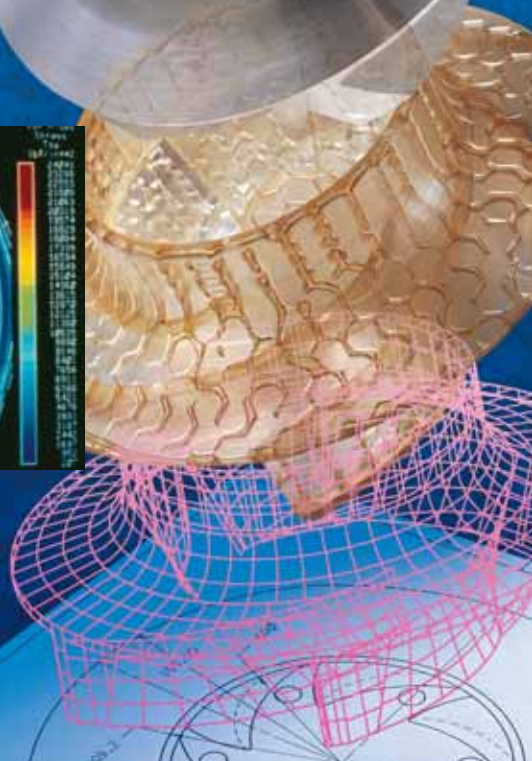
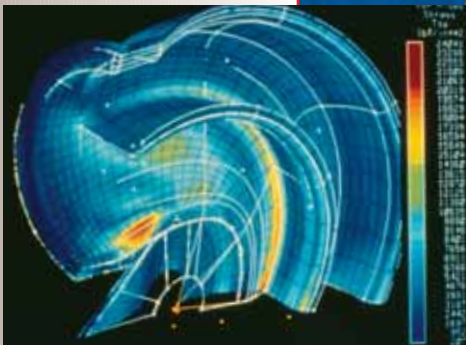
- Hydraulic engineering
- Mechanical design
- Materials science
- Intelligent pumping
- Manufacturing technology

### 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



**AFV  
Vertical  
Axial Flow  
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.

These single stage, propeller-type, axial flow pumps, available in sizes from 200 mm (8 in) to 3.1 m (123 in), are designed in accordance with Hydraulic Institute and AWWA standards.

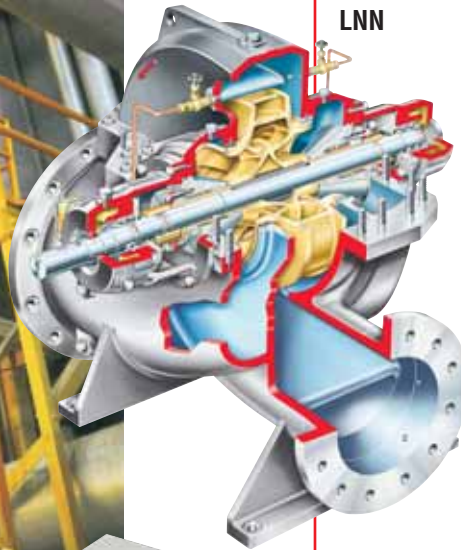
**Typical Applications**

- 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**

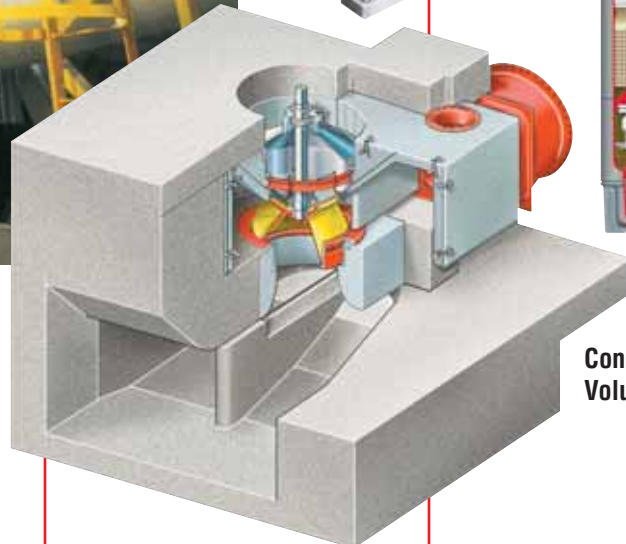
Depending upon application requirements, Flowserve can also provide these designs:

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



**Submersible  
Motor**

**LNN**



**Concrete  
Volute**

**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.

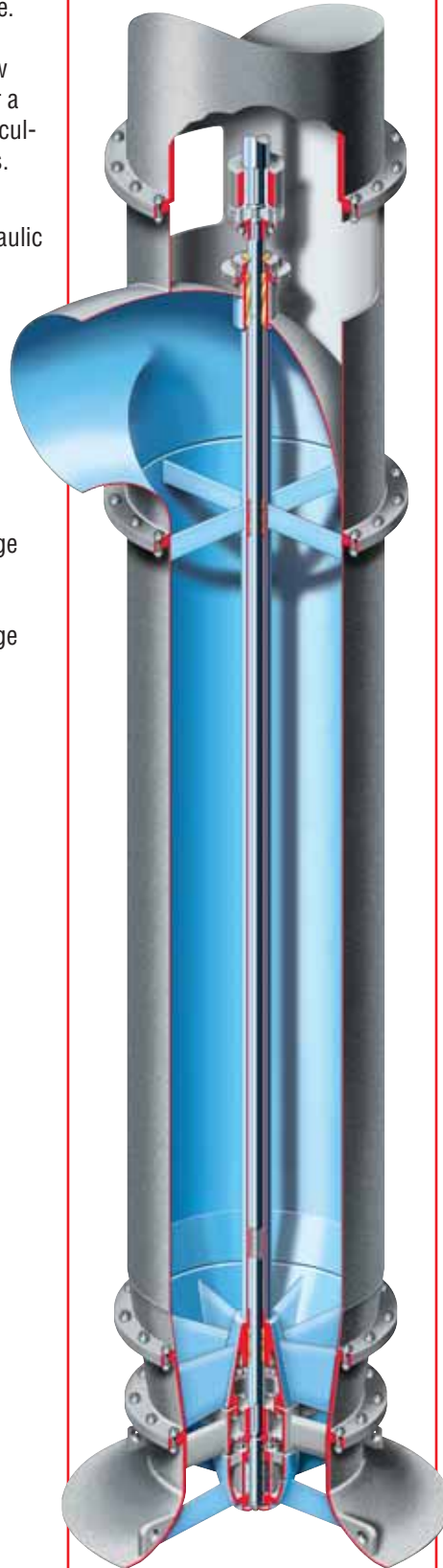
**Models Available**

- Above ground discharge
  - AFS: Flanged discharge
  - APS: Plain end discharge
- Below ground discharge
  - BFS: Flanged discharge
  - BPS: Plain end discharge

**Operating Parameters**

- Flows to 180 000 m<sup>3</sup>/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)

**AFV Design with Sealed Bearing Lubrication**



**Cast Discharge Head and Wet End**  
(shown above)

**AFV Advantages Over Horizontal Units**

- Self-priming
- Minimum 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

**Vertical Hollow Shaft Motor Option**

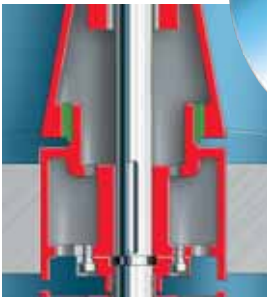
- Allows pump headshaft to extend through the motor, providing easy access for impeller clearance adjustment
- Adjusting nut located at the top of motor
- Two-piece headshaft with motor stand available where overhead clearance is insufficient to remove motor

**Vertical Solid Shaft Motor Option**

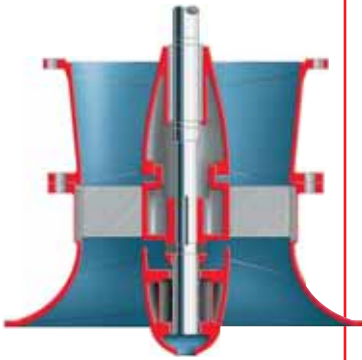
- Supplied by customer specification or preference
- Rigid coupling provided between motor and pump for shaft diameters greater than 75 mm (3 in)



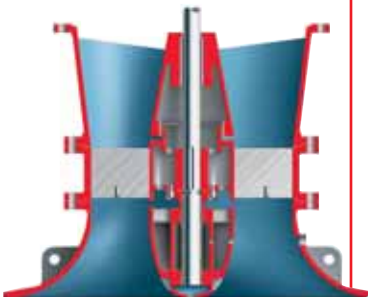
**Split Ring Line Shaft Coupling Detail**



**Optional Case and Impeller Wear Rings**

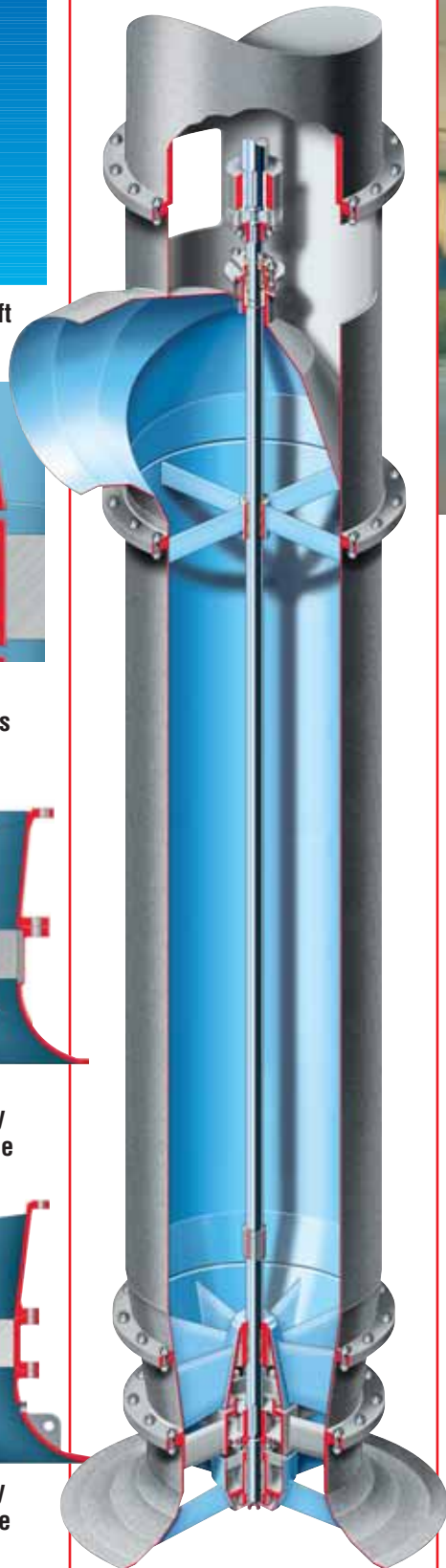


**Cast Bowl Assembly Impeller - Liner Type**



**Cast Bowl Assembly Impeller - Case Type**

**AFV Design with Self-Lubricated Bearings**



**Fabricated Discharge Head and Wet End** (shown above)



Construction Options	
Discharge Head	<ul style="list-style-type: none"> <li>• Cast for sizes to 500 mm (20 in)</li> <li>• Fabricated for sizes over 500 mm (20 in)</li> </ul>
Bowl Assembly	<ul style="list-style-type: none"> <li>• Cast for sizes 200 mm (8 in) to 685 mm (27 in)                             <ul style="list-style-type: none"> <li>– Impeller liner type standard</li> <li>– Impeller case type optional</li> </ul> </li> <li>• Fabricated for sizes over 685 mm (27 in) optional</li> </ul>
Impeller Casing	<ul style="list-style-type: none"> <li>• Integral with suction bell, one-piece casting or fabricated, depending on specifications and pump size</li> </ul>
Line Shaft Coupling	<ul style="list-style-type: none"> <li>• Threaded type for shaft diameters to 75 mm (3 in)</li> <li>• Split-ring type for shaft diameters over 75 mm (3 in)</li> </ul>
Pump to Motor Coupling	<ul style="list-style-type: none"> <li>• Threaded type for shaft diameters to 75 mm (3 in)</li> <li>• Two-piece type for shaft diameters larger than 75 mm (3 in)</li> </ul>

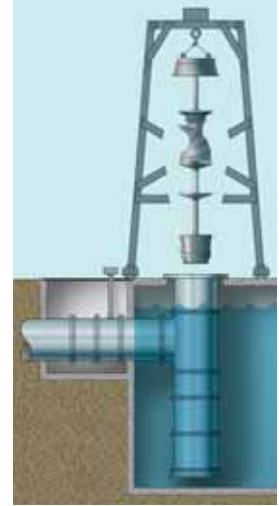
**Impeller Features**

- 3- or 4-vane axial flow design
- Mechanically balanced
- Profiled and finished vane surfaces
- Key-driven with split retaining ring
- Hydraulically balanced to reduce axial down thrust

**Options and Technical Data**

Standard Materials of Construction Material upgrades available	
Component	Material <sup>1</sup>
Suction bell and stator case – Standard construction - All sizes – Optional construction for sizes 685 mm (27 in) and larger	Cast Iron A48 Class 30 Sizes below 685 mm (27 in) Fabricated Carbon Steel A-36/A-53 Sizes 685 mm (27 in) and larger
Impeller case – Standard construction - All sizes – Optional construction for sizes 685 mm (27 in) and larger	Cast Iron A48 Class 30 Sizes below 685 mm (27 in) Fabricated 304 SS A240 Sizes 685 mm (27 in) and larger
Impeller <sup>2</sup>	Bronze B148 AI 952
Shafting	Carbon Steel AISI 4140
Bearings	Bronze B584 AI 836
Discharge head <sup>3</sup>	Fabricated Carbon Steel A-36/A-53
Outer column	Fabricated Carbon Steel A-36/A-53
Inner column	Carbon Steel Pipe A106
Thrust collar	410 SS
Shaft coupling	410 SS
Drive coupling assembly	Carbon Steel Gr. 1010-1025

1 Material upgrades to suit special applications are available  
 2 Upgraded materials supplied for impeller peripheral velocities greater than 21 m/sec (70 ft/sec)  
 3 A48 CI 30 is supplied for elbow diameters under 500 mm (20 in)



**Optional Pullout Design**

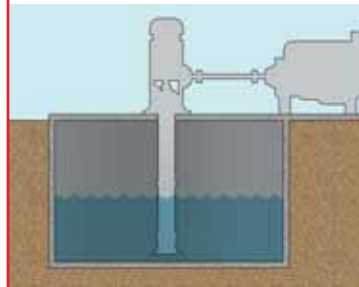
This option allows the rotating element and the critical non-rotating wear components to be quickly and easily removed for inspection without removing the complete pump



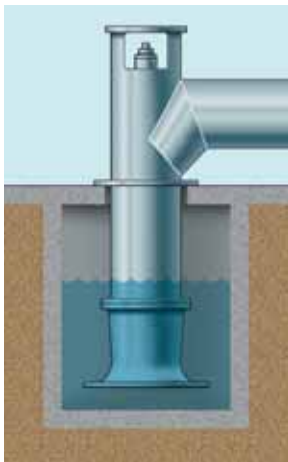
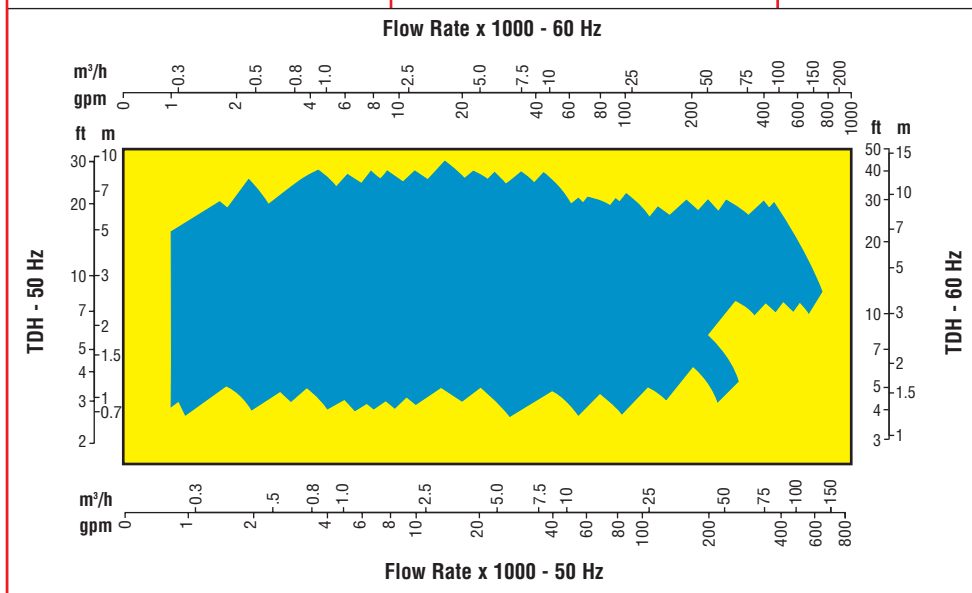
**Below Ground Discharge**

**Engine or Steam Turbine Drive Option**

- Pump package supplied with base-mounted right angle solid shaft gear
- Watson-type drive shaft supplied between pump and driver



**AFV Range Chart**



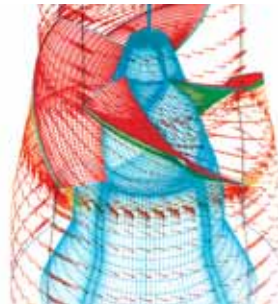
**Above Ground Discharge**

**Global Service and Technical Support**

**Advanced Technologies**

Few if any pump companies can match its capabilities in hydraulic and mechanical design or in materials engineering. These capabilities include:

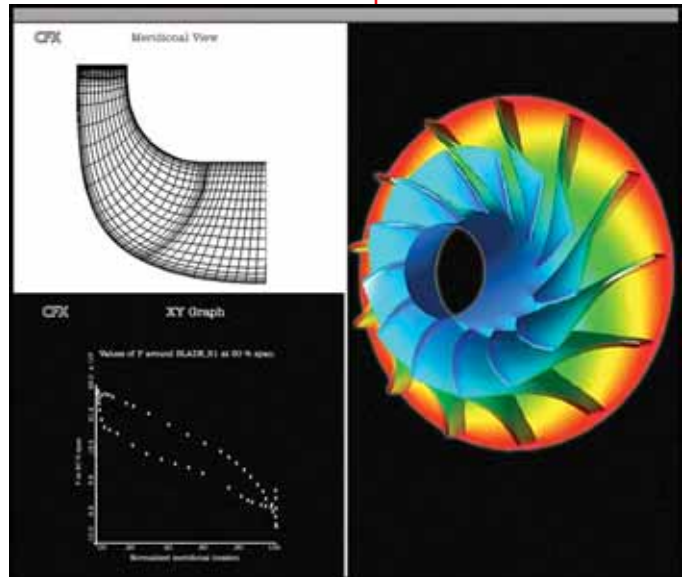
- Computational fluid dynamics
- Flow visualization
- Cavitation studies
- Efficiency optimization
- Finite element analysis
- Rapid prototyping
- Captive high nickel alloy and light reactive alloy foundries
- Non-metallic materials processing and manufacturing



**Service and Repair Group**

The Service and Repair Group is dedicated to maximizing equipment performance and reliability-centered maintenance programs. Pump related services include:

- Startup and commissioning
- Diagnostics and prognostics
- Routine and repair maintenance
- ANSI and ISO power end exchange program
- Re-rates, upgrades and retrofits
- Spare parts inventory and management programs
- Training



**Pump Improvement Engineering Services**

Flowserve is committed to helping customers obtain the best possible return on their pump equipment investment. Engineering assistance and technological solutions for pumping problems are readily available.

These services include:

- Field performance testing
- Vibration analysis
- Design analysis and root-cause problem solving
- Material improvements
- Pump and system audit
- Advanced technology solutions
- PumpTrac™ remote pump monitoring and diagnostic services
- Instruction manual updates
- Training courses

**Flowserve... Supporting Our Customers  
With The World's Leading  
Pump Brands**



**USA and Canada**

Flowserve Corporation  
Pump Division  
Millennium Center  
222 Las Colinas Blvd., 15th Floor  
Irving, Texas 75039-5421 USA  
Telephone: 1 972 443 6500  
Telefax: 1 972 443 6800

**Europe, Middle East, Africa**

Worthington S.P.A.  
Flowserve Corporation  
Via Rossini 90/92  
20033 Desio (Milan), Italy  
Telephone: 39 0362 6121  
Telefax: 39 0362 303396



**Pump Division**

*Your local Flowserve representative:*

**To find your local Flowserve representative  
please use the Sales Support Locator System  
found at [www.flowserve.com](http://www.flowserve.com)**

**Or call toll free: 1 800 728 PUMP**

**Latin America and Caribbean**

Flowserve Corporation  
Pump Division  
6840 Wynnwood Lane  
Houston, Texas 77008 USA  
Telephone: 1 713 803 4434  
Telefax: 1 713 803 4497

**Asia Pacific**

Flowserve Pte. Ltd.  
Pump Division  
200 Pandan Loop #06-03/04  
Pantech 21  
Singapore 128388  
Telephone: 65 6775 3003  
Telefax: 65 6779 4607