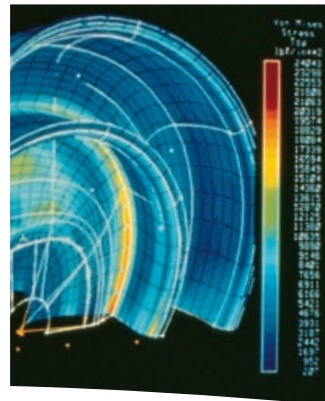




***WUJ
API 610 (VS1) Vertical Line Shaft
Multistage Process Pump***



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 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

Cameron® Pumps

Durco® Pumps

Flowserve® Pumps

IDP® Pumps

Jeumont-Schneider™ Pumps

Niigata Worthington Pumps

Pacific® Pumps

Pleuger® Pumps

Scienco® Pumps

Sier-Bath® Rotary Pumps

TKL™ Pumps

United® Centrifugal Pumps

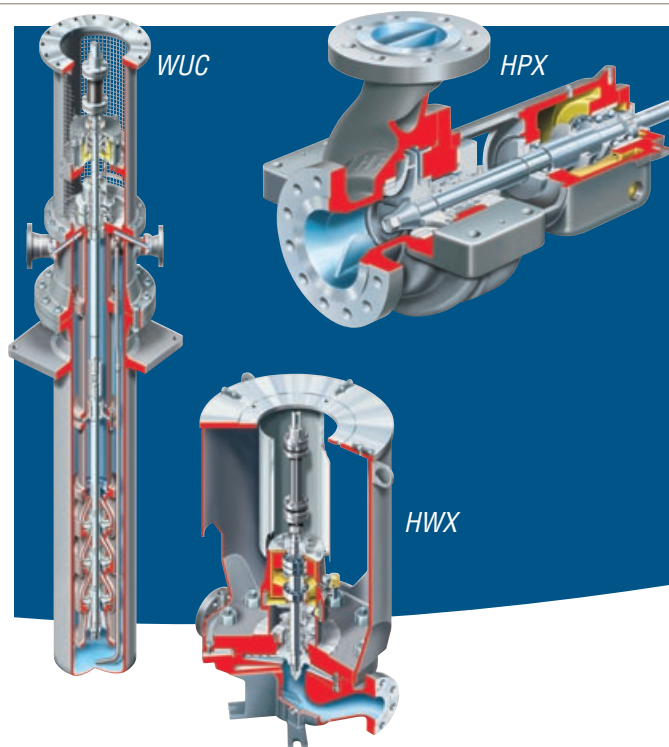
Western Land Roller® Irrigation Pumps

Wilson-Snyder® Pumps

Worthington® Pumps

Worthington Simpson® Pumps

**WUJ
API 610 (VS1)
Vertical Line Shaft
Multistage
Process Pump**



The Premier Wet-Pit Vertical Process Pump

The model WUJ comprises the highly engineered specialty class of Flowserve single casing vertical turbine pumps. It is based on a modular system to provide maximum design and operating flexibility. It also offers reliability-enhancing features such as stiff-shaft construction and a self-contained axial thrust bearing housing. Fully compliant with API 610, latest edition, the WUJ is the pump of choice for the most critical wet-pit pump applications.

Broad Application

- Refinery
- Chemical and petrochemical industries
- Liquefied gas
- Pipeline and transfer service
- Condensate service
- Offshore crude oil loading
- Lube oil
- Condensate extraction
- Seawater lift
- Stormwater and drainwater services
- Recovered oil
- Tank service

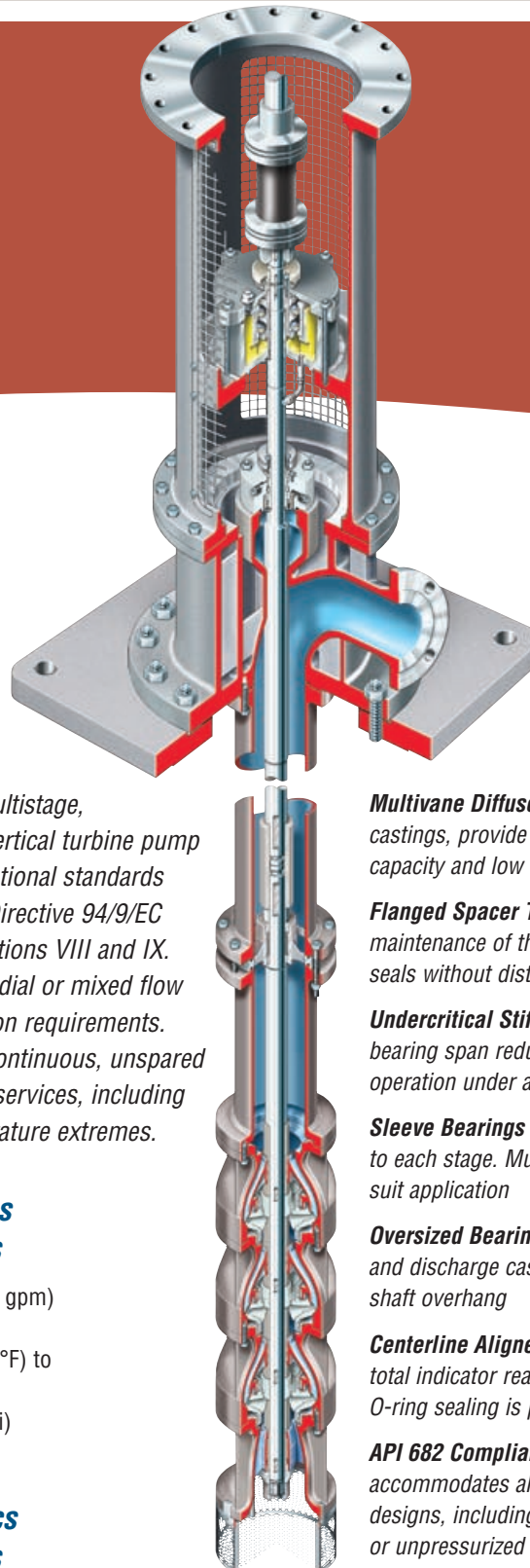
Complementary Pump Designs

Flowserve can also provide these pump designs:

- Vertical double casing pumps
- Multistage, axially and radially split between bearings pumps
- Vertical in-line or centerline mounted horizontal process pumps



WUJ
API 610 (VS1)
Vertical Line Shaft
Multistage
Process Pump



The Flowserve WUJ is a multistage, heavy-duty single casing vertical turbine pump designed to current international standards including API 610 (VS1), Directive 94/9/EC (ATEX 100) and ASME Sections VIII and IX. It is available with either radial or mixed flow hydraulics to suit application requirements. The WUJ is designed for continuous, unspared duty in a variety of severe services, including high pressures and temperature extremes.

Mixed Flow Hydraulics
Operating Parameters

- Flows to 3000 m³/h (13 000 gpm)
- Heads to 600 m (1950 ft)
- Temperatures from -10°C (5°F) to 150°C (300°F)
- Pressures to 64 bar (900 psi)
- Settings to 50+ m (164+ ft)

Radial Flow Hydraulics
Operating Parameters

- Flows to 500 m³/h (2200 gpm)
- Heads to 2000 m (6500 ft)
- Temperatures from -10°C (5°F) to 150°C (300°F)
- Pressures to 200 bar (3000 psi)
- Settings to 50+ m (164+ ft)

Multivane Diffusers, made from ceramic core castings, provide smooth operation at partial load capacity and low radial forces on each impeller

Flanged Spacer Type Coupling permits easy maintenance of thrust bearings and mechanical seals without disturbing or removing driver

Undercritical Stiff-Shaft Design and minimum bearing span reduce deflection and assure stable operation under all service conditions

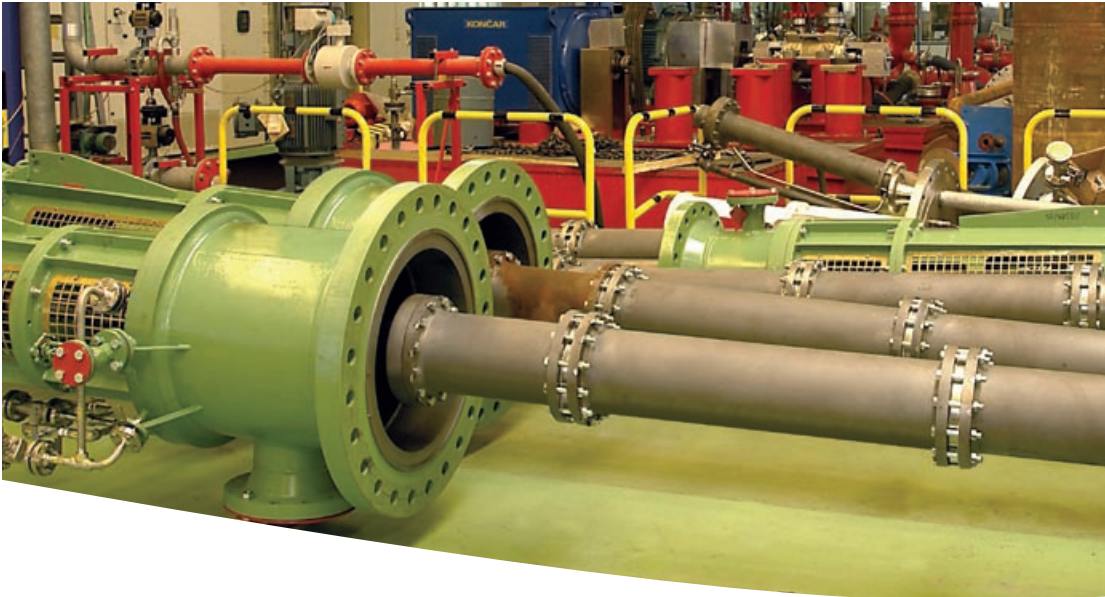
Sleeve Bearings provide hydraulic shaft support to each stage. Multiple materials available to suit application

Oversized Bearings mounted in suction bell and discharge case eliminate any unsupported shaft overhang

Centerline Aligned and Flanged Columns ensure total indicator readings well within API 610 limits. O-ring sealing is provided between column pipes

API 682 Compliant Mechanical Seal Chamber accommodates all cartridge-mounted seal designs, including: single and dual pressurized or unpressurized liquid; and gas designs

Discharge Head may be cast or fabricated and incorporates all gauge, vent and drain connections

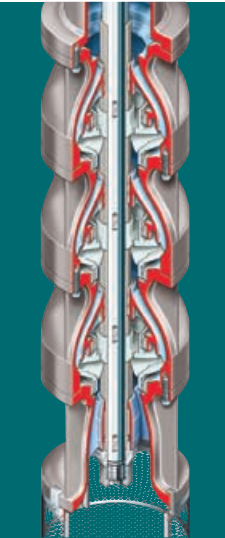


Choice of Hydraulic Design

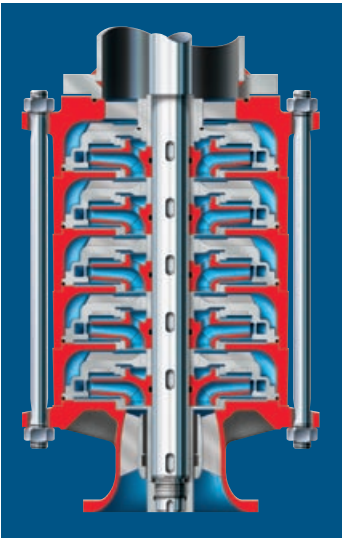
To best meet service requirements, the WUJ is available with either radial flow or mixed flow hydraulics.

- Radial flow hydraulics for low-flow, high-head applications, and featuring:
 - Stage casings with separate diffusers
 - Tie-bolt casing construction
 - Interstage bushings and sleeves
- Mixed flow hydraulics for high-flow, low-head applications, and featuring:
 - Integral diffuser design bowls
 - Individually bolted bowls connected to column pipe
 - Interstage fluid lubricated line bearings

Mixed Flow Hydraulics

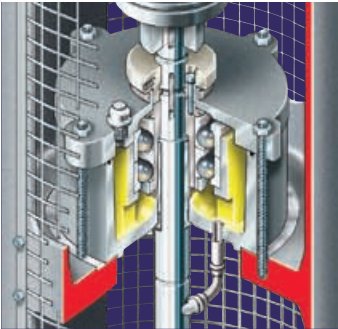


Radial Flow Hydraulics



Separate Axial Thrust Bearing Assembly

The WUJ axial thrust bearing assembly withstands the total hydraulic thrust as well as the rotor weight. Self-lubricating, anti-friction bearings are utilized for standard applications. Tilting pad thrust bearings are available for high horsepower or high thrust applications.



Axial Thrust Bearing Assembly

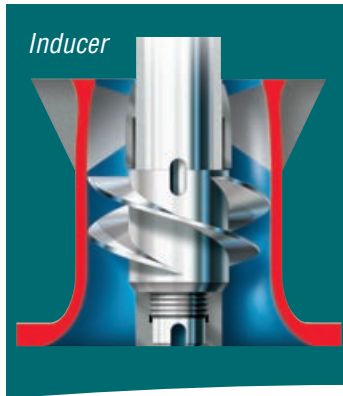
Casing and Impeller Wear Rings

With a minimum 50 Brinell hardness difference between them, casing and impeller wear rings prevent galling, allow economical retention of operating efficiency and maintain mechanical stability.

Additional Features

- Reinforced motor stand
- Screen-type, non-sparking coupling guard

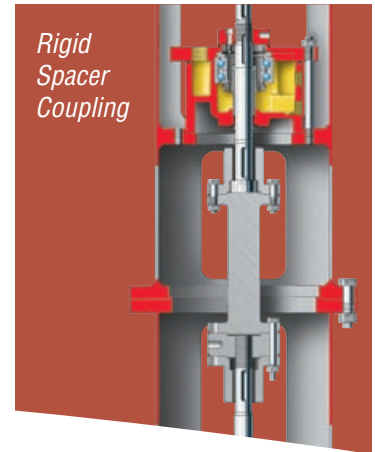
Options and Technical Data



Inducer



Axial Thrust Tilting Pad Bearing



Rigid Spacer Coupling

Optional Inducer

An inducer is available for all hydraulics when suction conditions are critical. The design reduces backflow and guarantees trouble-free operation over a wide flow range.

Optional Axial Thrust Tilting Pad Bearing

This bearing configuration allows use of standard motors for high horsepower or ultra-high thrust operating conditions. A lube oil system provides the lubrication for the bearings.

Rigid Spacer Coupling

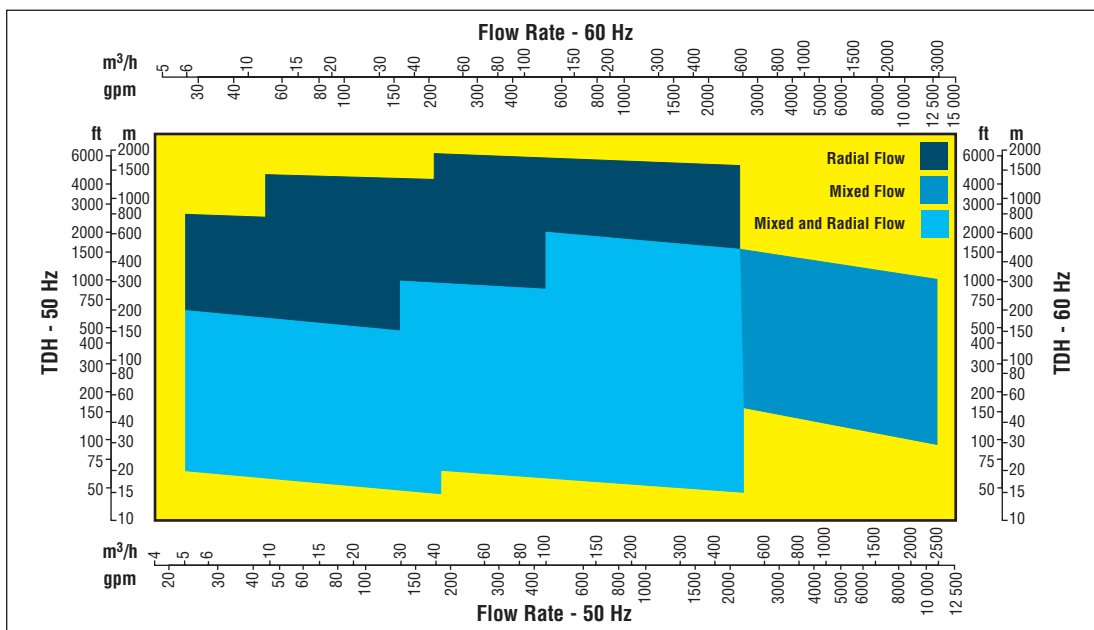
Permits access to mechanical seal assembly without the need to remove the flexible pump to driver coupling and the thrust bearing assembly.

Materials of Construction*

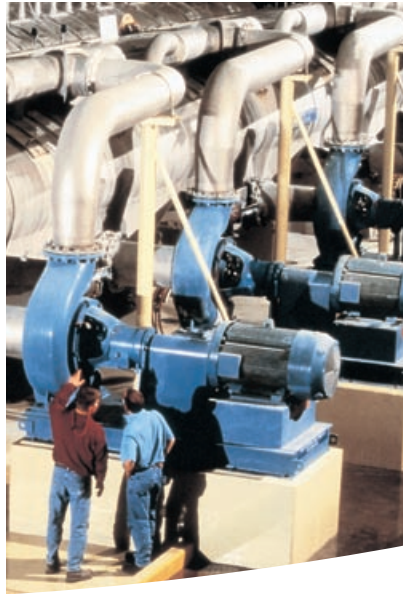
| API Classification | Casing | Internals |
|--------------------|---------------------|---------------------|
| S-5 | Carbon Steel | Carbon Steel |
| S-6 | Carbon Steel | 12% Chrome |
| S-8 | Carbon Steel | 316 Stainless Steel |
| C-6 | 12% Chrome | 12% Chrome |
| A-8 | 316 Stainless Steel | 316 Stainless Steel |
| D-1 | Duplex | Duplex |
| D-2 | Super Duplex | Super Duplex |

* Low temperature steel and other special materials available

WUJ 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

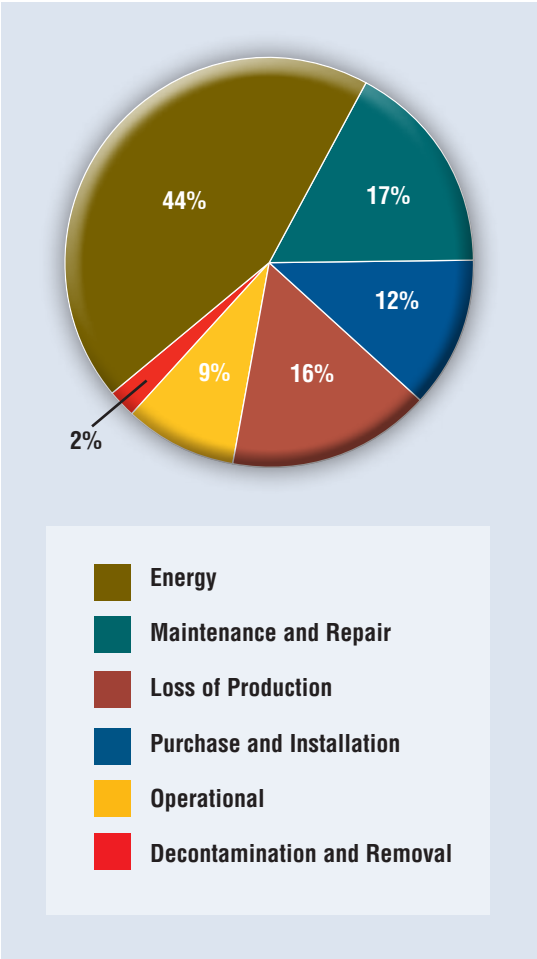
Operating Expenses

- 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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API 610 (VS1) Vertical Line Shaft
Multistage Process Pump***



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