FLOWSERVE

VPC
Vertical Turbine, Double-Case Pumps

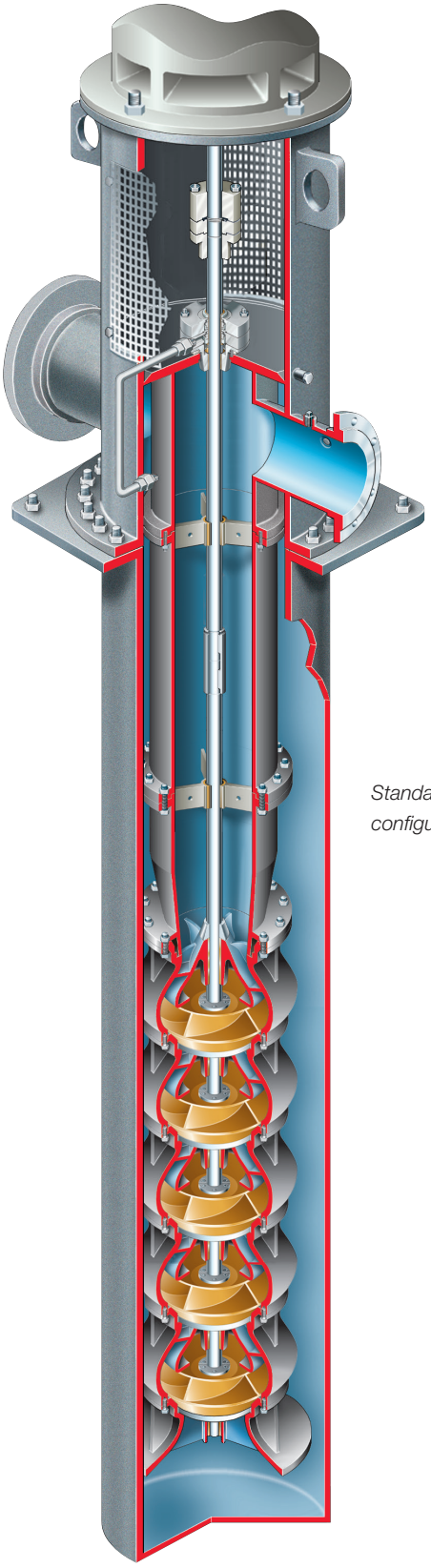


Experience In Motion

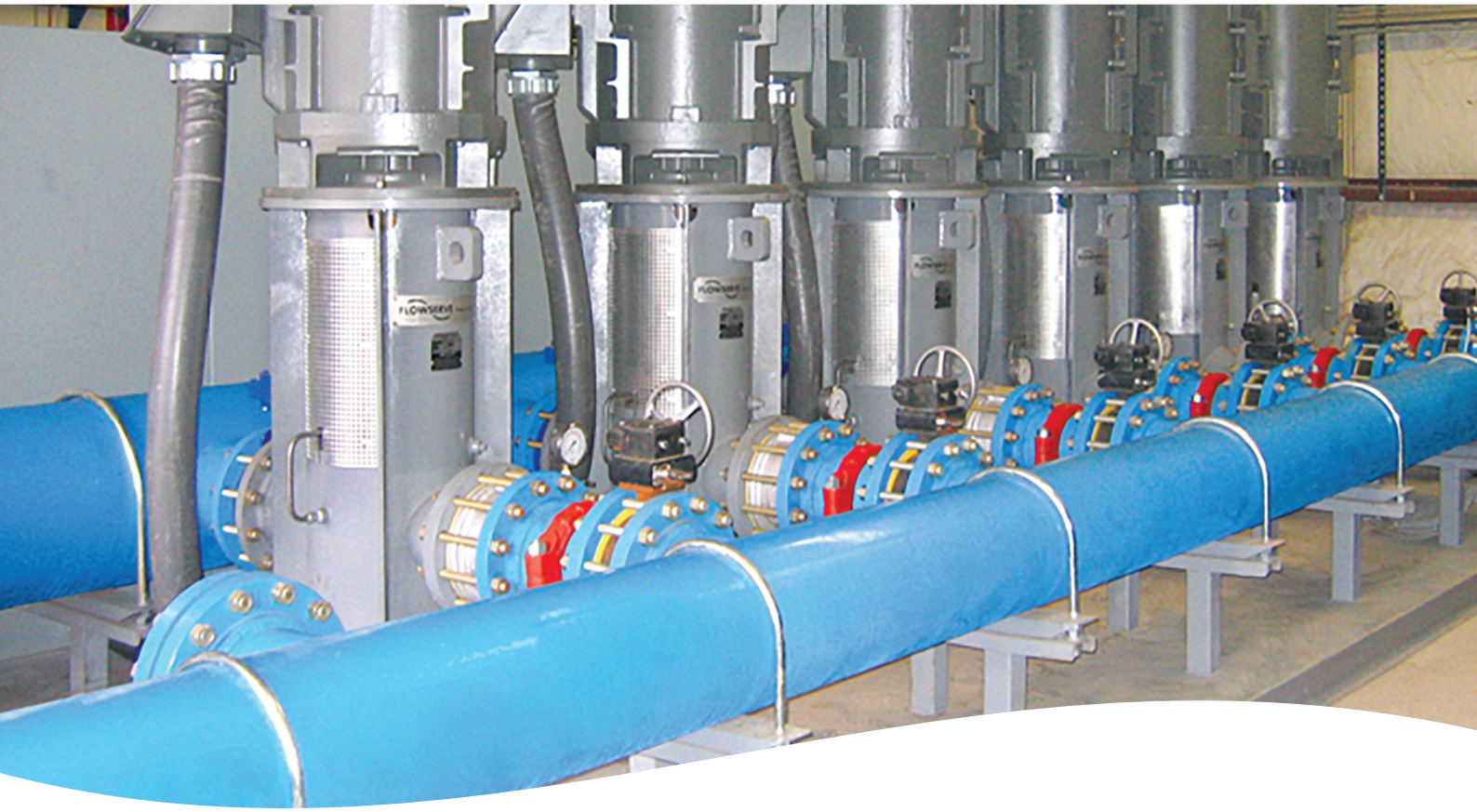
Unequaled hydraulic coverage and design flexibility

Flowserve VPC pumps are one of the world's most comprehensive lines of mixed-flow, diffuser-style, double-casing vertical turbine pumps. Available in single or multistage construction, as well as standard and ISO 13709/API 610-compliant designs, VPC pumps incorporate the proven hydraulics of the Flowserve VTP vertical turbine, wet-pit pump into a double-casing configuration. Multiple design configurations and broad hydraulic coverage ensure you get a cost-effective solution that precisely meets your application requirements.

- **Quick delivery and engineered flexibility —** VPC pumps come in a variety of standardized designs for quick turnarounds or they can be configured to order for custom specifications.
- **Unsurpassed hydraulic coverage —** Through design innovation and multiple legacy brands, the extensive hydraulic coverage meets nearly any duty condition requirement.
- **In-depth pump analysis —** A full array of structural (reed critical frequency, nozzle loads, seismic calculations), rotor dynamic (torsional, lateral) and thermal analyses are available to optimize pump performance and reliability.
- **Multiple design configurations —** VPC pumps are available in a variety of configurations to meet the requirements of a diverse range of applications and installation demands.
- **Wide range of material options —** Customers can select from numerous materials, including iron, bronze, stainless steel and super duplex, to maximize pump life in a range of applications.



Standard configuration



Application versatility

Flowserve VPC pumps are engineered to perform in a wide range of applications where a wet well is not available. They are designed for continuous duty and are particularly well suited for services with limited NPSH. VPC pumps meet the design requirements of international standards, including ANSI, AWWA, ASME and the Hydraulic Institute.

Principal industries

- Power
- Oil and gas
- General industry
- Water resources
- Chemical

Key applications

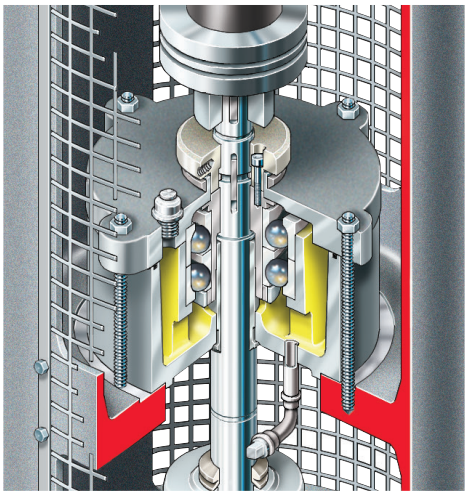
- Hydrocarbon booster
- Hydrocarbon transfer
- Pipeline booster
- Petrochemical transfer
- Condensate
- Water supply
- Water transfer
- Snowmaking
- Brine injection
- Heater drain

Configurations and options

Thrust bearing assembly

Axial thrust bearings withstand the total pump hydraulic thrust as well as the rotor weight. Self-lubricating, anti-friction bearings are utilized for standard applications.

- NEMA applications include a thrust bearing within the motor.
- IEC applications require the thrust bearing to be integral to the pump.

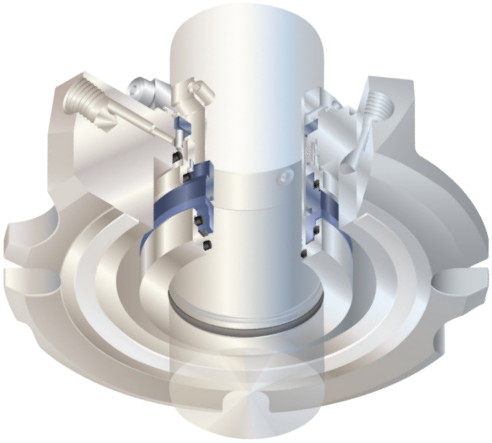


Sealing configurations

Sealing configurations include packed box with flexible graphite packing and mechanical seals.

Mechanical seals provide increased reliability and functionality for VPC pumps:

- Pressures to 100 bar (1,450 psi)
- No leakage
- Easy access for maintenance and parts replacement
- Single and dual arrangements available
- Multiple seal piping plans available



Intake Design

Single Suction

- Standard and low NPSH impellers
    - Minimize suction can length
    - Reduce risk of cavitation

Double Suction

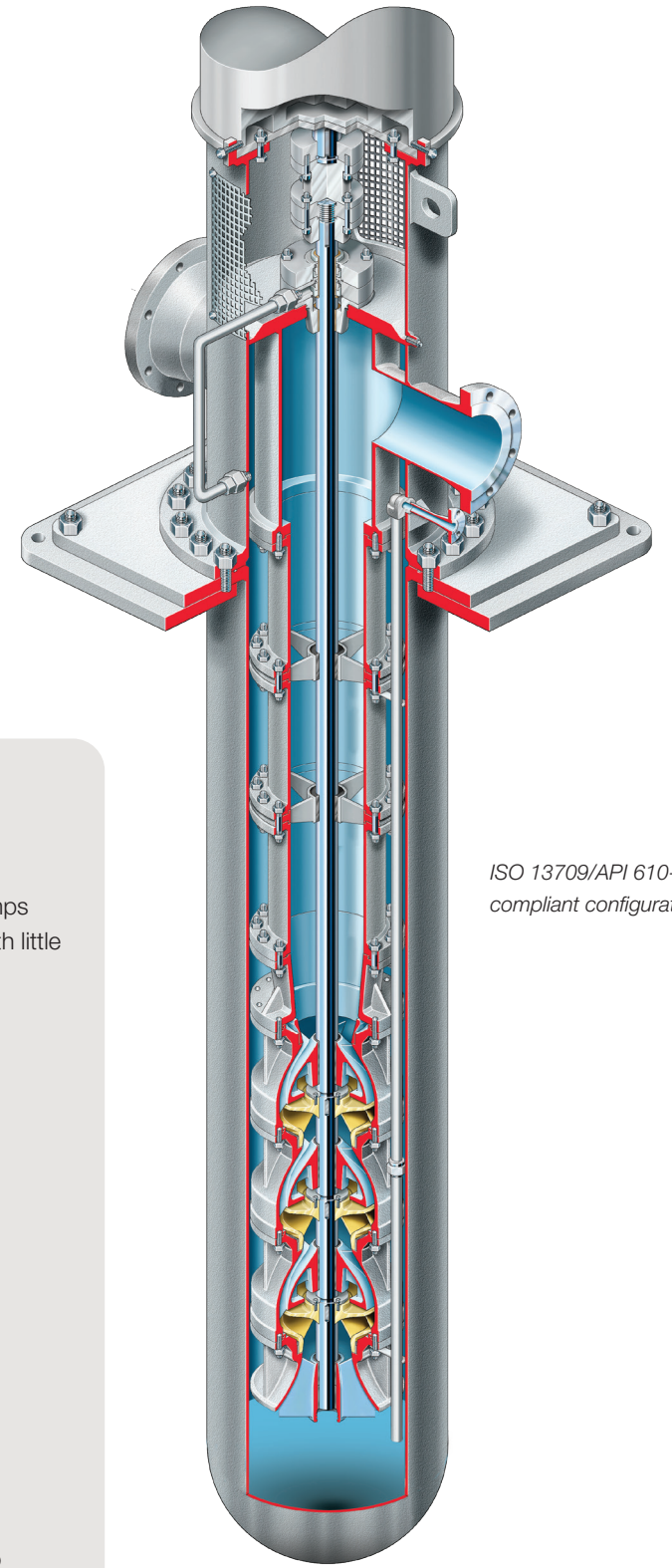
- Minimal axial downthrust to extend bearing life
- Low shut-off head reduces system pressure requirements
- Twin volute design minimizes radial loads, extending bearing life
- Low suction specific speed allows a wide operating range
- Superior NPSH characteristics reduces pump length



ISO 13709/API 610 compliance

VPC pumps are available in a configuration that meets ISO 13709/API 610 standards. They are engineered for easy maintenance, high efficiency and long life in demanding applications found in the oil and gas and related industries. Key features include:

- Pressure ratings of at least 40 bar (600 psi) MAWP
- Weld neck flanges
- Precision, rigid adjustable flanged spacer coupling
- Studs and nuts
- One-piece pump shaft up to 6 m (20 ft)
- Dynamically balanced, keyed enclosed impellers
- Pinned wear rings
- API 610 forces and moments
- Elliptical bottom barrel



ISO 13709/API 610-compliant configuration

Pipeline booster applications

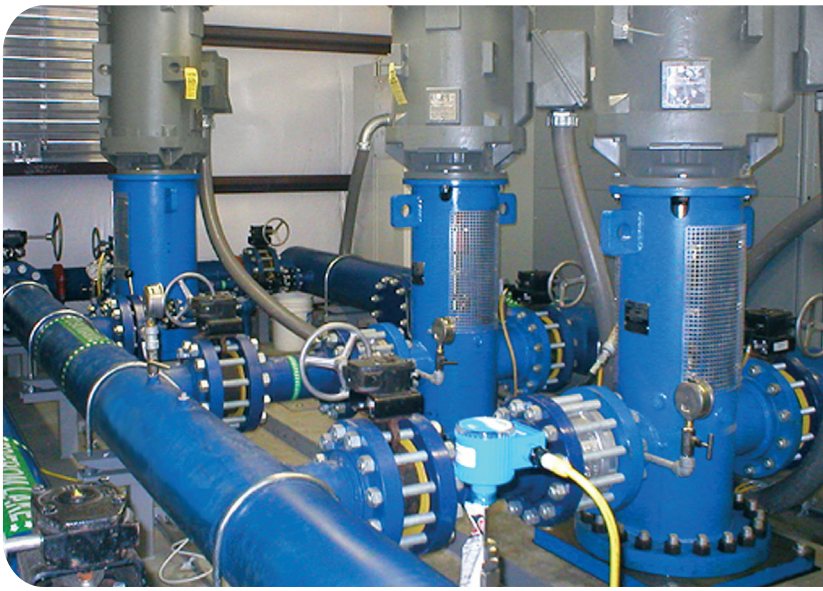
VPC pumps are available in a configuration designed specifically for crude oil transportation. These robust pumps are engineered to provide high reliability and efficiency with little maintenance.

- Standardized design features to minimize manufacturing cycle time
- Suitable for variable-speed operation to optimize operating parameters
- High-efficiency design to reduce power consumption
- Strict quality assurance standards
- Expedited lead times through advanced procurement
- Customized engineering solutions
- Dedicated customer service teams
- API-grade materials with optional NACE compliance
- Option for two times ISO 13709/API 610 nozzle loads to withstand excessive forces and moments

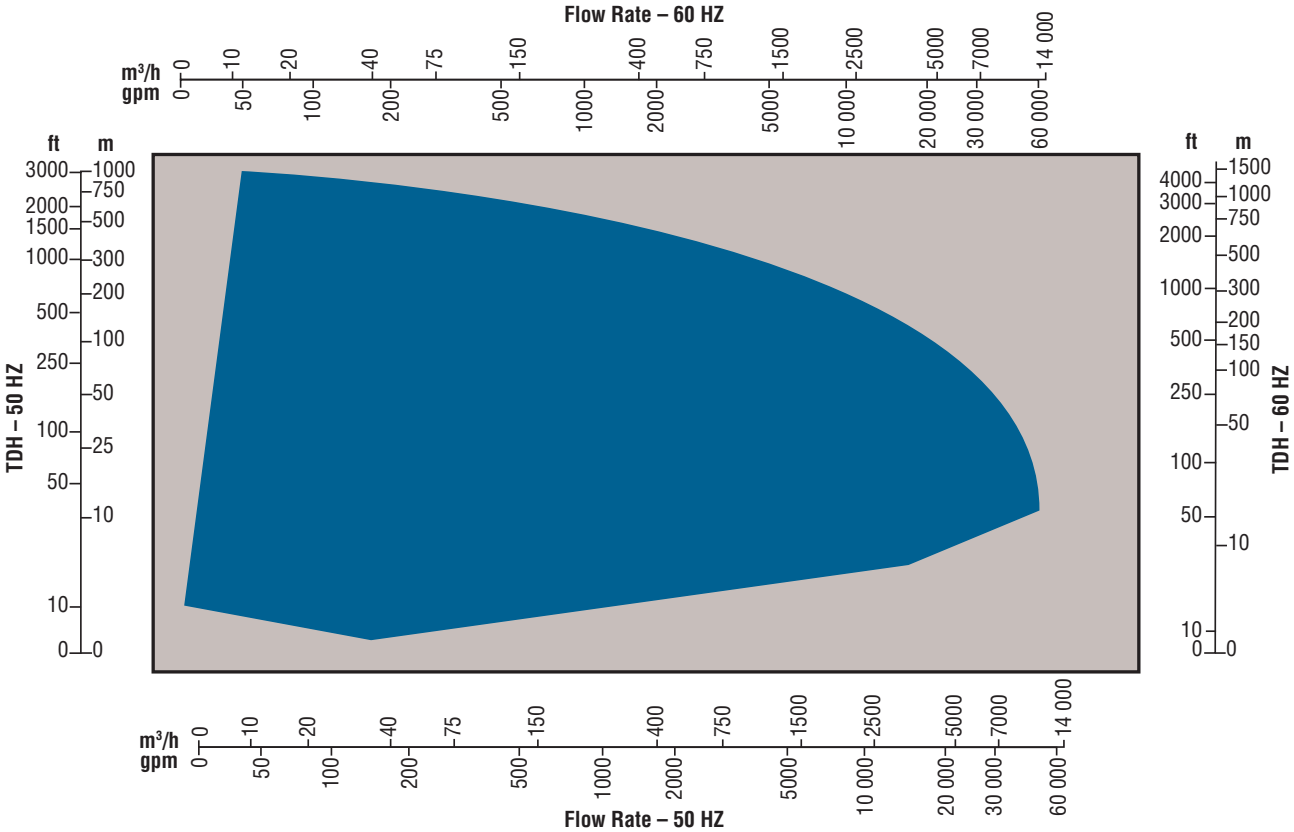
Performance capability

Operating parameters

- Flows to 13,600 m³/h (60,000 gpm)
- Heads to 700 m (2,300 ft)
- Pressures to 100 bar (1,450 psi)
- Temperatures from -75°C to 230°C (-100°F to 450°F)



Range chart



Rebowl services

Boost pump performance and reduce operating costs

Flowserve has developed an extensive rebowl services program that revitalizes the performance of vertical turbine pumps and reduces total pump operating costs. Whether restoring an aged pump or accommodating a change in operating conditions (capacity or head), customers are ensured high-quality upgrades that focus on prolonging equipment life and improving safety.

Service for all makes and models

Flowserve rebowl services are available for any vertical turbine pump, regardless of model, age, service or manufacturer. Rebowl services include:

- Complete upfront inspection of all pump components
- Refurbishment of deteriorated components
- Upgraded replacement components
- Materials upgrades
- Warranty of both service and parts
- On-site installation service available



Bottom-line benefits

- Improved pump performance
- Reduced power consumption
- Increased reliability
- Reduced maintenance costs
- Increased uptime

Refer to brochure PS-100-4 for more information about Flowserve's rebowl services.

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