



# VTP

## Vertical Turbine, Wet-Pit Pumps



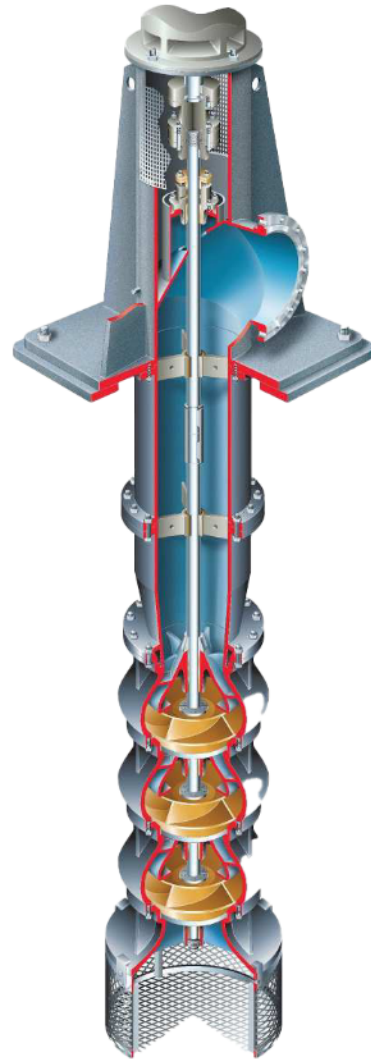
*Experience In Motion*



## Unequaled hydraulic coverage and design flexibility

With more than 250 models available, Flowserve VTP pumps are one of the world's most comprehensive lines of mixed-flow, vertical turbine pumps. 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** — The VTP pump comes in a variety of standardized designs for quick turnarounds or it 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** — The pump is 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.





## Application versatility

Flowserve VTP pumps are engineered to perform in a wide range of industries and applications. These single-casing, diffuser-type pumps are designed for continuous duty in wet-pit and deep-well applications. Broad hydraulic coverage is combined with numerous configurations, materials of construction and options to provide the best pump selection for a wide variety of services.

Flowserve VTP pumps are available in several specialty configurations to suit specific application requirements. Refer to page 5.

## Principle industries

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

## Key applications

- Intake water
- Circulating water
- Cooling water
- Irrigation
- Municipal water
- Chemical processing
- Storm water
- Oil and gas production



# Configurations and options

## Discharge configurations

When using a fabricated discharge design, VTP pumps are available with above- or belowground discharge flanges to suit site conditions.

## Line shaft bearing lubrication

Product lubrication utilizes open line shaft construction, allowing the line shaft bearings to be lubricated by pumped liquid. Enclosed oil lubrication isolates the line shaft and bearings from the pumped liquid, minimizing maintenance in abrasive services. Alternative lubricants such as clean water or grease also can be used with enclosed line shaft construction.

## Thrust bearing assembly

The axial thrust bearings withstand the total 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

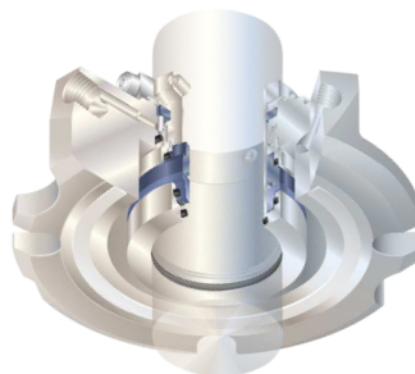
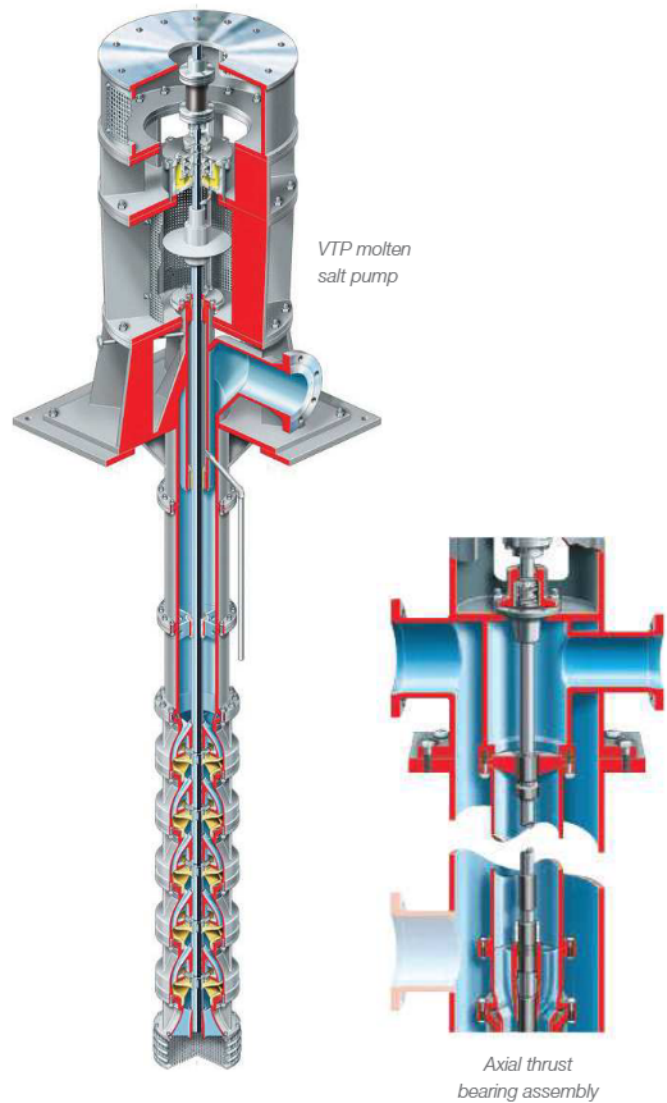
Sealing configurations include packed box with flexible graphite packing, single or double mechanical seal, and API piping plans.

## Multiple driver options

Flowserve VTP pumps are available with multiple driver options, including electric motors (solid or hollow shaft), diesel engines with right-angle gears and steam turbines.

## Vane grating baskets

Proper inlet fluid conditions are important to pump performance. Vane grating baskets help ensure uniform flow into the pump, even when sump conditions are not ideal. These baskets can also help reduce submergence requirements.



ISC2 mechanical seal





*Gemasolar plant. Property of Torresol Energy. © Torresol Energy*

## Specialty configurations

### Molten salt applications

Molten salt used in concentrated solar power plants possesses high thermal conductivity, allowing temperatures to reach 600°C (1,100°F). As a leading provider of molten salt pumps for more than 60 years, Flowserve understands the detrimental effects of heat distortion on a vertical pump. That's why Flowserve engineers utilize advanced thermal mapping software to ensure adequate heat dissipation and mitigate distortion.

### ISO 13709/API 610 compliance

VTP 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 weld neck flanges; precision pump-to-motor couplings; a one-piece pump shaft; dynamically balanced, keyed, enclosed impellers; pinned wear rings; and API 610 forces and moments.

### Barge stripping applications

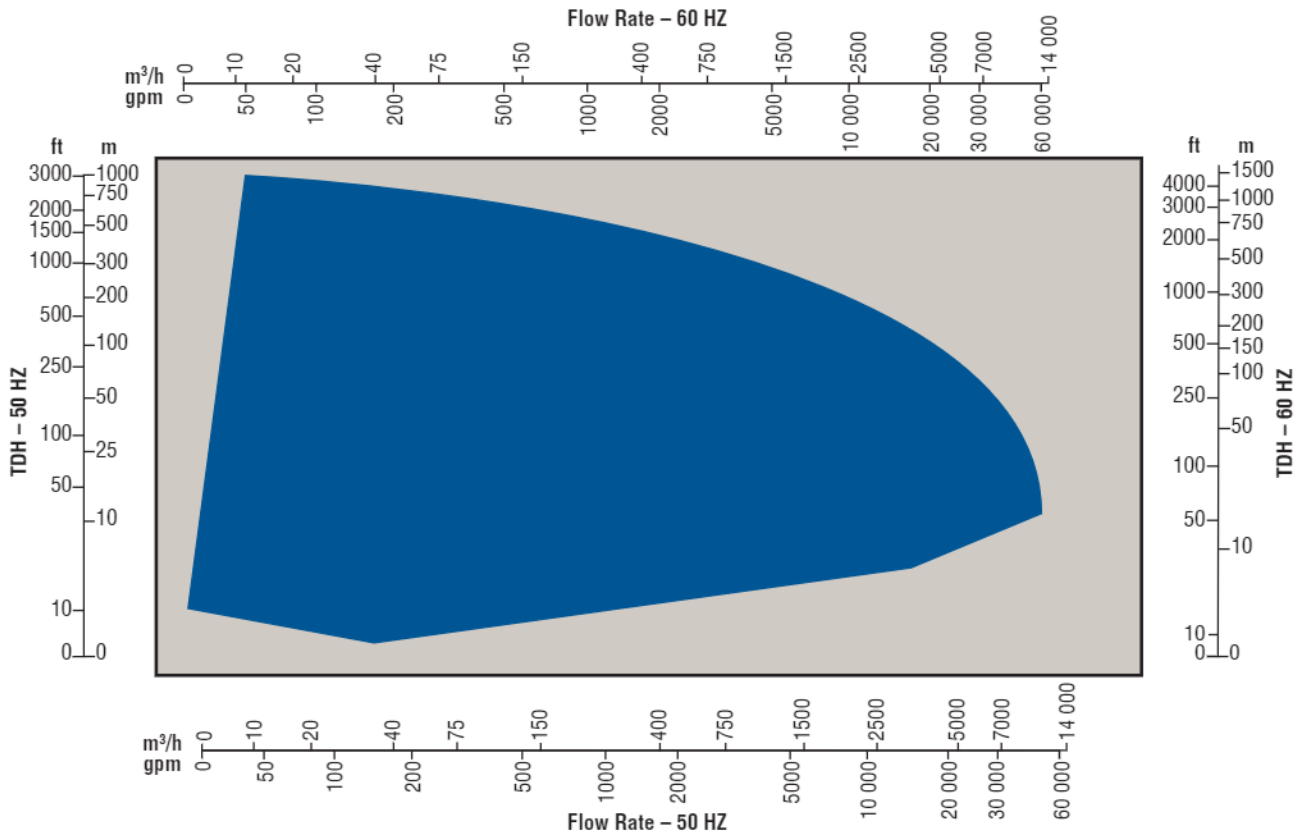
Specifically designed for transportation barges, the Flowserve Barge Pump continues to be the premier brand used on inland and coastal waterways. It is a vertical self-contained, self-priming unit designed for barge unloading and transfer operations. With the high-efficiency Barge Pump, stripping turnaround times are kept to a minimum. Furthermore, its innovative pollution-prevention design inhibits costly oil and chemical spills.

### Groundwater development

For irrigation and agriculture markets, pre-engineered designs, standardized materials and stocked components provide a reliable vertical turbine pump that minimizes price without sacrificing quality or performance.

# Performance capability

## Range chart



### Operating parameters

- Flows to 13,600 m<sup>3</sup>/h (60,000 gpm)
- Heads to 700 m (2,300 ft)
- Pressures to 100 bar (1,450 psi)
- Temperatures from -45°C to 300°C (-50°F to 570°F)
- Sizes 150 to 1,375 mm (6 to 55 in)
- Settings to 365 m (1,200 ft)

# 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

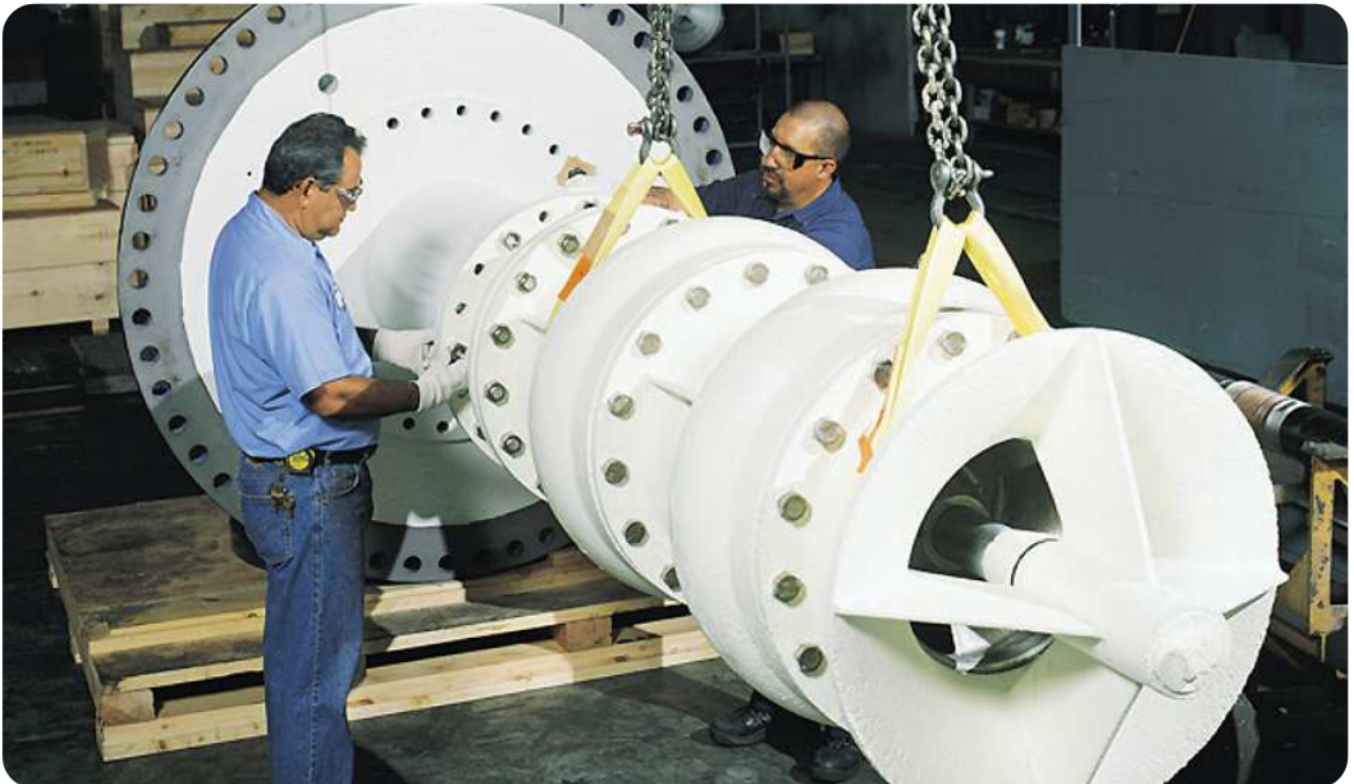
Flowserve rebowl services are available for any vertical turbine pump, regardless of model, age, service or manufacturer. Rebowl services include:

- 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.*





Flowserve Corporation  
5215 North O'Connor Blvd.  
Suite 2300  
Irving, Texas 75039-5421 USA  
Telephone: +1 937 890 5839

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PUBR000179 (EN/AQ) May 2020