



# Large Vertical Circulating Water Pumps



Model VCW

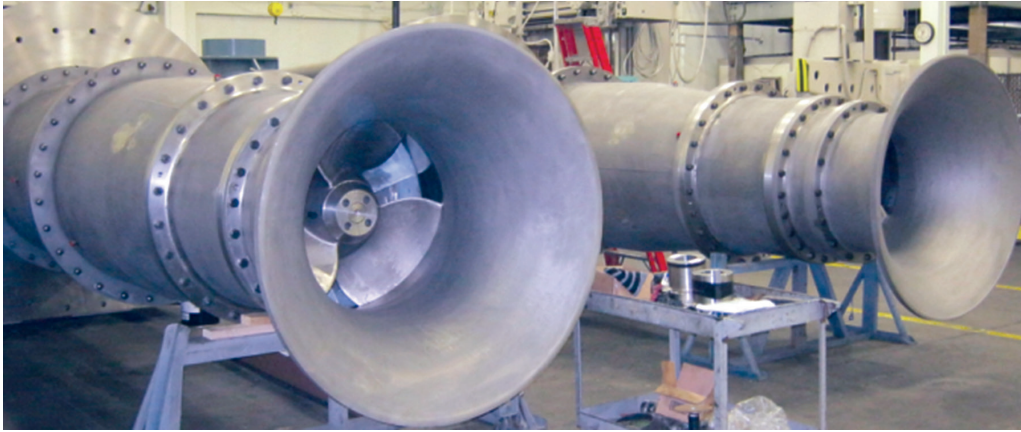


**ITT**

ENGINEERED FOR LIFE

# The Vertical Advantage™: Innovation. Performance. Versatility.

Unique design features, including many patented enhancements, provide a set of customer benefits we call The Vertical Advantage™.



There are pumps. Then there are ITT Goulds Pumps Verticals, the world's most reliable source of Vertical Circulating Water Pumps, model VCW. Unique design features, including many patented enhancements, provide a set of customer benefits we call The Vertical Advantage™.

## Tough Jobs. Tougher Pumps.

- Power generation cooling (main, intermediate and secondary water circulation)
- Condenser cooling with maximum efficiency
- Desalination sea water intake across the globe
- Flood protection in storm ravaged areas
- Waste treatment plants (industrial and municipal)
- Industrial services including descaling, cooling, quench process, fire protection and API services

## Taking Verticals To New Heights:

### **Discharge Head**

Patented "O" Head design provides consistent flow and eliminates potential resonance frequencies through a comprehensive Finite Element Analysis.

### **Impeller**

Optimum hydraulic balance conditions achieved by eliminating balance holes. Prototypes developed from

geometrically similar model impellers, tested to ensure peak performance in the field.

### **Wear Rings**

Reduce downtime and costly repairs with addition of this option on the impeller and diffuser/suction bell. Wear rings are made of hardened alloys and easily replaceable to renew design-running clearances.

### **Diffuser**

Recover the velocity head by straightening the flow of the impeller with this carefully crafted element.

### **Suction Bell**

Separately cast, precision component, provides a smooth flow to the impeller eye, with minimized submergence requirements.

### **Column and Elbow**

Column pipe is fabricated in discrete sections to provide intermediate guide bearings required. Elbow can be arranged for either above or below floor discharge required on specific applications.

# We're Models of Efficiency.

Pump issues? ITT Goulds Pumps will save you. Cost containing features are built into every one of our technologically advanced Verticals. Accurate models that match prototype specifications are tested and retested before your customized Vertical is created.

## Upgrades That Reduce Downtime.

- Cantilever impeller design eliminates the tail bearing and lowers NPSH values. This improves fluid inlet conditions and hydraulic performance.
- Want added stability? We support the upper bearing above the first stage impeller by adding an extra length or double bearing.

## Goulds Pumps Doesn't Just Pass Tests. We Ace Them.

### Computational Fluid Dynamic Analysis

Determines the sump flow conditions at the pump inlet for superior pump performance.

### Critical Speed Analysis

Ensures that the first critical speed is well above the maximum operating speed of the pump.

### Mechanical Design Analysis

Defines the proper shaft size and configuration along with other critical design features.

### Model Test Data

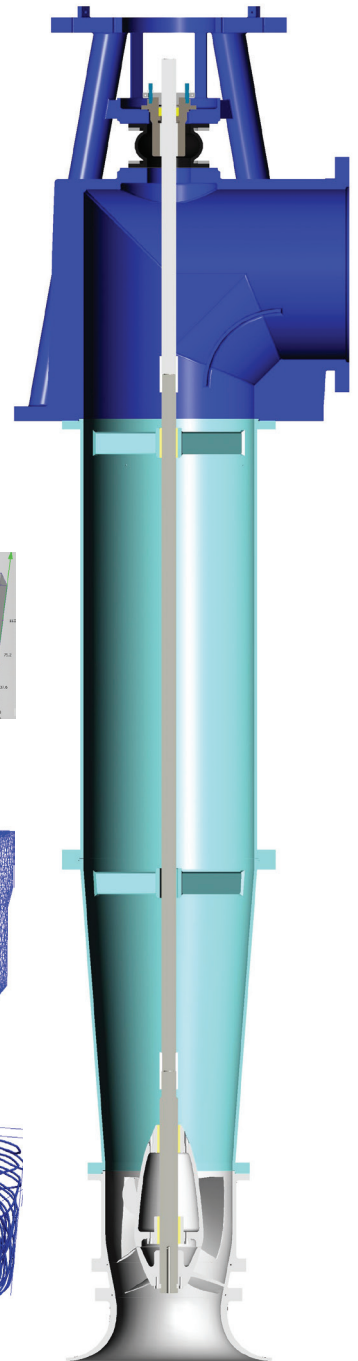
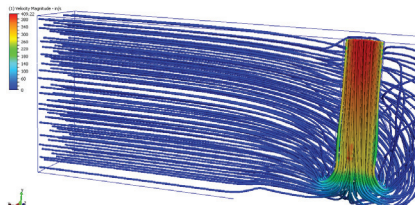
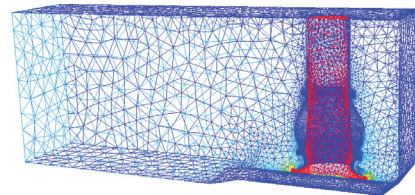
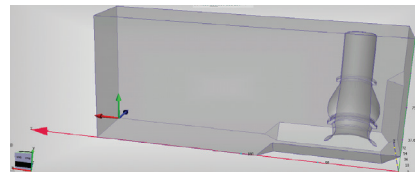
Validates geometrical similarity between pump models and full-size pumps. Aids in casting, fabrication, machining and inspection in pump manufacturing. No need for costly full-size testing.

### Start-Up Analysis

Identifies the optimal starting sequence between the pump, driver and discharge valve. Determines ability of pump to start under adverse conditions.

### Pump Quality

Inspection of all pump components and assemblies to ensure reliable operation, meeting the standards of the Hydraulic Institute.



# Outside The Box Design. An Inside Look.

Look behind the scenes. See how Goulds Pumps has reconfigured nearly every part of our Vertical Pumps to enhance functionality and reduce your repair and project management expenses.

## Shaft

Transmits maximum power at well below the pumps' first critical speed. Strict control of shaft straightness provides dependable operation and longer service life.

## Shaft Sleeves

Optional feature at all bearing sleeves and at the stuffing box locations. This hardened alloy alternative protects the shaft and extends service life.

Designed for easy replacement and maintenance.

## Bearings

Protected from high pressure pumpage and contaminants, our bearings are isolated inside enclosing tubes in the column pipe as an alternative.

A separate, clean fluid source lubricates bearings and seals, causing less abrasion and wear.

## Intermediate Coupling

This transmission of power and rotation through the shaft is driven by coupling keys. Thrust loads are transmitted through the split ring design.

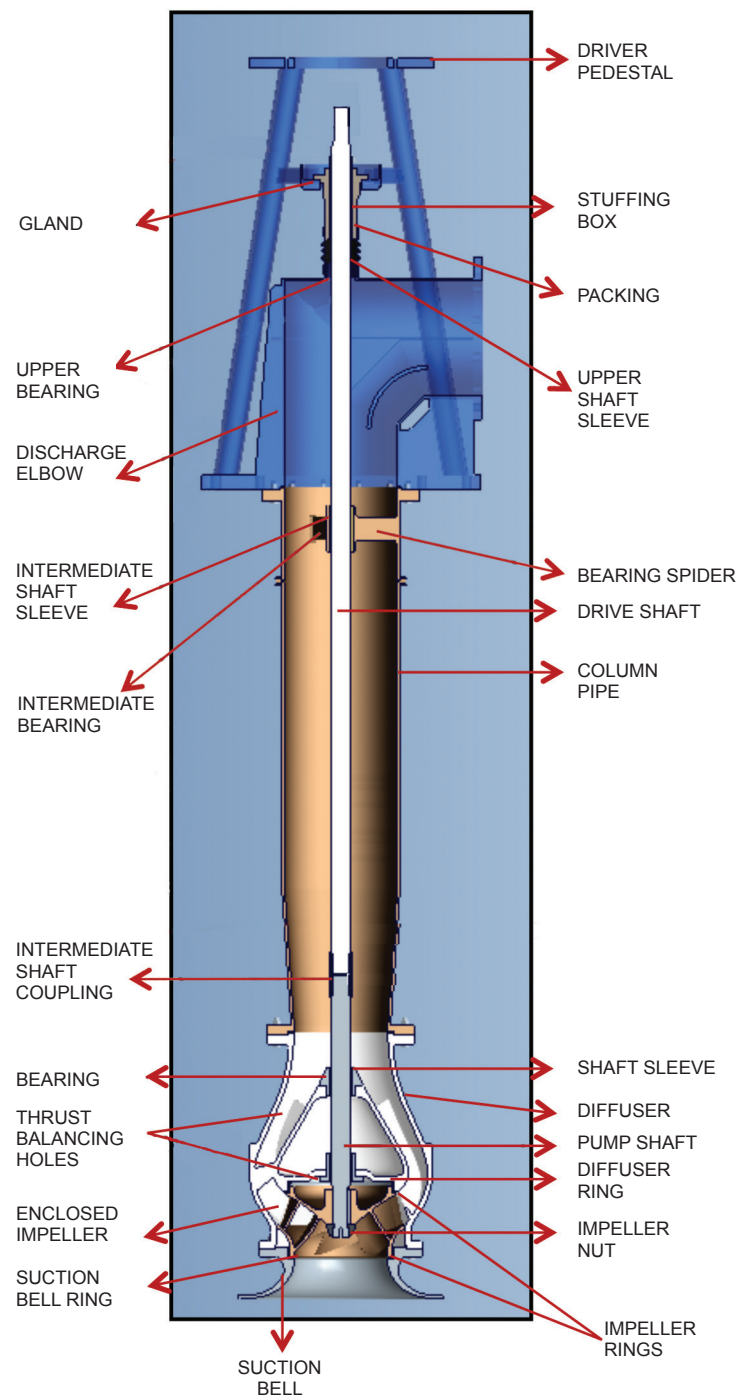
## Rigid Adjustable Drive Coupling

Coupling keys and split thrust ring design transmit the torque, hydraulic thrust and pump rotating weight to the driver. Also provides clearance adjustment between the wear rings.

## Stuffing Box

Packed with flexible graphite material to reduce resistance and prolong shaft service life. A split gland simplifies packing adjustment and replacement.

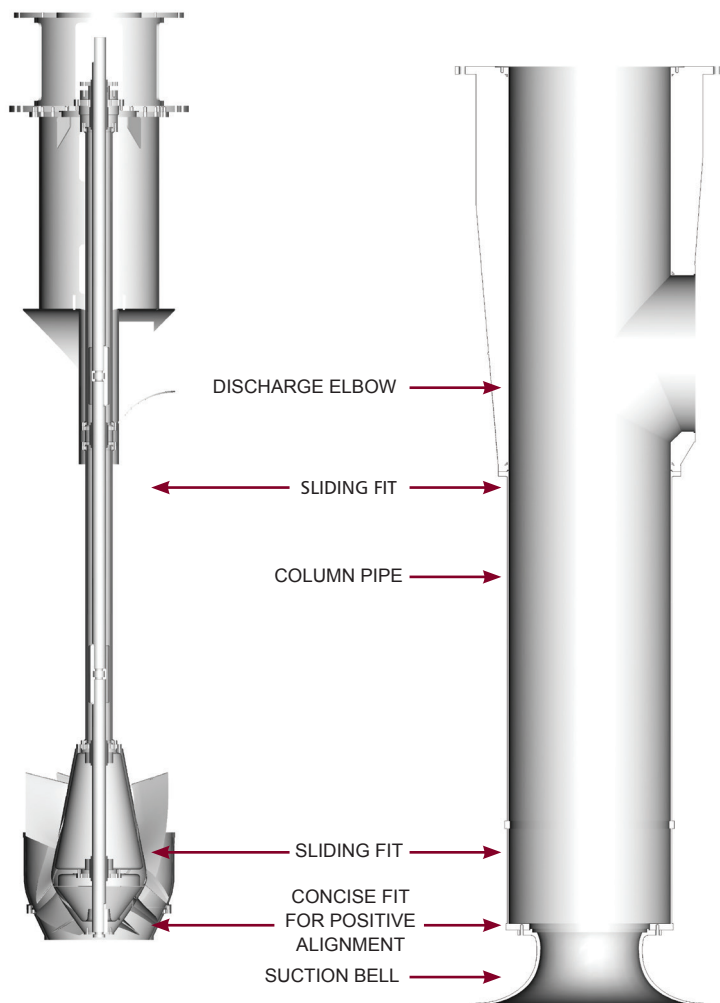
## Non "Pull-Out" Design



# Customers Are Pushing Our “Pull-Out” Design.

For the Power industry and other customers with below-grade discharge, comes a far more convenient way to maintain their high-performance pumps.

## “Pull-Out” Design



## The Ins and Outs of Pull-Outs

- Gone are the headaches of disconnecting and reconnecting pumps from bulky, below-grade discharge pipes
- Our “Pull-Out” option allows easy removal of the inner element of the pump for maintenance, eliminating the need to drain or enter the pump.
- Suction bell, column, discharge elbow and discharge piping are not disturbed. Downtime and repair costs are greatly reduced when worn parts are replaced, restoring system efficiency.
- Sliding and conical fit ensure proper alignment upon reassembly.
- Available on all ITT Goulds Pumps’ Vertical Pump models. Column size for a given capacity is not affected by “Pull-Out” design, with no loss in pumping performance.

## More Protection for Your Pump

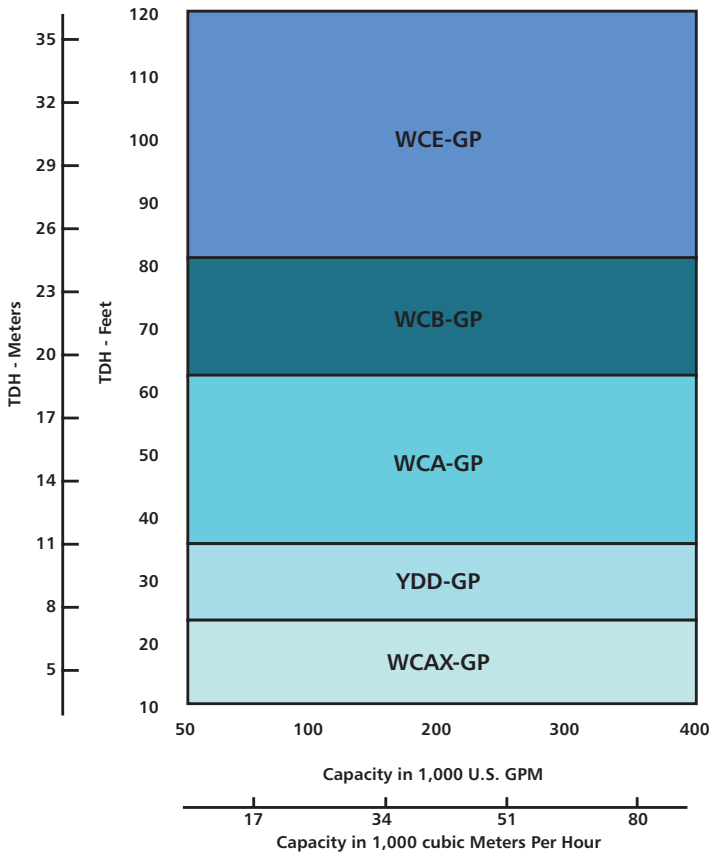
- Our shaft enclosing tube insulates the shaft from the pump fluid and provides a passage for bearing lubrication.
- One end of the shaft tube has an O-ring sliding fit for thermal expansion. Easy to disassemble and reinstall.

# Moving Forward On Hydraulics.

So much of what we do flows from hydraulics. Pumps must be designed to perform in specialized conditions with the right hydraulic fit.

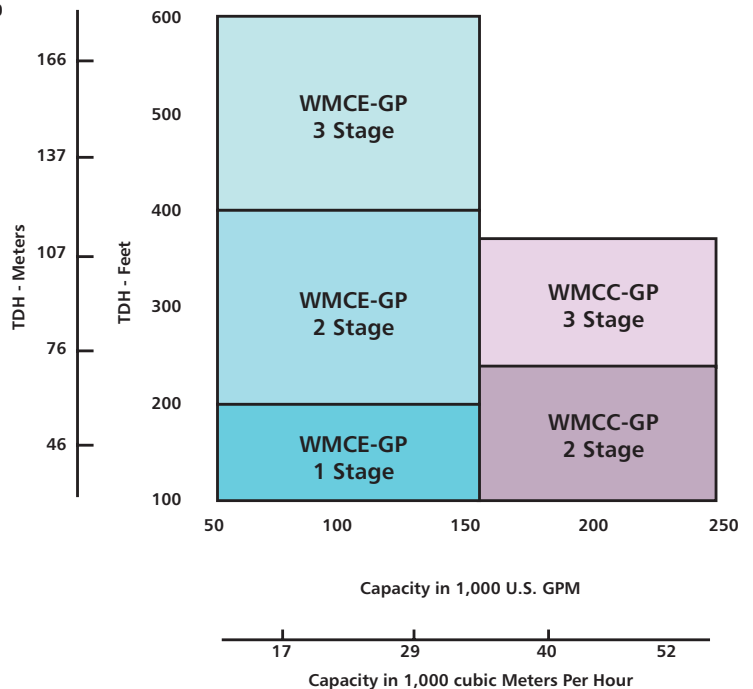
ITT Goulds Pumps has the technical expertise and the tools to make it happen.

## Range Chart



## A Fusion of Form and Function

- Goulds Pumps Engineering utilizes sophisticated 3D design tools to create scalable models of every custom pump. Each model undergoes extensive testing to optimize it for specific hydraulic applications.
- Other hydraulic enhancements include a Suction Bell with flared inlet controls to accelerate fluid to the desired inlet velocity.
- Outer walls on the bowls provide structural integrity, with flange fits located at each end for positive alignment.
- The contour of the diffuser/bowl provides accurate fit to the impeller, maximizing operating efficiency.



# We Know Who We Work For: You.

Customers. They're the reason we exist and the focus of all we do.

ITT Goulds Pumps has created a sales, service and research organization to meet every customer need. From pump selection through aftermarket repairs.



## The Best In The Field

- Our field service network includes maintenance operations that offer rapid response diagnostics and replacement parts worldwide.
- Highly trained engineers are stationed across the globe to provide on-site assistance for any customer service or sales need.
- Service Centers near your project site can repair or rebuild all brands of pumps, valves and rotating equipment. This often eliminates the need for replacement and significantly reduces downtime.
- Installation Specialists serve as customer liaisons on every project. These professionals ensure that your equipment is installed properly and operating according to contracted specifications.

## State of the Art Facilities

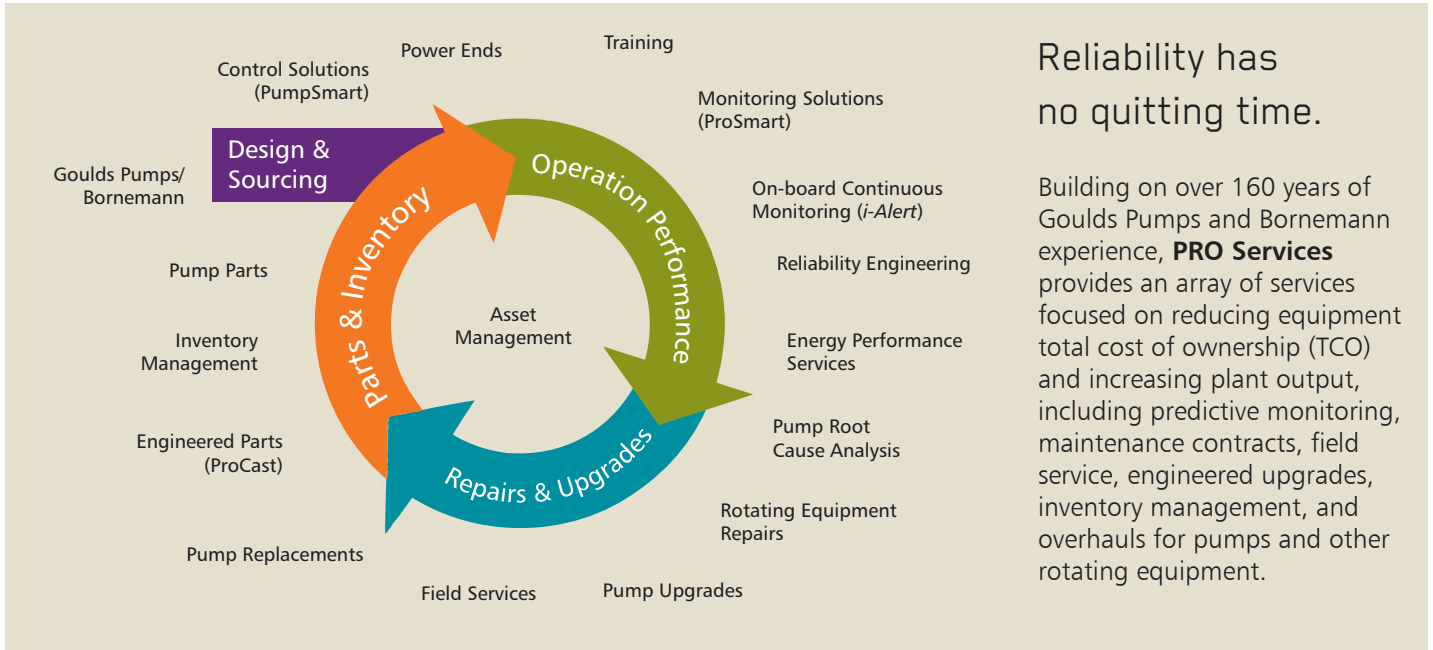
- Test capacities up to 400,000 GPM (90,850 m<sup>3</sup>/hour)
- 8,000 hp (6,000kW) capability, 300 PSIG multiple gear drives
- Enhanced data acquisition systems facilitate technical evaluation
- All vertical pump configurations
- Video monitoring of testing for all vertical pumps



Visit our website at  
[www.gouldspumps.com](http://www.gouldspumps.com)



Your Total Solution For Equipment Life Cycle Optimization



Reliability has no quitting time.

Building on over 160 years of Goulds Pumps and Bornemann experience, **PRO Services** provides an array of services focused on reducing equipment total cost of ownership (TCO) and increasing plant output, including predictive monitoring, maintenance contracts, field service, engineered upgrades, inventory management, and overhauls for pumps and other rotating equipment.



PRO Services provides OEM parts for Goulds Pumps, Bornemann Pumps, AC, Morris, Goyne, CB, HVC, UXN and ROV in a timely manner to meet end user requirements. Significant levels of inventory and quick response capability provide the necessary programs to meet all repair needs.

PRO Services provides programs of reliability services, energy assessments, asset management and training. These can be deployed as stand-alone or integrated solutions, tailored to the needs of your company.

PRO Services provides an array of repair and upgrade services to extend equipment life. PRO Services helps customers develop effective maintenance and asset management programs to lower maintenance costs, improve uptime, reduce inventory costs and extend equipment life.



ENGINEERED FOR LIFE

ITT Industrial Process  
 240 Fall Street  
 Seneca Falls Operations  
 Seneca Falls, NY 13148  
[www.itt.com](http://www.itt.com)

ITT Industrial Process  
 Vertical Products Operations  
 3951 Capitol Avenue  
 City of Industry, CA 90601

ITT Industrial Process  
 Engineered Valves  
 33 Centerville Road  
 Lancaster, PA 17603  
[www.engvalves.com](http://www.engvalves.com)