

VCW

Large Vertical Circulating Water Pumps



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

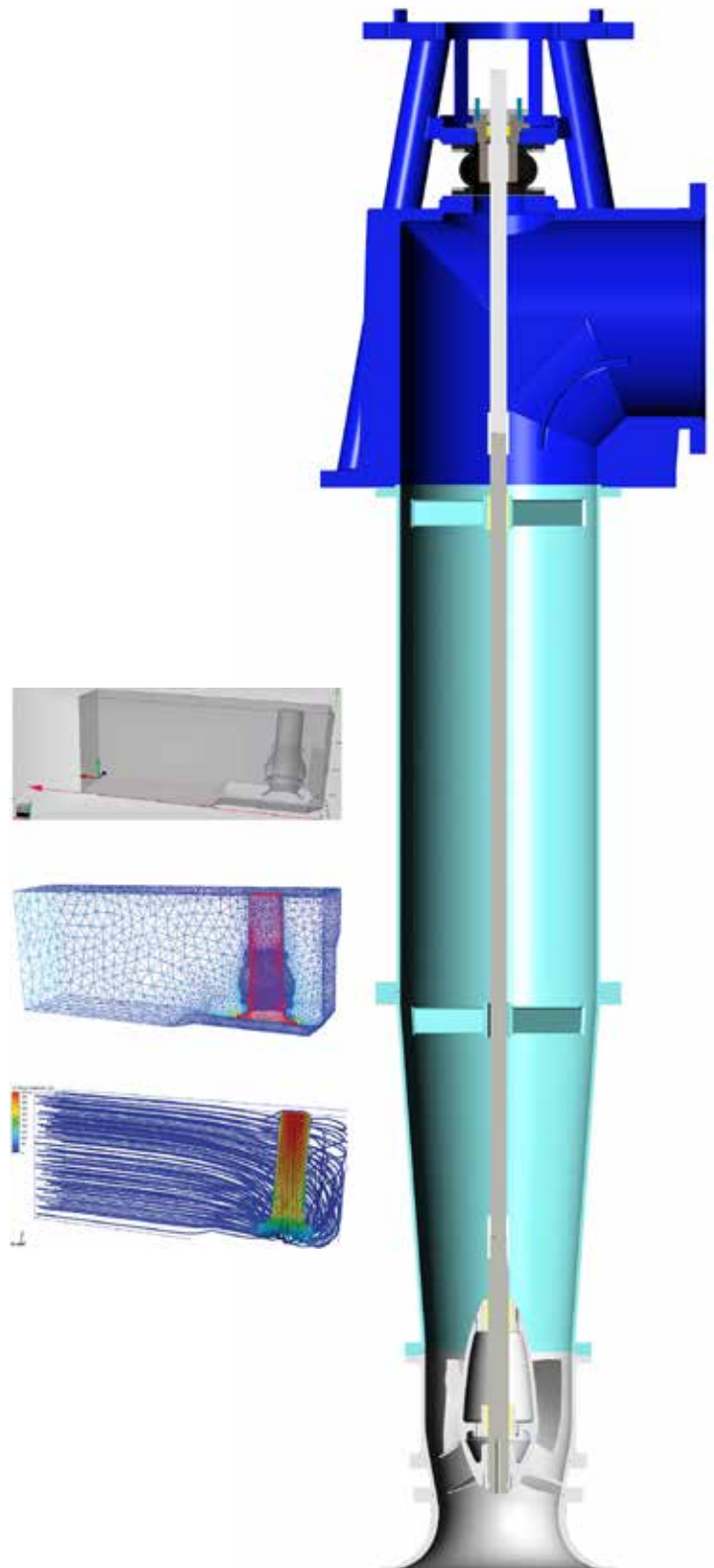
Validates geometrical similarity between pump models and full-size pumps. Aids in casting, fabrication, machining and inspection in pump manufacturing. No need for costly full-size testing.

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.

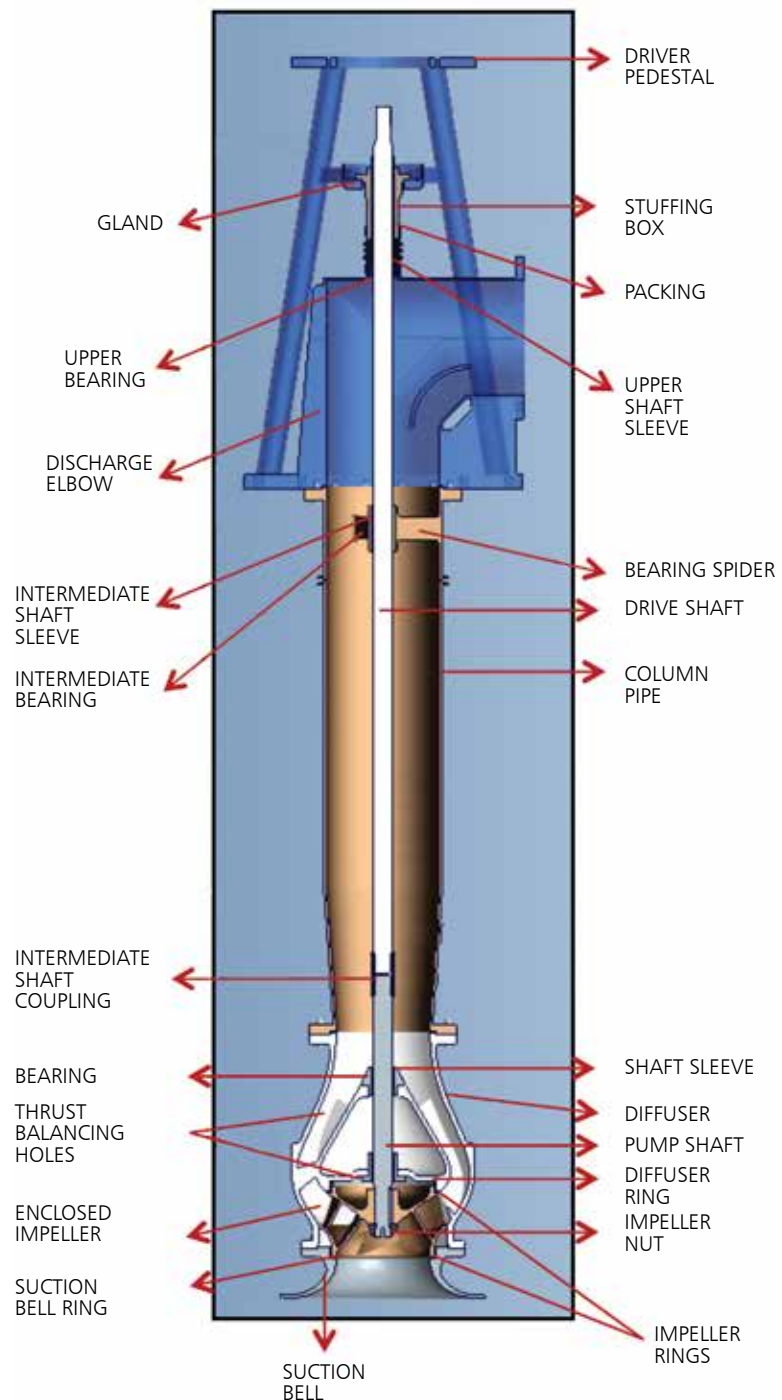
Rigid Adjustable Drive Coupling

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.

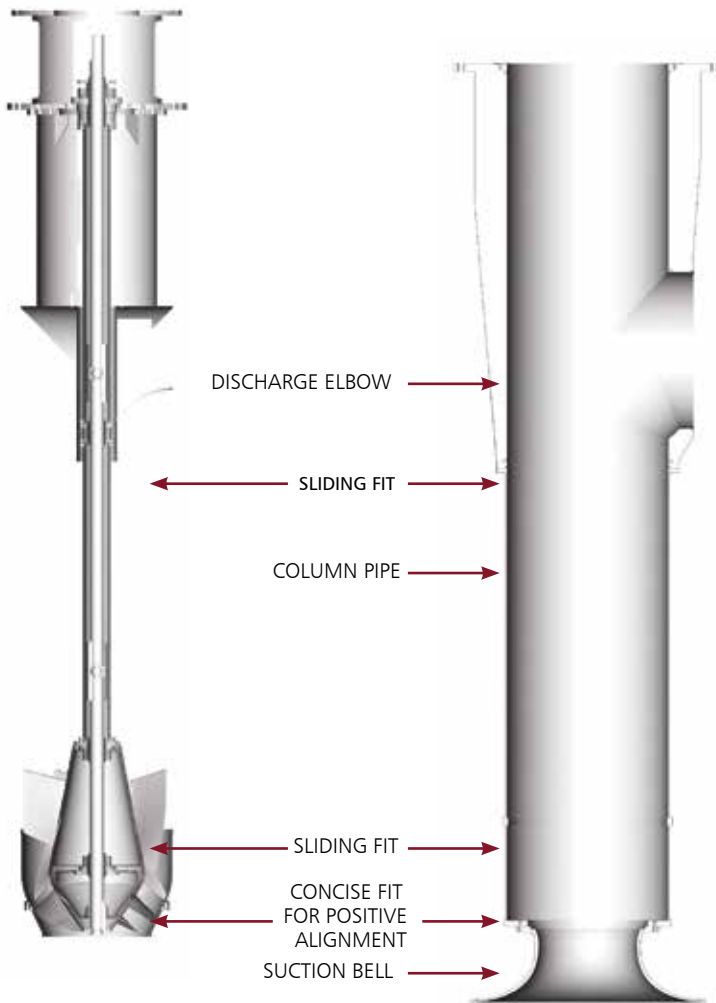
Non "Pull-Out" Design



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.

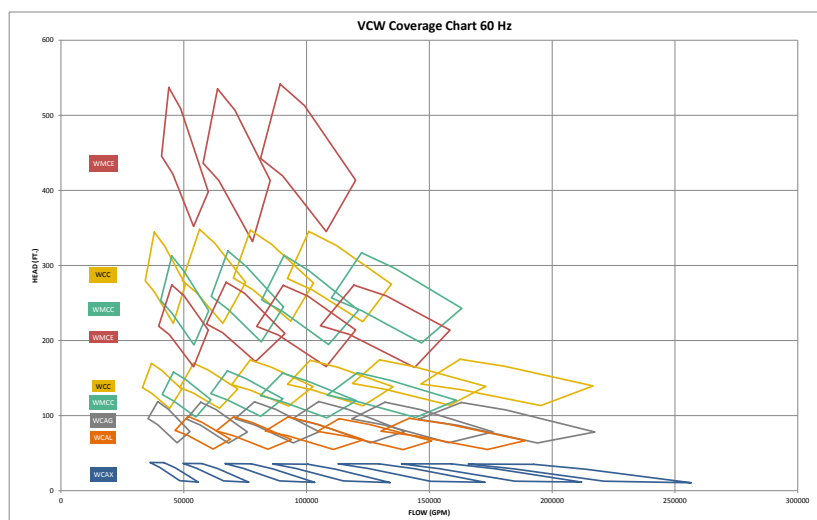
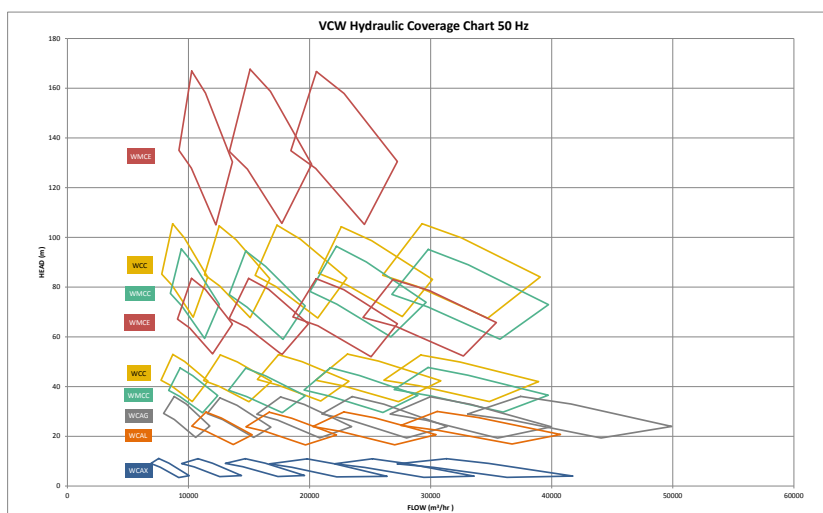
Moving Forward on Hydraulics.

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.

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.

Range Chart



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.



State of the Art Facilities

- Test capacities up to 400,000 GPM (90,850 m³/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

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.



Patented O-Head and OC-Head Eliminates Excessive Vibration

Converting to an O-Head or OC-Head results in smoother-running pumps with greatly increased mean time between failure (MTBF), thus avoiding costly repairs and downtime. The O-Head is ideal for high flow, low pressure applications with discharge sizes of 18-32" where vibration is an issue. The vibration is most often caused by excessive or variable loads applied to the discharge flange. The O-Head is available both in new pumps and as retrofits. The OC-Head, which includes an additional isolation element between the head and upper bearing area, is recommended for discharge sizes above 32".

With a traditional head design, any deflection at the discharge flange creates an even larger deflection at the seal housing and motor mounting flange. The O-Head, on the other hand, uses four separate legs to support the motor, which allows the discharge flange to move without affecting bearing alignment.

In the OC-Head, the flexible element isolates the discharge nozzle movement from the bearing and seal.



By mounting the motor on four legs, the O-Head effectively decouples the turning elbow from the motor.

Case Study

Circulating Water pumps at a US based electric company with aging infrastructure began to experience vibration issues. There were cracks in the pumps' concrete foundations. Over time seawater corrosion had reduced the wall thickness of the turning elbows, causing their resonance frequency to move closer to the running speed of the pumps. These two factors combined to create excessive vibration, which caused repeated premature mechanical seal failures and bearing wear. The issues were completely rectified by fitting the pumps with the O-Head, which improved isolation between the discharge flange and the motor mounting. Twelve pumps at the company have been fitted with the O-Head and a dramatic reduction in vibration has resulted in each of them.



— An ITT Brand

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