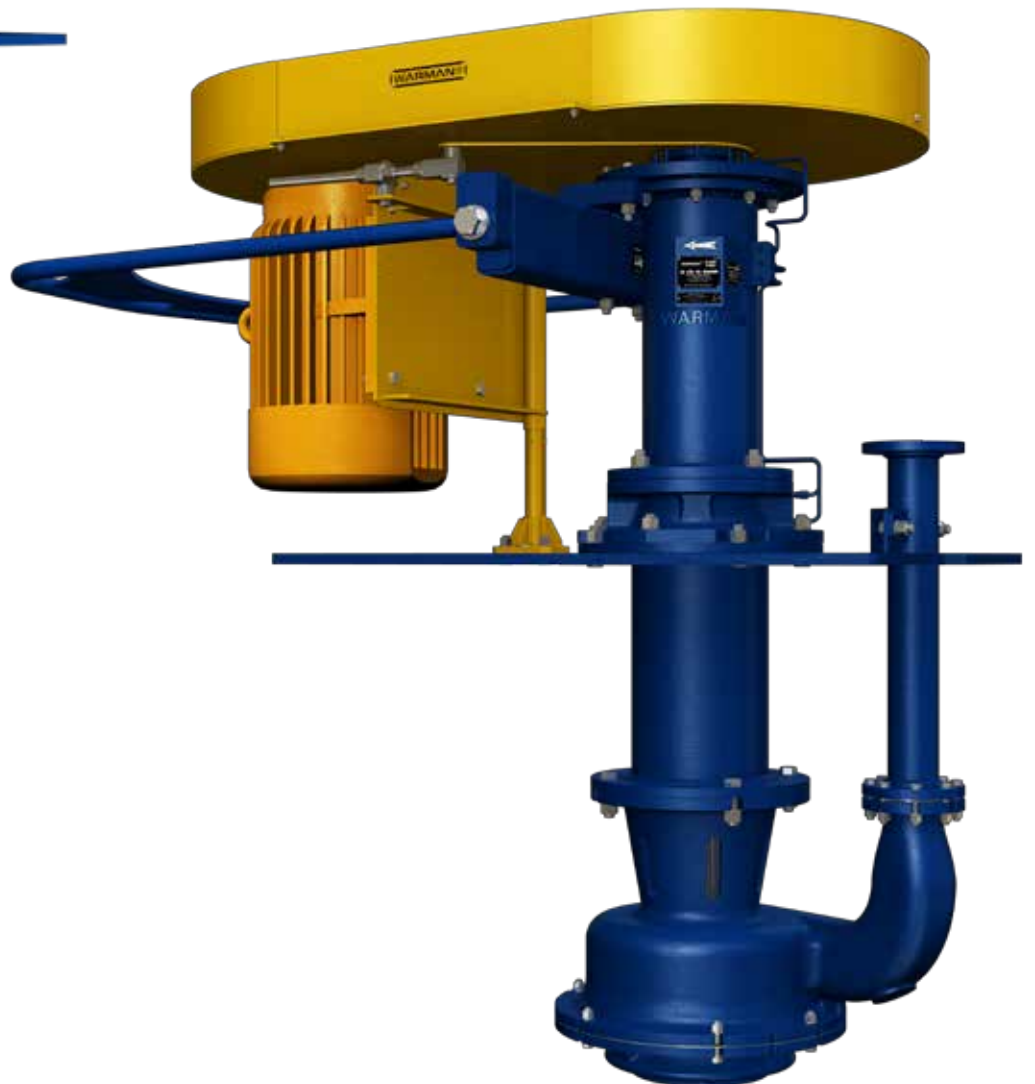


WEIR

Minerals

**WARMAN® Centrifugal
Slurry Pumps**

**WBV® Vertical Cantilever
Slurry Sump Pump Series**



The Warman® WBV® ultra heavy-duty range of vertical cantilevered slurry pumps sets a new industry benchmark for general sump applications.

The Warman® WBV® sump pump series provides substantial performance making it one of the lowest total ownership cost pumps of its class.

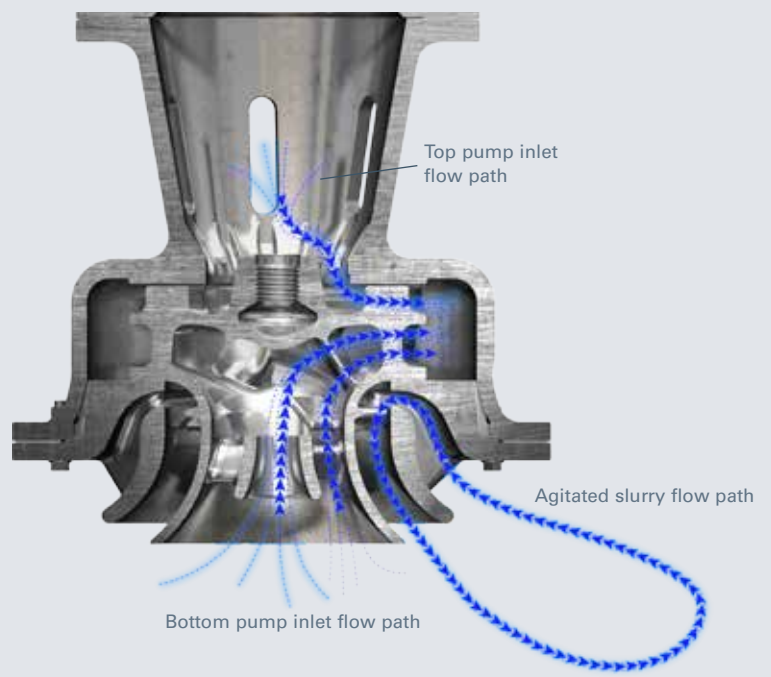
The Warman® WBV® pump offers a clean sump with consistent pump performance in an area of the slurry process that has posed a major concern for years.

The combination of agitation and inlet flow inducing features are designed to ensure that solids do not settle and build up in the sump or cause the pump intake to block during normal pump operation.



The design of the patented Warman® WBV® integrated agitation system achieves high performance with low power consumption.

Slurry flow path around the agitator blades





Warman® WBV® vertical cantilever slurry sump pump

Patented Agitation Technology

Integrated impeller agitation vanes prevent sump pump blockages. No need for an external system with questionable results and high costs.

Reduced Downtime

With only three major components, fewer assembled parts make for ease of maintenance and reduced downtime. Pump axial adjustment is done by adding or removing shims on the pump end during assembly, simplifying assembly and adjustment.

Improved Wear

Highly wear resistant A05 metal parts are used, with extra thickness added to high wear areas to provide long wear life. The casing, with a combination top entry strainer and flange that attaches to the pump column along with a cast discharge bend, minimises parts and reduces the number of joints and overall wear.

Improved Sealing

The suction cover and casing are sealed by a rubber casing seal which is activated by the internal pump pressure to ensure a consistent positive seal. An o-ring seal protects the impeller and shaft threads from ingress of slurry.

Damaging Particle Control

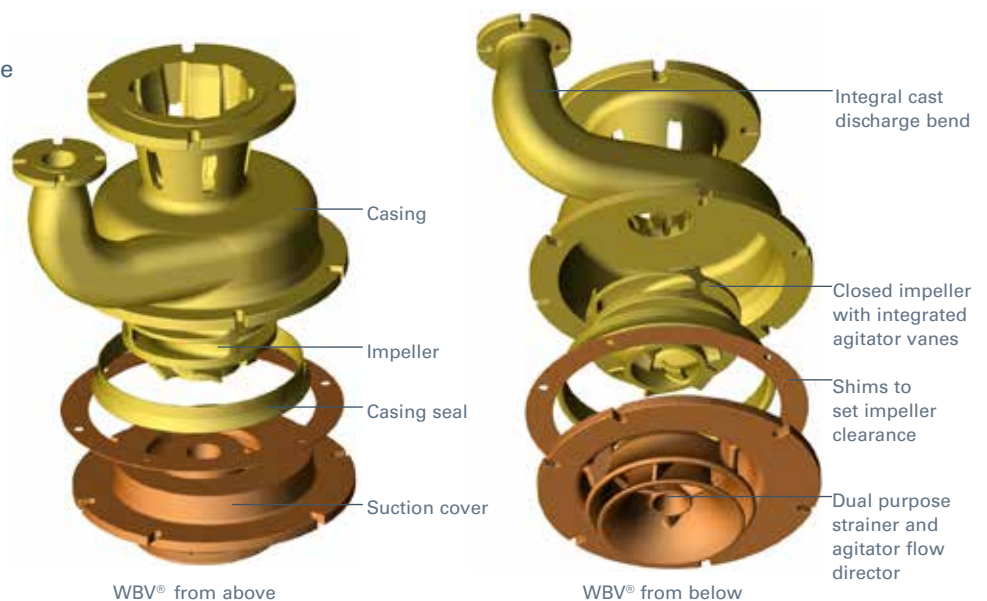
Inlets have strained passageways to limit the particle size that can enter the pump and potentially cause unnecessary damage or blockage. The pump suction cover directs flow from the agitator vanes into the pump inlet to prevent large particles from entering and clogging the impeller.

Constant Priming and Continuous Pumping

The pump takes suction from both the top and bottom to ensure constant priming and continuous pumping.

Retrofittable

Warman® WBV® pump wet ends are retrofittable to the Warman® SP sump pump mechanical ends.



WBV® from above

WBV® from below

Weir Minerals unleashes its newest technology to fight against sump blockage by introducing the all new Warman® WBV® hybrid pump.

Introducing the Warman® WBV® hybrid sump pump

The Warman® WBV® hybrid pump enables sump pump operators to benefit from the enhanced technical advantages of the WBV® sump pump. The WBV® hybrid unit provides hydraulic sump agitation, which keeps solids in suspension, meaning a sump can be almost completely emptied with minimal settlement, removing the need for mechanical agitation, or other external sump pump clearing solutions.

The new robust, long life hydraulics are available as a complete pump, built onto the trusted Warman® SP mechanical drive end, or as a kit enabling conversion in the field for existing SP pumps.

Advantages

- Hydraulic sump agitation
- Solids are kept in suspension and the sump can be almost completely emptied with minimal settlement
- Removes the need for mechanical agitation
- Takes the risk out of sump settlement

Features

The Warman® WBV® hybrid vertical cantilever pump series is a combination of the Warman® WBV® pump and the Warman® SP/SPR vertical sump pump, using the SP drive end with the WBV® wet end and WBV® hybrid column, discharge pipe and mounting plate.

The WBV® wet end offers a clean sump with consistent pump performance in an area of the slurry process that has presented a concern for years. The patented unique combination of agitation and inlet flow inducing features are designed to ensure that solids do not settle and build up or cause the intake to block during pump operation.

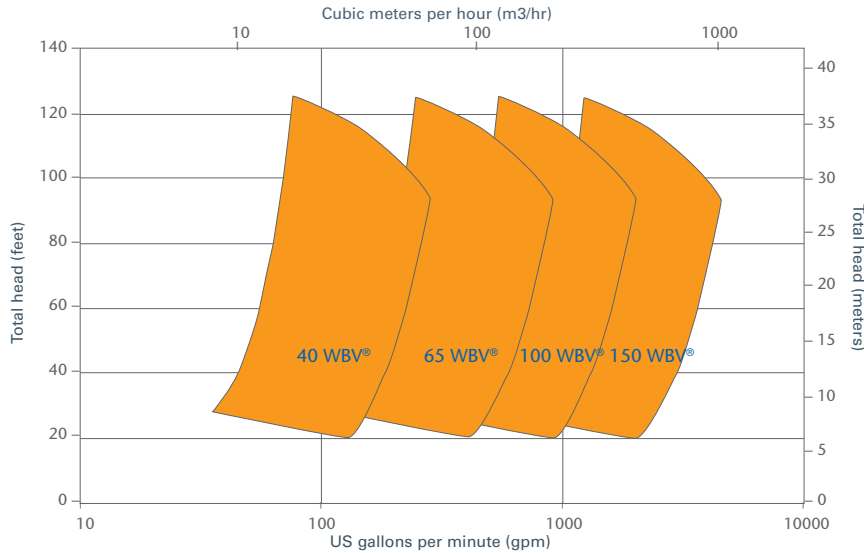
The WBV® hybrid pump can handle arduous sump applications requiring continuous pumping of corrosive slurries or medium which can be highly abrasive.



Warman® WBV® hybrid sump pump

Warman® WBV® sump pump series — quick selection guide

Approximate clear water performance - to be used for preliminary selection only.



The Warman® WBV® sump pump series is designed for tough operations, primarily:

- Difficult applications requiring agitation to ensure no solids build up
- Limiting density spikes normally associated with slumping in sumps or fast settling slurries
- Large particle sizes
- High density slurries
- Continuous or “snore” operation
- Abrasive and/or corrosive slurries
- Poor sump design where slumping prevents proper sump pump operation

Applications

- Minerals processing
- Coal preparation
- Chemical processing
- Effluent handling
- Sand and gravel
- Power generation
- General tank, pit or hole-in-ground slurry applications

Bearing assembly

Each model pump has two bearing frame options to enable the pump to operate throughout its full speed range and avoid critical speed bands.

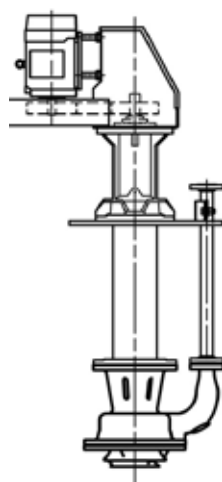
Bearings and labyrinths have a single point greasing design, with the grease block on the side of the frame allowing for easy access and maintenance.

Pump mounting

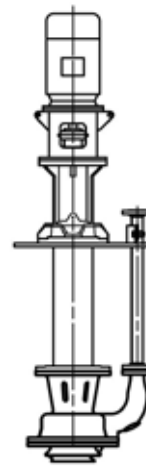
The electric motor is mounted on a pivoting motor plate with a one-point adjustment mechanism for ease of use and for quick and easy belt re-tension.

The motor mounting has an option of being mounted shaft up to maintain a low centre of gravity to minimise pump vibrations and head room required for installation.

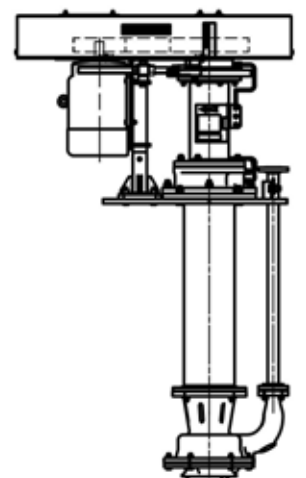
Drive arrangements



Vee belt drive ('Z') drive
Motor shaft vertical down



Direct coupled drive



Vee belt drive ('C') drive
Motor shaft vertical up

To be used for preliminary selection only. Contact your local Weir Minerals sales representative for more information.

Case Study: Kalgoorlie Consolidated Gold Mines – Fimiston

Upgrade to Warman® WBV® sump pump increases production and potentially saves KCGM more than \$536,000 per year.

Background

Located 600 km east of Perth, Western Australia, Kalgoorlie Consolidated Gold Mines (KCGM), (also known as the Super Pit), is the biggest open pit gold mine in Australia. It is jointly owned by Barrick Australia Pacific and Newmont Australia Pty Ltd. The Super Pit processes approximately 13 million tonnes of rock and produces over 700,000 ounces of gold per year.

The Problem

Reloading of ceramic media into the ultra fine grinding (UFG) mill was taking almost two hours to complete: more than double the time it should take. The main source of delay was the incumbent competitor's pump responsible for loading the UFG mill. The original equipment installed was simply not able to handle the volume of ceramic media fed into the sump during the UFG mill reloading process. During reload, the pump would become bogged down regularly.

The reliability team on-site were given the job to source a better-suited piece of equipment to pump the solids.

The Solution

John Gill, KCGM Reliability Supervisor, contacted Weir Minerals Australia for assistance and advice. Weir Minerals worked with KCGM to investigate the issues, gather data and begin a pump trial on-site.

Weir Minerals recommended the Warman® WBV® vertical cantilever sump pump. KCGM were keen to trial the pump, as they needed to resolve their system bottleneck at the UFG mill. The pump was supplied to site with a full drive arrangement. Some modifications were made to the sump to accommodate the larger pump.

The Product

Designed with computational fluid dynamic (CFD) technology, the WBV® pump includes features such as a patented integral agitator within the wearing parts which achieves a far more effective agitation than traditional designs. The design creates a cyclonic recirculating flow that induces a strong vortex at the intake, picking up coarse solids from well below the bottom of the pump.

The pump also features:

- Fewer parts for fast, easy rebuild
- Extra liner thickness in the high wear areas
- Integrally cast top and bottom suction strainers
- Shims for easy impeller/front liner clearance setting

The Results

The pump was installed within 10 hours during a planned shutdown.

KCGM had set their UFG mill reload target at 45 minutes. On the pump's first run, it met the 45 minute target. This was reduced by five minutes on the second run, and by the third run, the pump was able to reload the UFG mill in just 30 minutes, which was 70 minutes quicker than the competitor's incumbent pump. The reduced UFG mill reload time resulted in reduced system downtime, and is projected to save KCGM more than \$536,000 per year.

At the time of this case study (2012), the operators were still getting used to the new pump, and were coming up with different ideas to increase the flow into the pump. It is expected that the time to reload the pump will continue to decrease, improving the mill availability and therefore increasing throughput and profitability.



Kalgoorlie Consolidated Gold Mines- Fimiston



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