



Specialist for Pumping Technology



PUMPS FOR MINING INDUSTRY

CLEAN FLUID AND HEAVY DUTY APPLICATIONS

ONE SOLUTION FOR THE MINING INDUSTRY

MEET OUR PUMPS

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Advanced pumping solutions to keep mines moving

The ever-growing mining industry plays a vital role in the development of new technologies and the production of essential everyday items. What's more, today's mining sector faces tough challenges, from a volatile commodities market to higher energy costs. The pressure on mining companies to be efficient, productive and profitable, while adhering to environmental regulations, has never been greater.

Whether on the surface or underground, mining processes require efficient and robust pumping equipment capable of operating under the harsh mining conditions. Erosion, corrosion and lack of regular maintenance can cause failures and costly downtimes.

Ruhrpumpen has the mining solutions for the extraction and processing of minerals, enduring even the most abrasive pump applications. Our experience has resulted in the design and development of durable and high-quality pumps used in mining and mineral processing.

Mine operators around the world trust in Ruhrpumpen pumps for different services and applications, from water transportation to chemical processing, with industry-leading materials and robust designs to satisfy even the most demanding application.



ZM pump installed in underground mine in Norway.

Different jobs call for different solutions

Regardless of the metal or mineral being extracted, our pumping systems can be tailored to suit your specific needs. We have the ability to develop special and customized projects, such as pumping skids with controllers, monitoring and instrumentation.



Ruhrpumpen is your single source supplier

- Original Equipment
- Spare parts
- Installation and startup support
- Repair and maintenance
- Engineering, training and consulting
- Reverse engineering

Benefits of our pumps:

- Proven reliability
- High efficiency designs ensure lowest operating cost
- Robust design allows for long system life with minimal maintenance
- Optimized total cost of ownership

Seawater for the mining industry

Water supply is one of the great challenges for the mining activity.

Although mining sites are usually located high above sea level, seawater has proved a profitable resource in these projects.

Ruhrpumpen has the capacity to provide pumping equipment to drive and desalinate seawater for use in mining operations. As an example, different RP pumps, from our VTP and SM pump lines, are part of the project to drive seawater to the Sierra Gorda district, in the Antofagasta region, in Chile. The pumps, made of duplex stainless steel with some super duplex interiors, operate in water collection and pumping stations along 140 kilometers of pipeline to carry seawater up to a height of 1,700 meters above sea level.



Pumping stations for seawater in Chile.



Desalination by reverse osmosis

Desalination is a process by which salt is removed from sea or brackish water to obtain fresh water. The most common technology to desalinate seawater for mining operations is reverse osmosis.

Reverse osmosis consists of passing the salt water at high pressure through semipermeable membranes that impede almost completely the passage of salts, obtaining fresh water.

Ruhrpumpen can provide pumps for seawater intake, pre-treatment and transfer, as well as high-pressure feeding pumps for the reverse osmosis membranes, with great energy efficiency and corrosion-resistant materials to satisfy the necessary water requirements of mining operations.

Pumps for most mining applications and mineral processing

Throughout the exploitation and processing of mining resources, our comprehensive portfolio of pumping equipment allows us to find the right pump for your application. We have pumps for water management and process pumps in vertical and horizontal configurations for services in the mining industry such as:

Raw water supply and transfer

A reliable water supply is an important requirement for mining operations and mineral processing. We have pumps for the supply and transfer of water from sources such as: groundwater, surface water of rivers and lakes, treated water or even seawater.

Mine dewatering and groundwater control

Pumps to control and manage surface and groundwater play a major role to allow operation in relatively dry conditions and improve the efficiency of extraction methods. On the other hand, it is important to manage acid water from mines to ensure that the impact of mining operations on the environment is minimal.

Dust control

An inevitable result of mining operations, dust must be controlled to prevent clogging of pipes and mechanical parts. Our pressure booster pumps for sprinkler and water spray systems can help control dust emissions.

Wastewater treatment

The process of removing contaminants from water discharged from drainage, effluent and sewage derived from mining operations and mineral processing. Our pumps drive recycled water to re-enter processes and reduce the need for raw water.

Process water

Pumps for circulating and distribution of process water and reclaimed water from tailings dams, especially in mines with a negative water balance where water conservation is of vital importance.

Chemical processing

Our process pumps are a perfect fit for the recirculation of chemical solutions used during processes involved in the extraction and separation of minerals from ore.

- **Lixiviation/Leaching:** process of extracting a soluble metallic compound from an ore by selectively dissolving it in a suitable solvent such as water, sulfuric acid or sodium cyanide solution.
- **Flotation:** process by which chemicals are added to a crushed ore-water slurry to recover the mineral.

Construction materials

The use of highly corrosive liquids and transport of fluids with abrasive particles in mine operations require a careful selection of materials. Our pumps are available in metallurgies such as:

- | | | |
|-------------------|-------------|-------------|
| ■ Stainless steel | ■ Alloy 20 | ■ Inconel |
| ■ Duplex | ■ Titanium | ■ Hastelloy |
| ■ Super duplex | ■ Zirconium | |



CLEAN FLUID PUMPS

CRP-M

Sealless process pump with magnetic drive acc. to DIN EN ISO 2858 & 15783



CHARACTERISTICS AND DESIGN FEATURES

- Complies with DIN EN ISO 2858 and 15783
- Pump with permanent magnetic drive, sealless - no mechanical seal required
- Hermetically sealed by containment shell for environment protection
- Horizontal, single stage, end suction, foot mounted, back pull-out design
- Balanced axial thrust over complete operating range up to $Q_{opt} \times 1,5$
- Well-defined pressurized internal flush flow
- Self-cleaning internal and mainstream filter

OPERATING LIMITS

Capacity	up to 2,200 gpm up to 500 m ³ /h
Head	up to 705 ft up to 215 m
Pressure	up to 232 psi up to 16 bar
Temperature	-184 °F to 840 °F -120 °C to 450 °C

APPLICATIONS

- Chemical management in leaching and flotation processes
- Liquids with sulfuric acid, nitric acid, hydrochloric acid, cyanide, sodium hydroxide, chlorine, hydrogen peroxide, among others
- Acid water management (without solids)

CPP / CPP-L / CPO / CPO-L

Single stage, end suction, ANSI process pumps



CHARACTERISTICS AND DESIGN FEATURES

- HI design (OH1), compliant with the ANSI / ASME B73.1 specification
- Enhanced hydraulic design for low NPSH requirements
- Back pull-out design for ease of maintenance
- C-Frame option is available
- Optional cooling jacket and cooling coil for high temperature applications
- Available in ductile iron, stainless steel, duplex and alloy 20 (other materials on request)
- CPP-L and CPO-L models for low-flow, high-head applications

OPERATING LIMITS

Capacity	up to 12,340 gpm up to 2,800 m ³ /h
Head	up to 770 ft up to 235 m
Pressure	up to 375 psi up to 26 bar
Temperature	up to 700 °F up to 371 °C

APPLICATIONS

- Water supply and transfer
- Process water management systems
- Acid water management
- Auxiliary services
- Booster pump for dust control
- Fire systems

CRP

Single stage, end suction, ISO process pump



CHARACTERISTICS AND DESIGN FEATURES

- Fully in compliance with DIN EN ISO 2858 and 5199 specifications
- HI design (OH1)
- Back pull-out design for ease of maintenance
- Optimum efficiency in a compact design
- Durable mechanical seal
- Available in carbon steel, duplex and stainless steel (other materials on request)

OPERATING LIMITS

Capacity	up to 2,200 gpm up to 500 m³/h
Head	up to 705 ft up to 215 m
Pressure	up to 360 psi up to 25 bar
Temperature	up to 572 °F up to 300 °C

APPLICATIONS

- Water supply and transfer
- Process water management systems
- Acid water management
- Auxiliary services
- Booster pump for dust control
- Fire systems

GSD / GSD-C

Single stage, end suction, general service pump



CHARACTERISTICS AND DESIGN FEATURES

- HI design (GSD - OH0 / GSD-C - OH7)
- Maximum parts interchangeability to reduce costs
- Semi-open, adjustable impeller
- Frame mounted as standard
- Back pull-out construction is available
- Packing or mechanical seal
- Cast iron as standard material (other materials on request)

OPERATING LIMITS

Capacity	up to 4,500 gpm up to 1,022 m³/h
Head	up to 400 ft up to 122 m
Pressure	up to 150 psi up to 10 bar
Temperature	up to 250 °F up to 121 °C

APPLICATIONS

Clean fluids or with small particles in suspension:

- Water supply and transfer
- Potable water supply
- Recirculation of treated water
- Booster pump for dust control
- Auxiliary services

SHD / SKO

Single stage, end suction pumps (solids handling)



CHARACTERISTICS AND DESIGN FEATURES

- End suction, single stage
- Vertical and horizontal mountings available
- Solids handling, non-clog design, hydraulically balanced impeller
- Designed to handle solids from 1 1/2" (38 mm) up to 6" (152 mm) in diameter
- Enclosed, solids handling, non-clog impeller, hydraulically balanced
- Cast iron as standard material (other materials on request)

OPERATING LIMITS

Capacity	up to 35,223 gpm up to 8,000 m³/h
Head	up to 380 ft up to 116 m
Pressure	up to 150 psi up to 10 bar
Temperature	up to 176 °F up to 80 °C

APPLICATIONS

- Wastewater treatment and management
- Mine dewatering
- Groundwater control

SWP

Self-priming pump for solids handling applications



CHARACTERISTICS AND DESIGN FEATURES

- HI design (OH1A)
- Self-priming process pump
- Handles solids up to 3" (76 mm) in diameter
- Removable cover plate allows for easy access to impeller and seal to facilitate maintenance
- Availability of mounting above the liquid being pumped
- Cast iron as standard material (other materials on request)

OPERATING LIMITS

Capacity	up to 6,500 gpm up to 1,476 m³/h
Head	up to 140 ft up to 42 m
Pressure	up to 83 psi up to 5.6 bar
Temperature	up to 158 °F up to 70 °C

APPLICATIONS

Waste handling and sewage applications, it can handle clear liquids or with solids:

- Wastewater treatment and management
- Mine dewatering
- Groundwater control

SCE

Horizontal, centerline mounted, single stage process pump



CHARACTERISTICS AND DESIGN FEATURES

- Heavy-duty process design according to API 610 latest edition (OH2)
- Single or double volute depending on size
- Single suction, enclosed impeller
- Designed for continuous duty with over 130 hydraulic combinations available
- Back pull-out design for ease of maintenance
- SCE-L for low flow applications available
- Materials of construction per API 610 (other materials on request)

OPERATING LIMITS

Capacity	up to 14,000 gpm up to 3,200 m³/h
Head	up to 1,575 ft up to 480 m
Pressure	up to 1,300 psi up to 90 bar
Temperature	-110 °F to 850 °F -80 °C to 450 °C

APPLICATIONS

- Process water
- Acid water management
- Chemical management in leaching and flotation processes
- High-pressure applications

IVP / IVP-CC

Vertical in-line pump in split and close coupled configurations



CHARACTERISTICS AND DESIGN FEATURES

- HI design (OH4 / OH5)
- Fully enclosed, balanced, one-piece impeller design
- Split coupling simplifies maintenance (IVP-CC close coupled available)
- Top pull-out design for ease of maintenance
- Flanged suction and discharge on common centerline
- Coupling guard for protection during operation
- Cast iron as standard material (other materials on request)

OPERATING LIMITS

Capacity	up to 10,000 gpm up to 2,271 m³/h
Head	up to 400 ft up to 122 m
Pressure	up to 275 psi up to 19 bar
Temperature	-50 °F to 300 °F -45 °C to 150 °C

APPLICATIONS

- Water supply and transfer
- Potable water supply
- Booster pump for dust control
- Treated water systems
- Auxiliary services
- Fire systems

III

Vertical in-line process pump (close coupled)



CHARACTERISTICS AND DESIGN FEATURES

- HI design (OH5), dimensionally compliant with the ANSI / ASME B73.2 standard
- Space saving design allows for use in tight installations or modular packages and top pull-out design to simplify maintenance
- Protected one-piece shaft
- Flanged suction and discharge on common centerline
- Fully enclosed balanced impeller
- Ductile iron as standard material (other materials on request)

OPERATING LIMITS

Capacity	up to 1,300 gpm up to 295 m ³ /h
Head	up to 340 ft up to 119 m
Pressure	up to 350 psi up to 24 bar
Temperature	up to 350 °F up to 177 °C

APPLICATIONS

- Water supply and transfer
- Potable water supply
- Booster pump for dust control
- Treated water management
- Auxiliary services
- Fire systems

HSC / HSD / HSR / ZW

**See ZM line for API build*

Horizontal, single stage, split case pumps



CHARACTERISTICS AND DESIGN FEATURES

- HI design (BB1)
- High efficiency, foot mounted design
- Double suction, dynamically balanced enclosed impeller
- Mechanical or packing seal
- All HS/ZW pumps can be mounted vertically or horizontally
- Cast iron as standard material (other materials on request)

OPERATING LIMITS

Capacity	up to 140,000 gpm up to 31,800 m ³ /h
Head	up to 2,210 ft up to 673 m
Pressure	up to 298 psi up to 20 bar
Temperature	50 °F to 300 °F 10 °C to 150 °C

APPLICATIONS

- Water supply and transfer
- Potable water supply
- Water treatment
- Booster pump
- Seawater distribution
- Seawater desalination
- Auxiliary services
- Fire systems

HSM

Horizontal, 2 or 4 stage, split case pumps for high pressure applications



CHARACTERISTICS AND DESIGN FEATURES

- HI design (BB3)
- Two or four stage pump with double volute casing and side-side nozzle arrangement
- Double suction, dynamically balanced enclosed impeller
- Mechanical or packing seal
- Cast iron as standard material (other materials on request)

OPERATING LIMITS

Capacity	up to 2,000 gpm up to 454 m³/h
Head	up to 2,200 ft up to 670 m
Pressure	up to 740 psi up to 51 bar
Temperature	up to 250 °F up to 121 °C

APPLICATIONS

- Water supply and transfer
- Water treatment
- Treated water management
- Seawater distribution
- Seawater desalination
- Booster pump
- Fire systems

RON / RON-D

Radially split, two stage, heavy-duty process pump



CHARACTERISTICS AND DESIGN FEATURES

- Heavy-duty process design according to API 610 latest edition (BB2)
- Centerline mounted, diffuser/volute combined casing
- Single suction opposed impeller arrangement (RON model)
- Double suction first stage impeller (RON-D)
- Ease of maintenance due to the radial split pull-out design
- Low vibration operation due to dynamic balancing

OPERATING LIMITS

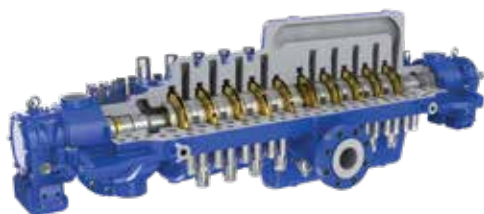
Capacity	up to 6,164 gpm up to 1,400 m³/hr
Head	up to 2,297 ft up to 700 m
Pressure	up to 1,305 psi up to 90 bar
Temperature	up to 842 °F up to 450 °C

APPLICATIONS

- Water supply and transfer
- Water treatment
- Treated water management
- Process water
- Mine dewatering

SM / SM-I

Axially split, multi-stage, double volute casing process pump



CHARACTERISTICS AND DESIGN FEATURES

- Heavy-duty process design according to API 610 latest edition (BB3)
- Designed for a minimum service life of 20 years and at least 3 years of uninterrupted operation
- Volute design allows direct access to the rotor providing ease of inspection and maintenance
- Double row bolting for upper and lower part of high pressure design (SM)

OPERATING LIMITS

Capacity	up to 8,806 gpm up to 2,000 m³/h
Head	up to 5,249 ft up to 1,600 m
Pressure	up to 4,000 psi up to 276 bar
Temperature	up to 392 °F up to 200 °C

APPLICATIONS

- Water supply and transfer
- Seawater distribution
- Feed pump for desalination through reverse osmosis
- Water and wastewater treatment
- Process water

JTN

Axially split, multi-stage, diffuser casing process pump



CHARACTERISTICS AND DESIGN FEATURES

- Heavy-duty process design according to API 610 latest edition (BB3)
- Axially split design enables easy access to pump internals for removal and maintenance
- Anti-friction bearings as standard (other bearing designs are available)

OPERATING LIMITS

Capacity	up to 1,321 gpm up to 300 m³/h
Head	up to 2,625 ft up to 800 m
Pressure	up to 1,880 psi up to 130 bar
Temperature	up to 392 °F up to 200 °C

APPLICATIONS

- Water supply and transfer
- Seawater distribution
- Feed pump for desalination through reverse osmosis
- Water and wastewater treatment
- Process water

GP

Radially split, multi-stage, single case, ring-section type process pump



CHARACTERISTICS AND DESIGN FEATURES

- Non-API and API 610 latest edition (BB4) constructions available
- Modular design for various number of stages
- "Blind" stages for future upgrades available
- Low NPSH first stage design is available
- Single or double mechanical seals

OPERATING LIMITS

Capacity	up to 4,000 gpm up to 900 m³/hr
Head	up to 13,120 ft up to 4,000 m
Pressure	up to 6,000 psi up to 416 bar
Temperature	up to 400 °F up to 205 °C

APPLICATIONS

- Mine dewatering
- Feed pump for desalination through reverse osmosis
- High-pressure water applications

VCT

Single or multi-stage, mixed and radial flow circulating pumps



CHARACTERISTICS AND DESIGN FEATURES

- HI design and API 610 latest edition (VS1) constructions available
- Open, semi-open and enclosed impellers available according to pump model
- Packing as standard, mechanical seal is available
- Above or below ground discharge
- Optional pull-out design for ease of maintenance (for some large models)
- Cast iron as standard material (other materials on request)

OPERATING LIMITS

Capacity	up to 300,000 gpm up to 68,137 m³/h
Head	up to 330 ft up to 100 m
Pressure	up to 285 psi up to 20 bar
Temperature	-20 °F to 275 °F -30 °C to 135 °C

APPLICATIONS

- Water supply and transfer
- Water treatment
- Seawater desalination
- Treated water management
- Process water

VTP

Multi-stage, vertical turbine pump with diffuser type bowl



CHARACTERISTICS AND DESIGN FEATURES

- HI design and API 610 latest edition (VS1) constructions available
- Collect mounted or ring and key, semi-open and enclosed impellers
- Threaded or flanged bowls are provided depending on pump size
- Up to 30 stages, number of stages according to requirement
- Basket or conical strainer available according to requirement
- Can be built as a vertical canned pump (VS6)
- Standard materials include cast iron bowls, bronze impellers and 416 SS shafting (other materials on request)

OPERATING LIMITS

Capacity	up to 60,000 gpm up to 13,630 m³/h
Head	up to 2,500 ft up to 762 m
Pressure	up to 1,080 psi up to 74 bar
Temperature	up to 250 °F up to 121 °C

APPLICATIONS

- Water supply and transfer
- Potable water supply
- Seawater intake
- Mine dewatering
- Groundwater control
- Reclaimed water from tailings ponds
- Seawater desalination
- Fire systems

VTP-Sub

Vertical submersible, single or multi-stage, turbine pumps



CHARACTERISTICS AND DESIGN FEATURES

- HI design (VS0)
- NEMA design motors
- Casting adapter for accurate alignment of pump and motor
- Enclosed impellers, dynamically balanced for smooth operation
- Stainless steel strainer prevents debris from entering the pump
- Materials on request

OPERATING LIMITS

Capacity	up to 60,000 gpm up to 13,630 m³/h
Head	up to 2,500 ft up to 762 m
Pressure	up to 1,080 psi up to 74 bar

APPLICATIONS

- Water supply and transfer
- Mine dewatering
- Groundwater control

VSP / VSP-Chem

Single casing, sump pumps for wet pit applications



CHARACTERISTICS AND DESIGN FEATURES

- HI design and API 610 latest edition (VS4) constructions available
- Semi-open impeller for clean water applications and enclosed impeller for solids handling (non-clog model)
- Can handle water with solids up to 4" (102 mm) in diameter (non-clog)
- Sump mount or tank mount available
- Sump depth up to 20 ft (6 m)
- Cast iron as standard material for the VSP model (other materials on request) for the VSP-Chem materials are according to API 610

OPERATING LIMITS

Capacity	up to 8,500 gpm up to 1,931 m³/h
Head	up to 425 ft up to 130 m
Pressure	up to 580 psi up to 40 bar
Temperature	up to 400 °F up to 200 °C

APPLICATIONS

- Water treatment
- Process water
- Mine dewatering
- Groundwater control



Our vertical pump models can be integrated on a pump flotation system (barge).

Designed to meet the demanding mining conditions, the floating barges can be constructed fully in polyethylene (HDPE) or can be hybrid of stainless steel with polyethylene floats.

The assembly of the pump allows the suction to be close to the surface, thus avoiding the aspiration of solids that settle in deep areas of recovered water tanks, leach pools and tailings ponds.



HEAVY DUTY PUMPS



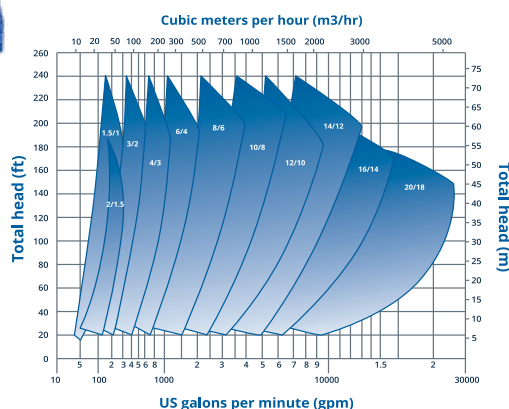
MPP

Horizontal, mining process pump



CHARACTERISTICS AND DESIGN FEATURES

- The MPP pump line offers high hydraulic efficiencies for optimized wear life performance in difficult solids handling applications.
- Casing liners are available in multiple abrasion-resistant materials and surface treatments to meet any process or operational requirement.
- Enclosed or semi-open impeller, depending on model.
- Dependent on the seal type, these can work by flushing water, grease lubrication or by an API seal flushing plan.
- Superior abrasive and corrosive wear life.



APPLICATIONS

- Mining and mineral processing
- Mill discharge
- Mine drainage
- Dredging of fine tailings ponds
- Coal
- Pumping of drilling mud
- Coarse sand
- Heavy media

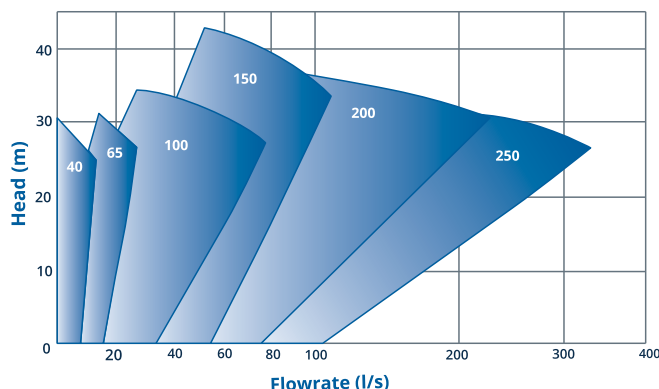
MPPV

Vertical, mining process pump



CHARACTERISTICS AND DESIGN FEATURES

- The MPPV heavy-duty sump pump is available in various standard lengths to suit common sump depths.
- A suction extension pipe can be fitted to the bottom inlet to extend the depth of the sump by up to 2 meters.
- Pumping is maintained even when the top inlet is not submerged.
- Low spare costs from long wear life.
- Low energy costs from maintained efficiency.
- Aftermarket support from our Global Service Network.



APPLICATIONS

- Mineral's processing
- Coal preparation
- Chemical processing
- Effluent handling
- Sand and gravel
- Abrasive and/or corrosive slurries
- Large particle sizes
- High density slurries
- Continuous or "snore" operation
- Heavy duties demanding cantilever shafts

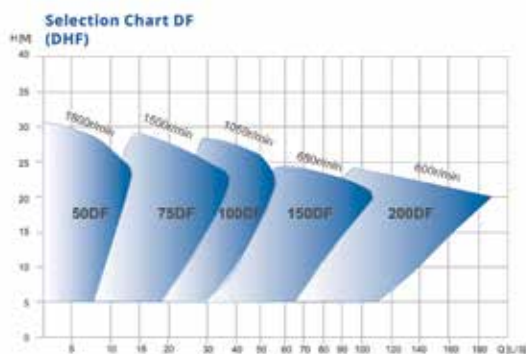
MPPF

DH / DHF Type froth vertical pump



CHARACTERISTICS AND DESIGN FEATURES

- According to mode of construction, the pumps are classified into vertical type and horizontal type
- pumps, use of double casing. It has the character of high efficiency, wear-resistance, stable performance and excellent changeable parts.
- The material of liner and impeller is wear-resistant metal or rubber.
- The vertical type pumps do not need seal, the work in lines with rubber; the horizontal type pumps may deliver the slurries of more flow and higher head with small installation volumes.
- The pumps may be driven by belt or direct coupling.
- Pump should be rotated clockwise viewing from the driving end.

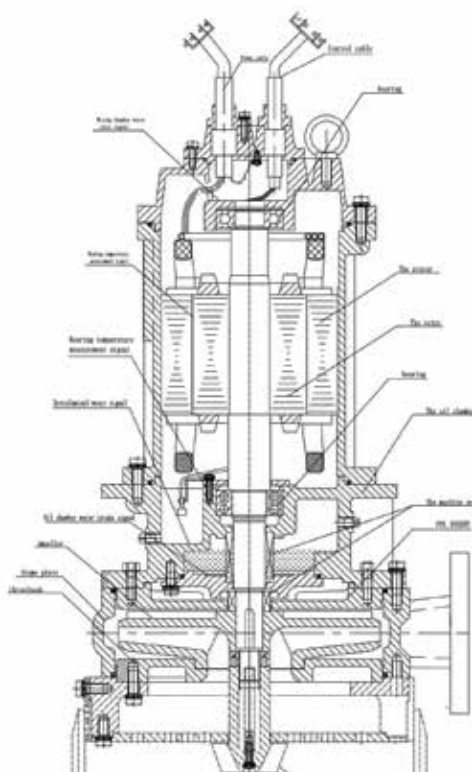


APPLICATIONS

- Used for the flotation technology.
- This pump is ideal type of pump for delivering foaming slurries.

MPPS

Submersible Pump













APPLICATIONS

- Thickener drain
- Fly ash sump
- Bottom ash overflow
- Pond water return
- Black liquor
- Red mud decanting
- Boiler blowdown
- Magnetite recovery
- Coal fines recovery
- Precipitator slurry
- Chlorinated thickener
- Mine dewatering
- Red mud recovery
- Clarifier sludge
- Coke quench
- Mill scale
- Seawater/sand slurry
- Clean-up sumps
- Lime slurry
- Skimming pit
- Coal pile runoff
- Kaolin clay

+65 years creating the pumping technology that moves our world

Ruhrpumpen is an innovative and efficient pump technology company that offers highly-engineered and standard pumping solutions for the oil & gas, power generation, industrial, water and chemical markets. We offer a broad range of centrifugal and reciprocating pumps that meet and exceed the requirements of the most demanding quality specifications and industry standards such as API, ANSI, UL, FM, ISO and Hydraulic Institute.

Ruhrpumpen Plants

-  ARGENTINA, Buenos Aires
-  BRAZIL, Rio de Janeiro
-  CHINA, Changzhou
-  EGYPT, Suez
-  GERMANY, Witten
-  INDIA, Chennai
-  MEXICO, Monterrey
-  RUSSIA, Moscow
-  UK, Lancing
-  USA, Tulsa

-  Manufacturing plant & service center
-  Service center