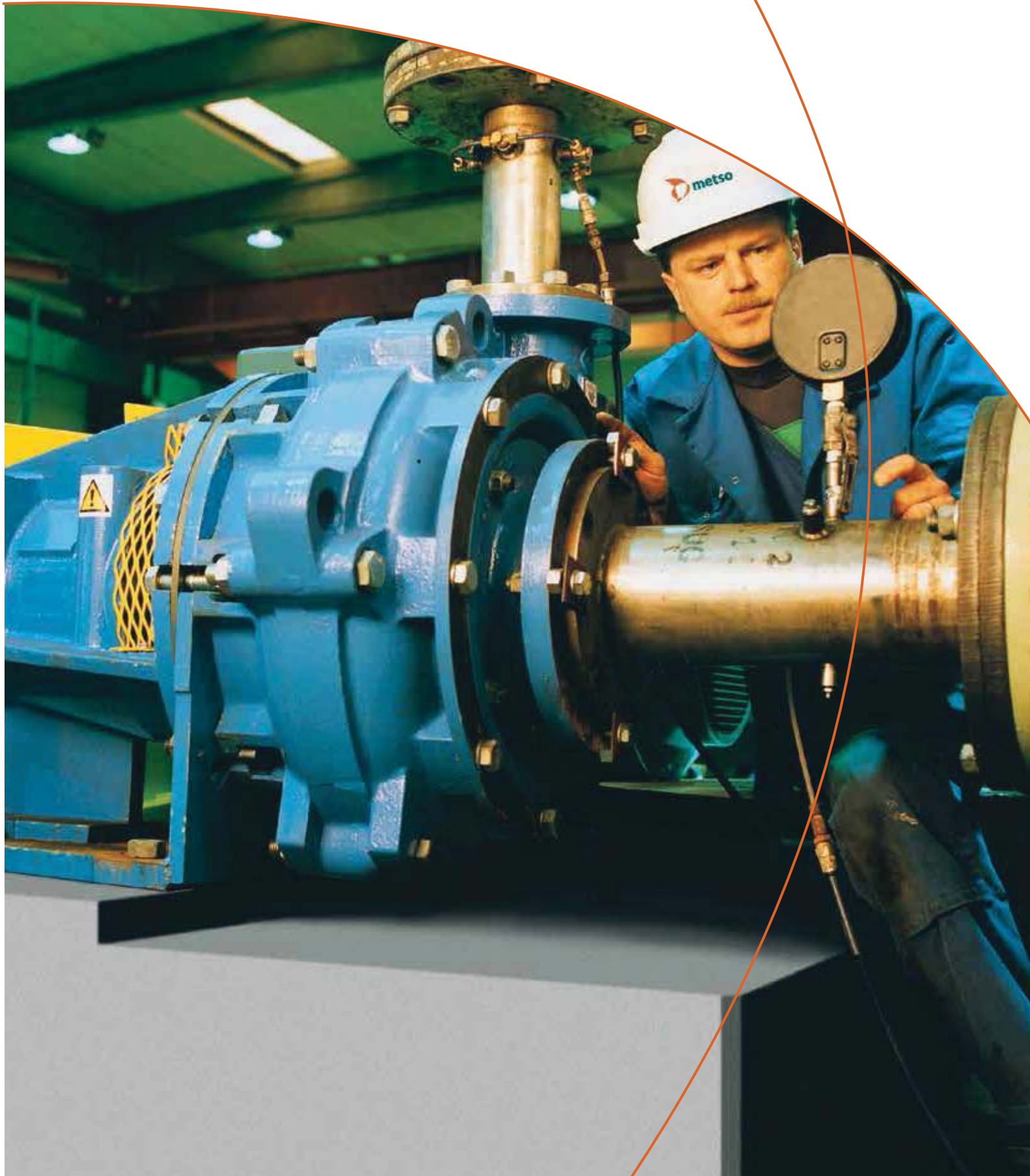
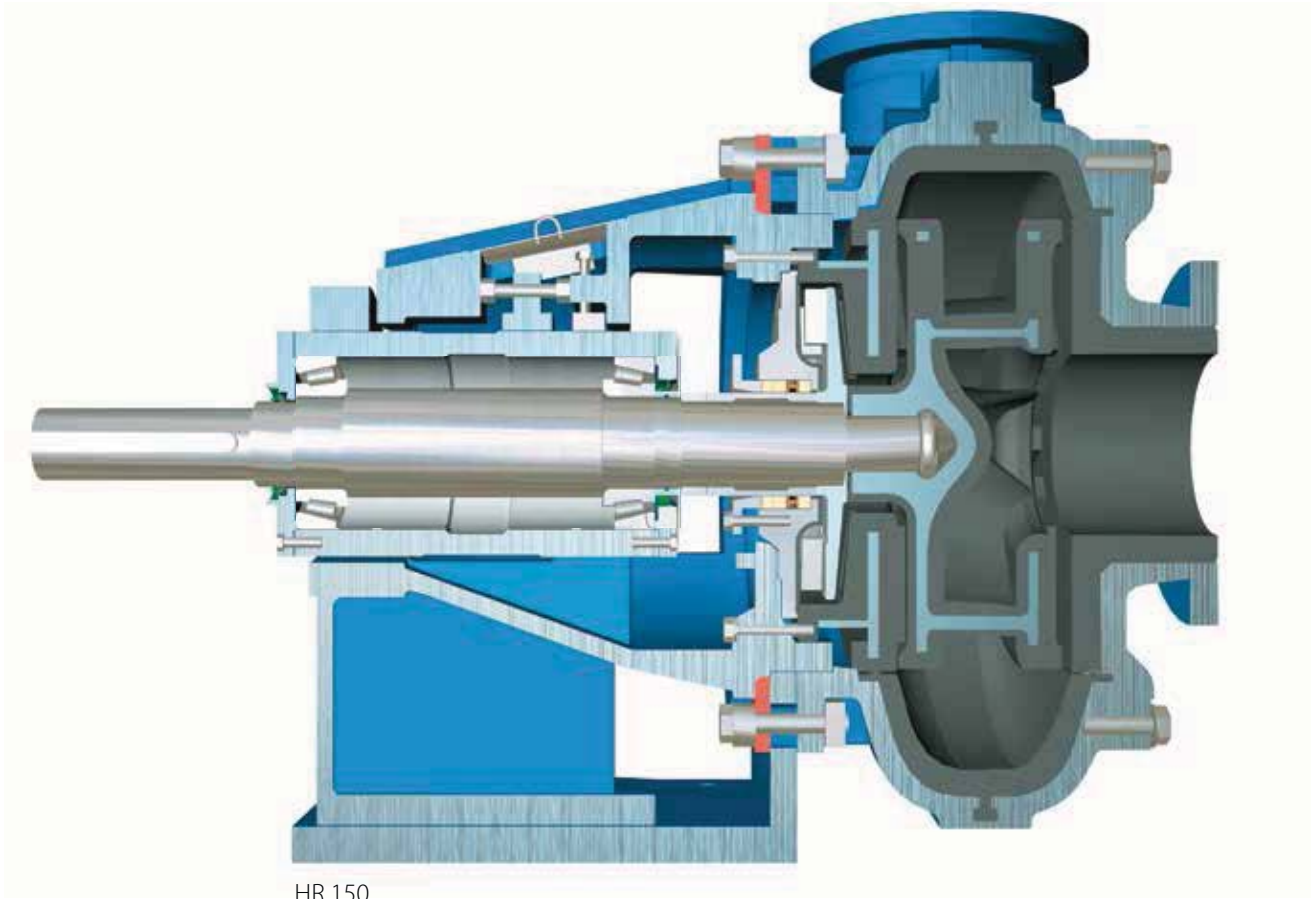


The Orion series of

Heavy & mining duty horizontal slurry pumps – Double adjustment





HR 150

The Orion series of

Heavy and mining duty rubber lined and me

The Metso heavy (HM, HR) and mining (MR, MM) duty horizontal slurry pumps offer a wide range of world class rubber lined and hard metal slurry pumps for abrasive pumping applications.

Lowest total cost

Our focused product development combined with over 60 years of experience from thousands of applications has led to continuous improvements in our products.

The benefits to customers are numerous but the most significant is the life time cost saving that will be achieved by using Orion horizontal slurry pumps.

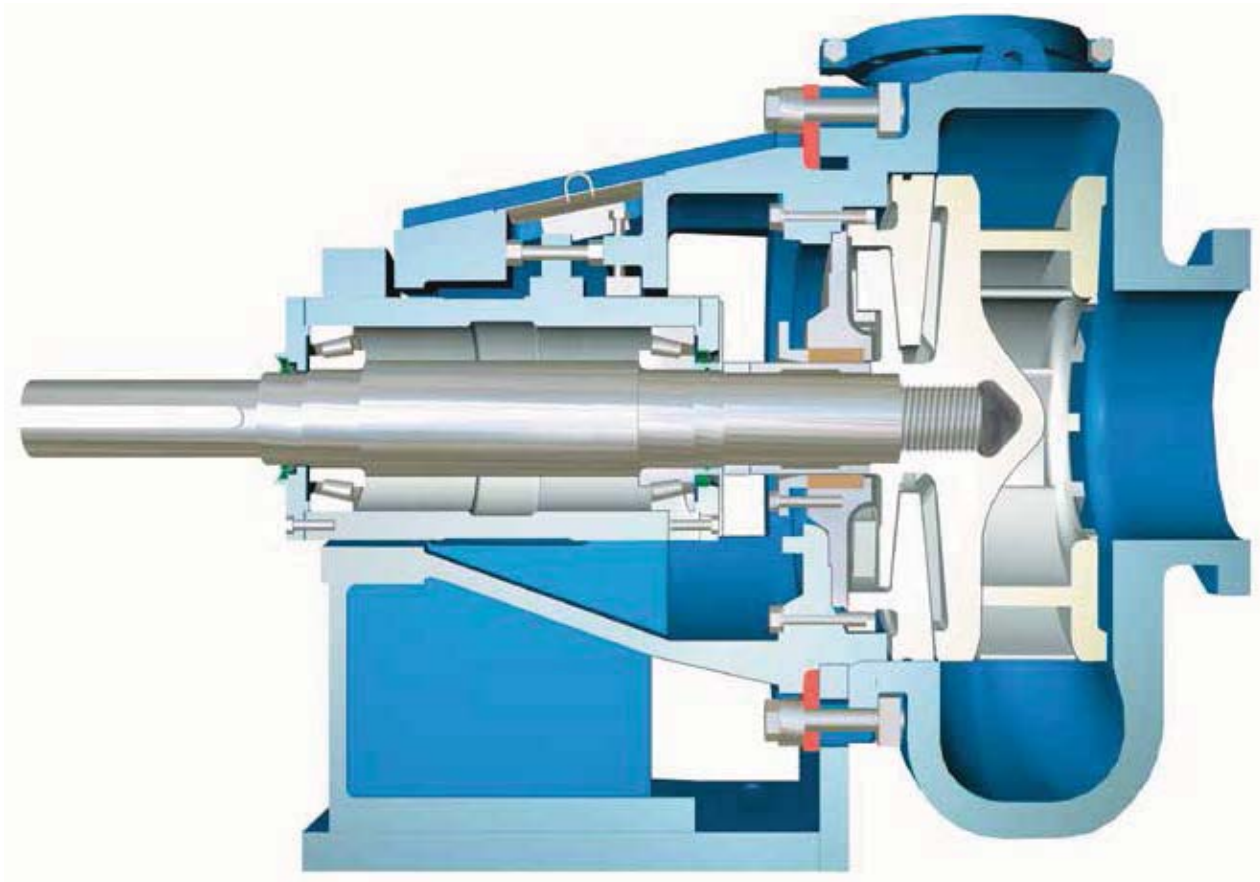
Low power consumption

- High efficiency hydraulic design ensures optimal power utilization
- Range optimization ensures operation close to the best efficiency point
- Use of fluid dynamic software to improve pump hydraulic efficiency
- 3-D computer design technology for development of hydraulic and mechanical components

Long wear life

- Wear parts of highest quality hard metal, rubber and corrosion-resistant materials
- Robust design with extra thick sections at known points of wear
- Highest quality of wear resistant elastomers developed by Metso

- Interchangeability of hard metal and elastomer parts to provide the best solution for each individual application
- Optional special materials available on request
- Careful application at best efficiency point and selection of wear-resistant material give even wear and long life



HM 150

Vertical horizontal slurry pumps, double adjusted

Reliability in operation

Specially developed features in our pumps provide trouble-free operation and a minimum downtime improving the cost effectiveness of the operation:

- Oversized high strength alloy steel shaft is carried in heavy duty grease lubricated bearings in a self-contained cartridge assembly
- Double seal arrangement provides positive seal of bearings against contamination
- Proven and reliable gland seal options to meet individual requirements, using expellers, flushed glands or mechanical seals
- Modular design and full interchangeability of parts minimizes stock levels
- Back pull out feature allows ease of inspection and maintenance
- Compact and functional design
- Metso pumps and parts are manufactured under total quality management and all our production units are ISO certified.

Typical applications

- Mining and mineral processing
- Highly abrasive slurries
- SAG and AG mill discharge recirculation duties
- Cyclone feed
- Mine refuse and tailings
- Industrial processing
- Coal and power plant ash
- Sand and gravel
- Mining duty abrasive slurries
- In-plant slurry transfer pumps
- Pulp & paper
- Lime slurry
- Alumina
- Fertilizer
- Acid Neutralization

Total impeller wear clearance adjustment

Closing both back and front impeller running clearances permits optimum continuous performance of the pump. All adjustments can be made on installed pumps without disassembly.

Back pull-out design

Designed for ease of maintenance.

Taper roller bearings

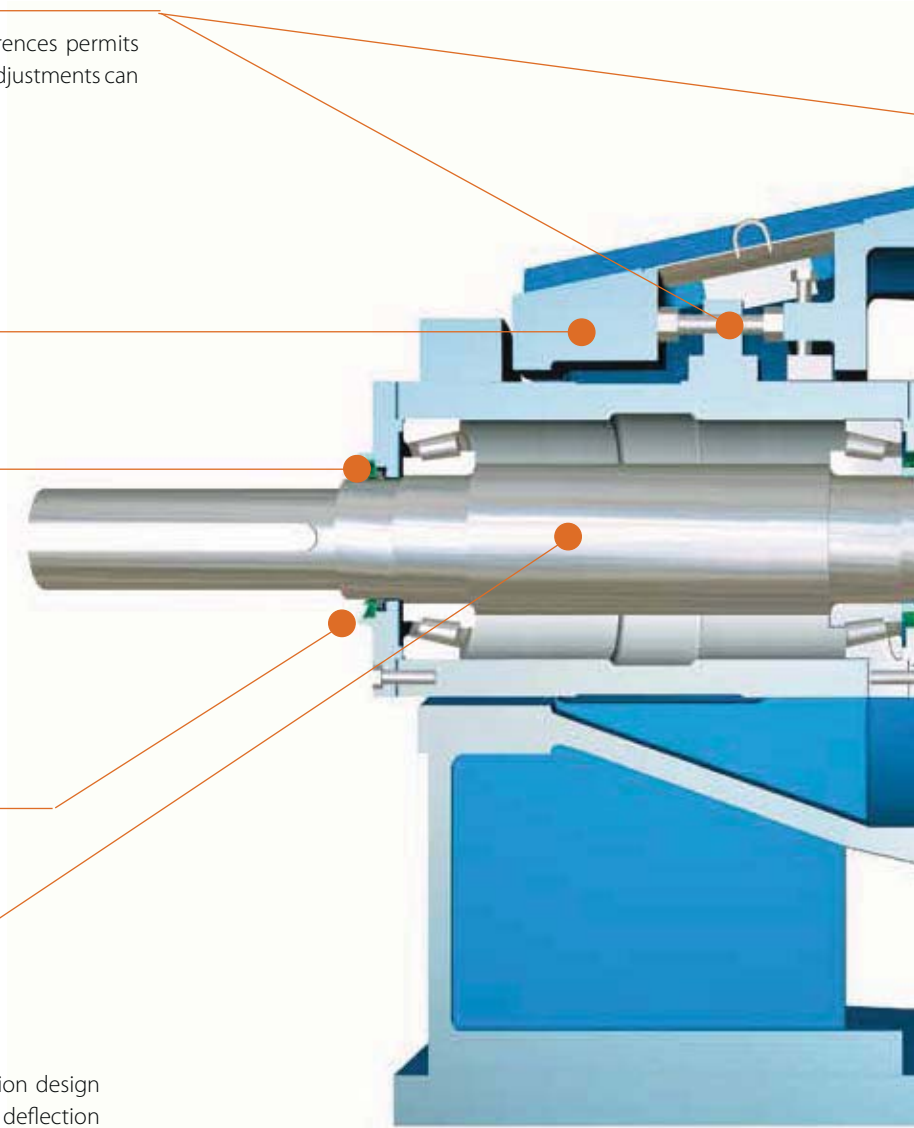
Heavy duty grease lubricated bearings in a sealed cartridge designed for maximum bearing life. Double bearing arrangements available.

Seals

Double sealed with V-ring protected lip seal to ensure reliable operation.

Heavy duty shaft

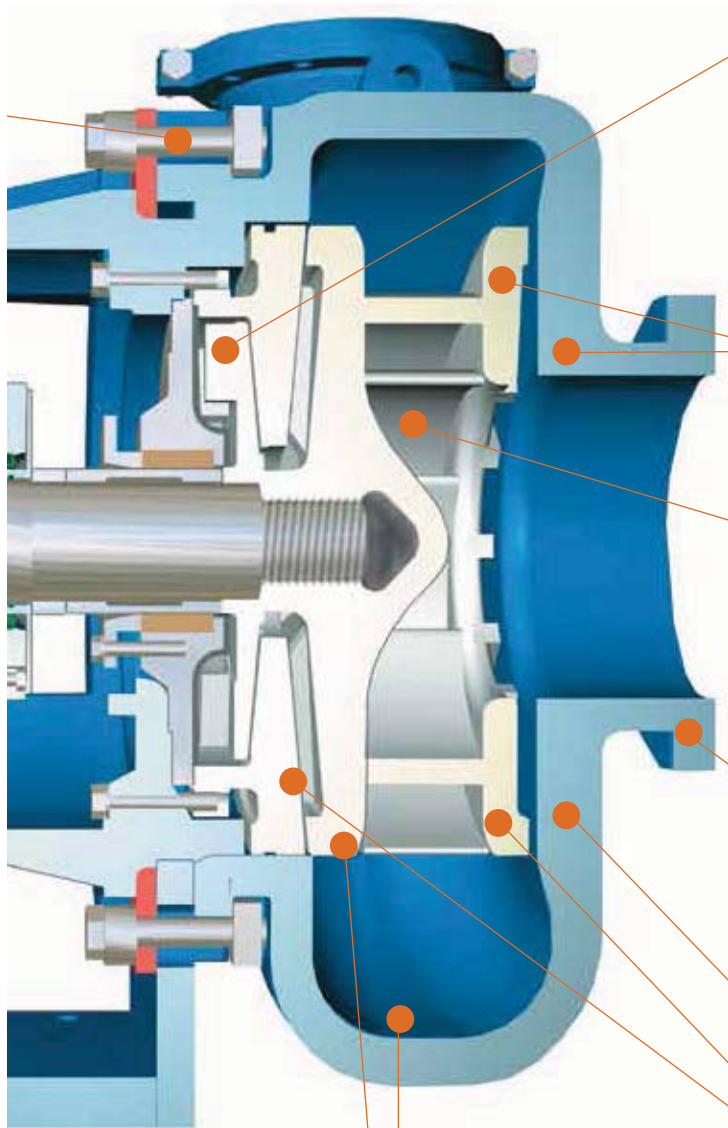
Designed for tough services. High power transmission design with reduced impeller overhang for minimum shaft deflection and a maximum pump life.



Standard materials of construction*

Metal Standard	Casing HighChrome	Impeller HighChrome	Back liner HighChrome	Expeller HighChrome	Expeller ring HighChrome	Shaft sleeve HighChrome	Shaft Carbon steel	Seals Nitrile
Rubber Standard	Case liners Natural rubber	Impeller Natural rubber	Backliner Natural rubber	Expeller HighChrome	Expeller ring Natural rubber	Shaft sleeve HighChrome	Shaft Carbon steel	Seals Nitrile

*Consult factory for available options



Centrifugal seal arrangement

The expeller generates a high head and works in conjunction with expelling back vanes of the impeller to provide a highly effective seal against positive inlet heads without gland leakage. Performance improves with wear clearance adjustment at the back of the impeller. Abrasion resistant materials ensure wear life equivalent to the pump. Four rings of grease-lubricating packing, seal the pump while stationary.

Even wear design

Case and impeller are matched for minimum hydraulic turbulence for longer and more equally distributed impeller and case wear life.

Impeller design

Partial mixed flow main vanes reduce hydraulic shock losses at the suction eye. Large diameters and strategic mass distribution permit high head and high performance at slow speeds without the sacrifice of efficiency.

ANSI / Metric flanges as required

Suction and discharge flanges are split on all HM and MM pumps for optional flange configurations, ease of pipe connection and alignment. Rubber lined pumps have slotted flanges to allow most metric or ANSI flanges.

Wear resistant castings

Strict metallurgical control and casting integrity with extra metal at known areas of severe wear.

Front and back expeller vanes

Double adjustment feature permits the use of narrow expelling vanes greatly reducing internal recirculation with minimal energy consumption.

Wet ends

Hard metal and rubber lined wet ends available.

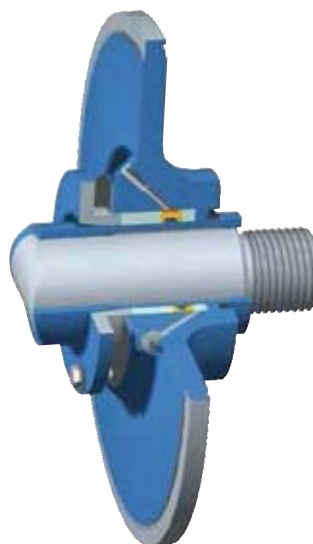
Shaft sealing options

Combined low flow / full flow stuffing box design can be built for either low or full flow options by changing the arrangement of the lantern ring, packing and flush connections.



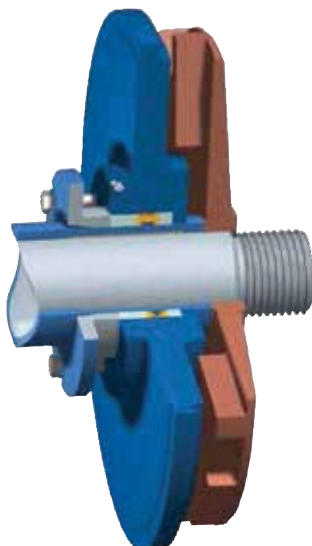
Full flow

Use for suction conditions not suitable for centrifugal sealing when product dilution is not important. Full flow provides the longest packing wearing life. The lantern ring is placed in the bottom of the stuffing box while the box is protected by a lip seal to avoid damage from temporary concentrate variations.



Low flow

Use for suction conditions not suitable for centrifugal sealing when product dilution needs to be minimized. One ring of packing is placed in front of the lantern ring. The expeller is not used on flushed seal assemblies.



Standard expeller shaft seal

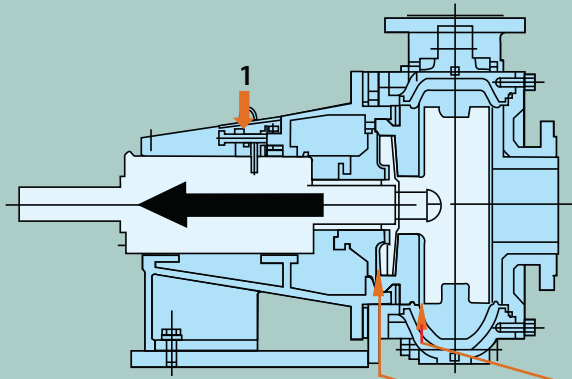
Used for no product dilution against positive suction head without leakage. The standard pump has a primary high performance hydrodynamic expeller dry seal which seals the shaft when the pump is running. A secondary, packed gland seal stops leakage when the pump is not running.



Metso slurry mechanical seal

Used for zero stuffing box leakage or product dilution. Available as single slurry type mechanical seal or double mechanical seal with external barrier fluid required. It is possible to use dead-end flush on the double seal.

Double adjustment features



The total impeller wear clearance adjustment is a patented design feature. The procedure of closing the back and front impeller clearances permits constant performance of the pump throughout the normal wear life of all components. This simple operation is illustrated in the two steps shown below and can be performed in minutes on site pump without disassembling the pump.

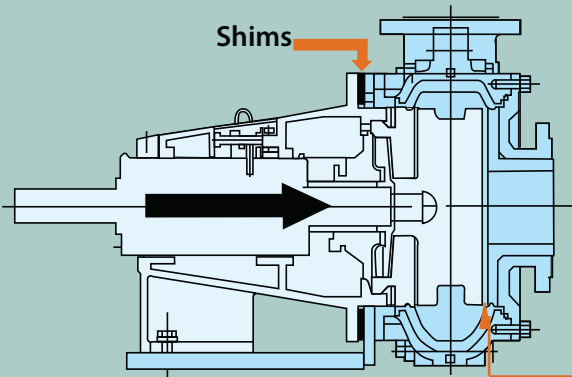
Step 1. Adjust impeller back-side clearance

Impeller back clearance and centrifugal seal adjustment is achieved by adjusting the screw on the bearing cylinder housing. The bearing cylinder housing, shaft and impeller move back in order to close the impeller back clearance.

Double adjustment can also be made on low flow, full flow and mechanical seal arrangements.

Back clearance

Centrifugal seal clearance



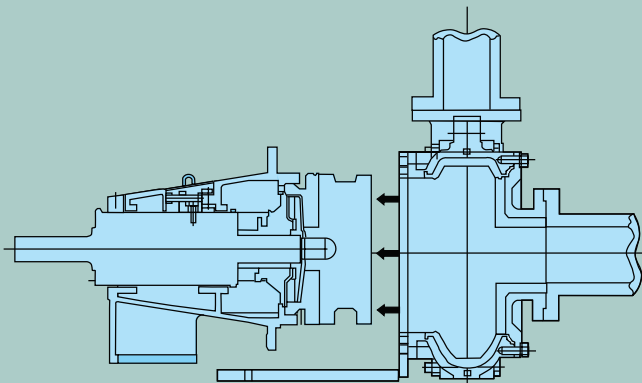
Step 2. Adjust impeller front-side clearance

Impeller front clearance is made by removal of casing half-shims and retightening casing bolts. This also acts as a visual wear indicator. The entire power frame moves forward to close the impeller front clearance.

Once all the shims are removed, the pump can still be operated as a single adjust build.

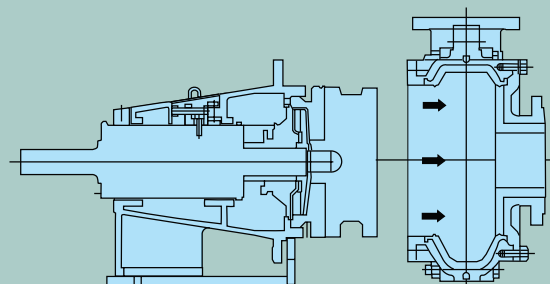
Front clearance

Back and front pull-out design



Back pull-out design

For normal routine inspection or repair, the bearing frame and rotating element can be removed as a unit. Impeller, piping and gland seal component renewal can be carried out rapidly.

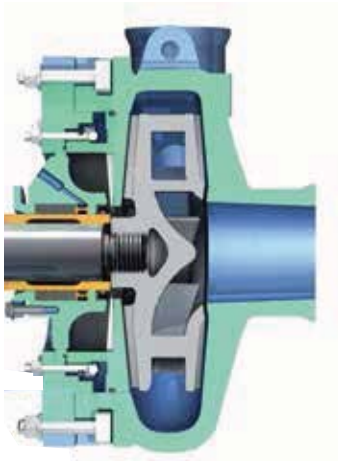


Front pull-out design

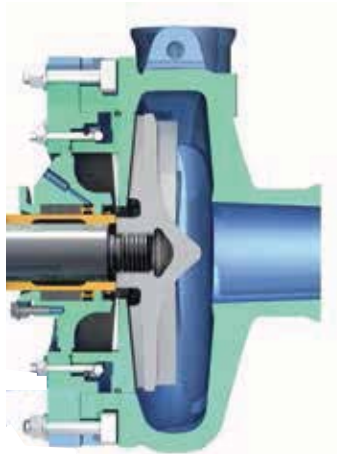
For casing only renewal, or if back pull-out is not convenient, the front pull-out feature can be used after pipework removal.



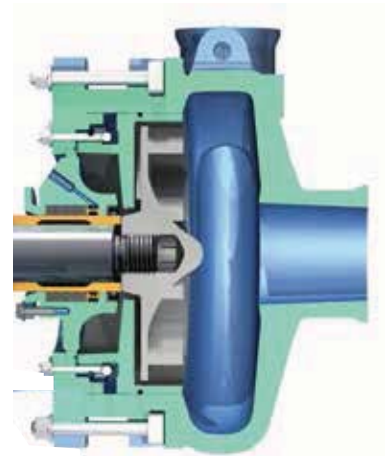
Standard closed impeller:



Induced flow (Vortex) impeller:



Fully recessed induced flow (Vortex) impeller:



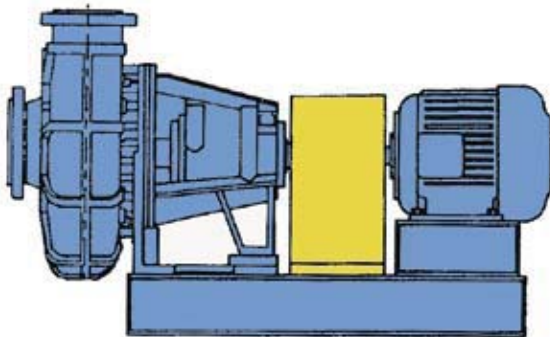
The Orion series of pumps can also be supplied in a variety of specialty configurations:

- HP - High Pressure - same as HM with heavier duty case for higher pressure.
- HG - Heavy-duty Gravel - suction and discharge flanges are the same size and impeller has less vanes to pass larger material size.
- HT - Heavy-duty Tunneling - same as HM with special 90° elbow cast into the casing.
- HH - High Head - Larger diameter impeller for a given flange sizes.
- HMPT - High Pressure and Temperature - HM pump with a metal liner inside a cast steel casing.

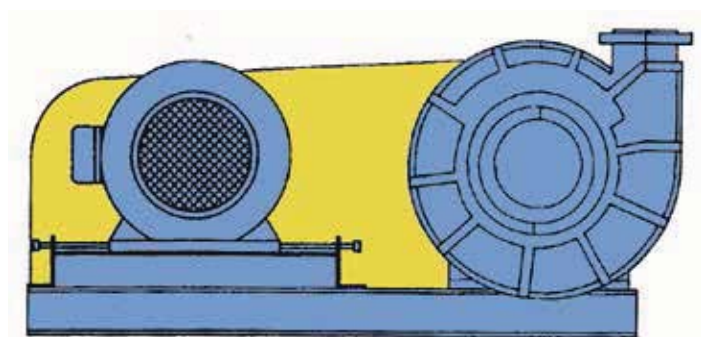
Contact your local Pump Solutions product support team for additional information.

Available motor arrangements

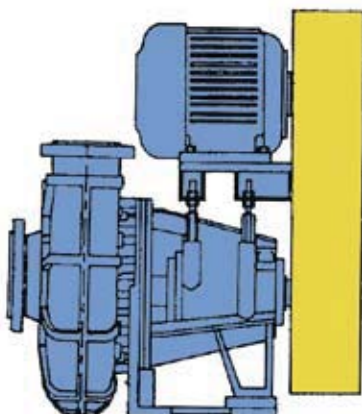
Direct drive



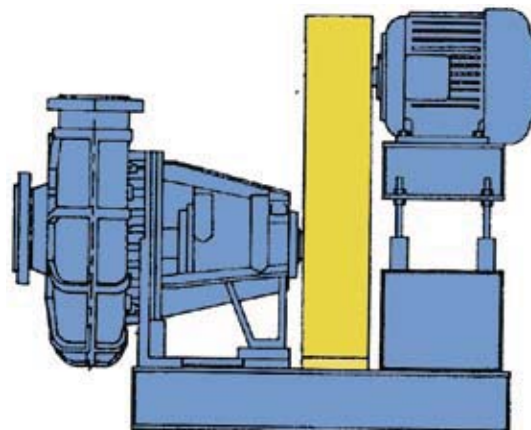
Side mounted



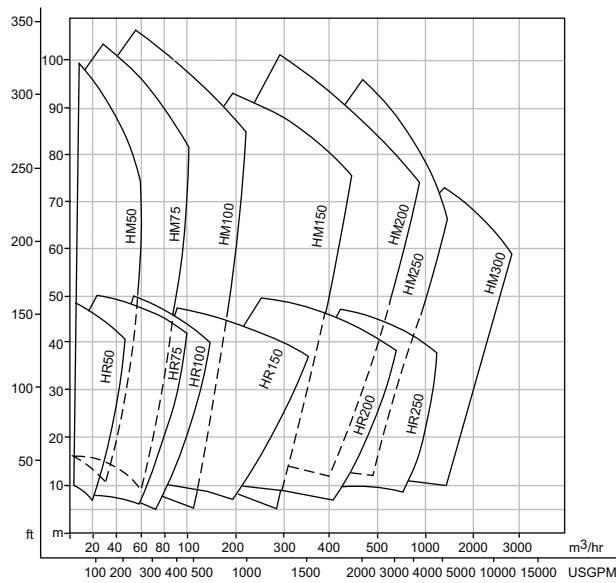
Overhead mounted



Reverse overhead mounted

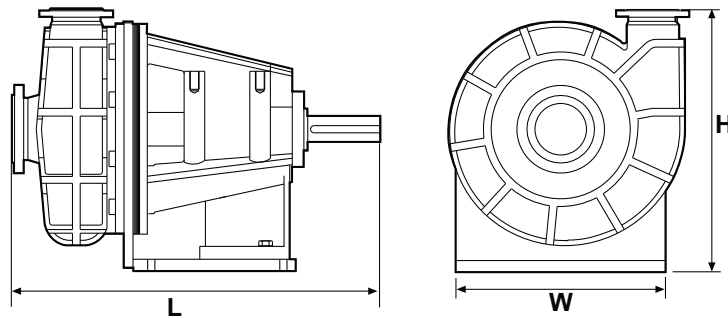


Selection of pump size for the heavy duty rubber lined and hard metal slurry pumps



Pump dimensions

Double adjustment frame

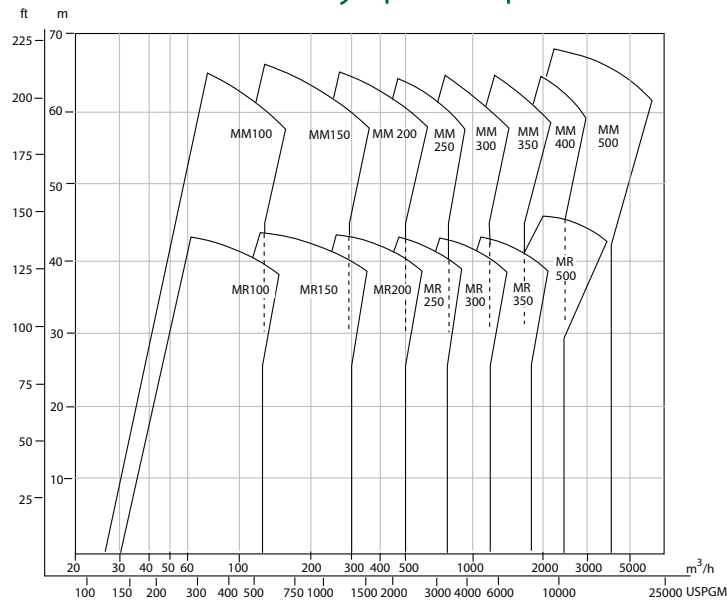


Model	Connection dimensions				General dimensions						Total weight*	
	Inlet		Outlet		H		L		W		Double adjustment	
	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	kg	lbs
HM50 ●	50	2	32	1,5	433	17	713	28	360	14	160	353
HM75 ●	75	3	50	2	438	17	734	29	360	14	200	441
HM100 ●	100	4	75	3	505	20	880	35	424	17	320	705
HM150 ●	150	6	100	4	630	25	1025	40	545	21	550	1213
HM200	200	8	150	6	855	34	1258	50	686	27	1220	2690
HM250	250	10	200	8	1030	41	1463	58	830	33	2040	4497
HM300	300	12	250	10	1150	45	1591	63	1000	39	2850	6283
HR50	50	2	32	1,5	428	17	709	28	360	14	180	397
HR75	75	3	50	2	463	18	729	29	360	14	220	485
HR100	100	4	75	3	555	22	913	36	424	17	330	728
HR150	150	6	100	4	713	28	1097	43	545	21	630	1389
HR200	200	8	150	6	965	38	1295	51	686	27	1250	2756
HR250	250	10	200	8	1125	44	1550	61	830	33	2110	4652

* Bare shaft pump weight

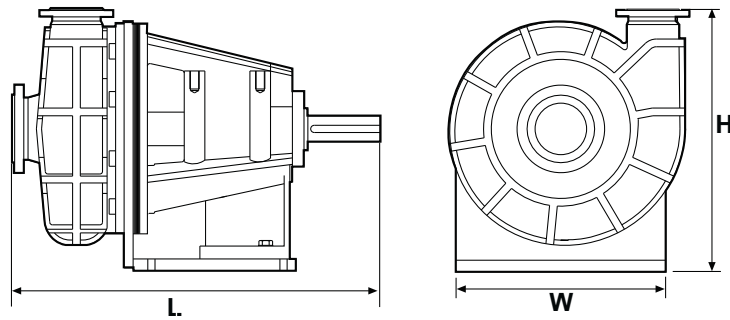
● These pumps are available with fully recessed induced vortex impeller.

Selection of pump size for the mining duty rubber lined and hard metal slurry pumps



Pump dimensions

Double adjustment frame



Model	Connection dimensions				General dimensions						Total weight*	
	Inlet		Outlet		H		L		W		kg	lbs
	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches		
MM100 ●	100	4	75	3	454	18	730	29	360	14	230	507
MM150 ●	150	6	100	4	527	21	889	35	424	17	370	816
MM200 ●	200	8	150	6	710	28	1 073	42	545	21	650	1 433
MM250	250	10	200	8	885	35	1 245	49	686	27	1 350	2 976
MM300	300	12	250	10	1 055	42	1 483	58	830	33	2 150	4 740
MM350	350	14	300	12	1 080	43	1 527	60	830	33	2 300	5 071
MM400	400	16	350	14	1 250	49	1 620	64	1 000	39	3 000	6 614
MM500	500	20	450	18	1 726	68	2 180	86	1 110	44	—	—
MM600	600	24	500	20	2 075	81.7	2 352	93	1 204	47	—	—
MR100	100	4	75	3	456	18	741	29	360	14	260	573
MR150	150	6	100	4	507	20	919	36	424	17	420	926
MR200	200	8	150	6	683	27	1 092	43	545	21	740	1 631
MR250	250	10	200	8	878	35	1 303	51	686	27	1 540	3 395
MR300	300	12	250	10	1 035	41	1 506	59	830	33	2 450	5 401
MR350	350	14	300	12	1 257	49	1 665	66	1 000	39	—	—
MR500	489	20	438	18	2 064	81	2 689	106	1 204	47	—	—

*Bare shaft pump weight

● These pumps are available with fully recessed induced vortex impeller.

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