Valve-controlled HSP series high density solids pumps

Putzmeister

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File under: A1.00, BP 1.03, A 4.00, BP 4.03

Putzmeister HSP pumps...

A feature of HSP pumps is their hydraulically-controlled disc valves

Features of HSP pumps

- suitable for high pressures and for pumping materials that are resistant to pumping
- suction supply from pipe, hopper or prepresser unit
- dry-running proof piston and cylinder due to central lubrication system
- hard-chrome plated cylinders and special pistons for long life, even when subjected to the highest pressures

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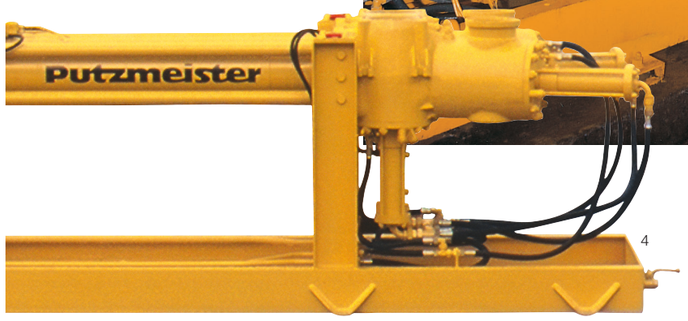

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Sewage sludge

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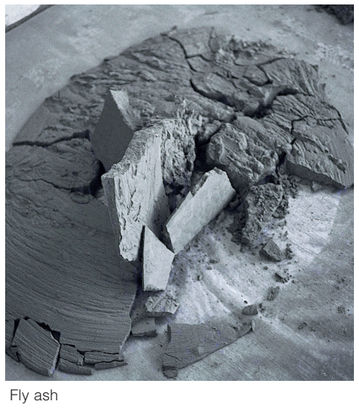

Fig ash

Titanium dioxide

...for fine grain slurries with a high proportion of solids

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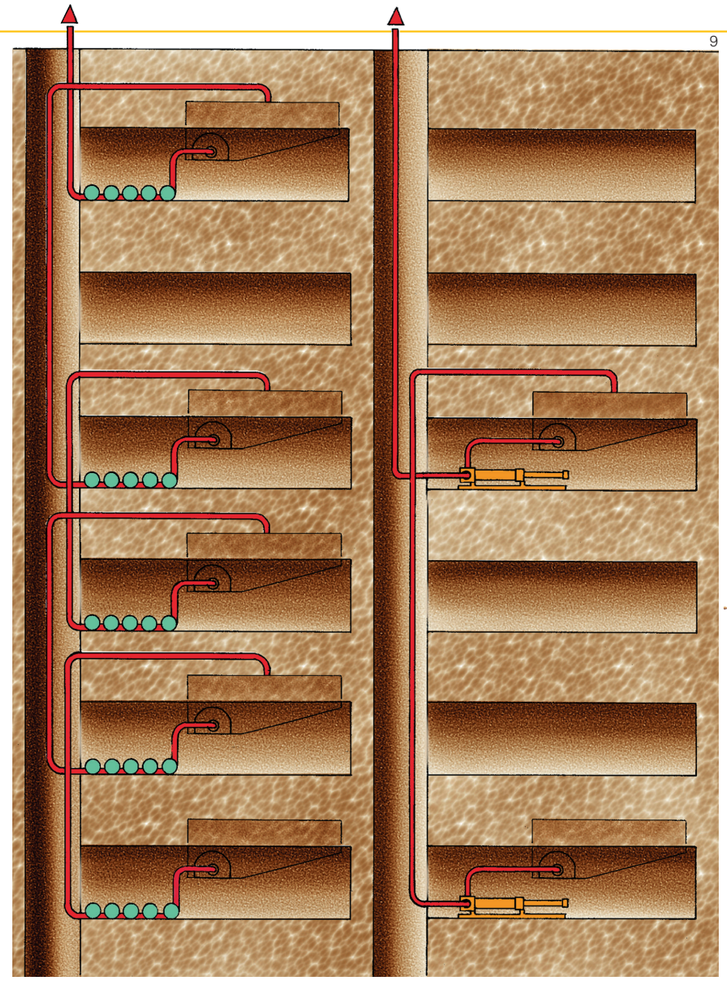

Two HSP 3080s replace 43 centrifugal pumps in the mine and pump slurry above ground from a depth of 1250 m (Vonters mine (HBL), France)

HSP pumps are mainly used where fine slurries laden with a high proportion of solids must be conveyed against high pressures.
They are used to pump media such as:

- sewage sludge with an extremely high proportion of solids (moist, compact)
- mineral solids (tailings) with particle sizes smaller than 100 µm and with a dry solids content of up to 80 %
- fluids containing slurry, e.g. pit water
- thick pastes of electrostatic filter ash
- various chemical and organic solids

Systems using HSP pumps can be found in many industries:

- mining (de-watering of mines, back-filling, pumping of tailings)
- sewage works (transport of sewage sludge)
- power stations (transport of fly ash)
- waste recycling (transport of oil sludge)

Distinguishing features:

HSP

- fine grain slurries
- switching without the risk of short circuiting
- no backflow at high pressure
- easy to install pulsation dampeners
- improved efficiency when pumping materials with entrained air

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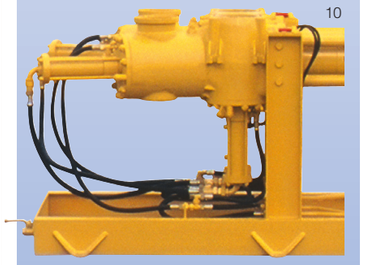

KOS

- for granular slurries with a high proportion of solids and containing coarse, discrete foreign bodies with a diameter of up to approximately 80 % of the internal diameter of the pipe or delivery outlet
- low maintenance costs and wear due to fewer moving parts
- less suction resistance due to the large and open design of material delivery
- hydraulic circuit reliably isolated from the product being delivered

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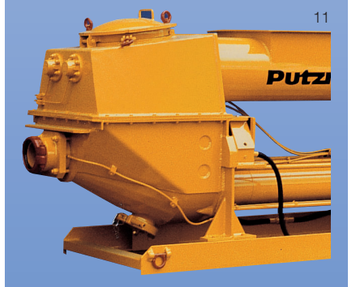
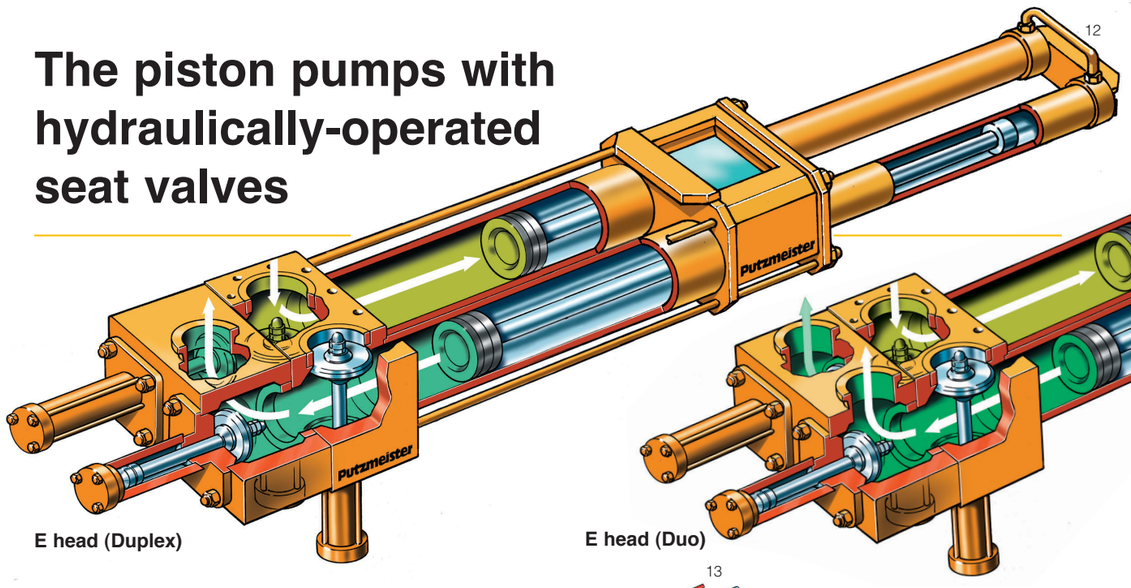


The piston pumps with hydraulically-operated seat valves



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E head (Duplex)

E head (Duo)

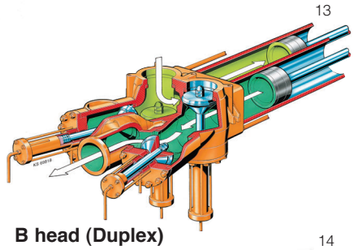
The pump head

The principal feature of the HSP pump series is the hydraulically-controlled disc valves they use. The pumps are either Duplex, Duo or Single pumps with two different pump heads.

On versions with the "E pump head", two lines supply the pumps with the product to be delivered. The delivery outlet is perpendicular to the pump direction. A pipeline bend at the outlet allows the delivery line to be routed in any direction. The delivery line is, therefore, kept free of tension and is easy to open in the event of repair work.

The concentric "B pump head" was designed primarily to replace an existing pump system with concentric delivery line outlet. This version has advantages where pumps have to be installed directly next to another with no space in between.

On versions using either the E or B pump head, the delivery may be separated into two outlets (Duo HSP).



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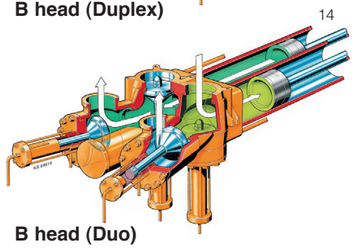
B head (Duplex)



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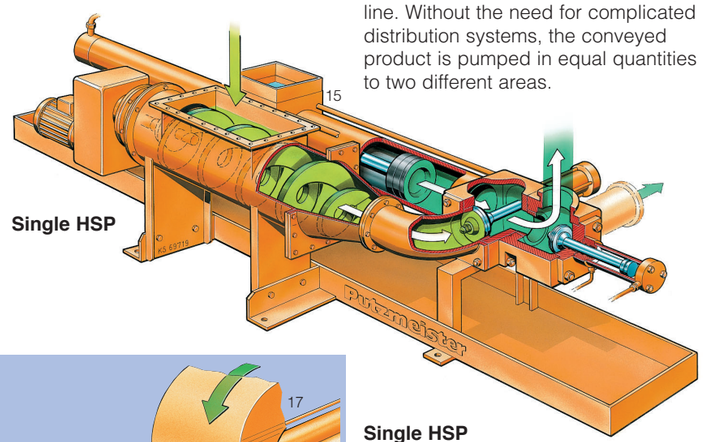
B head (Duo)



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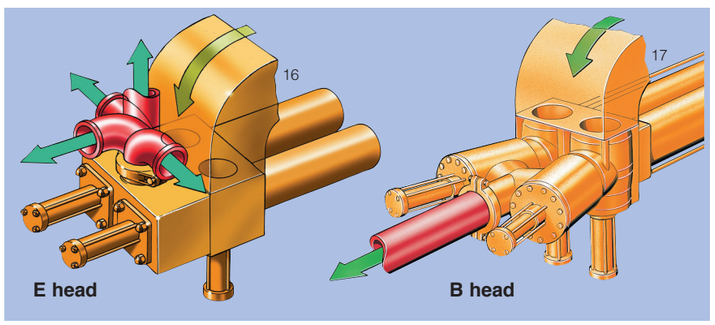
Single HSP



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E head

B head

Duplex HSP

In this standard version, two delivery pistons running opposed to one another supply a common delivery line. Depending on the pump head, this exits either at a perpendicular to (E) or concentric (B) to the pump direction. Interruptions to delivery when the delivery pistons switch over are only minimal (0.2 – 0.3 seconds). A damping vessel renders such interruptions even less significant.

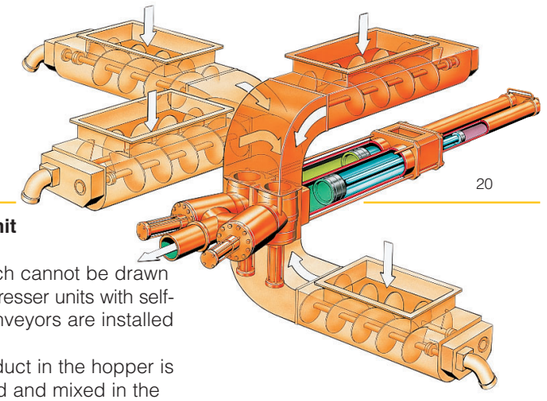
Duo HSP

Each cylinder pumps separately from its own intake line to its own delivery line. Without the need for complicated distribution systems, the conveyed product is pumped in equal quantities to two different areas.

Single HSP

This version is suitable for small outputs where cyclical interruptions to delivery do not pose a problem. The HSP variant taking the least space.

Both the Duo and the Single HSP deliver with interruptions in the delivery flow because of the intervening suction stroke.



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The valves

HSP disc valves with various diameters can be obtained, with the largest being 220 mm.

Two types of seal can be used, depending on the product being delivered:

- hard-soft: steel disc with elastic seal ring for watery or fine grain slurries
- hard-hard: hard metal seat for media with a high content of dry solids

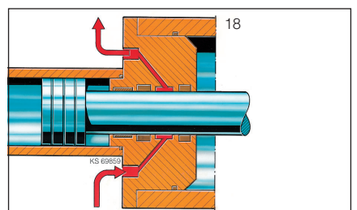
The capability to reverse the valve seats and valve discs saves on costs and doubles service life.

The machine is particularly service-friendly since wear parts can be replaced without the need to undo the delivery or intake connections on the pump. This minimises interruptions to operation and the system remains available as far as possible.

The valve rods are force-flushed beneath a cover, thus separating the hydraulic circuit from the conveyed product. Grease or optionally a special medium are used for flushing.

As long a cylinder stroke as possible is used to reduce valve play and interruptions during switching. Lengths between 1000 and 2500 mm are standard for diameters of 150 to 560 mm.

An L version seat valve is available for special applications. This prevents the piston rod, which is immersed in the conveyed medium, from coming into contact with the hydraulic fluid in the valve cylinder.



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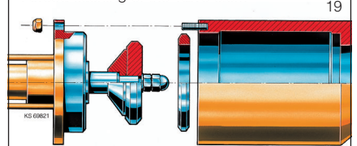
Forced flushing of the valve stem



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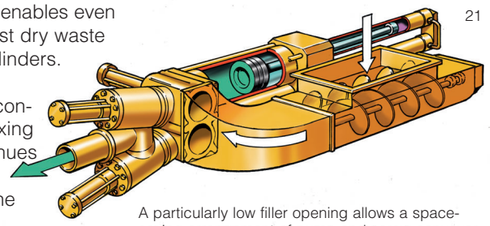
Simple valve change
without removing the pipeline

The prepresser unit

For stiff media which cannot be drawn in as they are, prepresser units with self-cleaning screw conveyors are installed on the intake side.
The conveyed product in the hopper is intensively kneaded and mixed in the screw conveyors and then forced in the cylinders to achieve a high level of volumetric efficiency. This enables even compact, moist and almost dry waste to be pumped into the cylinders.

The design of the screw conveyors determines the mixing intensity. The waste continues to be mixed in the pump and delivery line due to the turbulent flow.

A Mixopress device can dose several additives continuously.
The prepresser unit is modular and can be adapted to best suit each individual application.



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A particularly low filler opening allows a space-saving arrangement of pump and screw conveyor in the side parallel booster.

The hydraulic pack

The delivery rate and pressure can be very flexibly adjusted to suit various applications thanks to the hydraulic drive.

The delivery rate and pressure may be regulated by process control systems, remotely if required.

The CI hydraulic pack is particularly quiet in operation because of its vibration damping frame. The hydraulic fluid reservoir has a special coating on the inside which makes it resistant to corrosion.
The electric and diesel power units yield between 11 and 500 kilowatts, more under certain circumstances with special requirements.
The machine is delivered with an open (EHS) or closed hydraulic circuit (FFHE) depending on the volume of fluid required.

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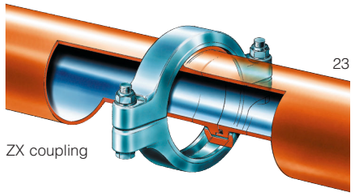
For problem-free operation, all essential information (hydraulic fluid temperature, pressure, level of filter contamination and motor speed) is displayed and recorded as required.

Accessories for custom design and equipment of your system

Delivery line:
Enclosed pipelines are used to transport solids, thus preventing odours and contamination and not requiring operating personnel to come into contact with the conveyed product. These pipelines can be laid in a way which is both economical with space and best suited to the construction.

The ZX delivery line system is completely leakproof and resists high pressures. The pipe are designed for the specified operating pressure by dynamic calculation, thus rendering them long-lasting and suitable for non-abrasive media. This is important for ensuring permanent operational safety of high pressure lines. Pipes may also be supplied with DIN flanges in addition to ZX delivery lines.



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ZX coupling

Gate valves and transfer tubes:
Hydraulically-operated and remote-controlled, the conveyed product can be distributed as desired.

Pig systems:
The pig gate allows pigs to be introduced to clean the delivery line without it being necessary to open the latter. This system can also be used when the machine is in continuous delivery mode.

Damping vessel:
Designed as a force-ventilated damping vessel (active "power damper") or as a free piston damper, the damping vessel ensures smooth delivery without interruption during stroke change of the Duplex pump. Pressure peaks in the delivery line are thereby reliably avoided and a continuous flow is achieved.

Lubricant injection:
This reduces the delivery pressure significantly, thereby avoiding wear on the pump and saving operating costs.
In this way, extremely viscous media – especially sewage sludge – can be conveyed over great distances with low energy requirements and at considerably lower pressure.

Central lubrication system:
Pistons, cylinders and valve stems are force-lubricated with grease or oil to allow them to withstand the heavy loads exerted on them by machines and materials. Maintenance costs are reduced as a result and the safety of the machine against dry running is enhanced.

Metering of pumping output:
This makes process-monitoring, control and metering possible; various systems can be supplied.

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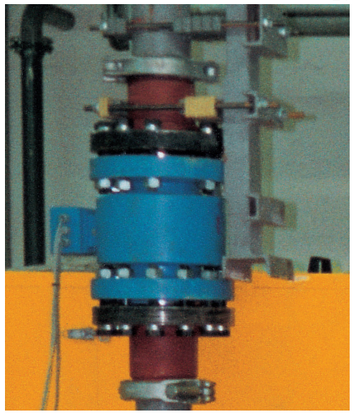

Inductive metering of pumping output

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ZX 200 pig gate, HPD 200/750 high pressure damping vessel and DVH 412 transfer tube

Putzmeister high density solids pumps provide solutions for the most difficult applications and for media most resistant to pumping

Putzmeister has been building pumps for concrete, mortar and all types of solids since 1958. Reliable engineering and practical innovations have placed these machines ahead of all others world-wide. Putzmeister pumps continue to achieve new records for pumping the most difficult material of all – concrete. With almost 200 bar concrete pressure, they can achieve delivery heights greater than 500 m and delivery over distances in excess of 2000 m.

In 1978, Putzmeister developed pumps for delivering slurry to be used in sewage engineering and throughout industry as a whole. Together with Putzmeister process engineering, PM high density solids pumps today have a wide spectrum of uses.
In sewage works, waste recycling, power stations, dewatering, mining and many other industry sectors you will find the right system for every product and every purpose: from simple piston pumps with ball valves, through seat valve pumps, to the powerful shredding piston pumps for hazardous waste and high pressure-proven S transfer tube pumps.
However, all Putzmeister pumps share several features: they are high quality, robust, reliable and economical.
Behind the scenes is the experienced Putzmeister process engineering team who will be able to offer you the best solution for every application.

KOV – hydraulic piston pump with ball valves
- pumps fine grain pastes
- simple construction, few moving parts, high availability

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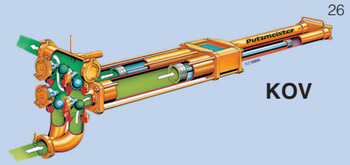

KOV

KOS – hydraulic double piston pump with S transfer tube
- pumps coarse grain slurries with a high proportion of solids
- low wear
- the world leader in high density solids pumps: the world's largest pump with an S transfer tube delivers up to 500 m³ per hour

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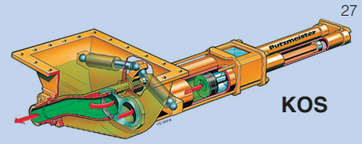

KOS

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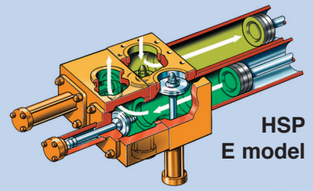

HSP
E model

HSP – hydraulic piston pump with hydraulically-operated seat valves
- pumps fine grain slurries
- highest delivery pressure

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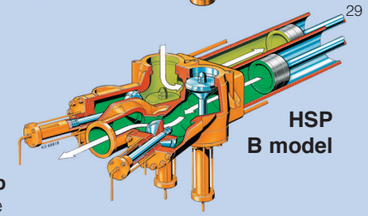

HSP
B model

EKO – hydraulic single piston pump
- a genuine "all-rounder": pumps the largest and coarsest particles and the most viscous of sludges
- can pump and shear the conveyed product in a single stroke

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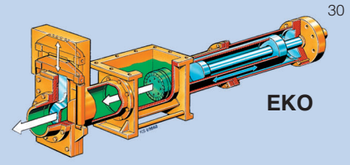
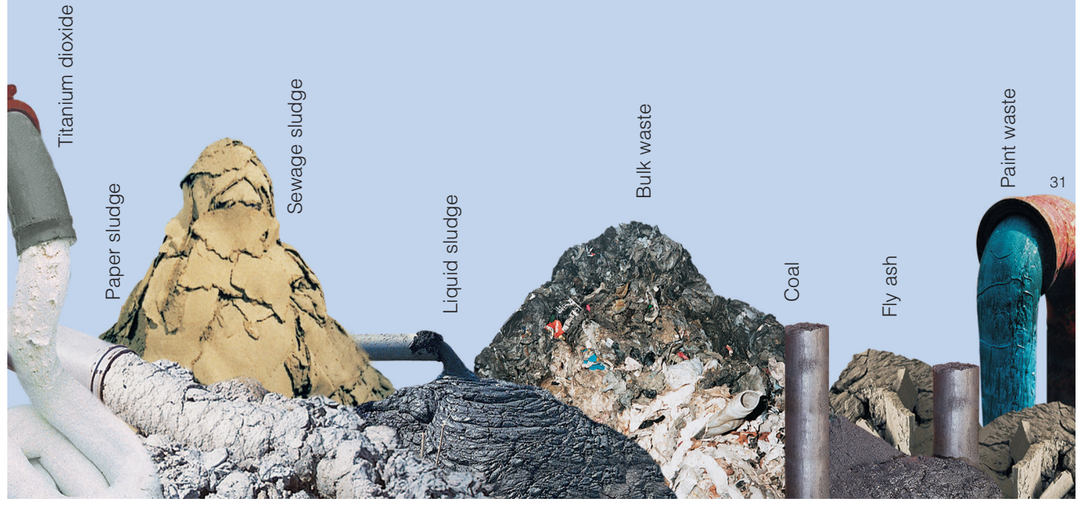


EKO



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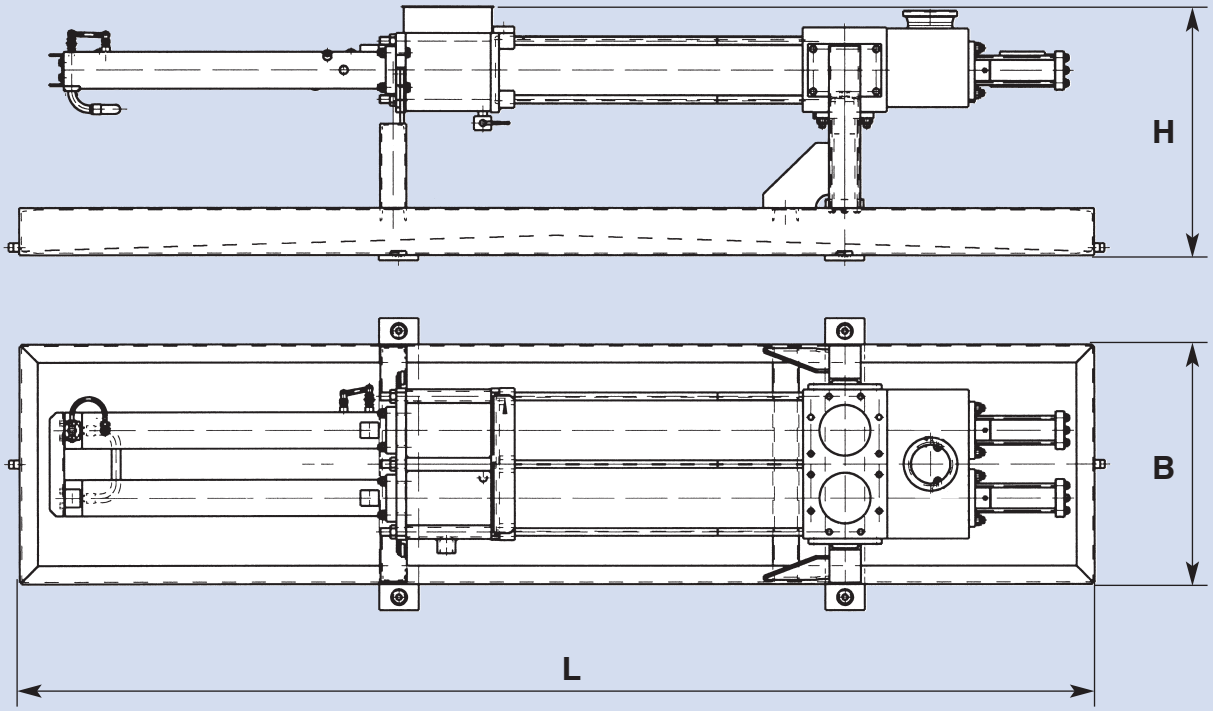
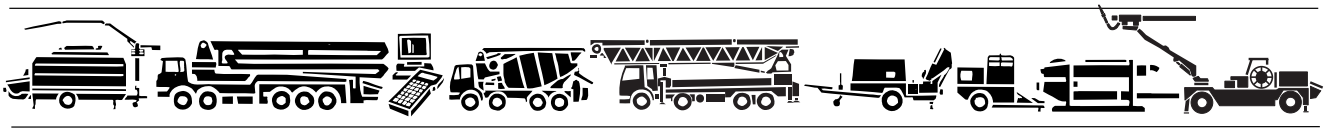
Technical data

Model	Delivery rate*	Delivery pressure**	Stroke	Delivery cylinder diameter	Length (L)	Width (B)	Height (H)
	m^3/h	bar	mm	mm	mm	mm	mm
HSP 1050 SP	15	50	1000	180	3800	600	900
HSP 1040	25	130	1000	150	4100	900	1200
HSP 1050	36	100	1000	180	4100	900	1200
HSP 1070	60	85	1000	230	4100	900	1200
HSP 1080	80	80	1000	280	4600	1100	1300
HSP 1480	85	80	1400	280	5400	1100	1300
HSP 2180	115	80	2100	280	6800	1100	1300
HSP 25100	200	35	2500	360	7500	1700	1500
HSP 25200	500	30	2500	560	7500	1700	1500

The values provided above are to be viewed as guideline values only and may alter depending on machine applications.
Please request detailed quotation drawings.

* Filling ratio 100 %, maximum stroke frequency
** Calculated maximum delivery pressure





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PM-Services
PM-Concrete Project Division CPD
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PM-Akademie GmbH

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