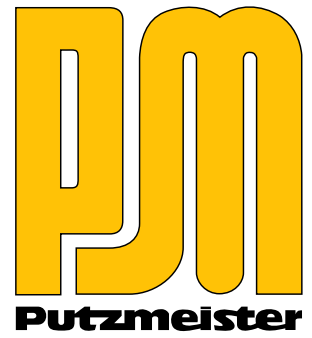


High density solids pumps KOS series

For coarse-grain high density solids
and high pressure applications



The KOS series...

Transfer tube controlled high density solids pumps without valves

One feature of the KOS series is its S-transfer tube. This connection of the drawing-in and pressure cylinders guarantees an almost continuous operation with free passage of the material to be conveyed without valves. Individual foreign bodies in the material to be conveyed can easily be conveyed with a particle size of up to 80 % of the outlet diameter.

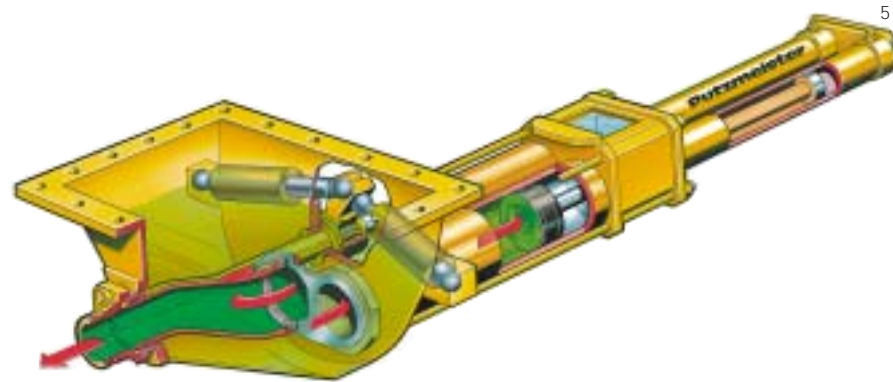
When the S-transfer tube switches over, minimum return flow can occur in isolated cases at very high pressures. This is usually less than 5 % of the stroke volume.

In these exceptional cases, it is advisable to use damping systems which exclude this return flow.

KOS pumps have free passage without any troublesome resistance to flow. They can thus suck in also the stiffest of sludges.

The simple design with very few movable parts reduces the share of wear parts to a minimum. This pump is thus ideally suitable for the 3 shift operation with high service life.

The KOS easily handles highly-viscous sludges such as materials to be conveyed with a high share of coarse grain.



2 high-density solids pumps KOS 1030 to charge sewage sludge into the garbage incinerator in Dinan, France



The largest S-pipe piston pump world-wide, manufactured by Putzmeister: KOS 25200 with a conveying performance of 550 m³/h. She is in operation claiming land just before Japan's coast

...for media to be conveyed with a high percentage of solid matter and coarse grain with pressures up to 130 bar

KOS-Pumps are especially robust and resistant. Coarse grain that occasionally gets jammed, does not cause any damage.

The main field of application is thus for materials with most extreme requirements. These are, for example:

- highly dewatered sewage sludges
- sewage sludges with percentages of foreign bodies
- oil sludges with percentages of foreign bodies
- bio waste and other waste
- chemical and organic high density solids with highest viscosity

A variety of task-specific components and functions are available for extreme application. Here are just some examples:

- reinforced S-pipes and S-pipe piston for shearing off the foreign bodies
- S-pipe with "ears" for a quiet delivery line at high pressure
- automatic reverse pumping functions for preventing and automatically removing blockages
- mixer paddles in the feeding device for homogenizing the materials
- agitators in the suction housing for extremely stiff and inhomogeneous materials
- different materials for the machine elements for handling abrasive and aggressive media (e.g. special steel for the foodstuff industry)
- different types of feeding devices on the suction side
- damping vessels
- pipeline flanges on suction inlet of hopper optional with agitator (horizontal or vertical)



Water sludges



Sewage sludge from filter press and centrifuges



Fly ash, tailings, coal paste



Bio-waste, special waste, compost

Differentiating features:

HSP

- fine-grain high density solids
- switch-over without short circuiting
- no reverse flow at high pressure
- simple installation of damping vessels
- better efficiency for materials to be conveyed containing a high degree of air



KOS

- for high density solids with a high percentage of solids and coarse, individual foreign bodies up to approx. 80 % of the pipe inside diameter, resp. pressure outlet
- less maintenance and wear as there are less moving parts
- less filling resistance due to large, open material inlet
- hydraulic circuit reliably separated from the material to be conveyed, also if maintenance is poor



The powerful high density solids pumps with S-transfer tube

The S-transfer tube

There are four variations in shape and diameter of the S-pipe (refer to Fig. 16). It can thus be adapted to the respective operating conditions.

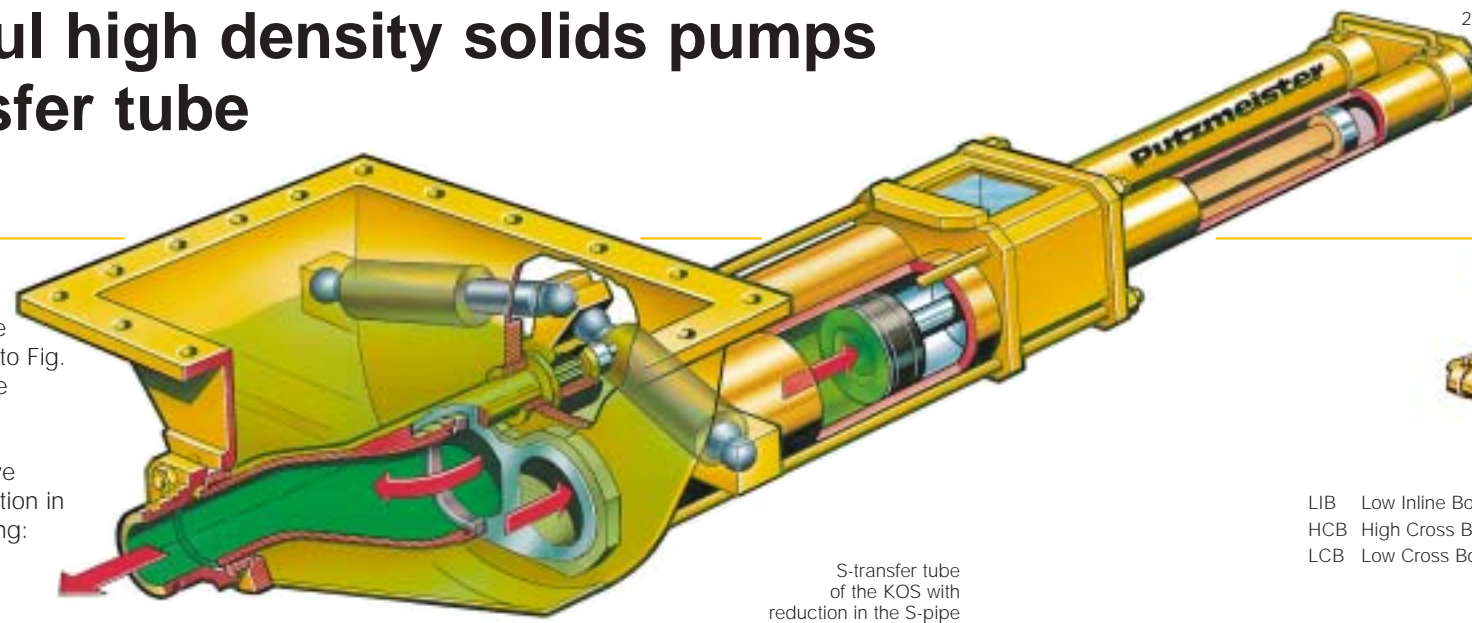
The S-transfer tube offers decisive advantages for you during operation in conjunction with the automatic ring:

- favourable flow conditions
- high cylinder filling rate
- low wear
- long service life
- easy-to-clean
- especially compression-proof even with a high percentage of solids
- quiet and exact pumping characteristic
- maintenance-friendly thanks to screwed-on changeover shaft

The range of thin, watery suspensions to thick, compact sludges is no problem for the S-transfer tube.

Numerous successful applications and satisfied customers in all fields of high density solids conveying, prove the reliability and efficiency of this system.

Many impressive world records have thereby been set under the most difficult of conditions.



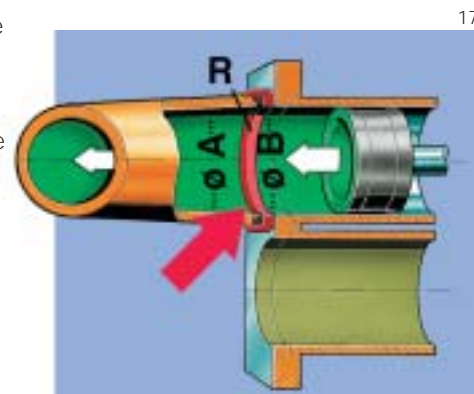
S-transfer tube of the KOS with reduction in the S-pipe

The automatic ring

It is especially difficult to seal between the S-pipe and delivery line when conveying at high pressure or when conveying abrasive material.

The Putzmeister solution here: the automatic ring.

Under pressure, wear ring R is pressed against wear plate B as $\varnothing A$ is larger than $\varnothing B$. The S-pipe slides back within R and is sealed by the O-ring (Fig. 17).



The automatic ring automatically seals under pressure and considerably reduces the wear

The higher the pressure, the more sealproof the system.

This ring automatically compensates for the switch-over wear of the transfer tube during operation.

It doesn't matter whether the material is fine or coarse, the patented automatic ring always seals well – when new it even seals hermetically against water.

The special advantage here: thanks to the special design, only one sealing point is required.

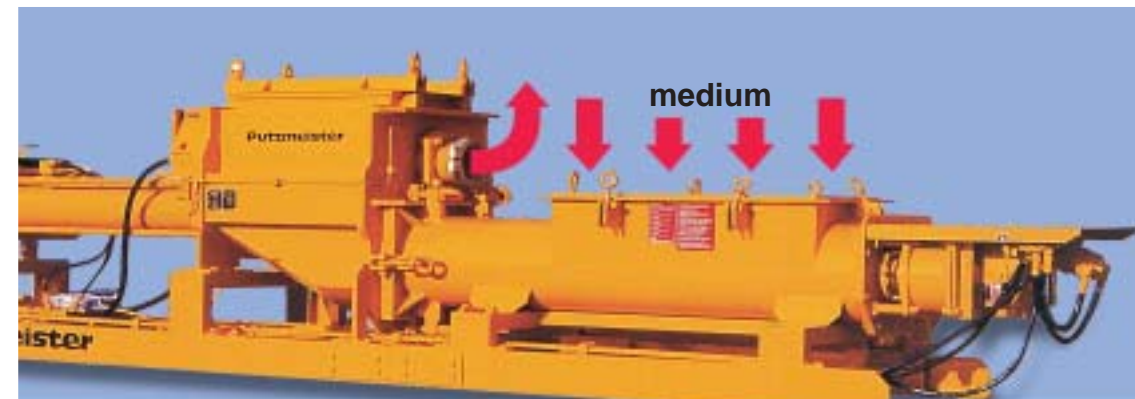


The few wear parts can be easily and quickly exchanged. They can also be supplied in an especially long-life hard metal version.

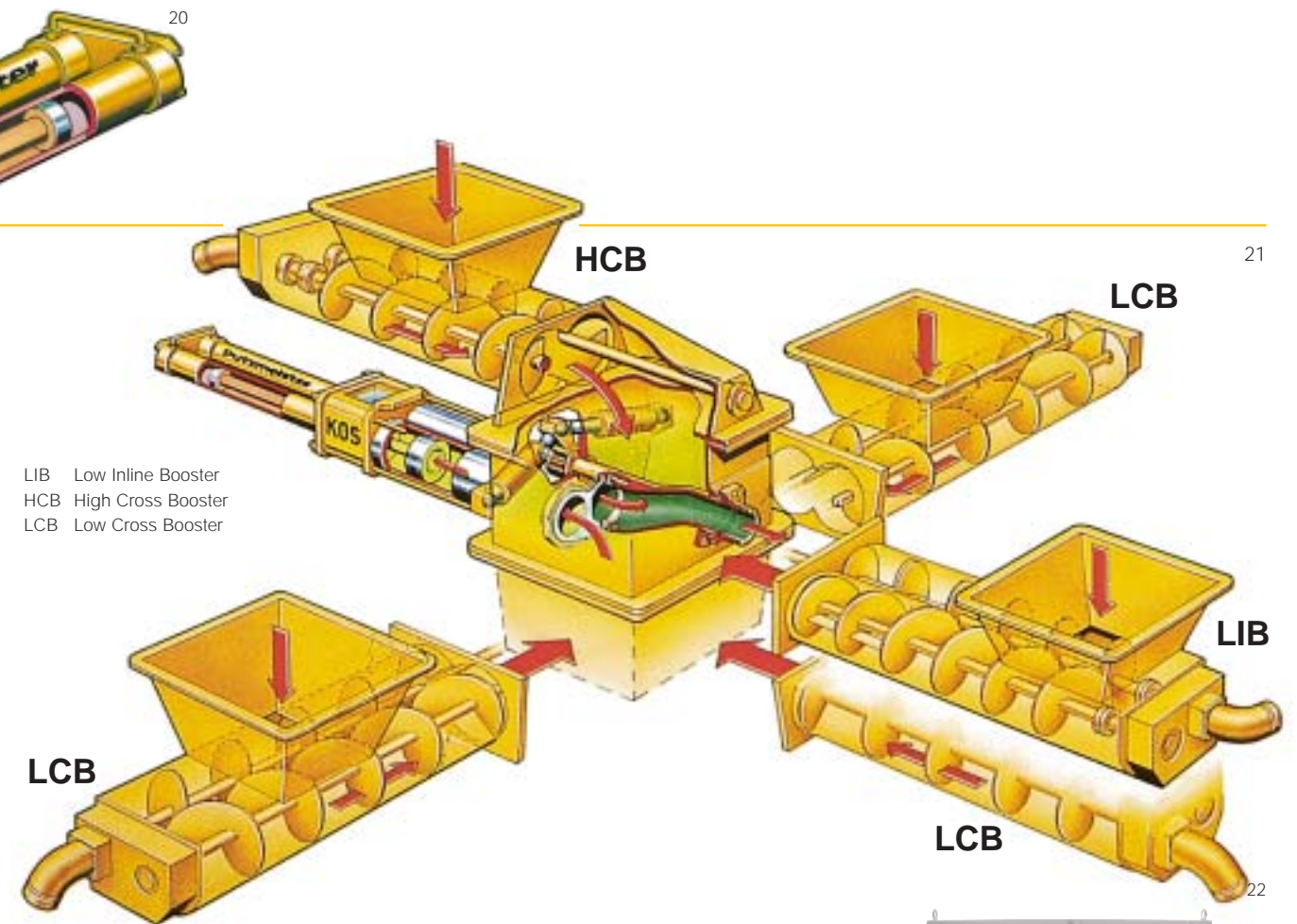
Type	Inside Ø	Inlet	Outlet
S 1812V	mm	180	120
S 2015V	mm	200	150
S 2018V	mm	200	180
S 2318V	mm	230	180



S-pipe with cyl. "full flow" passage



The KOS with feed device THS 332 LIB. The standard version for difficult pumping operations.



LIB Low Inline Booster
HCB High Cross Booster
LCB Low Cross Booster

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.

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.

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



The switchbox with the display of the POS (Putzmeister Operating System). It clearly indicates all the relevant data.



Hydraulikaggregat CI

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 pipes 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.



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 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.



Inductive metering of pumping output



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

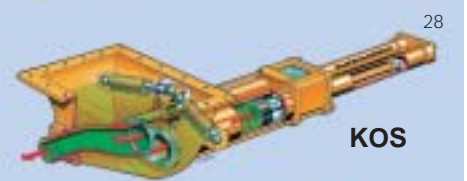
- pumps fine grain pastes
- simple construction, few moving parts, high availability



KOV

KOS – hydraulic double piston pump with S transfer tube

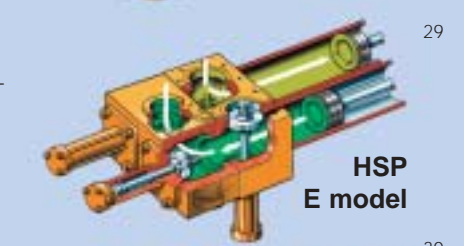
- pumps coarse grain slurries with a high proportion of solids
- low wear
- the world leader in high density solids pumps: the world's largest pump with an S transfer tube delivers more than 500 m³ per hour



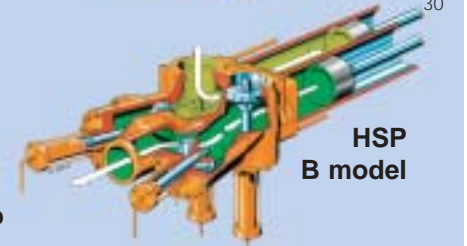
KOS

HSP – hydraulic piston pump with hydraulically-operated seat valves

- pumps fine grain slurries
- highest delivery pressure



HSP
E model



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



EKO



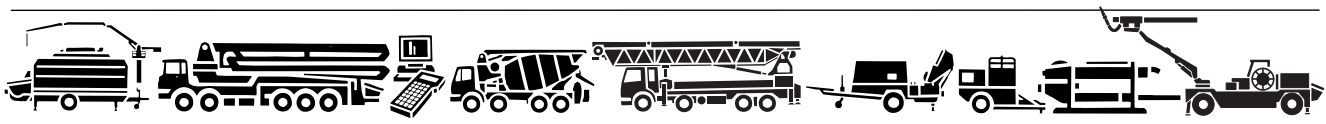
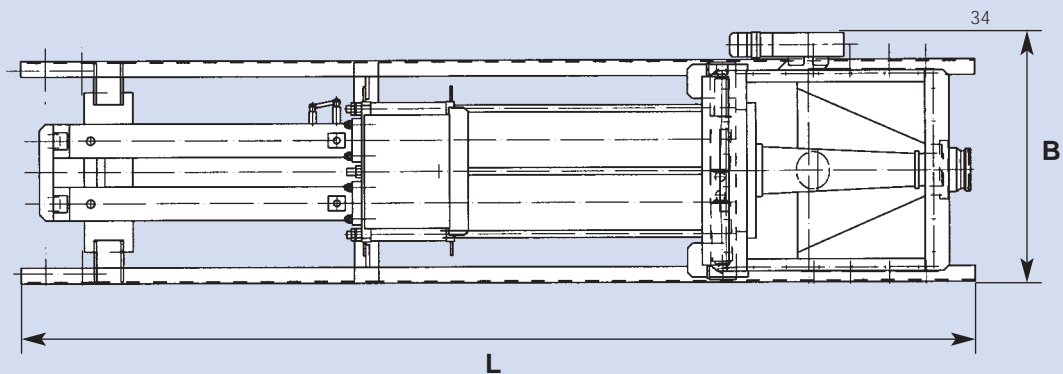
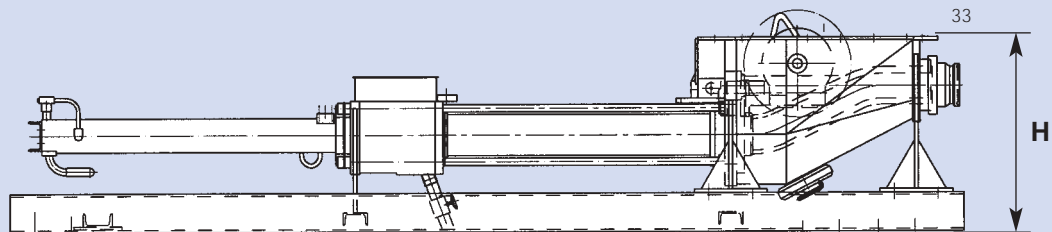
Technical Data

Model	Output* m ³ /h	Conveying pressure** bar	Stroke mm	Delivery cylinder Ø mm	Length (L) mm	Width (W) mm	Height (H) mm
KOS 1030	16	100	1000	120	3300	800	700
KOS 1050	36	100	1000	180	3900	900	800
KOS 1070	60	85	1000	230	3900	900	800
KOS 1080	80	80	1000	280	4300	1000	1100
KOS 1480	85	80	1400	280	5400	1100	1100
KOS 2180	115	80	2100	280	6800	1100	1100
KOS 25100	200	35	2500	360	7500	1700	1500
KOS 25200	500	30	2500	560	7500	1700	1500

The data quoted above serves as a guide line. Designs differ according to specific applications. Please ask for more detailed quotation drawings.

* Figures for maximum output refer to a 100 % fill level at the maximum stroke time technically possible.

** This figure represents the maximum theoretical delivery pressure and does not take the service life of the piston pump into account.



Putzmeister products and services

PM-Concrete Pumps

PM-Systems Engineering PAT

PM-Telebelt

PM-Mörtelmaschinen GmbH

PM-Dynajet high pressure cleaners

PM-Services

PM-Concrete Project Division CPD

PM-Consulting and Data Technology

PM-Akademie GmbH



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