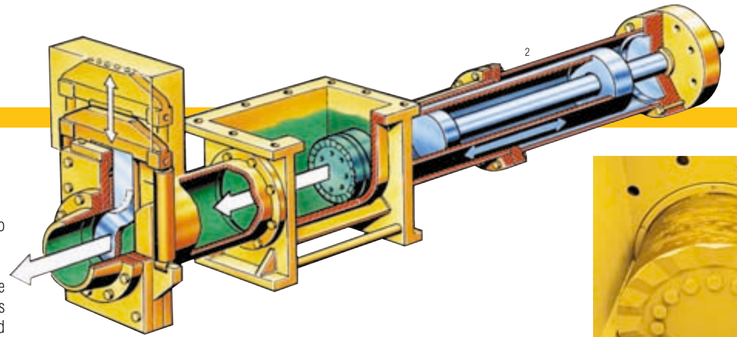
The EKO series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Principle of function and pump construction

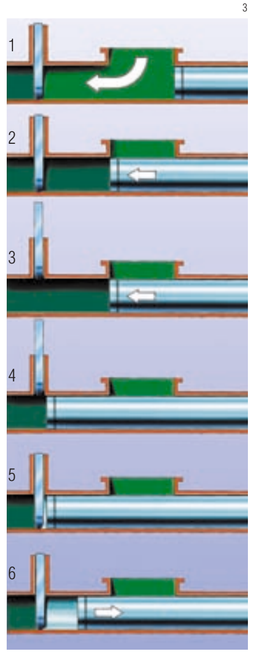
The material to be conveyed is fed into the pump via a material feeding hopper.

1. A hydraulic drive cylinder moves the plunger forwards and backwards. As the piston is retracting, the feed chamber is filled.
2. The plunger pushes the compressed material out of the feed chamber into the supply cylinder.
3. The slide valve opens on entry of the plunger into the cylinder.
4. The hydraulically driven plunger delivers the material into the pipeline.
5. The gate valve closes the pipeline, preventing any reverse flow material. In addition, this prevents „burn back“ from the furnace.
6. The plunger returns to its starting positon, thus opening the feed chamber allowing the material to enter.

Awkward shapes or oversize materials may additonally have to be pressed into the material feed area using a compactor (Fig. 6).

In the case of sticky materials, there is a danger of bridging. This problem is solved by the compactor as well (Fig. 6).

A sticky consistency can also result in overfilling, with the consequence that blockages can form. This can be avoided by metered dosing of the material using a dosing auger (Fig. 6).



3

The gate valve

A special gate valve designed for extremely heavy loading prevents back-flow of material from the discharge pipe. This gate valve is directly attached to the outlet flange of the EKO and is operated via the pump's control system. An automatic greasing system guarantees reliable operation, even with continuous use. The specially formed, robust valve blade is made from highly wear resistant steel, which easily shears foreign bodies on closing.

For bulky dry material that cannot flow back (e.g. screenings), a lamellar non-return valve is used (Fig. 4). This is a simply-added economical and reliable system.


4

EKO 1060 with lamellar non-return valve


5

Plunger with cutting edge

The EKO crown …

… cuts and transports in one operation

For the most demanding of requirements, the EKO crown is used.

This pump is used where the material contains large foreign bodies. In other systems, these often lead to blocking of the pump.

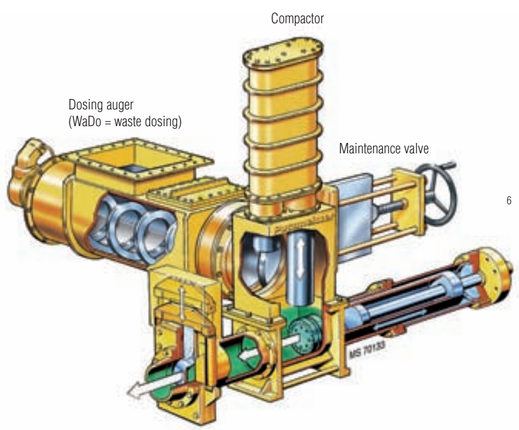
The EKO crown has a transport piston with a hardened and toothed cutting edge (Fig. 5). Foreign bodies (metal, steel, glass, wood, etc.) that may come between the piston and the material feed chamber, or the material jams in the pipeline, the EKO crown switches over automatically to half stroke speed. At the same time, the piston drive power doubles. The foreign body is cut up with double the force. Blockages are cleared automatically.

- If the foreign body should still be stuck, the piston automatically retracts a short distance and is then pushed forward again. This process repeats up to three times. This „loosening“ procedure usually leads to continuation of the flow.
- If the foreign body cannot be removed in this way, a fault signal is automatically given to alert the operator and permit the pump to be driven clear in manual operating mode.

A double chromium-plated and hardened plunger and various types of seales (e.g. Viton) are only two of the features that significantly increase the life-time of the EKO crown, making it capable of withstanding the most extreme demands.

Other performance features of the EKO crown illustrate its reliability:

- If a foreign body sticks between the piston and the material feed chamber, or if the material jams in the pipeline, the EKO crown switches over automatically to half stroke speed. At the same time, the piston drive power doubles. The foreign body is cut up with double the force. Blockages are cleared automatically.



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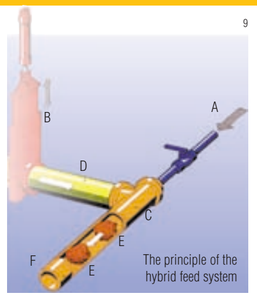
File under: A 1.00, BP 1.03, A 4.00, BP 4.03

Single piston pump based on the thrust principle

The hybrid feed system

Even with dry materials that are prone to bridging, long distances can be overcome. It is for just such cases that the “hybrid feed system“ is designed.
(The „hybrid“ designation denotes hydraulic + pneumatic).

It functions on the „pneumatic delivery“ principle. Compressed air is injected into the pipeline. This separates and fluidizes the material. Depending on the quantity of air, the material which is initially in the form of plugs can, with increaing distance, become a steady airborne stream. In this way, extending feeding distances are possible.
The feed air mixes readily with the combustion air in the furnace.



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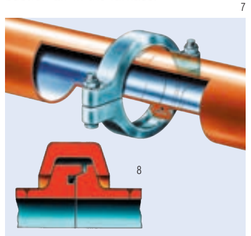
The principle of the hybrid feed system

A Compressed air
B Shut-off valve
C T-piece for air injection
D Pressure line for compression stream
E Plug of material
F Delivery line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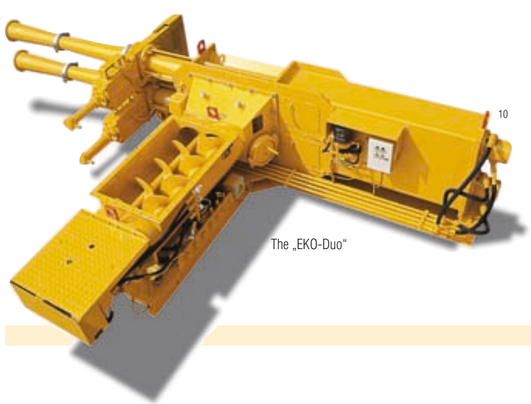
Delivery lines

The EKO is further complimented by a wide range of delivery line options. The ZX coupling system, for instance, allows a particularly flexible and economical pipeline arrangement.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The „EKO-Duo“

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The hydraulic unit

The EKO is fitted with a hydraulic drive unit. This operates the delivery piston, the gate valve, and the bridge breaker and compactor.

The hydraulic unit permits an optimal adjustment of the required „feed“ pressures and quantities. The feed rate can be adjusted manually or automatically at the equipment, or from a remote monitoring point.

For automatic operation, delivery rate information such as oil temperature, oil pressure and filter status, etc. are clearly displayed, and recorded if required.

For media that you previously thought of as ”not capable of being pumped“

In contrast to the alternative transport methods, „closed“ transport in pipelines with efficient piston pumps is becoming more and more widespread.

Older types of high density solids pumps with double pistons are limited in their applications by the fact that the cylinder must be filled with material before the feed stroke takes place.

The EKO single piston pump, on the other hand, works on the thrust principle. Bulky material is fed into the feed chamber – if needed, forced in. Finally, a piston pushes the medium out of the feed chamber into the delivery line.

Since the feed chamber has a large opening, it can be fed with bulky or hard to handle materials.

Possible applications

- Highly dewatered sludge from filter presses
- Dried paper pulp
- Hazardous waste from barrel comminution, including shredded barrels
- Screenings from sewage treatment works

The variants

Depending on the requirements, the EKO can be supplied in either single pump, dual pump or crown version.

The **Single EKO** is designed for standard applications and is particularly suited for charging of incinerators.

Where a semi-continuous delivery or larger feed output is required, the **EKO Duo** is used (Fig. 10). Two independent single cylinder pistons feed into a shared discharge line.

The **EKO Crown** handles the most difficult tasks and is even able to cut up large foreign bodies contained in the material.

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Shredded barrel material pumped with sludge

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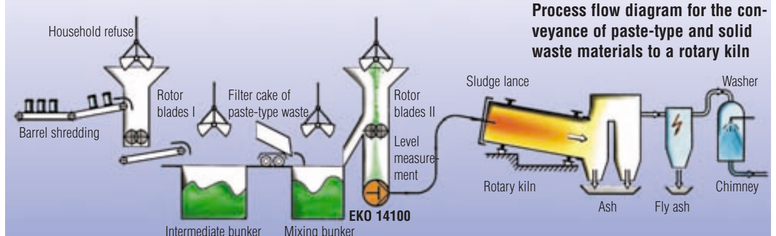
Biomass

14

Screenings from sewage plants

15

Process flow diagram for the conveyance of paste-type and solid waste materials to a rotary kiln



Single piston pump of the EKO series

For particularly difficult materials with a high solids content, such as shredded hazardous waste barrels

Putzmeister

1

EKO Technical data

Type	Delivery output m³/h (max ¹)	Delivery pressure bar	Cutting force t	Stroke mm	Delivery cylinder ø mm	Length mm	Width mm	Heigth mm
EKO 1060	7	60	—	500	200	3950	700	600
EKO 1060 Crown	7	40	25/80	500	200	3950	700	600
EKO 14100	14	40	—	700	350	3900	900	800
EKO 14100 Crown	14	40	80	700	350	3900	900	800

¹) including compactor

The above data should be taken as guide values and will be determined according to the specific use.
Please ask for a detailed quotation drawing.

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