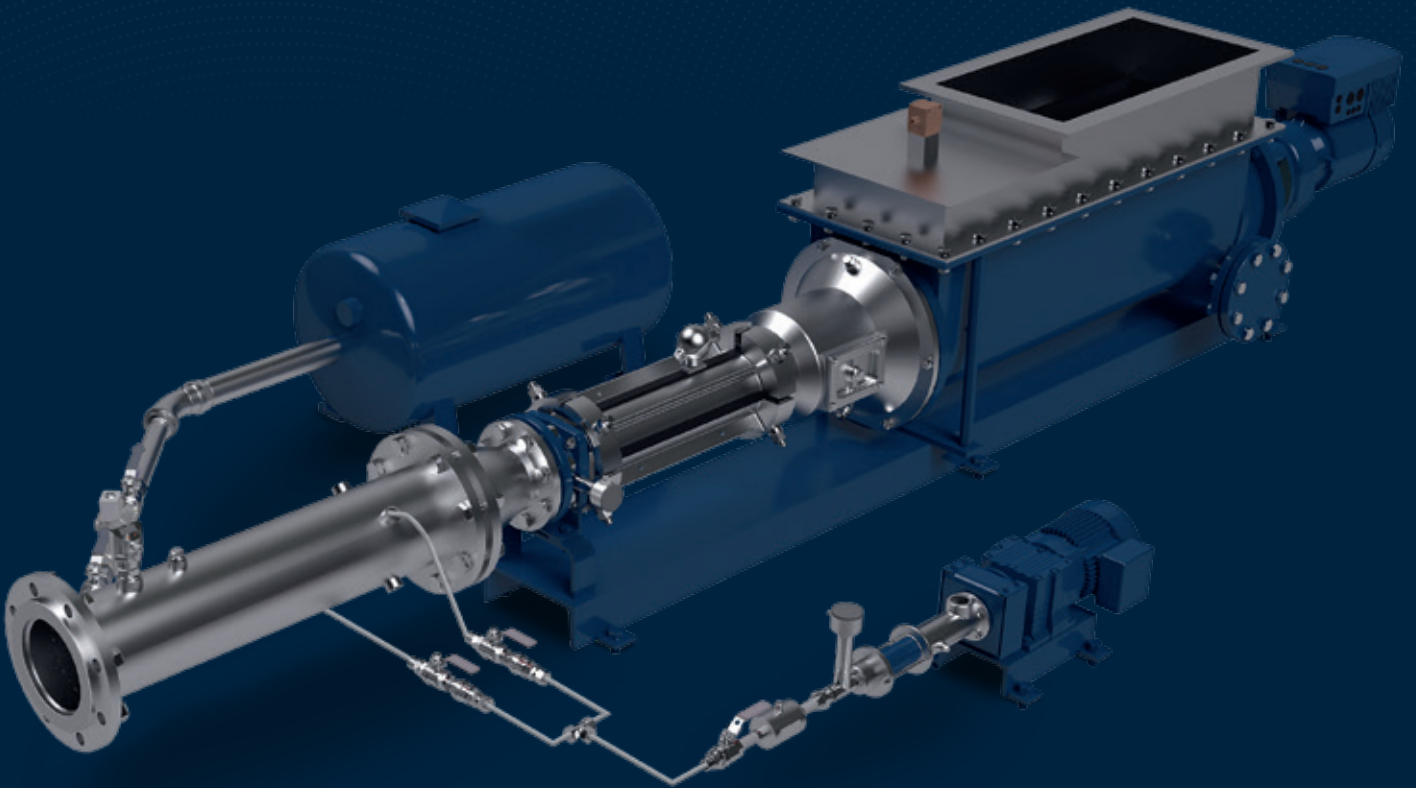


SEEPEX.
An Ingersoll Rand Business

OVER LONG DISTANCES SMART AIR INJECTION



SAI

LONG DISTANCE PUMPING.

Conveying highly viscous media, such as dewatered sewage sludge, over long distances is difficult due to its weak flow properties. Low flowability causes considerable friction loss in the pipeline, which can only be overcome by using high pressure displacement pumps or other conveying technologies. These pumps expend a large amount of energy and the high pressure load increases wear, resulting in high maintenance costs.

Conveying solutions using several drives (e.g. belt, screw, or chain conveyors) require high energy and maintenance. Some of these solutions are in an open-air design, meaning odors, nuisance noises and re-dilution of the media. Additionally there are limitations in the vertical height that can be overcome, which increases the conveyor complexity and maintenance requirements. Smart Air Injection overcomes all these issues.

Smart Air Injection (SAI), a customized system solution from SEEPEX, is particularly well-suited for environmental applications to convey sludge with a dry solids content of 20-40% over long distances up to 1,000 meters. Conventional conveying systems cannot typically convey dewatered sludge this distance, but SAI's long distance transfer capabilities open up new possibilities for the process design of sewage treatment plants.

With the patent pending SAI, the development team at SEEPEX has introduced a technology to the market that combines the innovative features of progressive cavity pumps with a pneumatic conveying system.

FEATURES

CONVEYING SOLUTION

The media is pre-compacted with the help of a SEEPEX open hopper pump into sludge plugs and conveyed further via pulsed compressed air injections. The timing of the air injections is specially designed to achieve an energy-efficient application.

Additionally, the plug is coated with a lubricant solution to reduce friction losses and further enhance the energy efficiency of the system.

PRESSURE LEVEL

The combination of pumping and dense phase conveying using compressed air and boundary layer injection reduces the pressure in the conveying pipeline to a very low level of only a few bars. This ensures increased durability of components as well as lower installation costs for thin-walled pipelines. Low pressure pumps with lower energy and space requirements can also be used.

SAI CONTROLLER

The SAI controller enables the visualization and control of the entire SAI process. Compressed air usage is controlled and all important process values and consumption variables are recorded. Safety functions, such as overpressure and dry running, are monitored and secured. Parameters can be adjusted by remote control from a control room or locally using the Touch Panel of the SAI controller.

PACKAGE UNIT

SAI is an automated subsystem, in which all machines, sensors and actuators are controlled and monitored using the SAI controller. The SAI controller can be easily integrated into existing controls using a field bus. In combination with SEEPEX Digital Solutions, comprehensive monitoring can be achieved.

SMART CONVEYING TECHNOLOGY

For rapid replacement of the rotor and stator. Maintenance downtime reduced by up to 85%.

AIR INJECTION

Compressed air is pulsed into the pipeline to convey the pre-compacted sludge plug.

INJECTOR

Connections for injecting lubricants and compressed air. Equipped with a pressure sensor to monitor and control compressed air pulses.

BOUNDARY LAYER INJECTION

To reduce friction losses in the pipeline. To optimize costs the conveying capacity of the lubricant is automatically adjusted to the conveying capacity of the main pump.

COMPRESSION CASING

Ensures optimal feeding of the media. Quick and easy maintenance: available as a conical compression casing in conjunction with Smart Conveying Technology or as a sliding compression casing.

AIR RECEIVER

For storing and releasing compressed air from the upstream compressor.

EXTENSION HOPPER

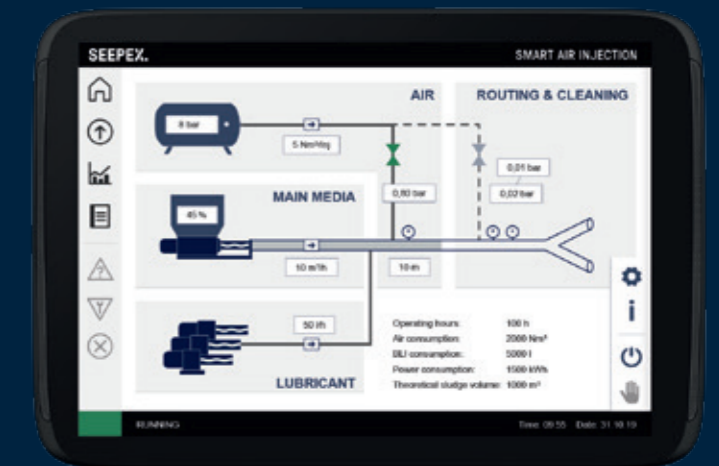
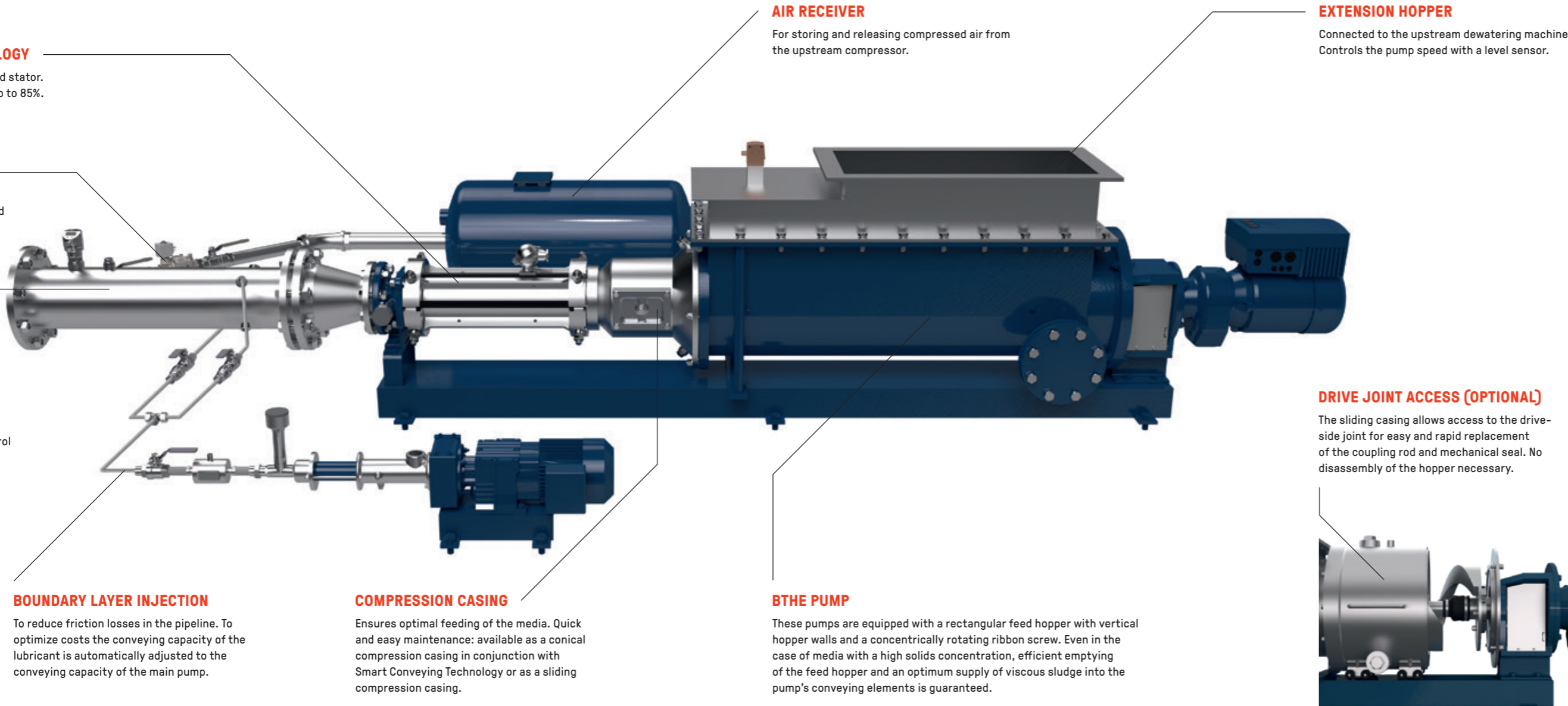
Connected to the upstream dewatering machine. Controls the pump speed with a level sensor.

DRIVE JOINT ACCESS (OPTIONAL)

The sliding casing allows access to the drive-side joint for easy and rapid replacement of the coupling rod and mechanical seal. No disassembly of the hopper necessary.

BTHE PUMP

These pumps are equipped with a rectangular feed hopper with vertical hopper walls and a concentrically rotating ribbon screw. Even in the case of media with a high solids concentration, efficient emptying of the feed hopper and an optimum supply of viscous sludge into the pump's conveying elements is guaranteed.



SAI Controller

APPLICATIONS

Smart Air Injection offers unprecedented benefits when conveying highly viscous media, such as sewage sludge, over long distances. With this innovative combination of various conveying and control technologies, the pressure level in the pipeline can be reduced by up to 90%.

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BENEFITS

- Total energy consumption reduced by up to 72%
- Reduced discharge pressure increases durability of all conveying components
- Operating costs considerably reduced: up to 72% for energy and 88% for maintenance
- Investment costs reduced up to 90% due to the use of thin-walled pipelines and valves (PN10)
- Transport routes up to 1,000 m and significant height differences can be easily negotiated
- Open hopper pumps with Smart Conveying Technology allow for less maintenance downtime without dismantling the discharge pipework
- Fully automatic subsystem for easy integration into existing control technology
- Closed system without odor nuisance or pollution along the transport route

KEY FACTS

- Conveying capacity:
0.5–20 m³/h
- Pressure:
up to 4 bar
- Pipework length:
up to 1,000 m
- Dry solids content:
20–40%
- Speed:
60–100 rpm