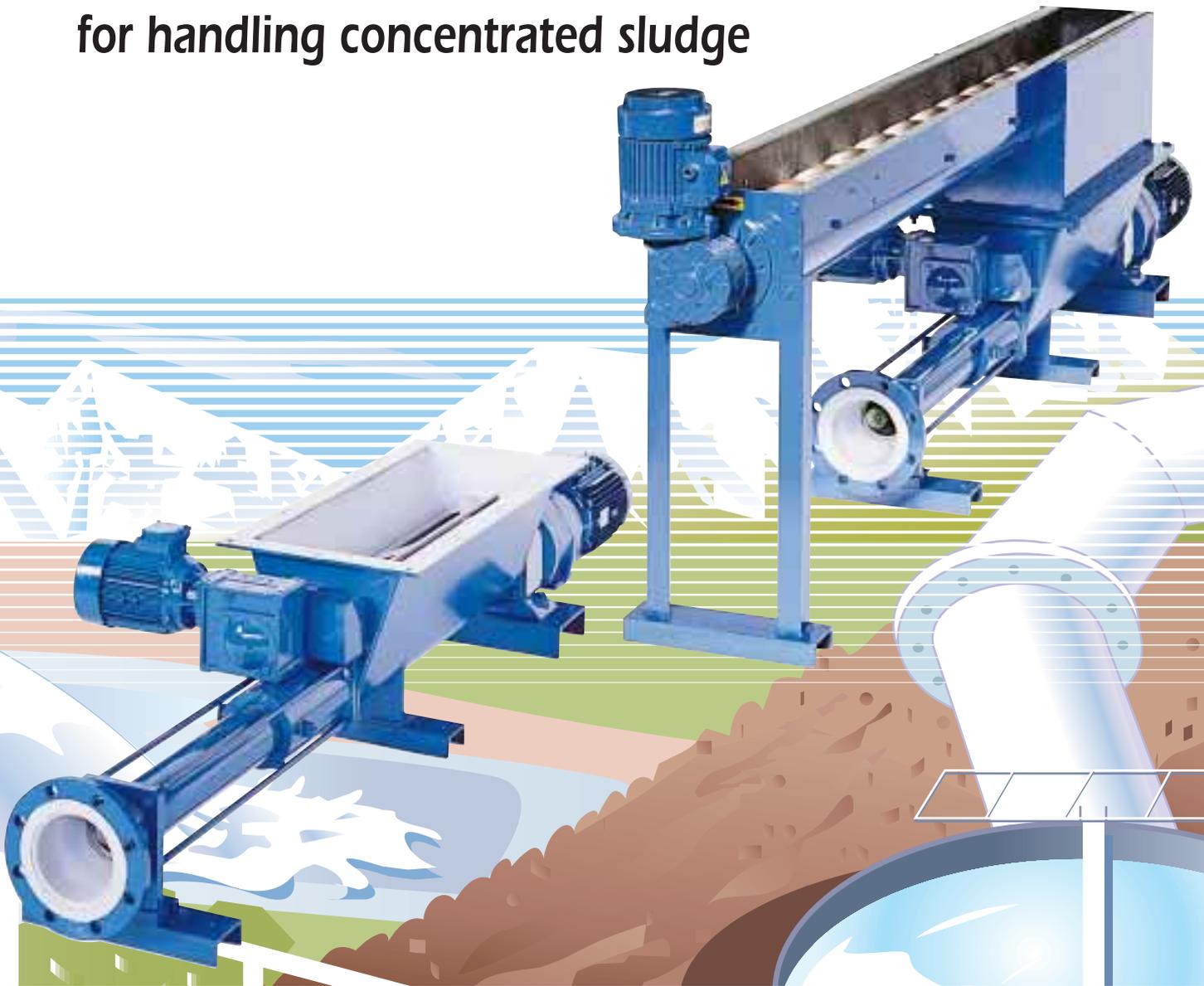


PCM MOINEAU

NEW!

GBB Series Force-Feed Progressive Cavity Pump

**With Forced screw
and built-in anti-cavitation device
for handling concentrated sludge**



From pumps to process



▶ Advantages

Force-Feed Pump for handling concentrated sludge

- Transports sludge while cutting down on problems from odours
- Used for mixing in lime treatment applications
- Suitable for all sludge concentration equipment
- Economical compared to other transfer systems such as:
 - belt conveyors
 - screw conveyors
- Low-cost alternative to piston pumps for handling major head loss
- Designed to cope with changes in service conditions at treatment facilities.

Moineau progressive cavity technology

- Gentle to material
- Constant flow without pulsation (important for providing feed for drying units for example)
- Easy to maintain

Characteristics

- Maximum flow rate: up to 30 m³/hr
- Maximum pressure: 12 bar - 18 bar - 24 bar
- Maximum temperature in continuous service: 80 °C
- Width of standard hopper: 350 mm for basic models
- Length of standard hopper for concentration equipment: 500 and 1000 mm for basic models
- Can be fitted to a conveyor system increasing lengths up to 1500, 2000, 2500 and 3000 mm
- Available in 2 or 4 pitch versions*

* Pitch represents the length of stator required for a chamber to rotate through 360° around the axis of the pump.

GBB force-feed pump from PCM Pompes: Handles concentrated sludge in complete safety with a range of equipment specially designed for the application.

The pumping solution for all applications involving:

- industrial or municipal sludge
- sludge (with or without lime treatment) for movement over long distances

Can be used in conjunction with all types of sludge dewatering equipment:

- draining tables
- belt filters
- centrifuges
- filter presses

Efficient wherever the sludge is being moved:

- transfer to storage areas or containers prior to disposal
- providing feed for dryers or incinerators

GBB force-feed pumps have been specially designed to deal with particularly difficult applications (sludge with high dryness content, adherent material, etc.) and include a number of original features:

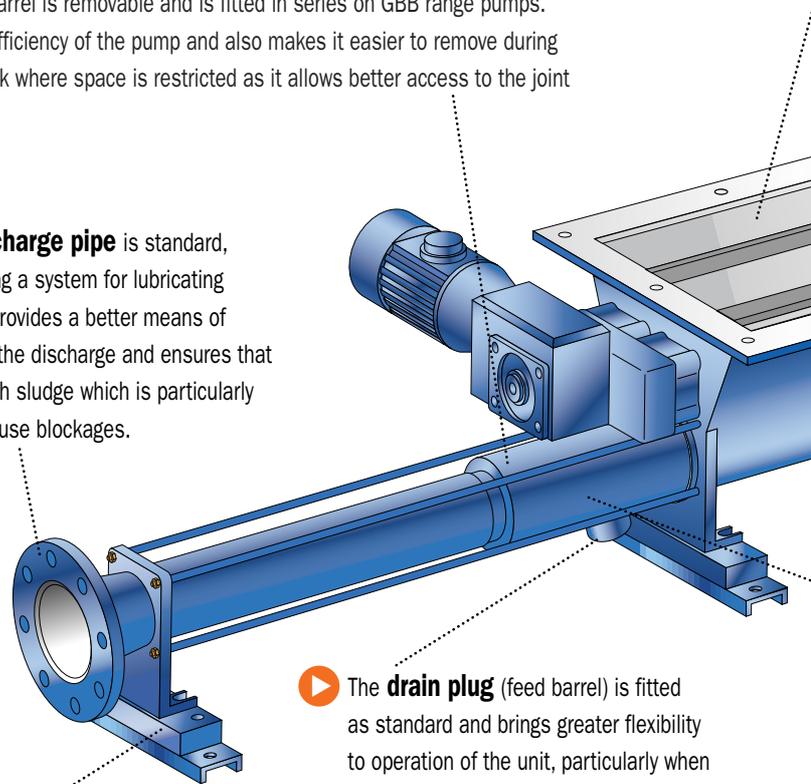
- elimination of retention areas
- drainage facility built into pump
- optimised performance for anti-cavitation and mixing functions
- easier to strip

▶ The new cone shape used for the **feed barrel** (part joining the hopper to stator) provides increased hydraulic performance and has been specially developed for moving difficult material (material with high dryness content and highly viscous or adherent products). This barrel is removable and is fitted in series on GBB range pumps. It improves the efficiency of the pump and also makes it easier to remove during maintenance work where space is restricted as it allows better access to the joint mechanism.

▶ The diameter of the **discharge pipe** is standard, with the pipe incorporating a system for lubricating the piping. This system provides a better means of monitoring head loss on the discharge and ensures that the pump will operate with sludge which is particularly adherent and liable to cause blockages.

▶ The **base** is designed to make it easier to install the pump and its drive on their foundations, whilst leaving enough room to access parts of the pump as required (drain plug for example).

▶ The **drain plug** (feed barrel) is fitted as standard and brings greater flexibility to operation of the unit, particularly when a cycle has been completed and the equipment is being cleaned. It also makes it easier to carry out maintenance work.



Construction

GBB Force-Feed Pump

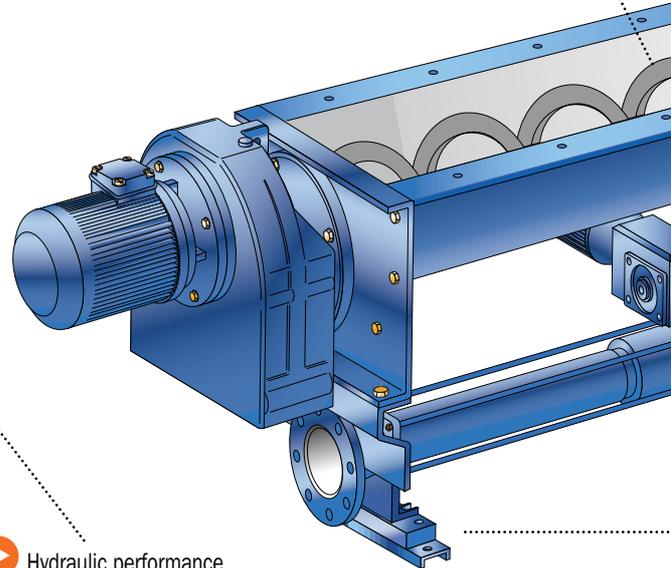
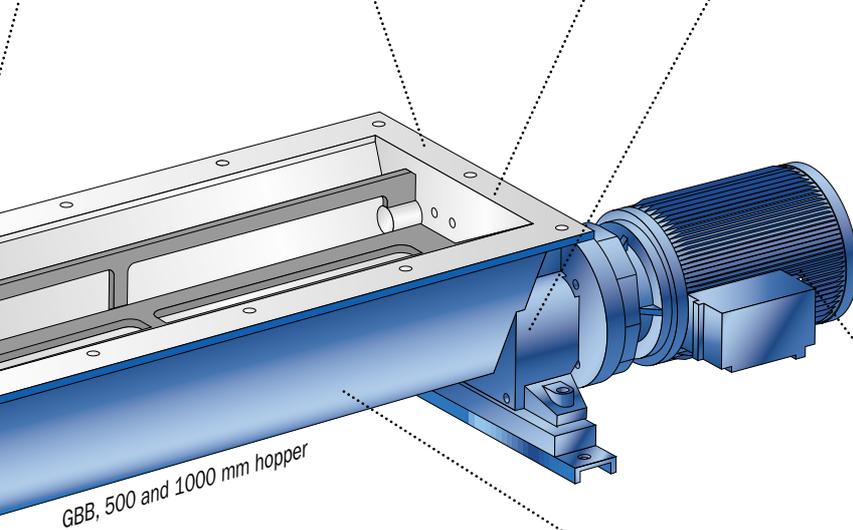
▶ The **anti-cavitation device** is fitted with frames and belongs to a new generation of this type of device. It promotes mixing if lime treatment is used and makes it easier for the material to be pumped to pass through. It is designed to prevent blockage and this ensures that the critical area on the sides of the hopper is cleaned continuously and optimal performance is obtained from any level sensors fitted to the pump.

▶ The dimensions of the **hopper** are **standardised** to allow the unit to be easily fitted to all types of dewatering equipment. A simplified system is used to fit the intermediate hoppers.

▶ The shape and construction of the **anti-retention hopper** keep flow problems to a minimum, even with particularly adherent material.

▶ The **screw conveyor** in the transfer area can have one or two threads and is used for moving the sludge to the mixing and pumping area.

▶ A new design has been used for the **cartridge seal system** making installation easier. The seal can be a simple gasket-type unit or have an automatic lubricator, and replacement is made easier with access from the back on the drive side.



▶ The rotor has a **simplified coupling** which is suitable for use with abrasive substances and is protected by a metal shell. Its design ensures that the pumped material flows better over the joint and makes it easier to remove the pump without having to take out the hopper.

▶ Hydraulic performance has been optimised for this new pump to allow the most suitable **drive** to be selected to cope with service conditions at the facility.

▶ **Retention areas** are eliminated due to the new design used for the back of the hopper (flanged spacer). This arrangement avoids the risk of having the material cake up at the back of the hopper when lime is used.

Collection under belt filter

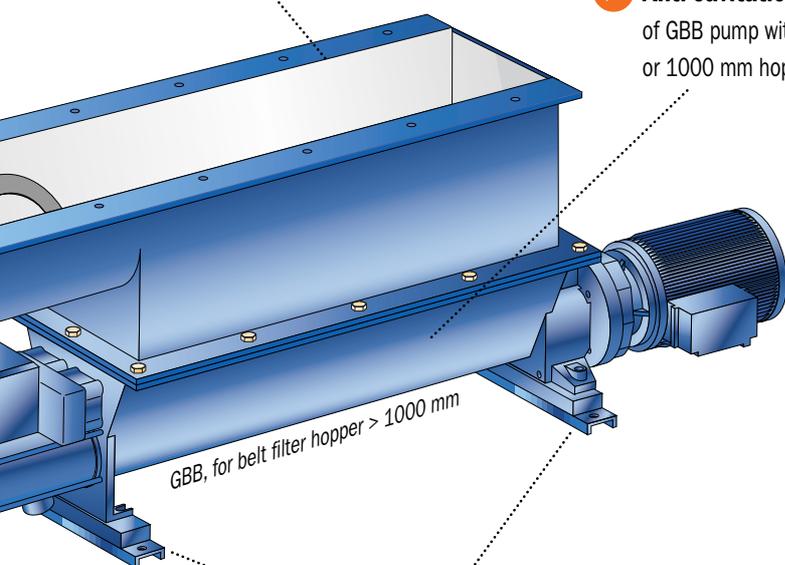
Belt width: 1500 to 3000 mm

A conveyor can be integrated into a standard 500 or 1000 GBB pump to provide a force-feed pump unit with a larger hopper size.

This particular design means that sludge can be collected behind belt filters with a belt width greater than 1000 mm.

▶ The **feed hopper** extends the transfer area to provide a single unit which can be fitted to all concentration equipment between 1500 and 3000 mm in length.

▶ **Anti-cavitation device area** of GBB pump with a 500 or 1000 mm hopper.



▶ **The base** is used to secure the assembly to form a single piece of equipment.

Advantages:

- Smaller space requirement: the pump is up to 25 % shorter than in standard systems.
- Simpler maintenance as tasks take less time and are easier to perform.
- Mechanical parts exposed to much less stress.
- Lower replacement part costs as wear parts are smaller for 500 or 1000 force-feed pumps.

Applicable standards and directives

CE

NF

Construction

Pump body

The body consists of a welded steel assembly, with corrosion proofing applied to ensure service under extremely corrosive conditions.

Rotor

Made from hardened steel,

Stator

Moulded unit inserted in a metal casing, made from hypalon which offers the best compromise between chemical resistance and resistance to abrasion.

Force-feed screw

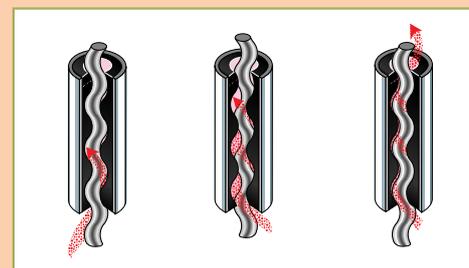
Made from steel.

Anti-cavitation device

Made from steel alloy.

Operation

A Moineau pump consists of a helical rotor which rotates inside a helical stator. The rotor is precision machined from hardened steel with the stator being moulded from an elastomer which is resistant to abrasion. The geometry and dimensions of these parts are designed so that a double string of sealed chambers (or cavities) are formed when the rotor is inserted in the stator. The cavities move along the pump shaft as the rotor rotates inside the stator (without changing their shape or their size) and carry the material from the inlet of the pump through to its output.



Optional equipment

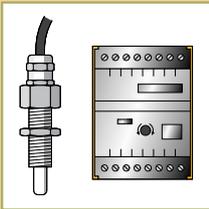
The secret of successfully integrating the equipment into the user's process facilities lies in taking all the variables associated with the pump and its environment into account.

PCM look at these operating constraints and put forward recommendations for options and accessories which will provide the level of safety necessary for the pump. These include:

Dry running protection device

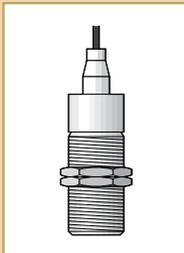
This system can be set up on the pump discharge or the force-feed barrel on the suction side, depending on the requirements of the process. The system checks whether material is present inside the pump body to prevent the possibility of the pump running dry and causing damage to the stator. This equipment has been specifically adapted for

use with sludge-type fluids and keeps the pump in a safe condition while it is in service.



Level detection

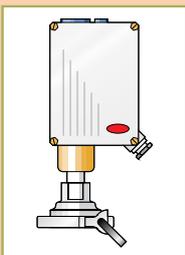
PCM have developed a number of different systems for monitoring the level of sludge in the hopper, to suit the particular service conditions of the pump. In addition to uses such as controlling the pump when lime is added, these devices also provide protection against the risk of running dry or cavitation.



Safety Pressure switch

Fitting a pressure switch to the pump discharge will prevent any damage caused

by operating the machine beyond its design limits, such as when piping becomes blocked or there is a large rise in pressure.



GBB force-feed pump: Setting up a force-feed pump is a part of the Client's process is necessary in order to take account of the Client's process. PCM are constantly striving to offer their customers a best price and Control Cabinet.

Control cabinet

Correct operation of the **GBB** force-feed pump depends on the quality of the control system linking the pump to the various items of equipment on the facility. PCM have developed a standard **module for controlling** the GBB pump within its environment which is suitable for all configurations encountered on sludge treatment facilities.

This equipment is available in a number of versions:

- modular version to be incorporated in the main cabinet for the facility which includes level control,
- enclosure version which provides the complete cabinet for controlling the unit.

Advantages:

- ready-to-run system or system which can easily be added to existing equipment
 - all operating constraints taken into account
 - PCM is the only contact the user needs on any aspect of the station
- The modular design of the control station means that the system is fully upgradeable and can be adapted to suit any changes in operation without having to change existing hardware, provided that there is sufficient space inside the cabinet.

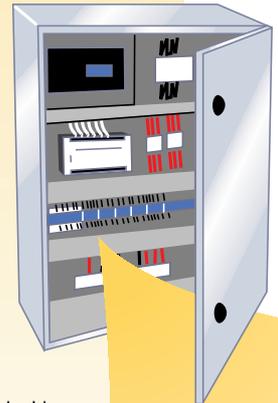
This method provides a high degree of flexibility in how the various items of equipment are operated and used together.

Data on operating conditions and faults shown on display unit (supplied as an option) to make the system as user-friendly as possible.

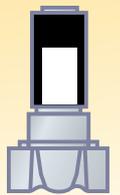
The following functions are available for each of the versions*:

- print-out of operating data on the fly on a local printer
- transfer of data to PC on the site
- transfer of summary of faults via modem using a method specified in advance

* In this case, a study of specific site conditions needs to be made beforehand.



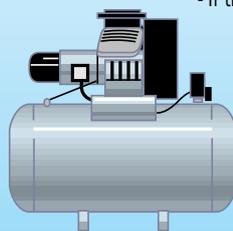
Solenoid valve



Lubrication using air injection

Equipment for injection of air

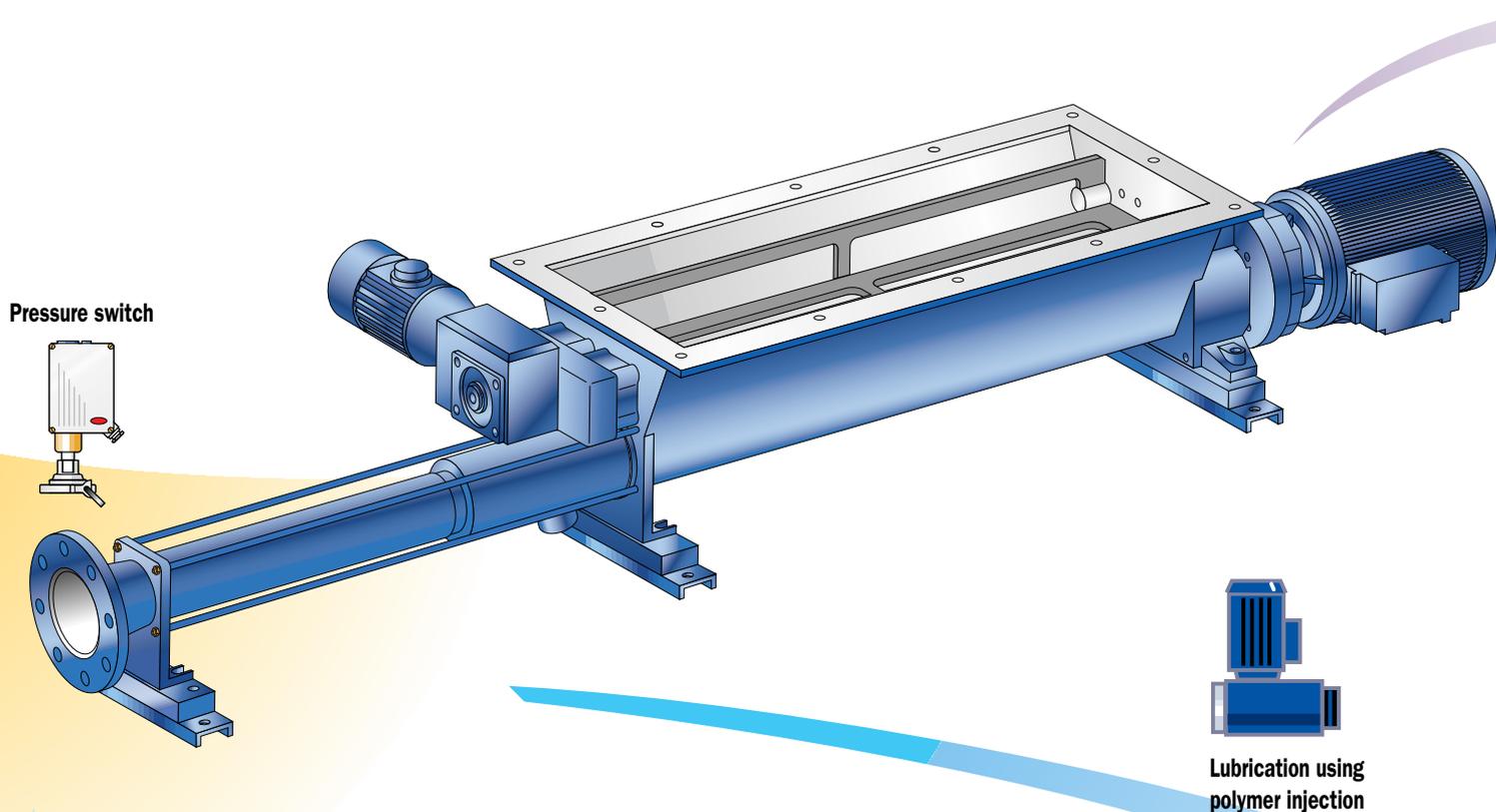
- If there is an air source on site, use of air will be less costly and will not involve any loss of dryness while the material is being transferred.
- The **air** used for lubrication is taken straight off the plant air system, if available. The unit can be made fully autonomous by use of a dedicated compressor (screw or piston type).
- The **solenoid valve** is used to distribute air on the injection ring. The valve is associated with the isolation valves and the check valve and isolates the air system from the sludge circuit.



Compressor

**delicate operation requiring a great deal of care. A thorough knowledge
of all aspects of the system and adopt appropriate solutions.**

offer service and can handle all of the following work: Lubrication, Lime treatment



Lubrication

Moving concentrated sludge with a high dryness content causes head loss, and this can be very high in discharge lines.

The way sludge behaves when it is being pumped varies considerably depending on the type of sludge in question (origin of the effluent treated at the station, seasonal variations, etc.), on how it has been treated and on its consistency. In view of the extent of the variation involved, PCM have developed a standard system for lubricating which reduces the pressure in discharge lines and encourages the material to flow more easily. This new system is designed for incorporation in the standard version of the pump, which means that it is much easier to install on site and does not require any changes to be made to existing discharge piping. This flexibility means that it is a simple matter to make alterations to the facility if there are changes in operating conditions, **with equipment being upgradeable to suit service conditions.**

PCM offer two lubrication solutions which are fully compatible with each other. The decision on which system to use depends on the operating constraints at the facility and should be taken after reviewing the cost implications for the site concerned.

Items of equipment which are common to both lubrication systems

- The **injection ring (or pipe)** forms an integral part of the pump and is the heart of the lubrication system. It is designed to provide even distribution of the injected lubricant over the entire circumference of the piping, making lubrication more efficient and keeping down consumption of the lubricant used (air or polymer). The ring is also available in the form of a spool which can easily be added to any existing facility.
- The **spool ring** can be used in conjunction with the control devices.
- The **pressure switch** monitors injection of the lubricant and/or trips out the facility if required.
- The **piping** is used to take the lubricant from its point of supply to the place where it is injected. The type of piping used depends on whether air or polymer is used.

GBB Series Force-Feed Pump Setting up the equipment

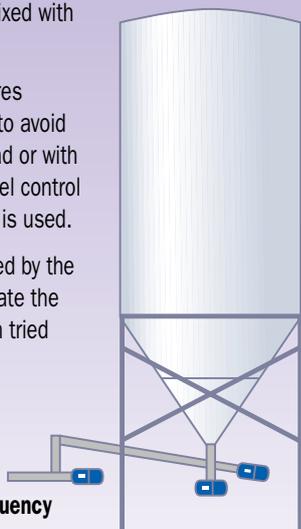
Lime treatment

In many cases, the use of lime makes it possible to increase the dryness of the sludge coming from dewatering equipment. The lime is injected directly into the hopper on the GBB unit, with the new design of the hopper ensuring that the lime is properly mixed with the sludge.

Operating with lime treatment requires extremely tight control of the pump to avoid the possibility of running without load or with lime only. This is the reason why level control is essential when this configuration is used.

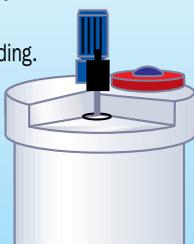
The lime injection point is determined by the type of equipment used to concentrate the sludge, with the system having been tried and tested for this application.

The method PCM recommend for obtaining optimal performance from the **GBB** series force-feed pump under these condition is to use **frequency variation** with a system to control the pump and lime distribution associated with the **level sensors** fitted in the hopper.



Special equipment for injecting polymer

- Use of polymer is preferable when material is being transferred to feed a drill or a dryer.
- The **polymer** used is the same as the one injected at the treatment station for preparing the sludge prior to dewatering, and it is often available close at hand, in some case in the sludge treatment building.
- The polymer can be injected in the sludge discharge piping using a PCM Moineau G-type **floating stator*** or **fixed stator pump (I or F series)**, or a diaphragm (**Lagoa series***) or piston (**Préci-Pompe***) dosing pump.
- PCM can offer a **Dosunit*** type polymer preparation tank specifically for this purpose. The tank can be located close to the injection point to make it easier to integrate the station within the sludge treatment facility.



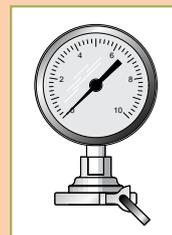
* see specific documentation for each of these products.

Optional equipment

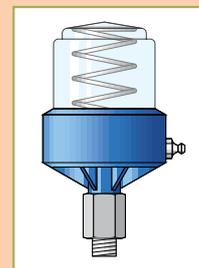
Pressure gauge

A pressure gauge can be used to display the discharge pressure or the head loss caused by the movement of the sludge.

This local indication is useful for checking operating conditions.



Stuffing box with automatic lubricator



The seal system must be lubricated when abrasive substances are present.

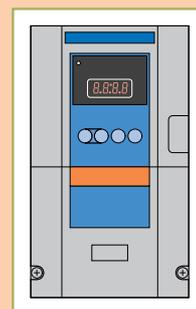
This new system consists of an automatic lubricator which makes the stuffing box seal easier to lubricate, and

allows it to function independently. This makes it simpler to maintain.

Frequency controller

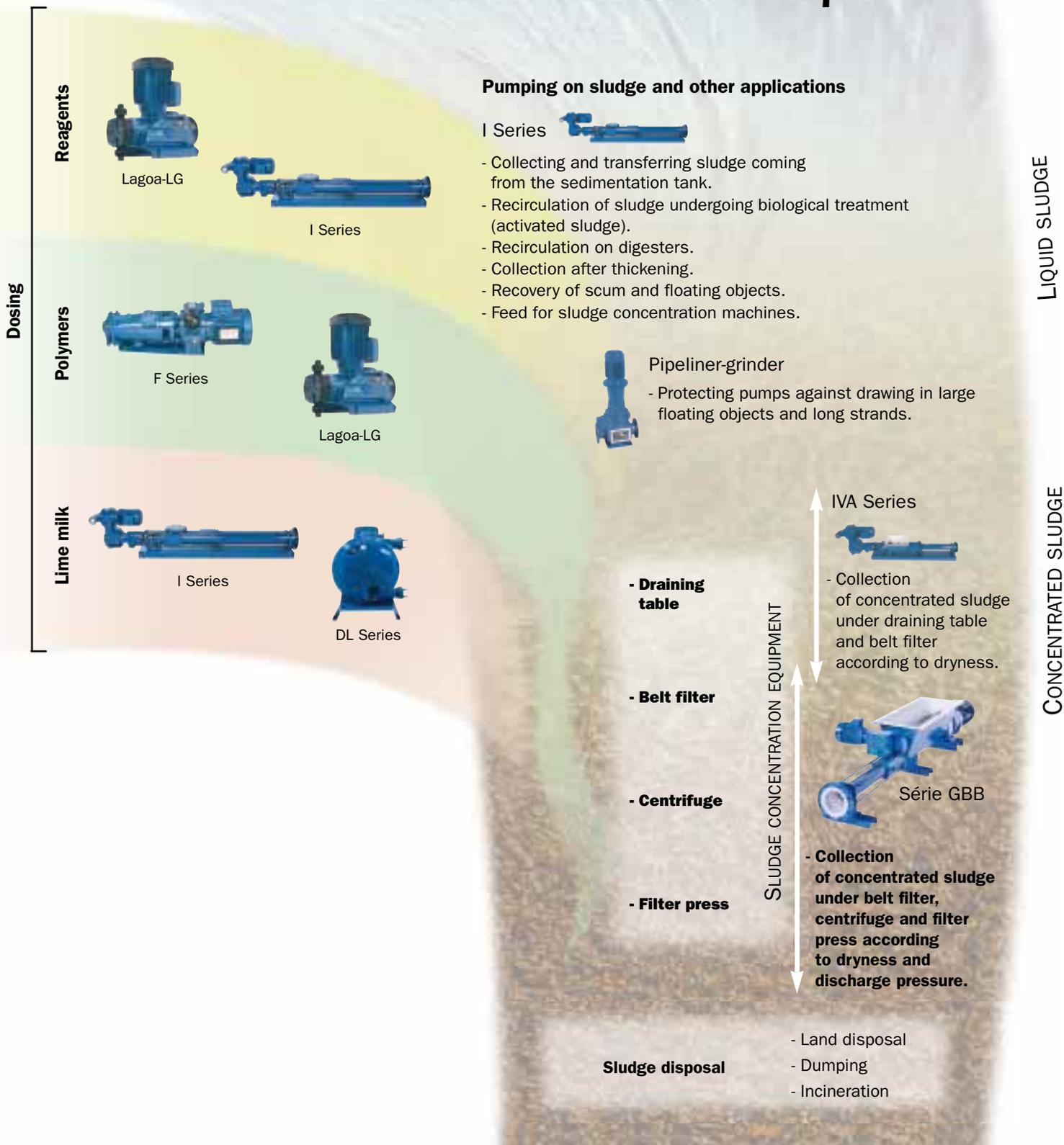
Using a frequency controller provides a much simpler way to adjust the flow rate, and gives a wider range of adjustment than a manual system.

When lime treatment is applied, variations in flow are essential to ensure optimal distribution of the lime and and to provide safe operating conditions.



Wastewater

PCM systems on treatment plants



GBB series pumps in other sectors

The pumping system can be adapted to handle highly adherent and viscous substances (such as bread dough) and products with large lumps such as offal and carcasses from abattoirs, crushed fish, mashed potato and vegetable peelings. Materials and use in manufacture. **This list shows the most common applications. There are many more in a wide variety of fields.**

Service Charter

PCM's commitment is embodied in the Service Charter. PCM are constantly striving to work closer with their partners by responding to their customers' needs and offering services of Quality. Further information is contained in the PCM Services brochure. To obtain your copy call:

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Equipment repair and overhaul...

Speed and efficiency. Our technical assistance staff undertake repairs to pumps and regularly overhaul equipment which is already installed.

Maintenance Contract...

PCM offer maintenance contracts drawn up to suit the requirements and operating conditions of each production unit.

Spare parts...

Unbeatable delivery. PCM hold a permanent stock of spare parts and accessories so that they can respond to all urgent enquiries.

Technical assistance...

PCM recommend that their customers take out a maintenance contract to ensure that their pumps provide optimum performance. PCM's technical assistance staff regularly visit installations to perform preventive or corrective maintenance.

Training...

PCM offer a two-day training course designed to give maintenance personnel a thorough understanding of how to use and maintain positive displacement pumps.

Pumpexpress...

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A service tailored to customers' requirements. PCM provides pumps on their customers' sites throughout all stages of a project.

PCM DOSYS

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PCM EQUIPEMENT

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From pumps to process

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