

# ODS<sup>®</sup> Diaphragm Pump

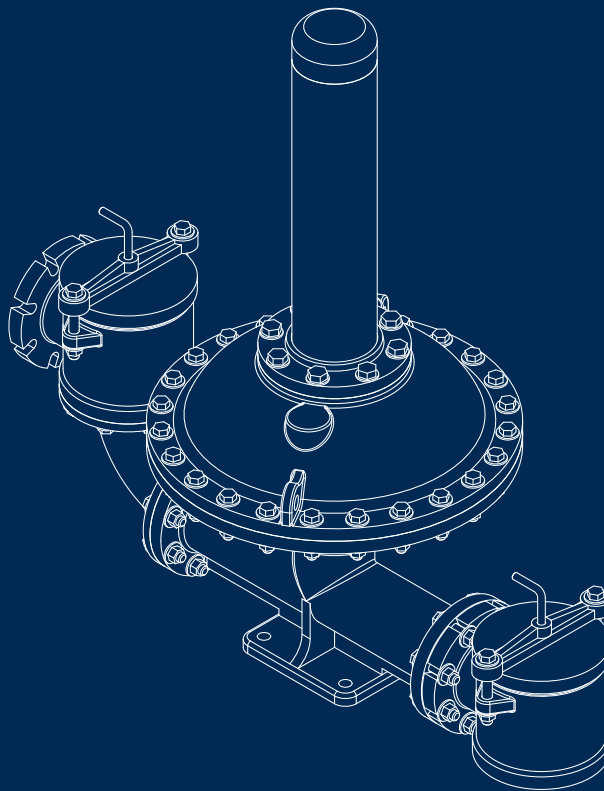
High-performance air-operated pump



**FLS**

# ODS<sup>®</sup> Diaphragm Pump

Our ODS<sup>®</sup> Diaphragm Pump design is the result of decades of experience in slurry- and sludge-handling technology. As part of your process flow, it will improve your plant performance and efficiency, even under the toughest conditions.



## Key benefits

- Simple operation, heavy-duty performance
- Low maintenance
- Manual or automated operation
- Operates indefinitely under dry conditions
- Efficient transfer of any liquid or slurry that moves through a pipe
- Tolerates extreme conditions and corrosive liquids
- Eliminates dilution when sludge is withdrawn from a clarifier

# Heavy-duty, high-performance pump

As the market-leading supplier of engineering, equipment and service solutions for the mining industry, we know pumps. Our ODS® Diaphragm Pump is one of the most unique, technologically advanced and dependable pumps available on the market today. Here's why:

## The FLS ODS® Diaphragm Pump advantage

As an air-operated diaphragm pump, the ODS offers advantages you won't find in other units. To begin with, diaphragm pumps are superior to centrifugal and helical screw pumps for heavy-duty performance. Also, because they are air-operated, they're significantly superior to mechanically or hydraulically operated models, due to their simple operation and evenly distributed power transmission.

Among air-operated diaphragm pump models, the ODS truly stands out, because it is designed and built for long-term, year-in-year-out, heavy-duty performance. Weighing in at two or three times more than other air-operated double diaphragm pumps, the ODS lasts longer and pumps the slurries that no other unit can handle. There is no equivalent.

## Pumps anything

The ODS® Diaphragm pump can efficiently transfer anything that moves through a pipe, including:

- Delicate crystal slurries.
- Highly concentrated and unusually viscous slurries.
- Highly abrasive slurries.
- Highly corrosive slurries.
- Very large solids in slurries.
- Extremely volatile slurries.
- Delicate and unstable slurries.
- Air-entrained slurries.
- Shear-sensitive liquids.

## Superior to other pump technologies

- May be automated to match capacity with your process requirements for maximum operational efficiency.
- Capable of indefinite dry operation – the pump cannot air bind; it has no stator to burn out and no seal to fail.
- With no seal, process slurry or environmental contamination is not possible.
- Adjustable under operation – providing maximum flexibility for both capacity and discharge pressure.
- Low-maintenance pump, requiring little attention.
- Capable of handling extreme conditions, including tough corrosives, abrasives, temperatures up to 200°F (93.3°C), and slurries containing up to 75% solids.
- Leak-proof, rhythmic plunger-type action minimises particle degradation of even the most delicate materials.
- Capable of pulse transfer thickening through constant pumping velocity matched to sludge accumulation rates at all pumping rates.



# How it works

In order to truly understand why the ODS® Diaphragm Pump is superior to other pumps, it helps to understand how it works.

## Basic non-assist pump – fill stroke

Electrical impulses from an adjustable timer alternately open and close solenoid-controlled air valves, which admit and exhaust air from the diaphragm cavity.

Positive suction head (inlet pressure) lifts inlet valve A (see Illustration 1), allowing the slurry to completely fill the pump cavity. The diaphragm lifts to its normal convex position and the air exhausts. Discharge valve B, seated by line pressure, prevents discharged slurry from returning to the pump cavity.

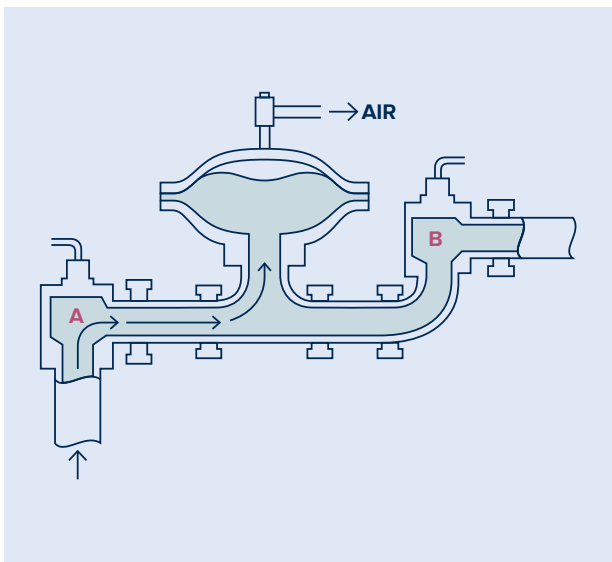
Positive suction head must be 2 PSI above the pump diaphragm centerline level pressure.

## Basic non-assist pump – discharge stroke

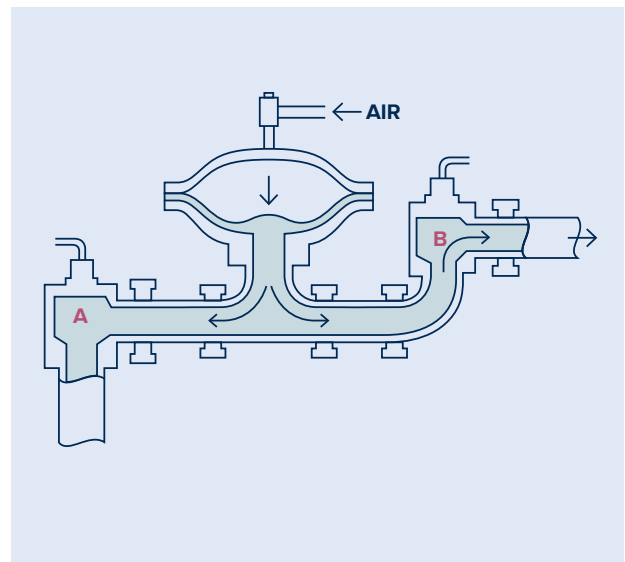
Compressed air then enters the chamber from the top (Illustration 2), causing the diaphragm to gradually descend and increase the pressure in the pump cavity. Inlet valve A closes and discharge valve B opens as the pressure line is exceeded. The descension of the diaphragm displaces the slurry from the pump cavity with pumping action that is positive yet gentle, so that delicate crystals and slurries can be transferred or metered without damage.

For applications requiring suction lift, a spring-assist or air-cylinder-assist model may be used.

### 1. Fill stroke



### 2. Discharge stroke



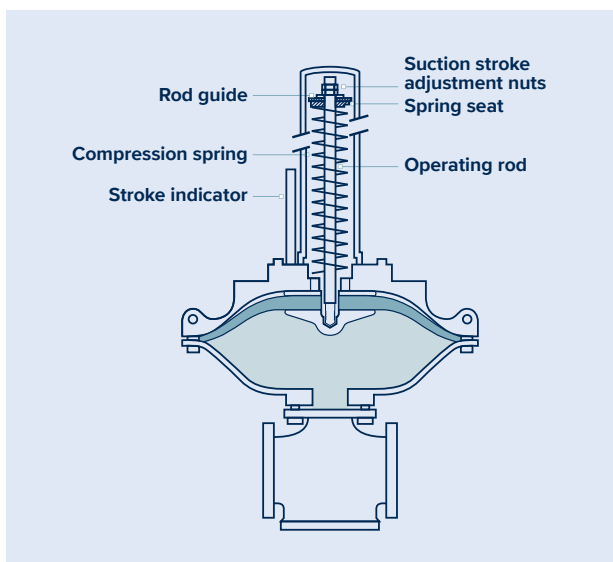
### Spring-assist ODS pump

In this version of the basic pump, a spring-actuated rod mechanically lifts the diaphragm, causing the slurry to enter the pump cavity (Illustration 3). The discharge cycle, which is the same as in the basic pump, compresses the spring as air pressure drives the diaphragm downwards.

We recommend this self-priming model for applications in which:

- Suction lift is up to 10 feet (3 m).
- Normal capacity is increased up to 50% due to faster filling action.
- Slurries with high solids concentration and high viscosity can be handled.

### 3. Spring-assist ODS pump

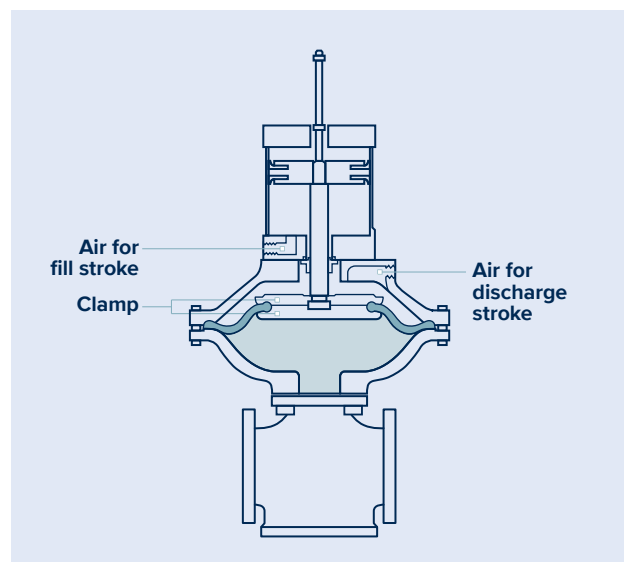


### Air-cylinder-assist ODS pump

This version of the basic pump employs an air-cylinder-actuated rod to mechanically lift the diaphragm. Following the lift stroke, air for the discharge stroke enters the diaphragm chamber, lowers the diaphragm, and drives the slurry out of the pump cavity – simultaneously returning the air piston to the lower position (see Illustration 4).

We recommend this model for applications requiring suction lift up to 20 feet (6 m).

### 4. Air-cylinder-assist ODS pump





## Controls

We bring extensive experience to your process needs, and can help determine the most cost-effective controllers for your application, without compromising quality or dependability.

An adjustable, variable timer controls the solenoid valve operation to set the number of pumping cycles per minute, as well as the discharge portion length for each cycle.

Housed in a protective NEMA Type 4 fiberglass enclosure with a hinged cover, the timer is offered in several designs, and can be automated for paced control in response to a 4-20 MA signal.

### Available pump operation options include:

- Single pump controller (standard).
- Multi-range with contacts for remote start/stop.
- 4-20 MA automated controller.
- Synchronisation for 2 units in parallel.
- Multi-pump controller.
- Remote or linear response timers.
- Solid state electronic or PLC controls with a variety of timing ranges and options, such as stroke counters and terminals for remote operation.
- Automatic pressure control system to feed a plate and frame filter press via single or multiple feed pumps.



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**Contact us**

**FLSmidth A/S**

2500 Valby  
Denmark  
Tel. +45 36 18 10 00  
[info@flsmidth.com](mailto:info@flsmidth.com)

**FLSmidth Inc**

Tucson Operations  
Tucson, AZ 85743  
USA  
Tel + 1 520-744-8200  
[krebs@flsmidth.com](mailto:krebs@flsmidth.com)



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