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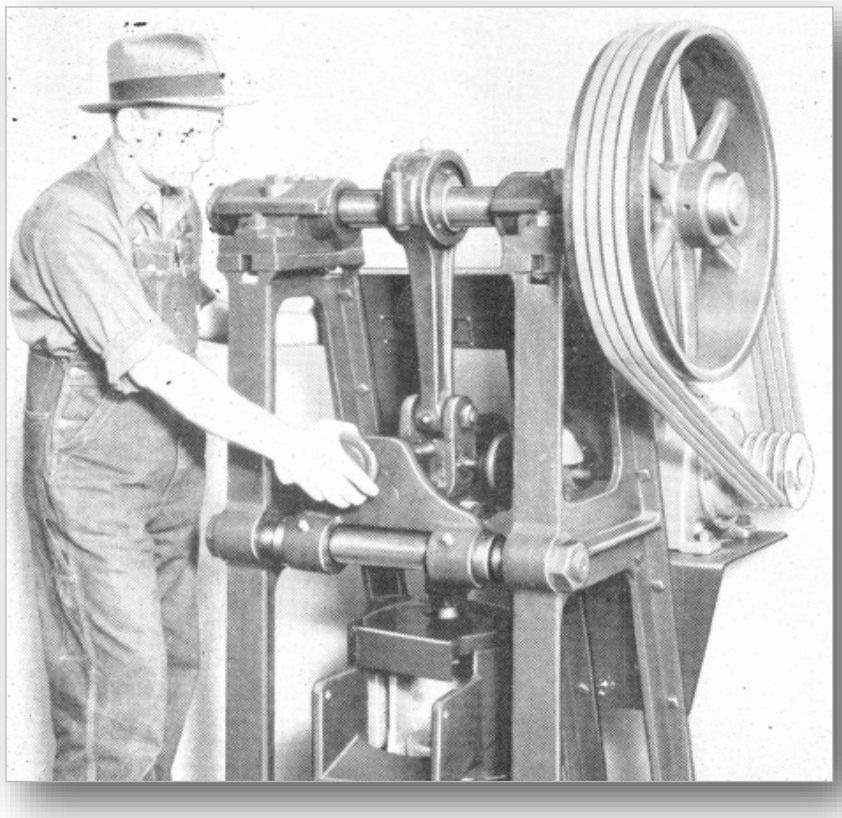

In This Issue

Here To Pump You Up!

Double Diaphragm Pump Systems

What Is A "Diaphragm" Pump?

The name of the diaphragm pump is derived from the rubber membrane that the pump uses to achieve its pumping action. The diaphragm works on an air displacement principle. The membrane is mechanically pushed and pulled in and out of a pumping chamber.

The Diaphragm Pump Working Principle involves the operation of two valves opening and closing using air pressure to force a piston back and forth.

Diaphragm pumps incorporate either hydraulic fluid or pistons to control the movement of the diaphragm. Low-lift, low-pressure pumps are designed to handle thick, viscous liquids, such as slurries or heavy oils, while others are engineered for high-flow applications and high pressures.

A double diaphragm is a positive displacement pump which utilizes two flexible diaphragms that reciprocate back and forth, creating a temporary chamber. The flexible diaphragms both draws in and expels fluids through the pump. The diaphragms work as a separation wall between the air and the liquid. The diaphragms are connected by a shaft in the center section.

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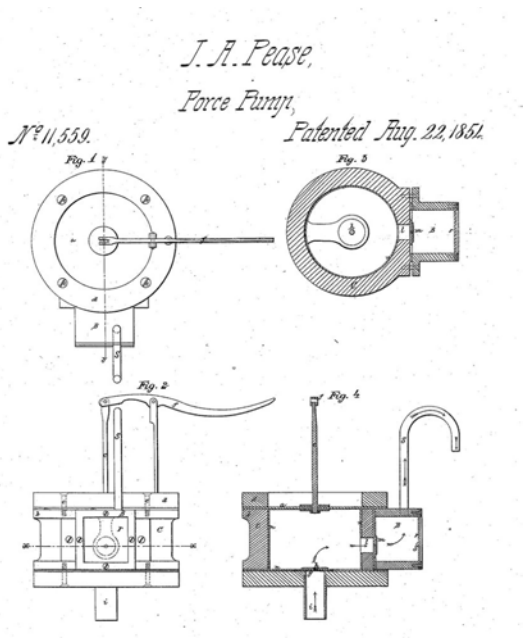
A Brief History Of Pumps

Pumps have come a long way since 2000 BC, when the Egyptians invented a simple device for fetching water called a shadoof. The shadoof was made out of a bucket, a rod and a weight. Though not a mechanical marvel, the shadoof is generally accepted as the first pump and would serve as the only pump design until 200 BC, when the building blocks to what would eventually become the double diaphragm pump were being formed.

The basic single diaphragm pump was invented by J. Pease in 1854. All subsequent patents that followed in the late 20th and early 21st centuries continue to support the tradition of connecting mechanically two elastic diaphragms or flexible membranes in an opposite, mirrored design for fluid transfer. Both membranes on each side of the pump body are connected with a rod passing through the center of the pump body for simultaneous mechanical operation driven solely by pressured air.



Double diaphragm systems came into the market in 1955 when Jim Wilden would finally create the first air-operated double diaphragm pump. It was designed then, as it is today, mainly for the mining and heavy construction industries. In the 1980's, Wilden would find a way to build his pumps out of hard plastic to avoid the corrosion that inevitably happened with metal pumps.

Today, double diaphragm pumps are used in a variety of ways. Large fluid delivery capability makes them ideal for transfer applications. They can also be calibrated for jobs requiring low pressure supply including spraying applications. Common applications include bulk tank supply, waste fluid evacuation, sludge evacuation, spraying or dispensing adhesives, conventional air spray supply pump for paints and coatings, and transferring acids and caustics.

Air vs. Electric

Double diaphragm pumps come in different models, usually falling into either electric operated (EODD) or air operated (AODD).

The electric diaphragm pump is changing the game in double diaphragm pumping. It is a positive displacement pump for municipal sludge, slurries, pastes, or anything that an air operated diaphragm pump can pump, but without the hassle of the usual drawbacks of having air. As air is being obsoleted by more and more customers these days for many reasons, such as cost, efficiency, functionality, safety, and lower energy usage, the EODD (electrically operated double diaphragm) pump can offer the lowest in class operating costs—and superior durability. In most cases, this can mean up to 95 percent volumetric efficiency on average compared to any other pump. You no longer need to use electricity to run air to run a pump. A whole other cost center is now removed with only mechanical fluid dynamics to deal with instead of fluid and air. True process control is achieved via optional variable frequency drive, technology unavailable in air operated diaphragm pumps. There is no air valve to stick or malfunction in cold and hot weather. Optional discharge dampeners and suction stabilizers are available to minimize flow pulsations under variable or demanding system conditions.

The EODD pump also offers the extreme versatility of operating in duplex mode with two pumps working at the same time—something that an air operated double diaphragm pump cannot do.

An electric double diaphragm pump will provide the very best return on investment that checks all of the boxes when it comes to pump selection and lasts two to three times longer with better parts wear and less maintenance than air operated double diaphragms.

References: 911 Metallurgist- *Diaphragm Pump Working Principle*
Corrosionpedia - *Corrosionpedia Explains Diaphragm Pump*
Pump Solutions - *The Origin of the Air-Operated Double Diaphragm Pump*
PumpCell - *Diaphragm Pump History*
Verder - *How Do Diaphragm Pumps Work?*
Modern Pumping Today - *All Electric Double Diaphragm Pump Changes The Game*

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Graco's Husky Electric Operated Double Diaphragm Pump (EODD) is the most energy-efficient and technologically advanced electric diaphragm pump on the market.

Take a look at its exclusive features:

- *Stalls under pressure* - One of the key advantages of the Husky EODD pump is that it is the only electric double diaphragm pump on the market that stalls under pressure. This eliminates the risk of damaging the pump or pipeline when it is blocked or a valve is closed.

Husky 2150e

- *Low pulsation mode* - For applications that require low pulsation and a smooth flow, consider the Husky EODD technology. The patented drive allows for the elimination or reduction of pulsation without expensive dampeners or surge tanks.

- *No expensive equipment* - There is no need to install additional deadhead protection equipment such as recirculation lines, pressure sensors, or motor management controllers.

- *Energy-efficient* - Powered by a patented energy-efficient electric drive, the Husky EODD pumps hardly consume any air. Only a limited amount of air is used to pressurize the inner chamber, and this air remains within the pump.

- *Flow control and batch dispense* - The Graco EODD Motor Control offers two control methods. Flow Control allows the pump to control its flow by increasing or decreasing the speed of the motor. The controller can be set to a specific desired flow rate, including maximum acceleration and deceleration. In Batch Dispense Mode, the pump dispenses a user-specified amount of material. The dispense flow rate and other characteristics can be specified by the user.

Husky 1050e

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- *Self-priming* - The Husky EODD is self-priming and has excellent suction capabilities. There is no need to install additional equipment to guarantee constant flow.

- *Dry running* - Because of its unique diaphragm lock system, the Husky EODD can run dry indefinitely without any damage to its inner mechanism or its diaphragms. When the fluid supply is interrupted and the pump runs dry, the pressure difference between the air and fluid sides of the membranes causes them to decouple from the drive and remain stationary, while the drive keeps turning.

- *Seal-less design* - The Husky EODD has no sensitive mechanical seals, which significantly improves its life expectancy. Seals used in other pumps are often difficult and expensive to replace.

- *Low maintenance costs* - No sensitive parts are used to manufacture the Husky EODD pump, and its diaphragms last up to five times longer than traditional pump components.

- *Wide operating range* - The Husky EODD can be configured for any application and it can easily handle slurries, abrasives, shear-sensitive materials, and a wide variety of chemical substances.

- *Quiet operation* - The Husky EODD does not require a muffler to dampen the noise caused by the air emitted by an air motor, so it runs much more quietly than AODD pumps.

To find out more, or to enquire about pricing options, contact our CIS representatives today!

Husky 3300e

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Electric Diaphragm Pumps

Electric Operated Double Diaphragm Pump

GRACO

Find the Right Pump for your Application

For more information, please see the
Husky eSeries Sales Brochure

Or visit Graco.com

PROVEN QUALITY. LEADING TECHNOLOGY.

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COMPANY OVERVIEW

Coast Industrial Systems, Inc. is the #1 supplier of painting and coating application equipment to the marine and manufacturing industries, and is proud to serve both San Diego and Mexico since 1986.

Coast Industrial Systems, Inc. has always placed the customer first, and strives for business excellence in all ways. Our friendly sales and customer service staff are knowledgeable, experienced and qualified to help meet your painting and coating application requirements, and to exceed your expectations.

Graco Top 20
High-Protective Coatings & Foam
Distributor Award Winner
2010-2020