KelairPumps

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PumpAction..... Issue 38

Welcome to the 38th edition of Pump Action

This month we have two case studies showing different applications for the Sandpiper air-operated double diaphragm pump.

These pumps are possibly the most versatile of all pump types, with the ability to run dry for long periods of time, pump against a shut valve, self-prime from dry, as well as pump a huge variety of different chemicals and viscosities.

The pumps are available in a wide variety of material options including metal and non-metallic bodies.

Add to this the fact that most material options are readily available ex-stock from Kelair and that they can be easily installed without the need for an electrician or detailed alignment on site, and you have an idea as to their popularity.

Despite their popularity many people do not understand how they work so this month's Pump Clinic goes through the operation of the Sandpiper air-operated double diaphragm pump.

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CASE STUDY

Sandpiper's smooth operation has wool processor running on air

Sales Engineer Frank Molinaro (VIC)

Victoria Wool Processors is a leading wool scouring plant in the western suburbs of Melbourne. As part of its wool scouring process, it recovers wool grease (lanolin) which is a very valuable by-product.

The recovery process utilises a 3-stage centrifuge/separation process with transfer pumps required at each stage.

On this application Victoria Wool was using motor-driven gear pumps. However, due to the inconsistent flows, the pumps were at times running dry which caused them to regularly fail.

In replacing the pumps, an electrician was always required to remove the failed pump/motor base set and replace it with a new pump base/motor set.

This set up was not reliable enough for plant production requirements so the company changed over to Sandpiper air-operated double diaphragm pumps because they work on air, therefore no electricians are required.

Also, the pumps can very easily handle temporary dry-running without damage.

(Sandpiper 1" Model S1FB1ABBABS100 pictured)

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CASE STUDY

Sandpiper's safety, solids-handling, self-priming ability is sought after

Sales Engineer Michael Charnley (WA)

When Mintech Chemical Industries opened a chemical manufacturing plant in Kwinana WA they needed pumps to service their customers in the mining and mineral, oil and gas, and allied industry sector.

They had air operated diaphragm pumps in mind because of their safety, ability to handle solids and self-priming ability.

After investigating several manufacturers, Mintech's Operations Manager, Mike Cameron chose Sandpiper pumps. Mike's decision was based on several factors, including all-bolted construction (no clamp bands), serviceability of valve area (replaceable ball retainers), the externally serviceable non-stall air valve and of course the excellent value.

As Mike was looking at using a 1" pump he was especially interested in the Sandpiper S1F high capacity pump. Its liquid chamber capacity, that is the amount of liquid displaced by the pump on each stroke, is nearly double that of its nearest competitor.

The Mintech range is varied, so we consulted the Sandpiper Chemical Resistance Guide for material selection. For recirculation and loading/unloading, we selected Polypropylene and Teflon wetted parts and for the very arduous transfer duties, Kynar and Teflon was the only choice.

It is interesting to note that all wetted parts in a Sandpiper non-metallic pump are actually non-metallic, not non-metallic with metal fixings as one manufacturer offered.

After the first three months of operation the pumps are performing flawlessly. Mike commented one of the reasons he is very pleased with the 1" S1F non-metallic pump is because of its large liquid chamber capacity which is an alternative to the competitor's 40mm pump.

Also. because of their robust design and features Mike considers Sandpiper as the "industry leader".

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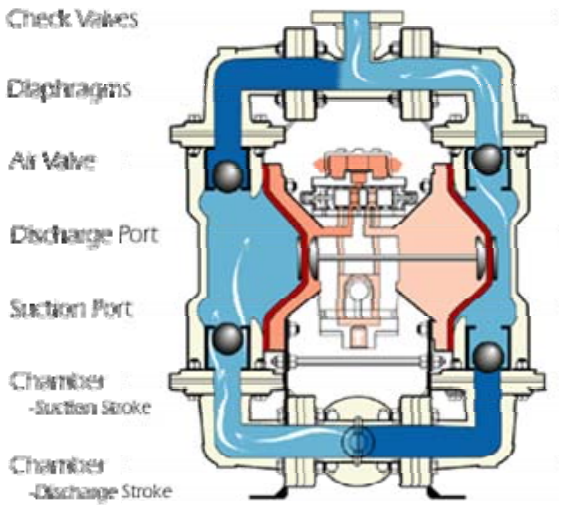
PUMP CLINIC 13

Sandpiper Air-operated diaphragm Pumps
-Principle of Operation-



Basic Design Features
Most Warren Rupp (Sandpiper) diaphragm pumps are driven by compressed air. The directional air distribution valve and pilot valve, referred to as the "air end", are located in the center section of the pump. Liquid moves through two manifolds and outer chambers of the pump, referred to as the "wet end". Generally, check valves are located at the top and bottom of each outer chamber or on a common manifold. The two outer chambers are connected by suction and discharge manifolds. The pumps are self-priming.

No-Lube Air Distribution Valve
During operation, the Air Distribution Valve controls alternate pressurising of one diaphragm, then the other. The Valve automatically transfers air pressure to the opposite chamber after each stroke. This provides alternating suction and discharge strokes, as the diaphragms move in parallel paths. Warren Rupp air valves require no lubrication. This is the preferred mode of operation. Clean, dry air will enhance pump performance.

Diaphragms
Flexible diaphragms are clamped at their outer perimeters, between the inner and outer chambers. The diaphragms are connected at their movable centers by a rod.

Check Valves
As fluid moves through the pump, check valves open and close. This allows each outer chamber to alternately fill and discharge. The check valves respond to differential pressures. Ball-type check valves can pass very small particles.

The Pumping Cycle

As the Air Distribution Valve directs pressurised air to the left diaphragm, the diaphragm is pushed outward. **This is a discharge stroke**, which forces liquid from the left outer chamber. Discharged liquid moves from the chamber, through an open discharge check valve, and exits the pump at the discharge manifold.

The position of the discharge port can be top, bottom or side. As the left diaphragm is pressurised outward, the connecting rod pulls the right diaphragm inward on **a suction stroke**, which fills the left chamber with fluid. Liquid enters the pump at the suction manifold, moves through an open suction check valve and fills the chamber. At the end of the cycle, the Air Distribution Valve automatically shifts the air pressure to the opposite diaphragm, initiating another pumping cycle.