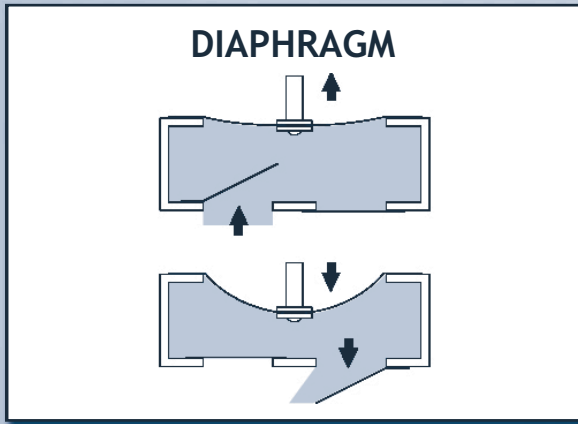


PUMPING PRINCIPLES

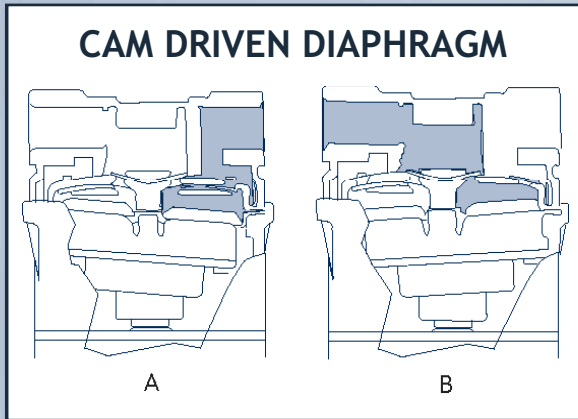


HOW IT WORKS:

- As the piston diaphragm is pulled away from the housing, the cavity increases in size. This creates a vacuum that draws in the liquid through the one way inlet valve.
- As the diaphragm is pushed toward the housing, the cavity decreases in size which forces the liquid out through the one way outlet valve.

FEATURES:

- Dry Running:** can run dry indefinitely without damage
- Self-priming:** can lift up to 15 feet under ideal conditions
- Self-adjusting:** "air operated" diaphragm pumps automatically adjust their speed as viscosity fluctuates



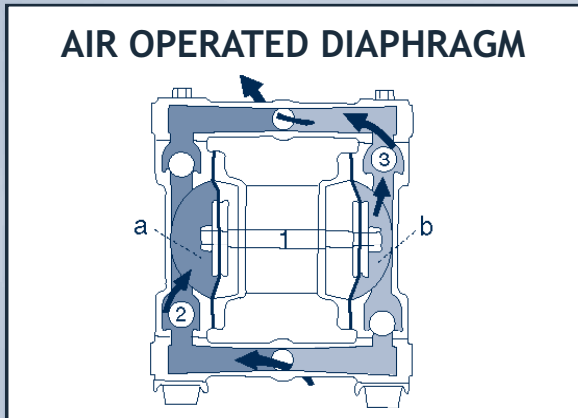
HOW IT WORKS:

A multiple diaphragm pump utilizes an offset cam attached to the diaphragm by pistons to alternately enlarge and decrease the size of each chamber.

- As the piston moves away from the housing, the cavity increases and draws in liquid through the one way inlet check valve.
- As the piston moves toward the housing the cavity decreases in size and forces the liquid out through the one way outlet check valve.
- Each diaphragm cavity works independently as their piston alternately decreases and increases the diaphragm cavity.

FEATURES:

- Same as the diaphragm principle shown above.
- High Pressure:** up to 150 psi is possible; 2500 psi for Hydracell
- Smooth Flow:** multiple diaphragms smooth out the pulsation of the single diaphragm design

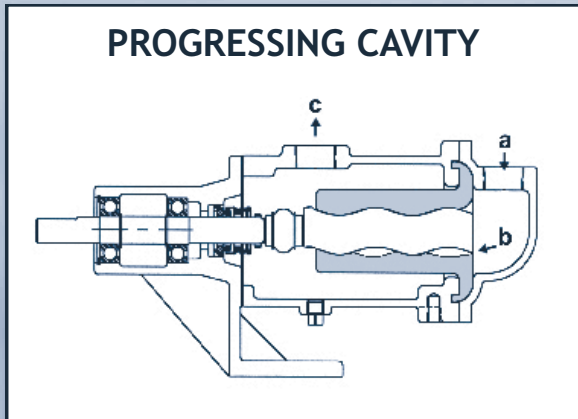


HOW IT WORKS:

- Compressed air powers the piston (1) moving it right to enlarge cavity "a". This action draws in liquid through the inlet check valve (2).
- While the piston (1) enlarges cavity "a" it compresses cavity "b" forcing liquid out the one way check valve (3) toward the discharge.
- Once the piston (1) has fully extended, it is redirected (by compressed air) to compress chamber "a" (forcing liquid out) and enlarging chamber "b" (drawing liquid in).
- Once the piston (1) has fully extended to the left the cycle repeats as compressed air redirects the piston (1) back to the right.

FEATURES:

- Dry Running:** can run dry indefinitely without damage
- Dead Head:** will simply stall and will not be damaged when the discharge is blocked
- Self-priming:** can lift up to 20 feet under ideal conditions



HOW IT WORKS:

- Liquid is drawn into the suction of the pump as the corkscrew shaped rotor revolves within the rubber stator.
- Liquid is captured in the cavity between the rotor and stator. This cavity travels toward the discharge during rotation.
- The cavity opens into the discharge chamber and delivers its contents as it reduces in size. Liquid is forced out the discharge as more liquid is delivered by continued rotation.

FEATURES:

- Abrasive Handling:** the rotor/stator design allows the handling of abrasive and/or viscous liquids
- Low Shear:** smooth gentle pumping action enables the pumping of shear sensitive and solid entrained liquids
- High Pressure:** up to 600 psi can be achieved with low to high viscosity liquids

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