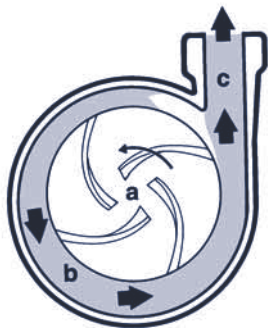


PUMPING PRINCIPLES

CENTRIFUGAL



HOW IT WORKS:

- Liquid enters the inlet port of the pump through gravity or priming and is directed towards the center of the impeller.
- The rotating impeller uses centrifugal force to add velocity to the liquid as it is slung off the edges of the blades into the volute casing.
- The volute configuration converts the velocity energy into static pressure or available pump head as the liquid leaves the discharge port.

FEATURES:

High Volume Flow: centrifugal pumps deliver a high volume of flow with smooth, non-pulsating delivery

Low Maintenance: wear due to operation is minimal, are easily disassembled and have few moving parts

Low Power Consumption: most efficient pump for moving large volumes of liquid

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ENGINE COOLING

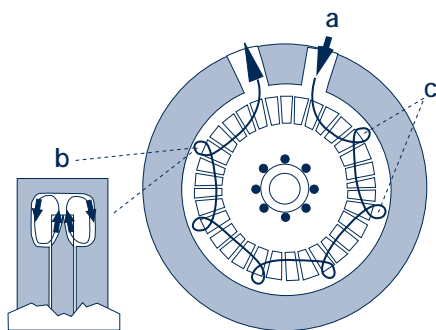
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REGENERATIVE TURBINE



HOW IT WORKS:

- Liquid enters the suction port (a) and is pushed forward by the blades of the impeller (b) in an orderly circular flow around the periphery of the housing.
- The circular liquid flow in the side channels (c) occurs many times during one revolution resulting in 10 times or more discharge pressure than from a similar diameter impeller turning the same speed in a centrifugal pump.

FEATURES:

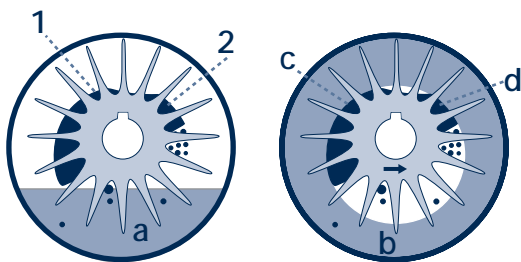
High Head/Low Flow: Produces high head at low flow without damaging pump components

Continuous Duty: Designed to run 24 hours a day, 7 days a week

Compact: More compact than multistage centrifugals that deliver the same flow and head

Entrained Air Handling: up to 20%

LIQUID RING



HOW IT WORKS:

- Liquid remains trapped in the pump housing between uses.
- When impeller rotates the trapped liquid forms a ring around the interior diameter of the pump housing.
- The expanding cavities formed between the rotating impeller vanes and the liquid ring draws in liquid through the inlet port area (1).
- The compressing cavities formed between the rotating impeller vanes and the liquid ring forces the liquid out through the discharge port area (2).

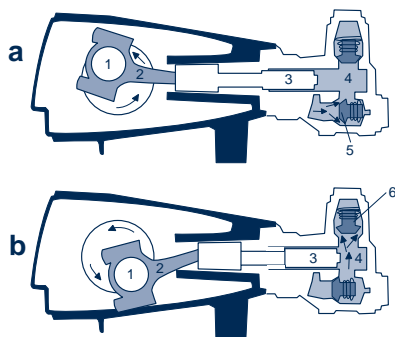
FEATURES:

Won't Airlock: fastest, surest priming there is!

Low Wear: non-contacting internal parts using the "liquid ring" to maintain efficiency

Reversible (some models): great as a transfer pump

PLUNGER



HOW IT WORKS:

- As the crankshaft (1) rotates, the connecting rod (2) pulls back the plunger (3) from the liquid chamber (4) within the manifold which increases the chamber's size. This creates a vacuum that draws in liquid through the inlet valve (5).
- As the crankshaft's rotation continues, the connecting rod (2) pushes the plunger (3) toward the liquid chamber (4) reducing the chamber's size. This forces the liquid out the discharge valve (6).

FEATURES:

High Pressure: pressures of up to 15,000 psi can be achieved

Clean Liquids: closed fitting components require clean non-abrasive liquids

Durable: ceramic plungers and an oil filled crankcase ensure a long operating life