LEH Series - Liquid Ring Vacuum Pump

SIHI Pumps
www.sterlingamericas.com
MECHANICAL SEALS

Are standard on all models, variety of types and materials available.

ADDITIONAL FEATURES

• Single stage design capable of operating to 29” Hg. Vacuum.
• No metal-to-metal contact offers quiet and virtually vibration-free performance.
• Fewer parts means lower cost and reduced maintenance.
• One drain connection provides safety for repairs and for maintenance.*
• Available in standard materials and special alloys.
• Continuous purge connections provided to aid in removal of abrasives and excess liquid draining.

T-SHAPED MANIFOLD*

Offers increased liquid carryover handling capabilities, surge protection, and maximum flexibility for piping installations.

ORIFICE BALL ASSEMBLY

• Interior variable port design increases efficiency throughout the operating range.
• Wear-resistant ball check design increases reliability and lowers maintenance cost.

MECHANICAL SEALS

Are standard on all models, variety of types and materials available.
Isothermal Compression
Practically isothermal compression hence safe handling of explosive & volatile vapors and gases.

Anti-Cavitation
Automatically provides cavitation protection without affecting vacuum.

Internal Recirculation
Reduces water consumption resulting in lower operating cost.

Service Liquid Connections*
Single point service liquid supply, accessible from either end, reduces installation cost.

Optional Pedestal Arrangement
- Models up to 20 HP
- Standard C-flange motors
- Eliminates misalignment
- Reduces maintenance costs
- Extends seal and bearing life
- Reduces installation costs

* Not available on LEH 3400.
**PRINCIPLE OF OPERATION**
**SINGLE ACTING LIQUID RING PUMPS**

In a round pump body (A), a shaft mounted impeller (B) is positioned at a point eccentric to the centerline of the pump body. The centrifugal action of the rotating impeller forces the service liquid introduced via channel (D) towards the periphery of the pump body forming the liquid ring (C).

When pumping action is achieved, the gas mixture being handled is introduced to the impeller through the suction port (H), in the intermediate plate (E), causing a vacuum at the pump suction. The gas mixture fills the impeller cavity between the inside diameter of the liquid ring and the root of the impeller blade. As the impeller rotates, the impeller blade immersion in the liquid ring increases reducing the volume between the liquid ring and the root of the impeller blade. The result is the compression of the gas mixture until it reaches the discharge port (J), located in the intermediate plate (K). The gas mixture exits through the discharge port.

During the compression cycle heat is being imparted to the liquid ring. In order to maintain a temperature below the vapor point of the service liquid, cooling must be applied. Cooling is achieved by continuously adding a cool supply of service liquid to the liquid ring. The amount of service liquid added is equal to that discharged through the discharge port (J) together with the compressed gas mixture. The gas mixture and service liquid is eventually passed through the pump discharge for separation.

★ The illustration is intended to depict the operating principle of the SIHI liquid ring pump only and should not be considered for engineering details of construction.
SERVICE LIQUID ARRANGEMENTS

ONCE THROUGH
Used where service liquid is plentiful and contamination is not a problem.

**Benefits**
- Simplicity
- Lowest initial cost

PARTIAL RECIRCULATION
Used where service liquid is available and contamination problems are minimal.

**Benefits**
- Simplicity
- Low initial cost
- Reduced service liquid consumption

TOTAL RECIRCULATION
Used where gases and liquids are toxic or hazardous, and when environmental contamination is a concern.

**Benefits**
- Service liquid contained and separated from nonhazardous coolant systems
- Low service liquid usage
- Allows recovery of condensable inlet gases

Accessories for the above service liquid arrangements can be provided by SIHI in completely piped, assembled and tested factory packages.
This data represents average values for pumps in standard materials discharging at sea level barometric pressure (29.92” Hg. Abs.). Capacity in actual cubic feet per minute at the inlet pressure handling dry air at 68°F (20°C) and using 60°F (16°C) water as the service liquid.

* Motors with 1.0 service factor use next larger size.

(1) Average flow is representative. Actual flows are a function of the actual application.

When handling saturated air at higher temperatures, capacity of vacuum pumps will increase substantially. Details available by application.
Typical Applications

Drying
Distillation
Evaporation
Crystallization
Vapor Recovery
Deaeration
Sterilization
Filtration

Evisceration
Impregnation
Extrusion
Condenser Exhaust
Vacuum Conveyance
Priming
Vacuum Packaging
Central Vacuum Systems

Advantages

Varying Vacuum Levels
Hogging and Holding
Cavitation Protection
Compact Design
Batch Processes
Water Savings
Liquid Carryover

Various Port Configurations
Soft Solids Handling
Safe Operation
High Vapor Loads
Discharge Pressures
Above Atmospheric