FLOWSERVE

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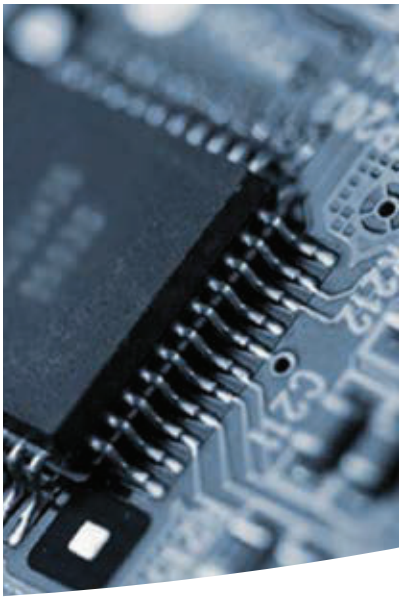
SIHI® LPH-X
Liquid Ring Vacuum Pumps

Experience In Motion



SIHI® LPH-X – Cool, robust and cost effective …

Reliability, that has stood the test of time, ensures this generation of vacuum pump is positioned to tackle the most demanding applications. For almost 100 years SIHI® has maintained its innovative position as a leading supplier of liquid ring vacuum and liquid ring compressor technologies.

The comprehensive SIHI® range of liquid ring vacuum pumps is available in single and two stage designs, with suction capacity up to 12 000 m³/h (7063 cfm) and pressures in the range 33 (25) to 1013 mbar (760 Torr) without further boosting equipment. Additionally, the liquid-ring principle is also used as a compressor in which to generate positive pressures up to circa. 13 barg (188 psig).

Lately, the SIHI® LPH-X has been introduced to the range in which to address the elevated demands of our developing customers. Improved maintenance, longevity, reliability, modularity, and performance all being considered within the design of this ultra-modern liquid-ring construction. Available in one and two stage variants the unit can operate at 50 Hz and 60 Hz speeds. Importantly, the SIHI® LPH-X offers the lowest cost of ownership.

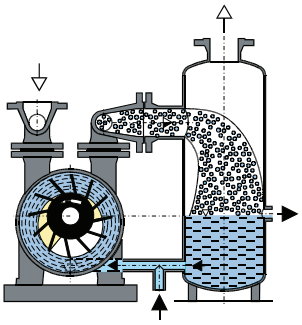
Benefits

- Extremely robust
- Cool operation
- Superior liquid, vapour and solids handling
- High Volumetric flow-rate
- Simple maintenance
- Effective heat exchanger
- ATEX Category 1 without flame-arresters

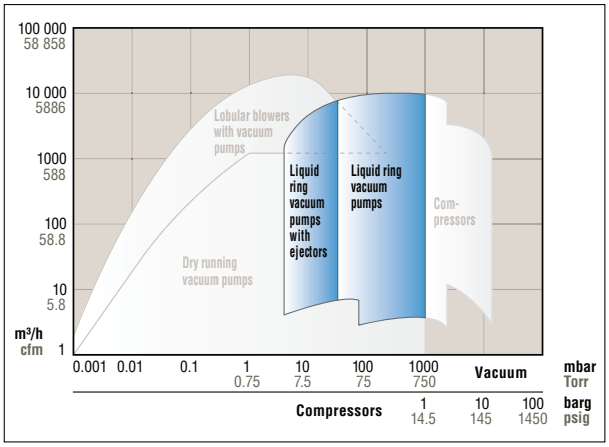
Industries/Markets

- Chemical
- Pharmaceutical
- Plastics & Plastic
- Food
- Beverage
- Ceramics
- Medical
- Textile
- Pulp & Paper
- Printing
- Electronics

  and many more



Performance graphics



The SIHI® LPH-X range has been designed to incorporate the best features of the widely accepted LPHA range whilst improving the overall design, reducing part complexity and cutting life cycle costs. The benefits are lower maintenance, reduced requirement for spare parts, enhanced reliability and increased customer satisfaction.

Simple installation & Integration

- Universal flanges: DIN/EN, ANSI, and JIS

Increased shaft stiffness for extended seal life

- Reduced distance between bearings

Secure component sealing

- O-ring seals
- Reduced number of sealing faces

Diverse material options

- Guide discs available in different materials
- Exotic materials available throughout

Reduced internal wear

- Peripheral dirt drain permits continual liquid-ring cleaning

Drain

- Drain plug to empty the central bodies

Benefits

- Certified for Category 1 and Category 2
- Enhanced performance range
- Ease of maintenance and low inventories of spare parts
- Space saving
- Short lead times and fast deliveries
- Ensures optimal solution for the application
- Ease of maintenance
- Complete solution

“Drop in” replacement for the former LPHA range with key wear part interchangeability

Features

- Complies with ATEX legislation
- Single and two stage
- Modular construction
- Compact design
- Extensive range of sizes, materials and shaft sealings
- Seal accessibility

SIHI® LPH-X with single acting mechanical seal

SIHI® LPH-X with double acting mechanical seal

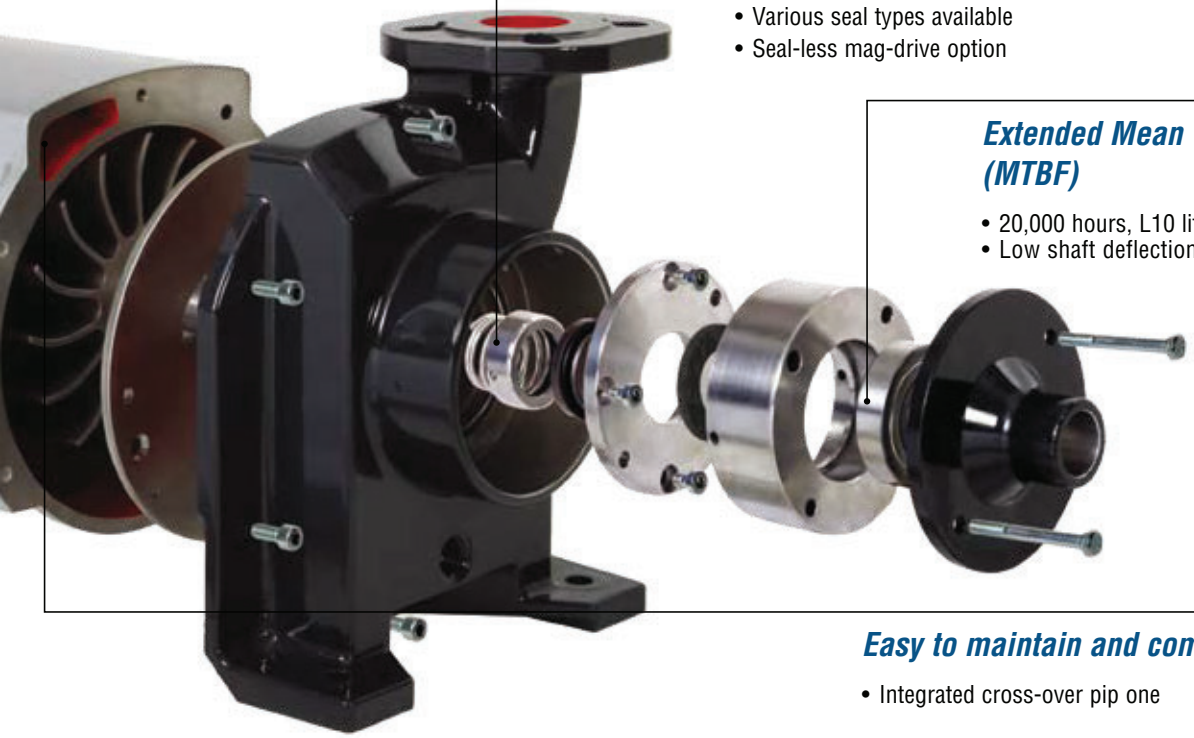
SIHI® LPH-X with magnetic coupling

Cavitation protection

- Enhanced performance and reliability

Flexible sealing

- Seal replacement without dismantling the pump
- Various seal types available
- Seal-less mag-drive option



Extended Mean Time Between Failure (MTBF)

- 20,000 hours, L10 life - maintenance free bearings
- Low shaft deflection for longer seal life

Easy to maintain and compact

- Integrated cross-over pip one

Materials

Item	Material of Construction
Casing	Grey cast iron, stainless steel
Central Body	Grey cast iron, stainless steel
Impeller	Cast steel, bronze, stainless steel
Guide Disc	Grey cast iron, stainless steel
Shaft	Chrome steel, stainless steel

The Proven Vacuum Solution

The modular SIHI® LPH-X is an ideal choice for the most demanding vacuum applications. Near isothermal compression presents an opportunity to handle thermally sensitive, and explosive, media in a secure manner.

ATEX Category 1, without flame-arrestors underpins the wide-reaching flexibility of the liquid-ring principal together with low noise and its suitability for temperatures up to 170 °C (338 °F).

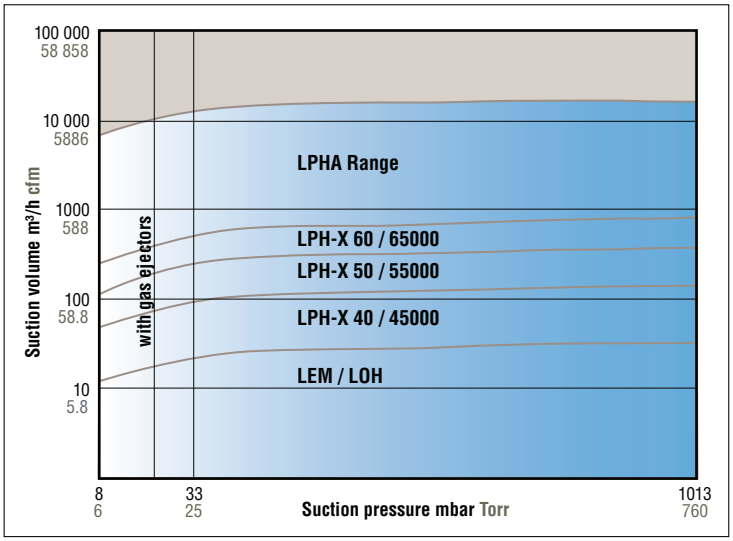
Water doesn't need to be the Liquid Ring…

- Water is conventional, clean, and accessible
- Hydrocarbons can be chilled to promote process-condensation for subsequent recovery

Typical Applications

- Distillation
- Drying
- De-gassing
- Filtration
- De-odorisation
- De-oxygenation
- Sterilisation
- Filling
- Product transfer
- Vapour recovery
- Priming
- Central vacuum systems

LPH Performance Range



LPH-X

LEM

Ejectors

Global Service and Technical Support

Life Cycle Cost Solutions

Typically, 90 % of the total life cycle cost (LCC) of a pumping system is accumulated after the equipment is purchased and installed. Flowserve has developed a comprehensive suite of solutions aimed at providing customers with unprecedented value and cost savings throughout the life span of the pumping system. These solutions account for every facet of life cycle cost, including:

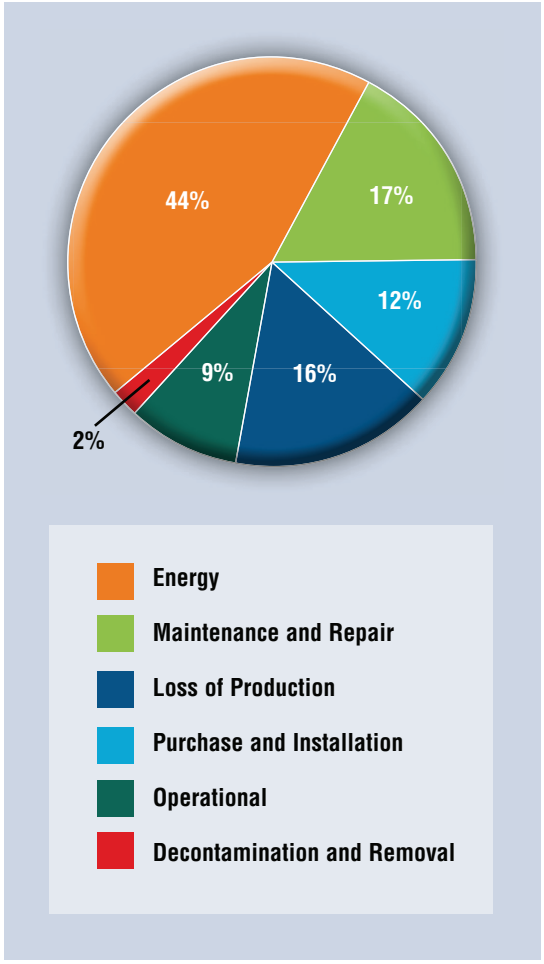
Capital Expenses
- Initial purchase
- Installation

Operating Expenses
- Energy consumption
- Maintenance
- Production losses
- Environmental
- Inventory
- Operating
- Removal

Innovative Life Cycle Cost Solutions

- New Pump Selection
- Turnkey Engineering and Field Service
- Energy Management
- Pump Availability
- Proactive Maintenance
- Inventory Management

Typical Pump Life Cycle Costs[1]



[1] While exact values may differ, these percentages are consistent with those published by leading pump manufacturers and end users, as well as industry associations and government agencies worldwide.