Flowserve is the driving force in the global industrial pump marketplace. No other pump company in the world has the depth or breadth of expertise in the successful application of pre-engineered, engineered, and special purpose pumps and systems.

Life Cycle Cost Solutions
Flowserve provides pumping solutions that permit customers to reduce total life cycle costs and improve productivity, profitability and pumping system reliability.

Market-Focused Customer Support
Product and industry specialists develop effective proposals and solutions directed toward market and customer preferences. They offer technical advice and assistance throughout each stage of the product life cycle, beginning with the initial inquiry.

Broad Product Lines
Flowserve offers a wide range of complementary pump types, from pre-engineered process pumps to highly engineered and special purpose pumps and systems. Pumps are built to recognized global standards and customer specifications.

Pump designs include:
• Single-stage process
• Between bearings single-stage
• Between bearings multistage
• Vertical
• Submersible motor
• Positive displacement
• Vacuum & Compressor
• Nuclear
• Specialty
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.

**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

**Increased shaft stiffness for extended seal life**
- Reduced distance between bearings

**Simple installation & Integration**
- Universal flanges: DIN/EN, ANSI, and JIS

**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

“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

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

<table>
<thead>
<tr>
<th>Item</th>
<th>Material of Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Casing</td>
<td>Grey cast iron, stainless steel</td>
</tr>
<tr>
<td>Central Body</td>
<td>Grey cast iron, stainless steel</td>
</tr>
<tr>
<td>Impeller</td>
<td>Cast steel, bronze, stainless steel</td>
</tr>
<tr>
<td>Guide Disc</td>
<td>Grey cast iron, stainless steel</td>
</tr>
<tr>
<td>Shaft</td>
<td>Chrome steel, stainless steel</td>
</tr>
</tbody>
</table>
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**
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

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*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.*
To find your local Flowserve representative:

For more information about Flowserve Corporation, visit www.flowserve.com or call +1 937 890 5839.