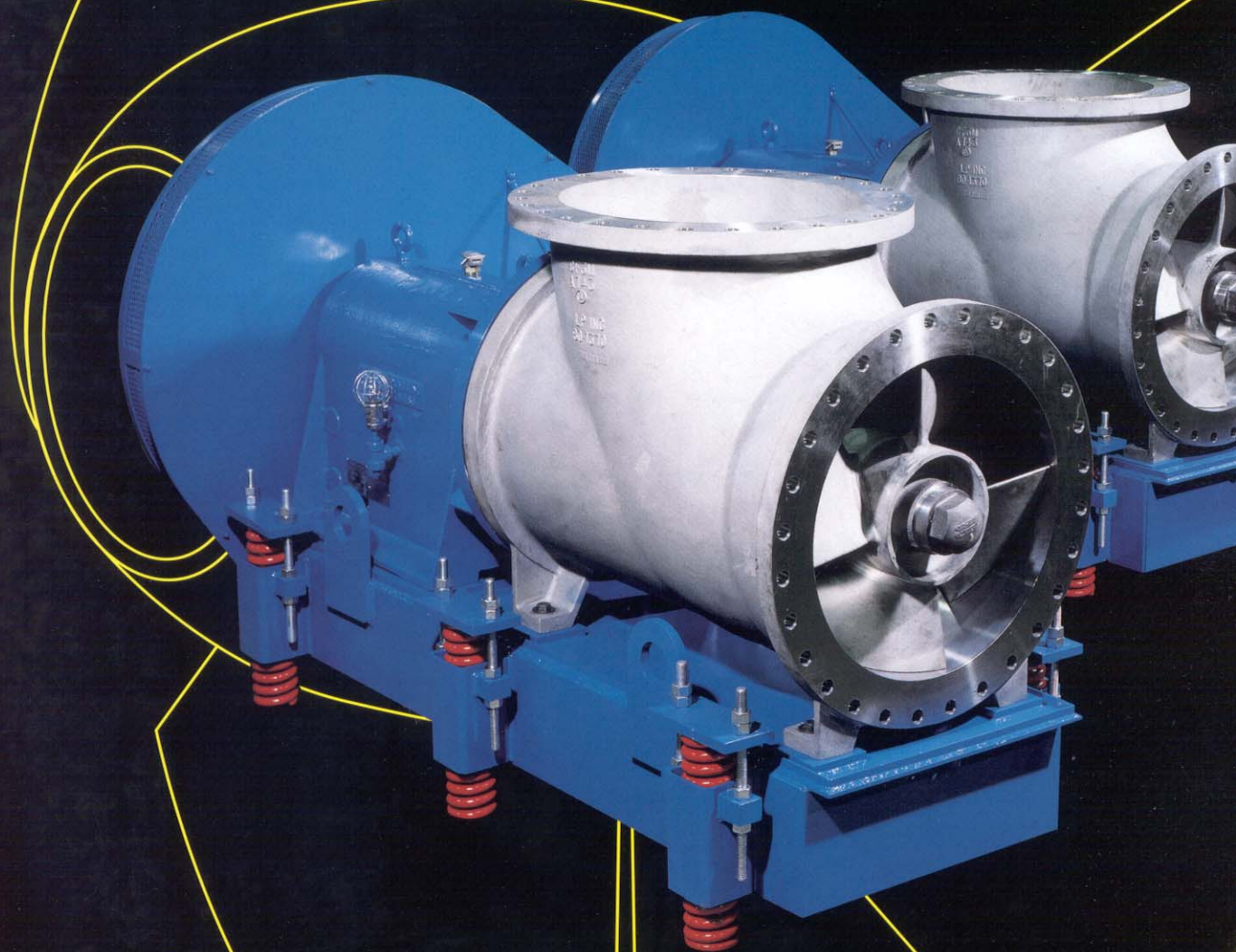


# Axial Flow Pump Technologies

SERIES 9000

ПромХимТех - дистрибьютор Flowserve  
[www.promhimtech.ru](http://www.promhimtech.ru)  
[zakaz@promhimtech.ru](mailto:zakaz@promhimtech.ru)  
8 800 250-01-54



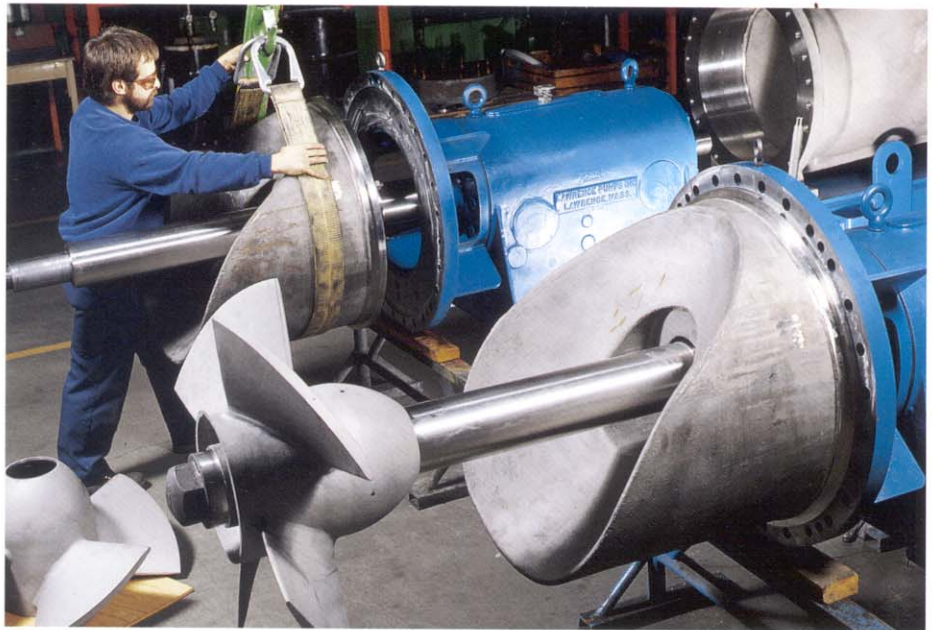


# More Than 60 Years of Axial Flow Pump Experience

LPI has been manufacturing Axial Flow Pumps for more than half a century. Today, LPI is recognized worldwide as a technological innovator of Axial Flow Propeller Pumps with proven performance in a wide range of applications.

By consistently improving technologies to increase pump reliability, operational life and environmental safety, LPI maintains its commitment to continuous improvement of Axial Flow Pumps. Industry proven hydraulics and numerous design options ensure that every LPI Axial Flow Pump meets and/or exceeds each customer's performance requirements.

LPI supports its worldwide Axial Flow Pump installed base with a global network of sales representatives and service centers. Every LPI Axial Flow Pump provides the standards of quality, performance, and service that are the legacy of more than a century of leadership in the industrial pump business.



*LPI's manufacturing flexibility allows your Axial Flow Pump to be designed, engineered and manufactured in the most timely and cost effective manner.*

## Axial Flow Pump Performance Capabilities

### Typical Flow Capacities and Heads

- Flows from 250 to 250,000 gpm (57 to 57,000 m<sup>3</sup>/hr)
- Heads from 2 to 36 ft (0.6 to 11 m)  
— special designs to 190 ft (58 m)

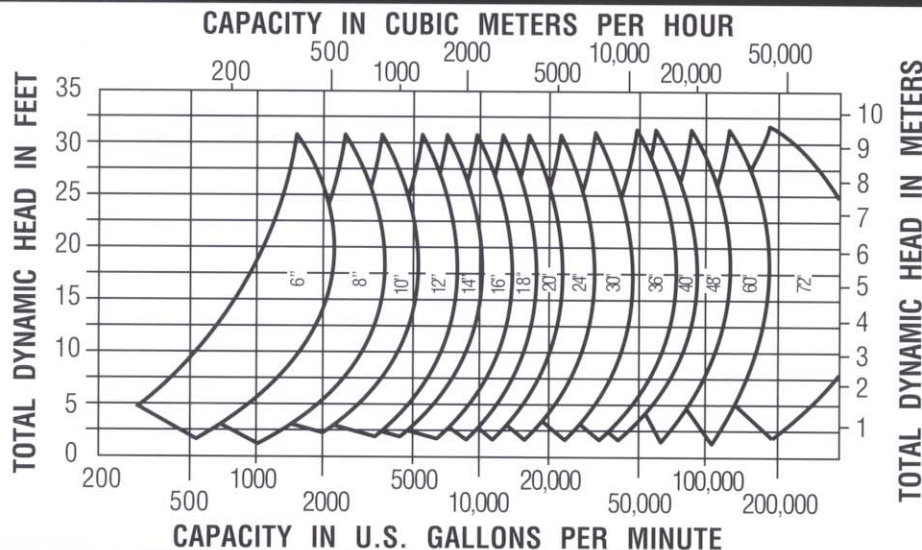
### Design Pressures and Temperatures

- Flexible to meet customer specification

### Available Metallurgies

- Cast iron
- Abrasion and corrosion-resistant alloys
- Stainless steels and Duplex alloys
- Titanium, Zirconium

## RANGE CHART



*This range chart should be used for quick reference to approximate pump size. Final selection is determined after a thorough analysis of process requirements and required performance parameters. Please contact LPI for other hydraulics.*

## Optional Features

- Flanges to ANSI, DIN
- Lap joint flanges
- Highly polished internals
- ANSI/API flush plans
- Oil mist/grease lubrication
- Labyrinth oil seals
- High pressure designs
- High temperature designs
- Vertical cantilever shaft designs
- Multi stage options
- Base plates
  - API 610
  - coatings
  - alloy options
- Highly radioactive environments
- Custom features upon request



# Axial Flow Pumps ... Maximize Productivity in Your Critical Processes



LPI's back pullout feature allows ease of pump maintenance and enhancements without removal of pump elbow from system piping.

- Efficient, Reliable Performance
- Ease of Maintenance
- Increased Throughput and Yields
- Increased Profits



A precision fabricated propeller being retrofitted at one of LPI's global service centers.

## **Lawrence Pumps:** **Your Proven Resource For** **Axial Flow Pumps – Worldwide**

Our worldwide Axial Flow Pump installations have a record of proven performance in a wide range of process applications including:

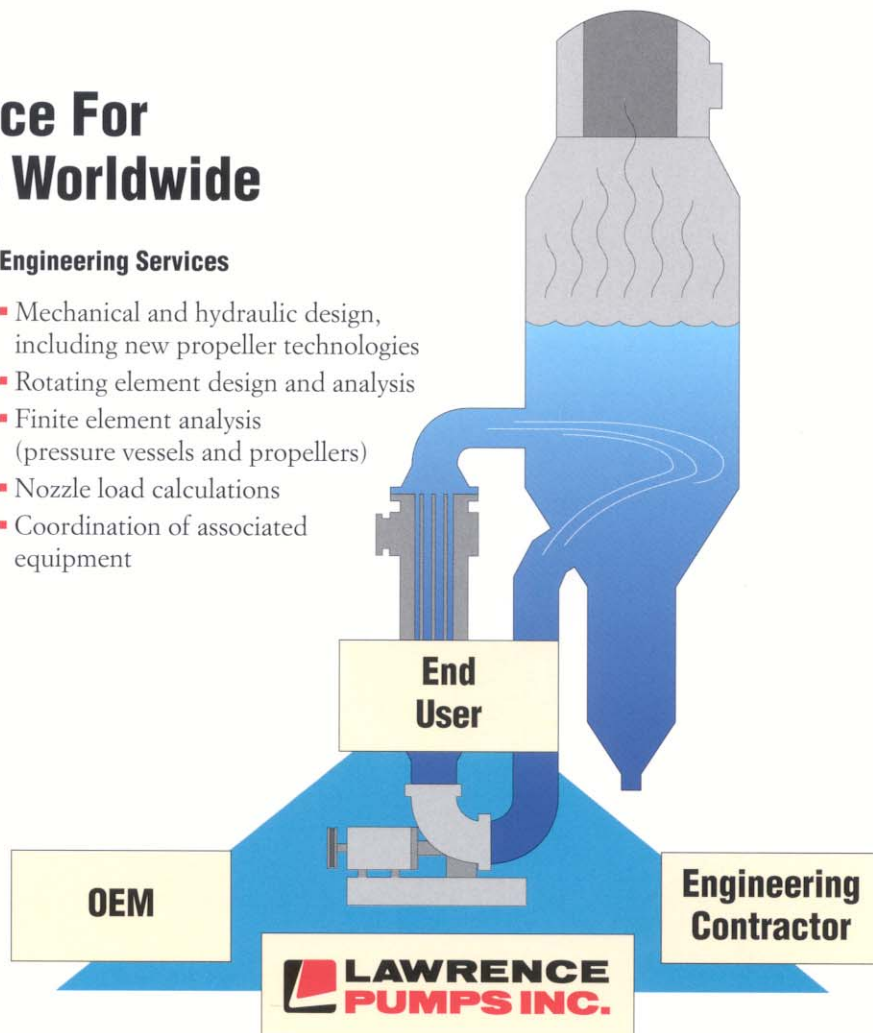
- Evaporators
- Crystallizers
- Sewage Treatment
- Heat Recovery
- High Volume Mixing
- Reactor Circulation
- Biotechnology

### **Custom Pump Capabilities**

Axial Flow Pump technologies can be readily adapted to meet your specific performance requirements.

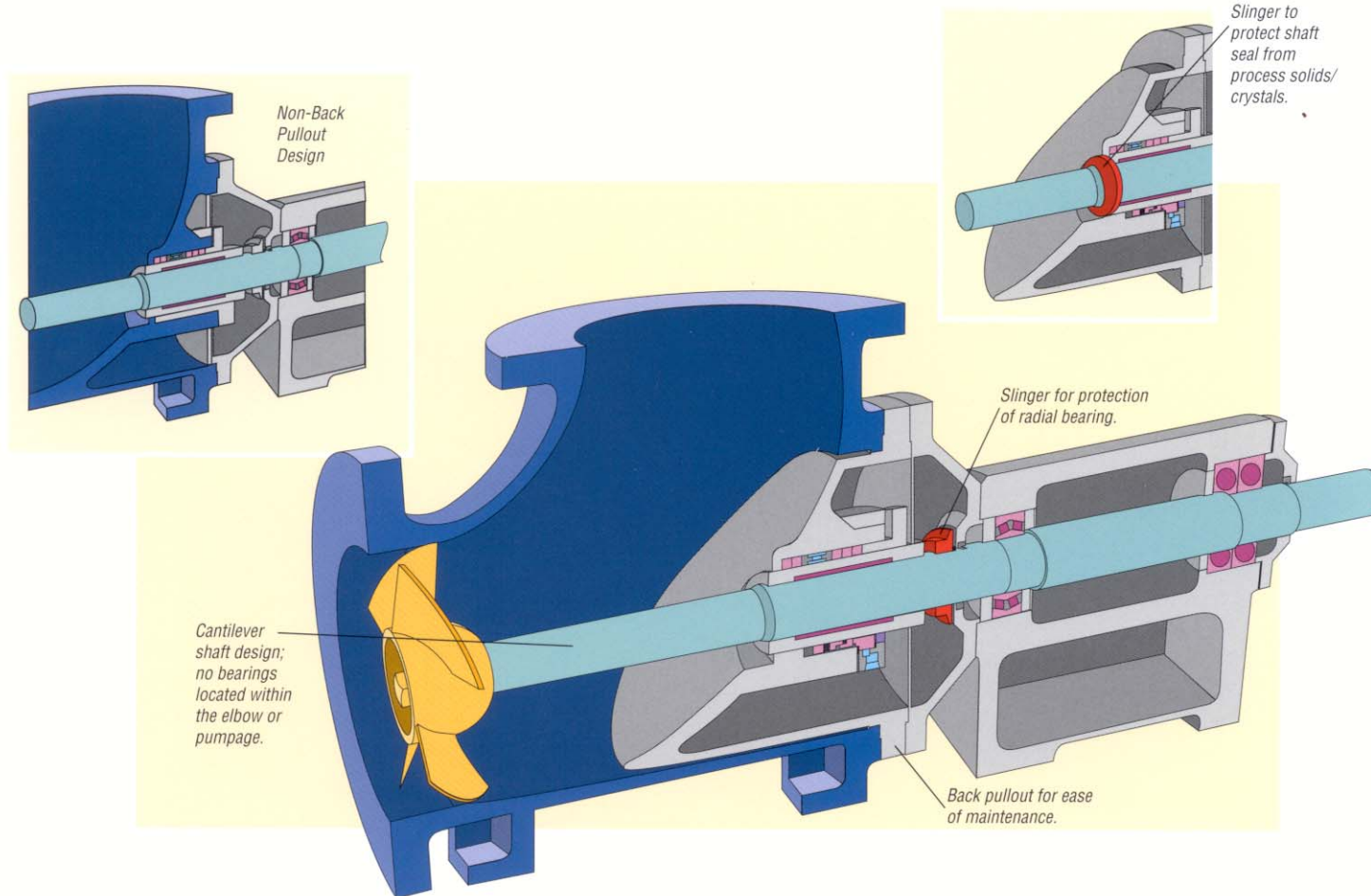
### **Engineering Services**

- Mechanical and hydraulic design, including new propeller technologies
- Rotating element design and analysis
- Finite element analysis (pressure vessels and propellers)
- Nozzle load calculations
- Coordination of associated equipment



# Engineered Axial Flow Pump Technologies

## Series 9000 Cast Axial Flow Pumps with Back Pullout Feature

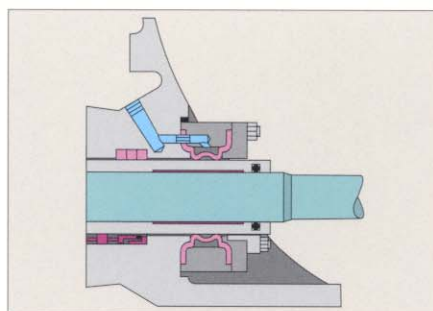


## Design Options



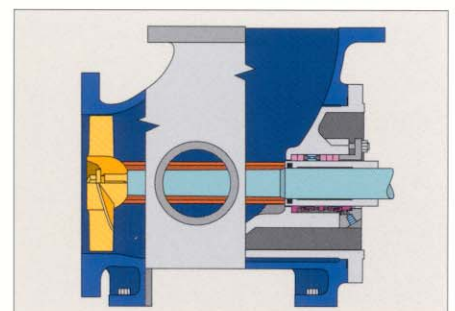
*Guide Vanes*

- Under demanding operating conditions, guide vanes may be specified to optimize hydraulic performance
- Standard on 6" and 8" pumps, optional on all other sizes



*Inflatable Shaft Seal*

- Allows shaft packing replacement or seal maintenance/inspection without draining entire system
- May act as a stationary emergency seal

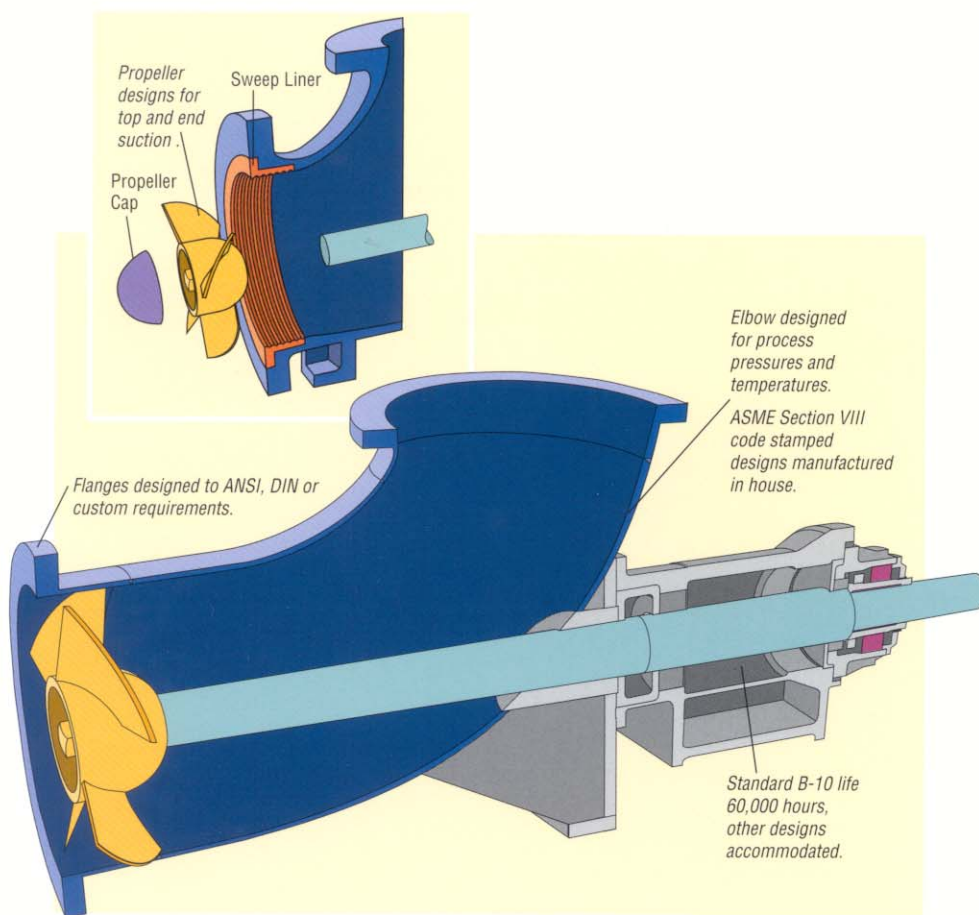


*Municipal Options*

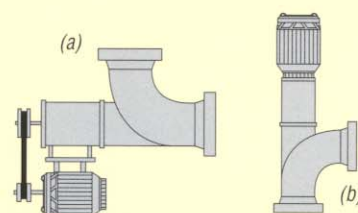
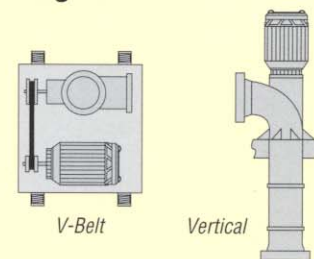
- Stationary **shaft tube** prevents stringy particulate from wrapping around shaft
- **Hand hole** for inspection port allows visual assessment of pump internals without removal from piping



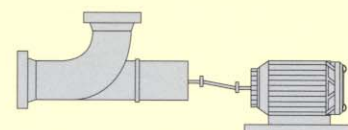
## Series 9100 Fabricated Axial Flow Pumps



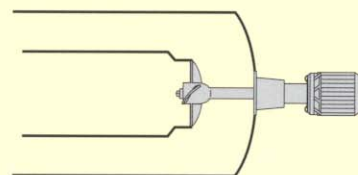
## Typical Axial Flow Pump Configurations



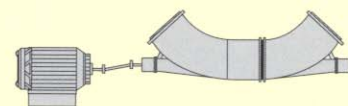
Pipe suspended with (a) v-belt and (b) direct drive



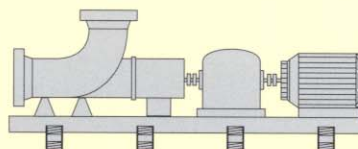
Pipe suspended with flexible shaft



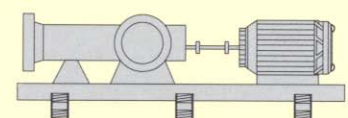
Internal vessel circulation



Double elbow

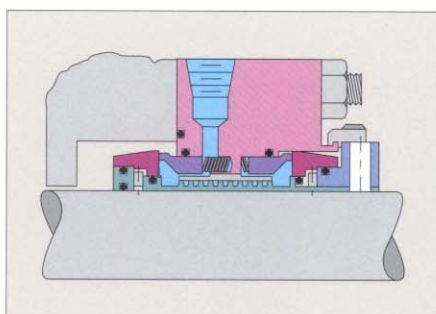


Horizontal gear box/motor drive



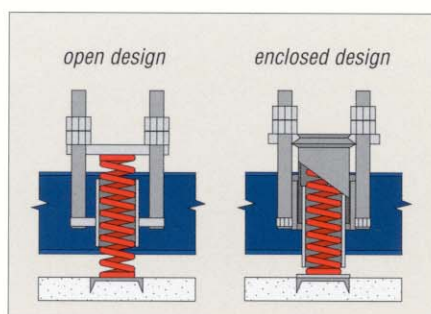
Horizontal direct drive

Other designs and configurations available upon request



Seal Chamber Design

- Accommodates any seal manufacturer's shaft mount or cartridge mount single, double or tandem seal
- Split seal designs available



Spring Mounting Options

- Accommodates system thermal expansion both horizontally and vertically
- Used in place of piping expansion joints (bellows)
- Springs easily replaced without pump shut down or removal





24" Reactor Circulator Propeller Pump in test.

## In House Total Performance Testing Capabilities

LPI's in house propeller pump test loop allows testing through 60,000 gpm. This testing capability represents our dedication to the continued development of custom and advanced hydraulic capabilities to meet the specific needs of our customers. Our in house testing facility includes a 800 HP variable frequency drive and a fully instrumented test lab for measuring flow, head, efficiency, NPSH and a wide range of mechanical parameters.

### PumpsPLUS<sup>®</sup>

LPI's *Pumps Plus* team of pump professionals is dedicated to providing rapid response to customer needs for pump systems, parts and service. *Pumps Plus* ensures that each customer's requests are handled with care and expedience.

#### Typical Industry Design and Building Specifications Met by LPI

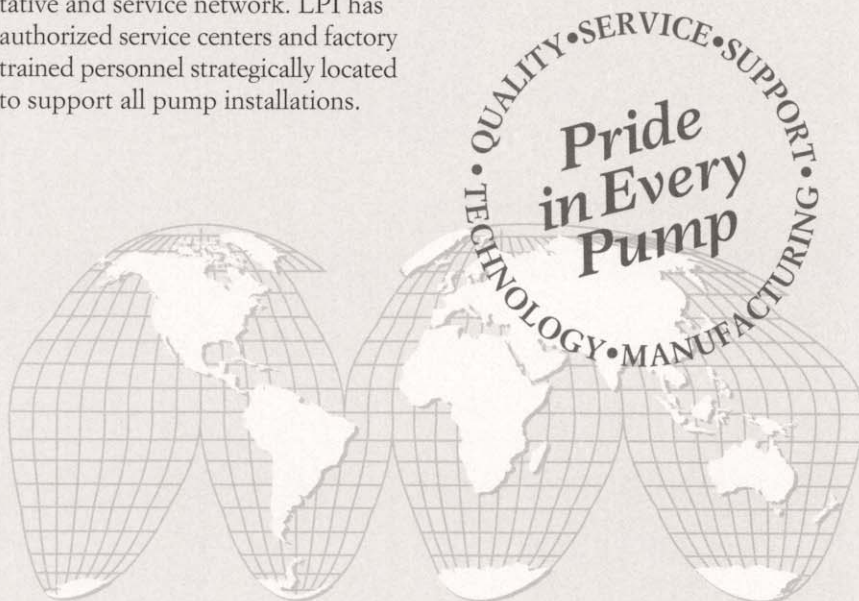
- API
- ASTM
- DIN
- NACE
- AFBMA
- Hydraulic Institute
- AGMA
- ANSI
- ASME
- AWS
- OSHA
- SSPC
- Other standards upon request

#### Additional Brochures from the Lawrence Pumps Technology Series:

- Hydrocarbon Process Industry Slurry Pumps
- Reactor Pumps for PP/PE Plants
- Vertical/Submersible Pumps
- Screw Centrifugal Pumps
- Cryogenic Pumps
- Process Pumps
- Low Flow/High Head Pumps
- High Temperature Pumps (Molten Metals/Salts)
- Temperature Sensitive Liquid Pumps (Jacketed)
- Slurry and Solids Handling Pumps

## Global Representation and Worldwide Technical Support

Widespread installations are supported by our worldwide representative and service network. LPI has authorized service centers and factory trained personnel strategically located to support all pump installations.



ПромХимТех - дистрибьютор Flowserve  
[www.promhimtech.ru](http://www.promhimtech.ru)  
[zakaz@promhimtech.ru](mailto:zakaz@promhimtech.ru)  
 8 800 250-01-54



371 Market Street, Lawrence, MA 01843  
 TEL: (508) 682-5248 FAX: (508) 975-4291

Copyright © 1994 Lawrence Pumps, Inc. Printed in USA



Bulletin No. 9000-1