

## **LNN**

***Between Bearing,  
Axially Split,  
Single Stage,  
Double Suction  
Pump***

## Pump Supplier To The World

*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.*

### Pumping Solutions

Flowserve is providing pumping solutions which permit customers to continuously 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 inquiry.



### Dynamic Technologies

Flowserve is without peer in the development and application of pump technology, including:

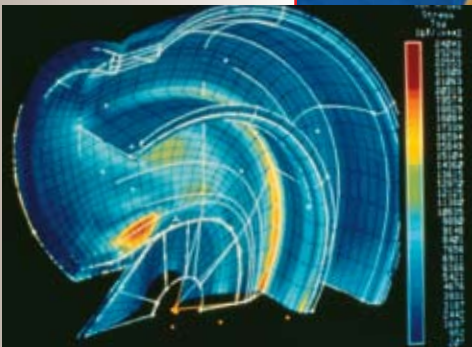
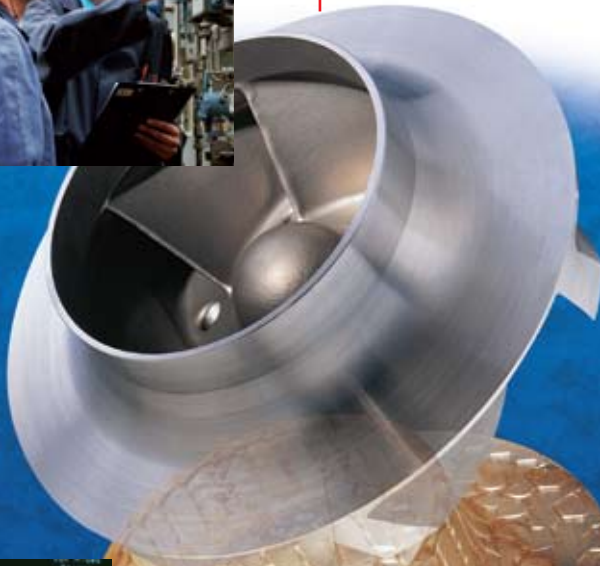
- Hydraulic engineering
- Mechanical design
- Materials science
- Intelligent pumping
- Manufacturing technology

### 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 bearing single stage
- Between bearing multistage
- Vertical
- Submersible motor
- Rotary
- Reciprocating
- Nuclear
- Specialty





**LNN**  
**Family of**  
**Horizontal Split**  
**Case Pumps**  
**For Application**  
**Versatility**

**Broad Hydraulic Coverage**

The Flowserve LNN and associated double suction axially split pumps are available with 145 impeller and volute combinations. As a result, Flowserve provides the most options for highest efficiency operation in all water applications.

User industry standards, specifications and preferences have been incorporated in the rotating element design with particular emphasis on ease of maintenance.

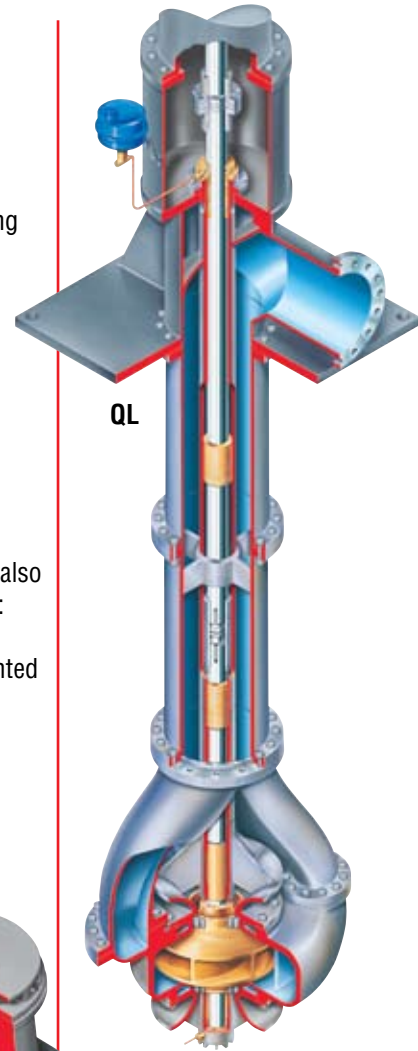
The integrated design philosophy provides optimum parts interchangeability of bearing housings, seal chambers, wear rings and shaft sleeves.

**Typical Applications**

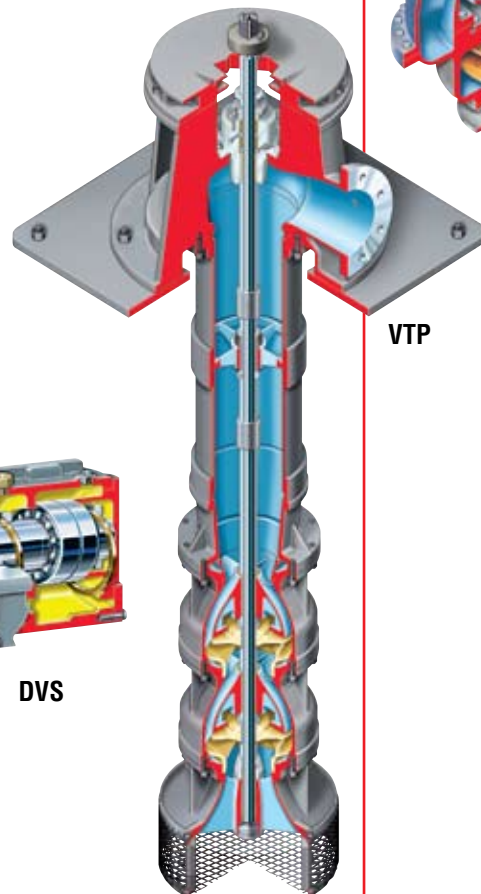
- Water cooling
  - Cooling tower
  - Circulating
- High and low water lift
- Raw water transfer
- Cargo loading and unloading
- Heating, ventilation and air conditioning
- Low pressure pipeline
- Fire protection
- Irrigation
- Crude oil transfer
- Seawater circulation
- Marine services

Depending upon application requirements, Flowserve can also provide these design pumps:

- Vertical turbine
- Horizontal, centerline mounted
- Vertical double suction

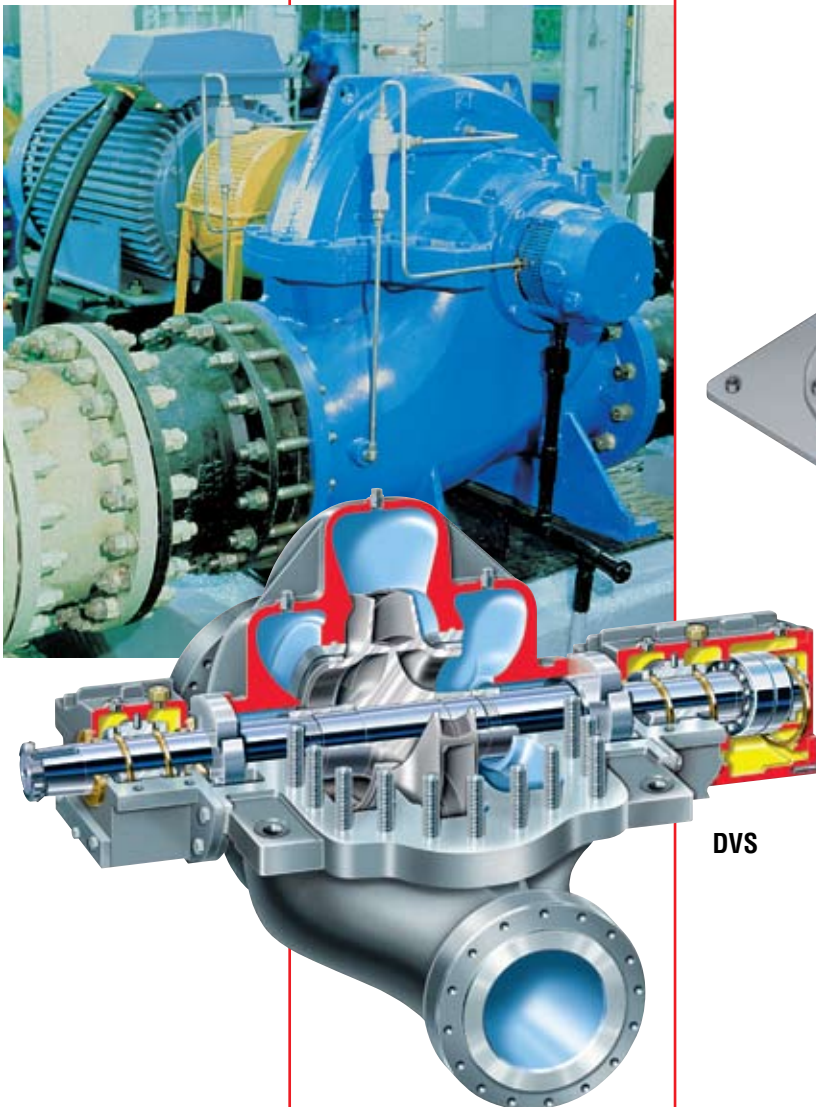


QL



VTP

DVS



**LNN**  
**Between Bearing,  
 Axially Split,  
 Single Stage,  
 Double Suction  
 Pump**

The LNN family of pumps is the outcome of many years' experience in the design and manufacture of axially split casing pumps. State of the art pump design technology from Flowserve has resulted in superior pumps combining quiet operation, low NPSH requirements and high operating efficiency.

**Operating Parameters**

- Flows to 30 000 m<sup>3</sup>/h (132 000 gpm)
- Heads to 300 m (980 ft)
- Pressures to 40 bar (580 psi)
- Temperatures to 140°C (285°F)
- Sizes 125 mm (5 in) to 1200 mm (48 in)

**Pump Casing Features**

- Double volute
- Suction and discharge flanges in ANSI, DIN or ISO configurations
- Heavy duty integral mounting feet
- Upper case lifting lugs

**Seal Chamber Features**

- Independent cast housing for packing or mechanical seal
- Four bolt gland attachment for mechanically sealed designs
- Easy retrofit capability for conversion from packing to mechanical seal

**Bearing Options**

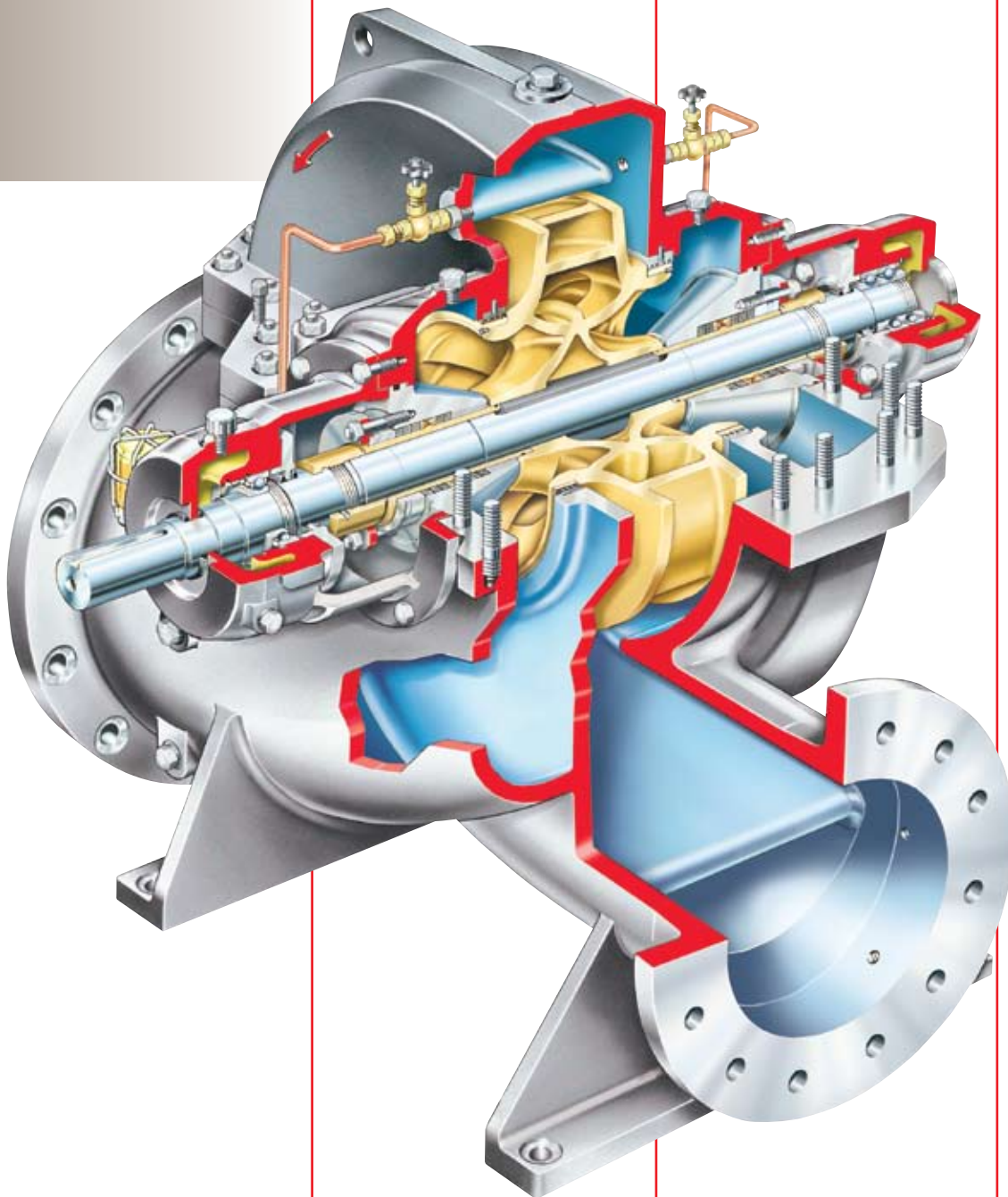
- Antifriction ball bearings standard
- Double row, angular contact thrust bearings option
- Sleeve radial and hydrodynamic axial thrust bearings option

**Bearing Sealing and Lubrication Options**

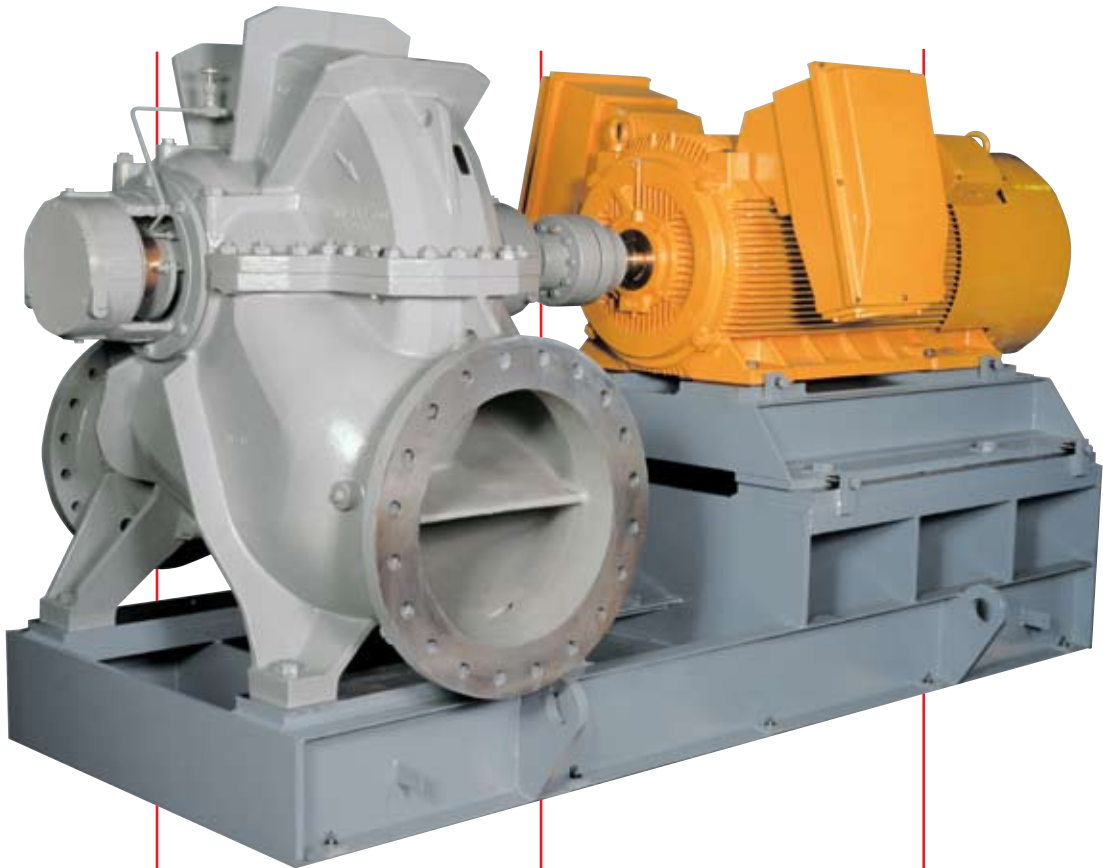
- Grease lubrication standard
- Oil bath or oil mist lubrication option
- Bearing housing protection by "V" ring seals or optional labyrinth seals

**Shaft and Shaft Sleeve Features**

- Steel or duplex stainless steel shaft material
- Outside mounted and set screw locked shaft nuts
- Precision ground, key driven, locked and "O" ring gasketed shaft sleeves







**Bearing Housings** with 360° attachment and unique fastening to upper and lower casings provide superior bearing stability and shaft support. Perfect shaft alignment is assured by a full register fit to the casing. Bearing housings and stuffing boxes can be easily removed and reinstalled.

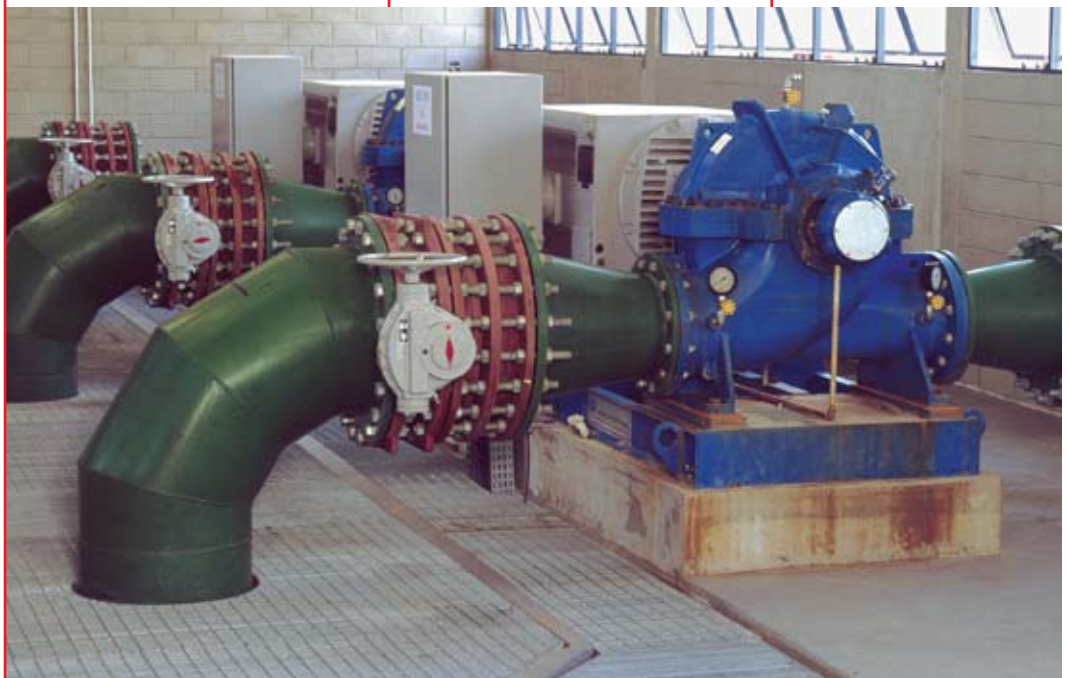
**Casing Materials** available to suit service conditions include cast iron, ductile iron, ductile Ni-Resist D2, bronze, nickel aluminum bronze, carbon steel, 316 stainless steel and duplex stainless steel.

**Casing Design** with suction and discharge flanges in the lower half, allows access to the rotating element without disturbing piping or driver. Upper casing does not have to be opened to remove and replace bearings, packing, mechanical seals, sleeves and sleeve nuts.

**Precision Cast Impeller** assures achievement of maximum pump efficiency. Impellers are dynamically balanced to ISO 1940 tolerances. Multiple impeller designs exist for each casing to give maximum flexibility for upgrading pump performance to meet future service conditions.

**Shaft** is conservatively designed to minimize deflection and reduce maintenance costs caused by wear.

**Wear Rings**, positively locked by radial pins, are standard for casing protection. Optional for impeller protection, wear rings are shrinkfit and pinned securely.



**Options and Technical Data**



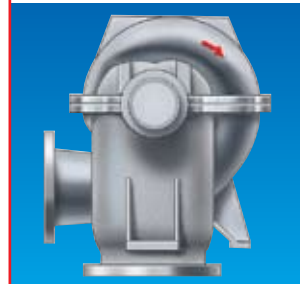
**Mounting Options**



**LNN**  
Horizontal mounting with side suction and side discharge

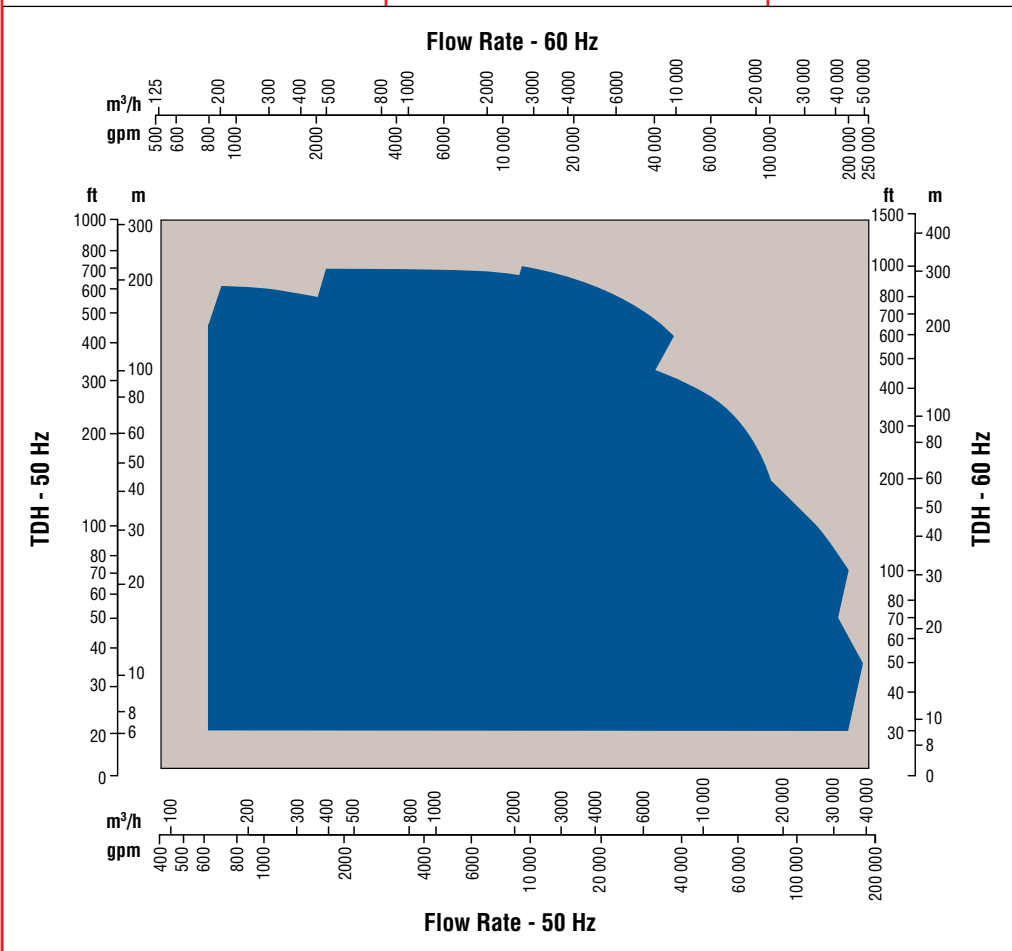


**LNNV**  
Vertical mounting with suction and discharge in-line



**LNNC**  
Horizontal mounting with bottom suction and side discharge

**LNN Range Chart**



**Global  
Engineered Services  
and Support**

- Total Cost Reduction*
- Asset Management*
- Product Life Cycle*
- Performance Re-rates*
- Site Diagnostics*
- Repair Services*
- Energy Management*
- Spare Parts*
- Maintenance Contracts*
- Materials Upgrades*
- Turnkey Services*
- Field Repairs*
- Installation*
- Project Supervision*
- Commissioning*
- Equipment Upgrades*
- Condition Monitoring*
- Systems Analysis*
- Field Machining*

**Service Dedication**

Flowserve Engineered Services is focused on providing customers with uncompromising service and support, where and when needed. Dedicated to delivering the highest quality support, Engineered Services integrates its extensive pump and materials engineering knowledge with creative service solutions. Engineered Services fully understands the business challenges facing customers and is prepared to manage solutions to succeed as a team.

A worldwide network of service and repair centers staffed by highly skilled engineers and technicians is available around the clock, seven days a week to respond to customer queries, to evaluate and troubleshoot problems and to provide reliable solutions.



**Strength of Experience,  
Commitment to Excellence**

Flowserve has long served industries requiring superior equipment performance and service life.

- Oil and gas production
- Hydrocarbon processing
- Chemical processing
- Water resources
- Power generation
- Nuclear
- Mining and mineral processing
- Pulp and paper
- General industry

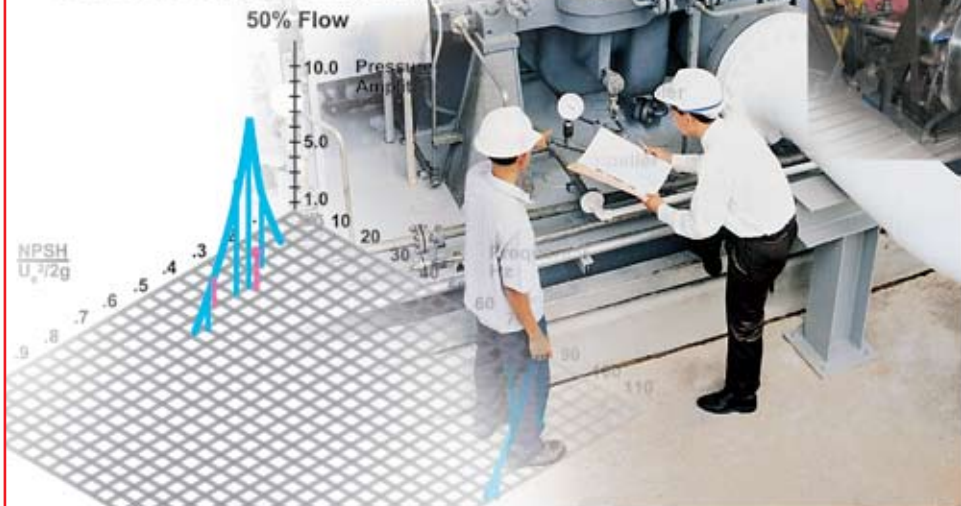
Engineered Services is dedicated to maximizing equipment performance and providing reliability-centered maintenance programs for pumps and related equipment, regardless of manufacturer. Using the FlowStar™ asset management software, Engineered Services tracks performance and supports improvement programs using a service life cycle cost business approach. The results are improved reliability and increased profitability.

**Business Partner**

Flowserve partners with customers to respond to the dynamic business conditions that affect them. Flowserve will work with customers to drive efficiency, maximize throughput and control process quality. Whether user needs involve on-site technical assistance or broader project planning with full turnkey responsibility, Flowserve Engineered Services will deliver professional, reliable results.



**Low Frequency Pressure Pulsations**





**Flowserve... Supporting Our Customers  
With The World's Leading  
Pump Brands**



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