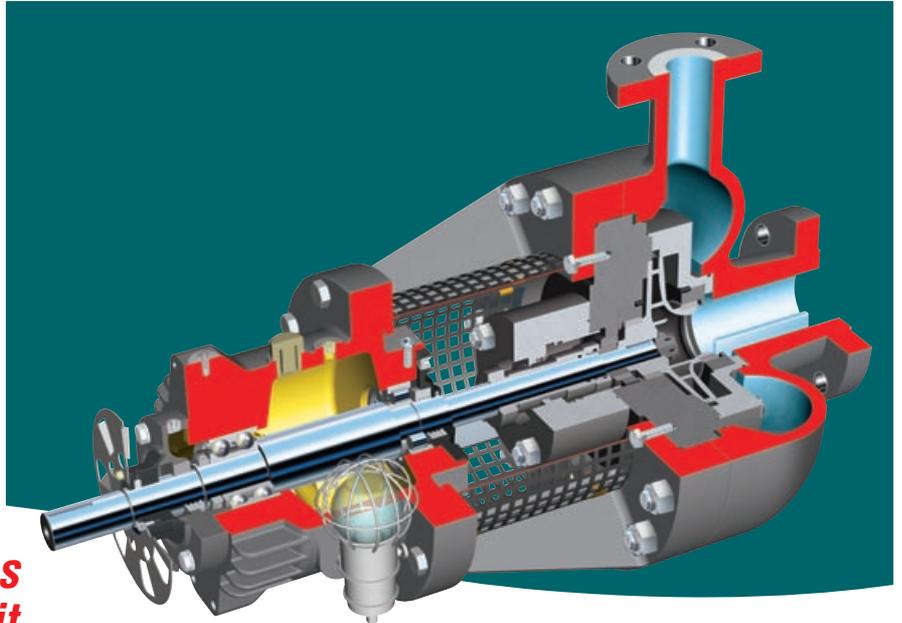
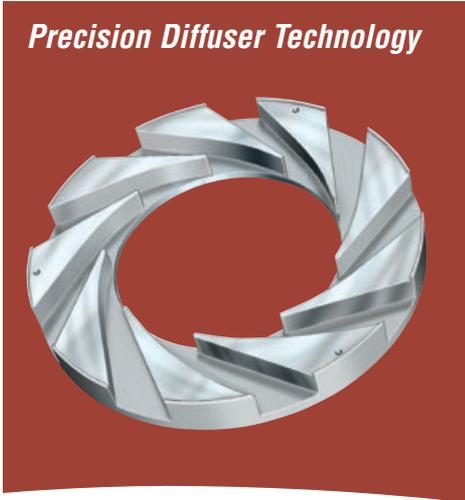


## Precision Diffuser Technology



## Custom-Tuned Hydraulics Ensure Best Efficiency Fit

Fully compliant with ISO 13709/API 610 (OH2), latest edition, the PHL process pump offers exceptional customization. Its innovative multi-channel diffuser technology allows the pump hydraulics to be custom tuned to ensure best efficiency hydraulic fits while maximizing parts interchangeability. In fact, this versatile and highly engineered pump boasts more than 170 hydraulic configurations supported by only four shaft and two bearing housing designs.

In addition to custom hydraulics, the PHL's state-of-the-art diffuser technology results in extremely low total cost of ownership. This is due to:

- Long mean time between failures (MTBF) and low maintenance cost
- Low seal emission and long mechanical seal life
- Low vibration and noise levels
- High efficiency for low energy consumption
- Low NPSH

Flowserve has been recognized for these benefits by Dow Chemical with its Energy Award.

## Broad Application

- Oil production and transportation
- Hydrocarbon processing
- Petrochemical processing
- General industry

## Features and Benefits

**Multi-Channel Diffuser Technology** permits hydraulic customization for optimal performance and efficiency while minimizing radial loads at all flows. Diffusers are replaceable, providing users flexibility in addressing changing operating parameters.

**ISO 21049/API 682 Seal Chamber** accommodates a variety of seal types, including dual pressurized, unpressurized and gas, for the most severe applications.

**End or Top Suction Nozzle Orientation** is available to suit site piping systems.

**Air Fan or Water Jacketed Cooling** of bearings allows operating temperatures up to 450°C (840°F).

**Available Boron Diffusion Surface Treatment** offers increased abrasion resistance for applications containing fines or particulates.

### Performance Advantages

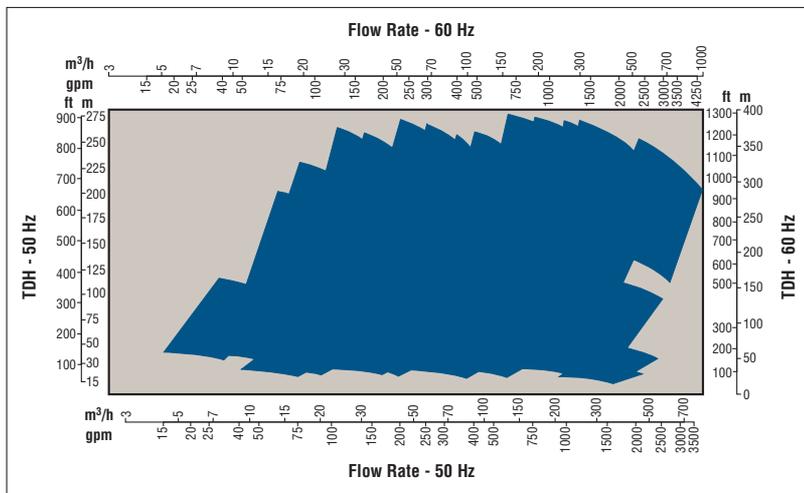
- Diffuser tuning maximizes pump efficiency, widens operational flow window and minimizes radial hydraulic thrust at all flows
- Diffuser design permits 10 to 20% of BEP minimum continuous flow, compared to 20 to 35% for volute pump design
- Low shaft vibration results in longer L10h bearing life
- Low shaft deflection assures optimal mechanical seal
- Low noise level (at least 3 dB(A) below volute pump designs) helps reduce plant sound levels

### Operating Parameters

- Flows from 2.5 m<sup>3</sup>/h (11 gpm) to 900 m<sup>3</sup>/h (4000 gpm)
- Heads to 400 m (1300 ft)
- Pressures to 40 bar (600 psi)
- Temperatures to 200°C (392°F); 450°C (840°F) with air fan or water jacketed cooling of bearings



### PHL Range Chart



### Complementary Pump Designs

PHL pumps may be used with other Flowserve design pumps, including:

- PVML ISO 13709/API 610 (OH5) vertical in-line, diffuser style process pump
- PVXM ISO 13709/API 610 (OH3) vertical in-line, diffuser style process pump
- HPX ISO 13709/API 610 (OH2) overhung, end suction, volute style process pump
- ERPV overhung, end suction, volute style process pump

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