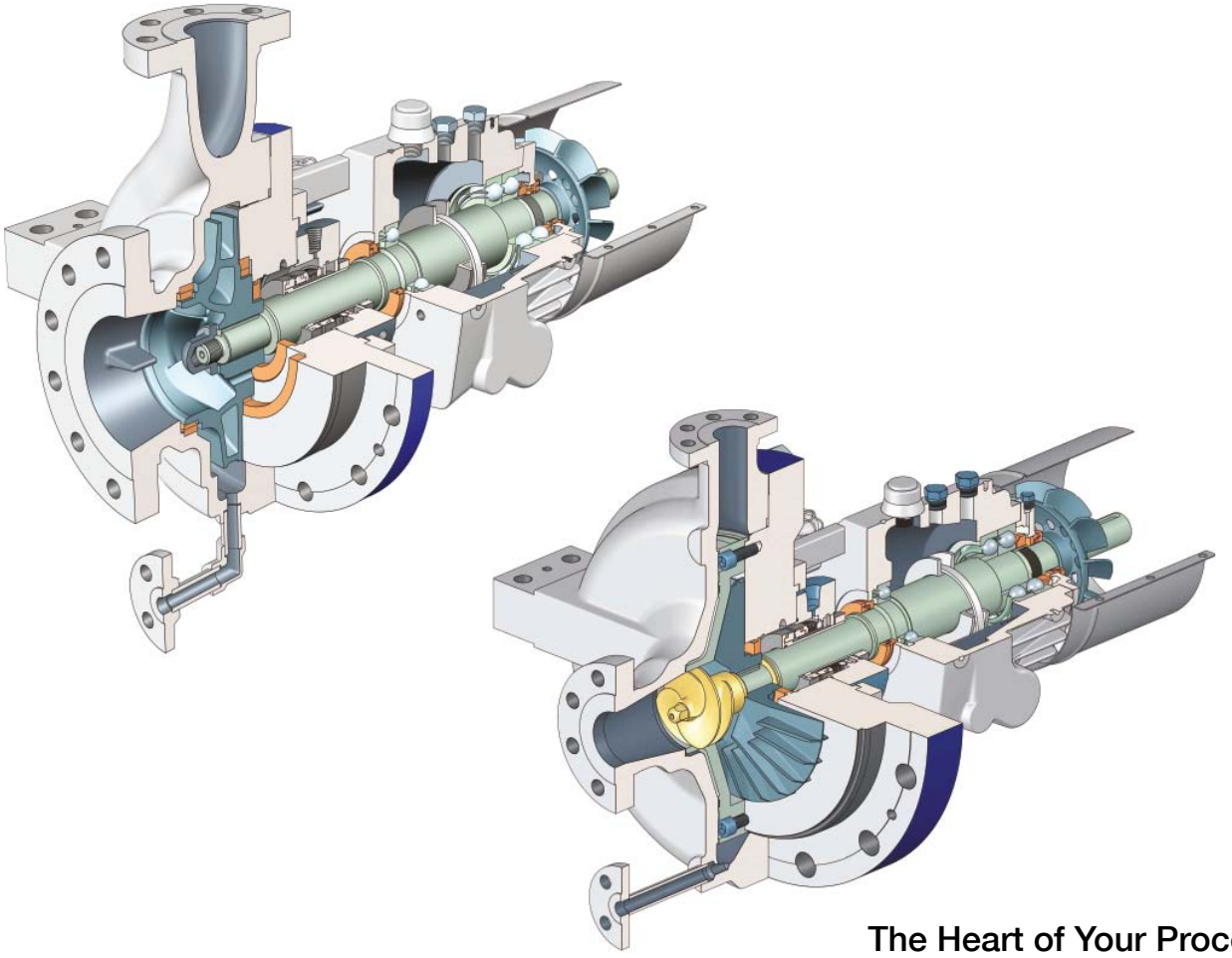
SULZER

Sulzer Pumps

OHH and OHHL Process Pumps ISO 13709 (API 610)



The Heart of Your Process

Sulzer Pumps

Sulzer Pumps is a world leader in reliable products and innovative pumping solutions. Our advanced research and development, detailed process and application knowledge together with a comprehensive understanding of market demands keeps us consistently at the leading edge of technical development. Our global network of modern manufacturing and packaging facilities together with sales offices, service centers and representatives located close to major markets provide fast responses to customer needs.

Sulzer Pumps has a long history of providing innovative pumping solutions to business partners in the following industries:

- Oil and Gas
- Hydrocarbon Processing
- Pulp and Paper
- Power Generation
- General Industry
- Chemical Process Industry
- Water

OHH/OHHL Global Manufacturing Facilities

Navi Mumbai, India

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Application Knowledge for Better Efficiency

Synfuel plants, refineries, petrochemical plants and gas plants operate sophisticated production processes requiring reliable pumping solutions. Continuous product innovations such as our improved hydraulic performances on oil production and process pumps are helping the industry improve its operational efficiency.

All our pumps are engineered in line with the latest standards issued by API, ISO and ANSI in order to ensure reliable and safe operation at your site. The Hydrocarbon Processing Industry is one of the core business segments within Sulzer Pumps. Following industry practice, we further subdivide the segment into:

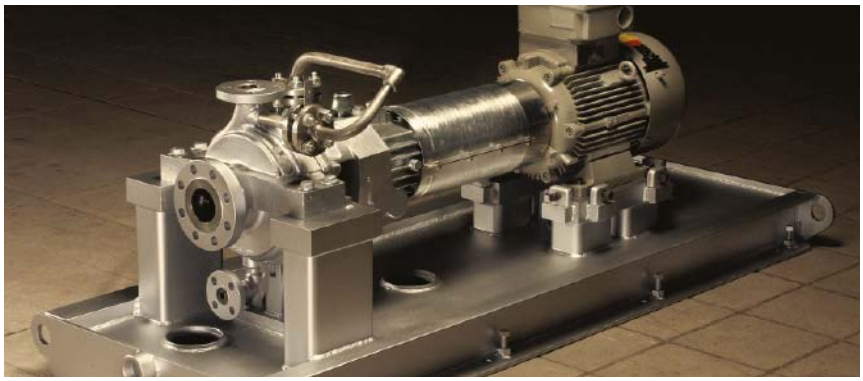
- Synfuels
- Refining
- Gas Processing
- Petrochemicals
- Nitrogenous Fertilizer

Extensive Product Range

Sulzer Pumps provides a broad range of ISO13709 (API 610) centrifugal pumps for the demanding applications of the Hydrocarbon Processing Industry.

The conventional OHH features over 110 hydraulics—from 25 mm discharge to 400 mm discharge (1" to 16") and power levels that can exceed one MW. The OHH is designed to ISO 13709 (API 610) with ISO 21049 (API 682) cartridge type mechanical seals.

Market needs and the desire to cover all hydraulic requirements prompted the development of the OHHL, or low flow version of the OHH. The OHHL utilizes the same extra heavy shaft and bearing frame as the OHH. Only the shaft end under the impeller is modified to accommodate the OHHL's unique low flow impeller design.



OHH pump completely assembled

OHHL pump ready for shipment

Engineered for Application Flexibility

The OHH is an overhung, horizontal, centerline mounted, single stage, radially split process pump. The OHH process pump includes the latest in mechanical seals technology and is used in heavy-duty refinery services, petrochemical plants, gas processing and offshore services. The mechanical seals and auxiliaries supplied are in full compliance with the requirements of ISO 21049 (API 682).

The fluids pumped include sour water, gasoline, light hydrocarbons, and vacuum bottoms. The customers benefit from the robust construction, the versatility in application, and the long reliable service life.

The OHHL is designed to provide an optimum solution for lower flows and higher heads. Some applications require a horizontal direct drive pump capable of delivering 3 m^3/h (13 USgpm) capacity and head to 360 m (1,200 ft). Customers require low NPSHr, while meeting ISO 13709 (API 610) vibration levels.

The OHHL utilizes a precision cast, semi-open, multi-vaned impeller that produces much more head per mm of impeller diameter than does a conventional enclosed impeller. The OHHL pump design provides geometric flexibility to adjust the best efficiency flow while providing excellent efficiency and a stable performance curve. On larger sizes inducers are available for low NPSH applications.

Materials

All the standard ISO 13709 (API 610) material combinations are available from S-4 to D-2 for hot or cold services.

OHH Design Features and Benefits

Casing Feet and Baseplate

- Centerline mounted pump casing and baseplate designed to meet ISO 13709 (API 610) nozzle loads
- 2 x API nozzle load option available depending on size
- Non-grouted or pre-grouted base plates available for motor or steam turbine
- API 610 defined baseplate dimensions are standard

Impeller

- Dynamically balanced impeller
- Enclosed impellers provided for increased efficiency
- Optional impellers in most sizes for low NPSHr
- Wear ring diameters and balance holes are optimized to maximize seal and bearing life
- Proven Coke Crusher available for coking applications

Shaft

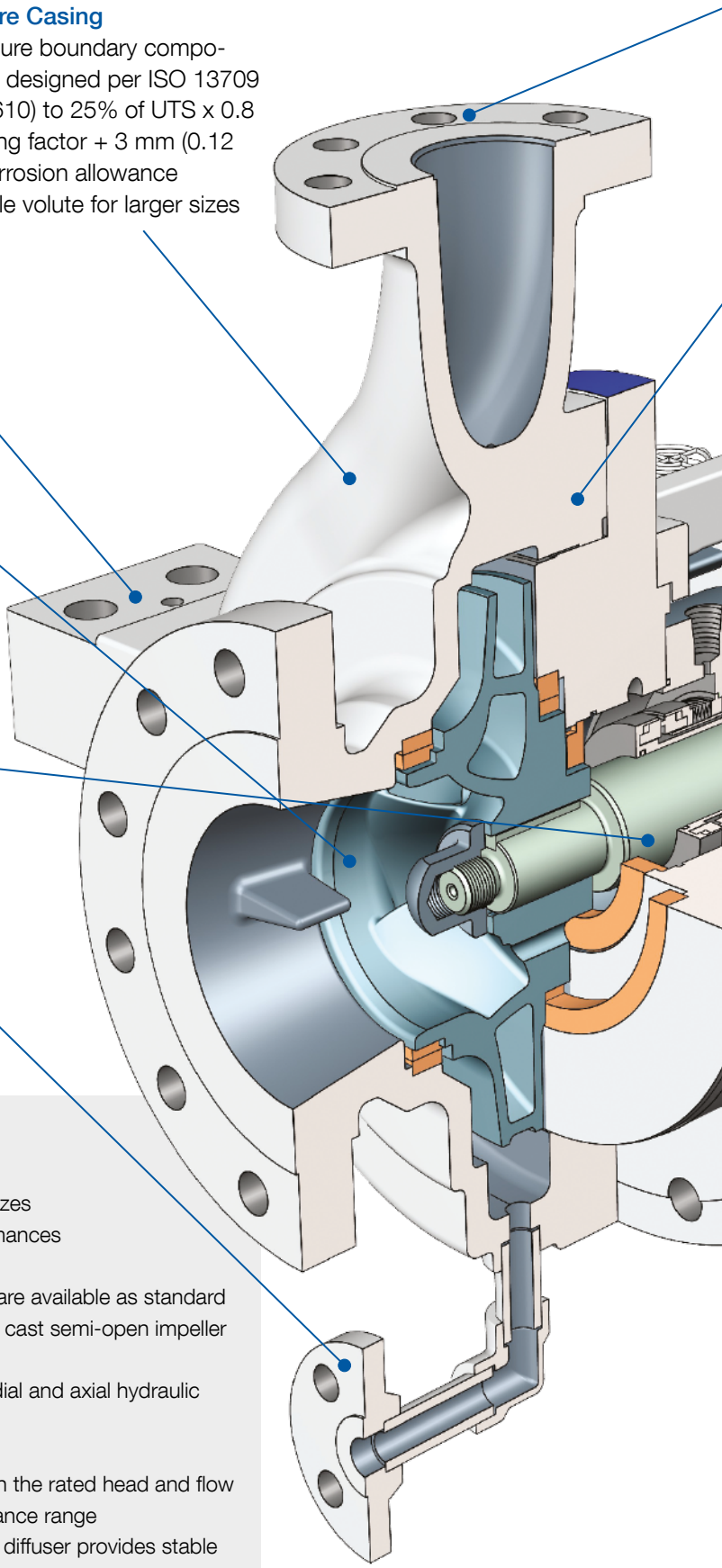
- Extra heavy duty, large diameter shaft for low shaft deflection and long life

Case Drain

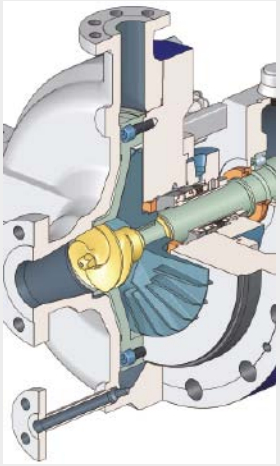
- Socket welded flanged drains are standard
- Butt welding also available
- Gussets or bracing available to suit customer specifications

Pressure Casing

- Pressure boundary components designed per ISO 13709 (API 610) to 25% of UTS x 0.8 Casting factor + 3 mm (0.12 in) corrosion allowance
- Double volute for larger sizes



OHHL Design Features and Benefits



Inducer

- Inducer available on larger sizes for improved suction performances

Impeller

- Over 50 different hydraulics are available as standard
- Specially designed precision cast semi-open impeller with liberal clearances
- Unique design minimizes radial and axial hydraulic loads

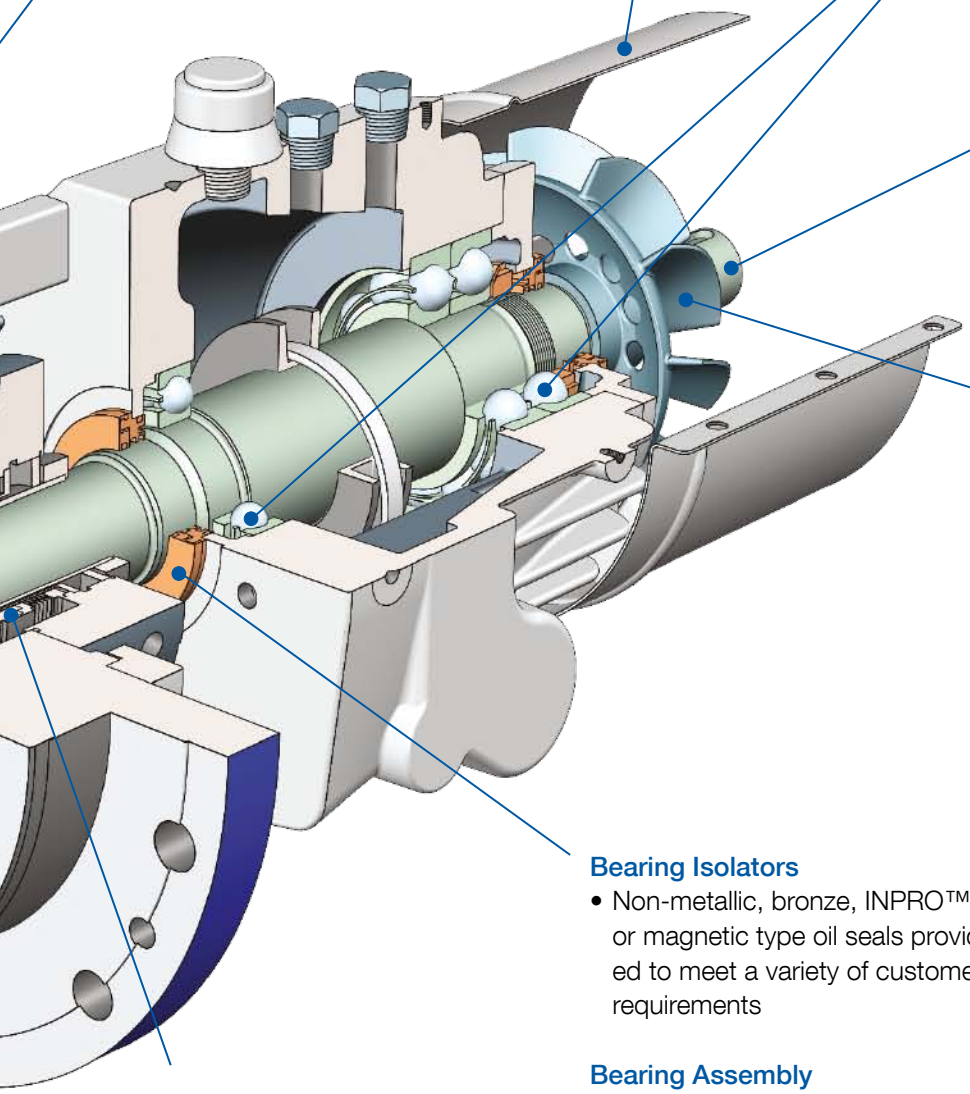
Diffuser

- Precision machined to match the rated head and flow within the optimum performance range
- Combination of impeller and diffuser provides stable H-Q-curve

Flanges
- Backfaced ANSI B16.5 300#R.F. flanges with required serrations
- ISO/DIN or 600# flanges available
- Top Suction available on OHH

Casing Gasket
- Fully confined with controlled compression and metal-to-metal fit

Coupling Guard
- Standard coupling guard meets ISO 13709 (API 610), ATEX and OSHA requirements
- Other type of guards are available



Bearings
- 7300 series, heavy duty 40° angular contact thrust bearings with machined brass cages—mounted back-to-back
- Deep groove ball radial bearing with increased clearance as required by ISO 13709

Coupling
- Flexible disk spacer couplings are supplied to comply with customer and ISO 13709 requirements

Bearing Housing
- Carbon steel construction with cooling fins for improved heat dissipation
- Variety of instrumentation available for condition monitoring
- Dimples are provided for consistent location when taking vibration measurements with a portable instrument
- Optional high capacity bearing frame for high suction pressure

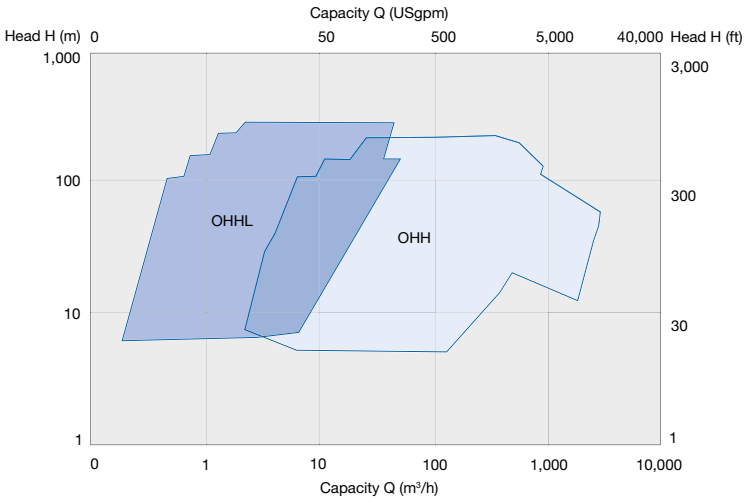
Bearing Isolators
- Non-metallic, bronze, INPRO™ or magnetic type oil seals provided to meet a variety of customer requirements

Bearing Assembly
- 4 sizes of bearing housing cover the product range for maximum interchangeability
- Pre-defined list of features available to meet the most difficult operating conditions
- Low noise fan added for high ambient or high product temperatures
- Oil sump heater added for low ambient or low product temperatures

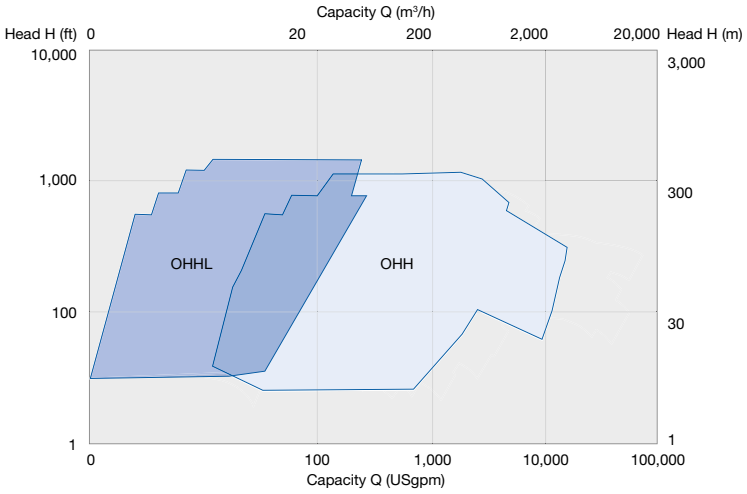
Bearing Lubrication
- Standard highly effective ring oil lubrication system utilizes an oil ring mounted within a deep groove retainer that guarantees the oil ring does not become displaced
- Bearing housing oil channel routes the lubricant to the rear of each bearing to ensure positive lubrication under all conditions
- Housing is supplied with connections for purge oil mist or pure oil mist
- Oil mist ports are located on the outboard side of each bearing to ensure positive oil mist flow through each bearing

Seal Chamber
- Standardized dimensions according to ISO 13709 (API 610)
- Furnished with all ISO 21049 (API 682) piping plans for improved seal life
- Single or dual cartridge type mechanical seals available to meet all process requirements
- Standard and close clearance throat bushing for control of seal chamber pressure

OHH and OHHL Performance Ranges



50 Hz



60 Hz

Operating Data

OHH	50 Hz	60 Hz
Pump sizes	25 to 400 mm	1 to 16 inches
Capacities	up to 2,250 m³/h	up to 10,000 USgpm
Heads	up to 360 m	up to 1,200 ft
Pressures*	up to 51 bar	up to 740 psi
Temperatures**	-40 °C to 425 °C	-40 °F to 800 °F

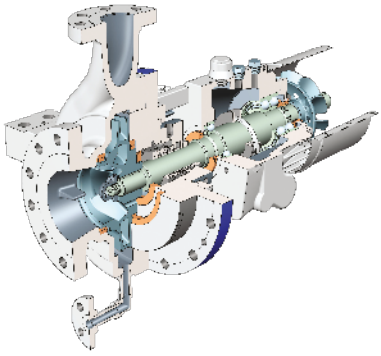
OHHL	50 Hz	60 Hz
Pump sizes	25 to 40 mm	1 to 2 inches
Capacities	1 m³/h to 60 m³/h	4 to 260 USgpm
Heads	20 m to 450 m	65 to 1,500 feet
Pressures	up to 51 bar	up to 740 psi
Temperatures**	-40 °C to 425 °C	-40 °F to 800 °F

*Optional OHH high pressure casing with 600# flanges on most sizes to > 80 Bar (1,160 psi).

**Pumping temperatures below -40 °C (-40 °F) may be possible and are engineered on an order specific basis.

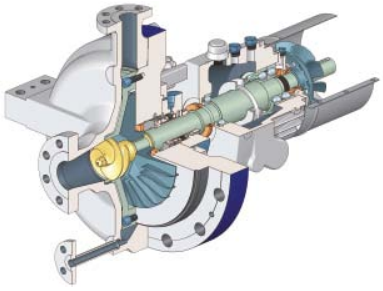
Sulzer Overhung Process Pumps

Sulzer Pumps' heavy duty, overhung process pump product range is one of the pump industry's most versatile, serving a diverse number of applications in several market segments. Many users have a preference for its rugged centerline support, radial split casing, extra heavy shaft and ease of maintenance.



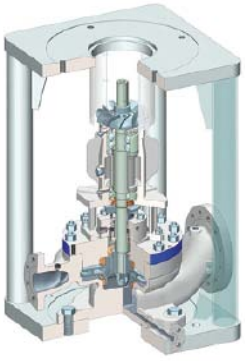
Type OHH

Overhung horizontal centerline mounted single stage, radially split ISO 13709 (API 610) process pump. Available with single, dual-pressurized and dual un-pressurized mechanical seals, including dry gas seals to the latest ISO 21049 (API 682) Seal Standard.



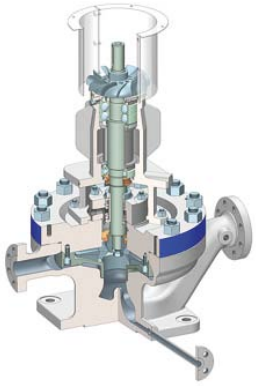
Type OHHL

The OHHL is the same rugged design with low flow hydraulics for improved hydraulic fit—even at low flow conditions.



Type OHV

The OHV is an inline version of much of the OHH pump product line. It combines proven pump technology to create a world-class ISO 13709 (API 610) Type OH3 overhung inline pump. OHV inline pumps are designed for pumping applications covering a myriad of produced or process fluids such as produced water booster, crude oil booster, propane transfer, reflux, gas oil, etc.



Type OHVL

The OHVL is an inline version of the OHHL and covers the low flow range. It utilizes the OHHL shaft. The OHH, OHV, OHHL and OHVL all use the same rugged bearing and ISO 21049 (API 682) cartridge type mechanical seals for durability and maximum interchangeability.

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