FLOWSERVE

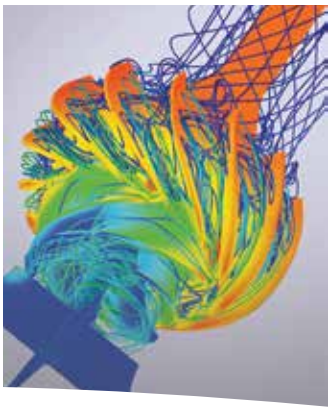
HPX
Hydrocarbon Processing Pump

ISO 13709/API 610 (OH2)



Experience In Motion






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.

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
- Nuclear
- Specialty

Product Brands of Distinction

ACEC™ Centrifugal Pumps

Aldrich™ Pumps

Byron Jackson® Pumps

Calder™ Energy Recovery Devices

Cameron™ Pumps

Durco® Process Pumps

Flowserve® Pumps

IDP® Pumps

INNOMAG™ Sealless Pumps

Lawrence Pumps®

Niigata Worthington™ Pumps

Pacific® Pumps

Pleuger® Pumps

Scienco™ Pumps

Sier-Bath® Rotary Pumps

TKL™ Pumps

United Centrifugal® Pumps

Western Land Roller™ Irrigation Pumps

Wilson-Snyder® Pumps

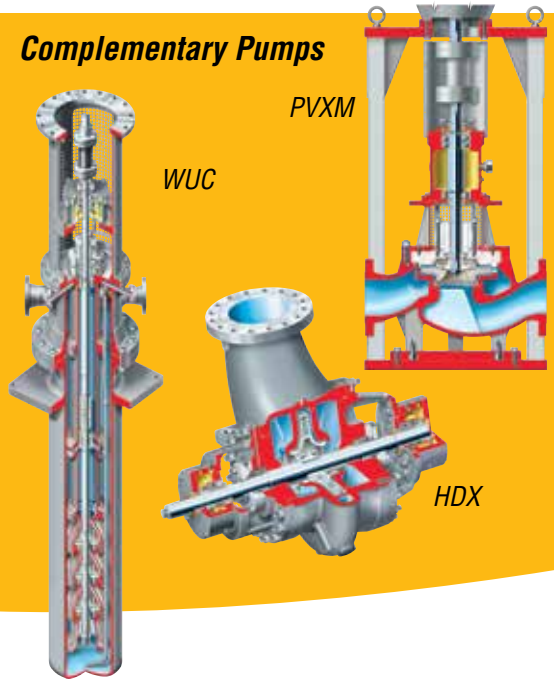
Worthington® Pumps

Worthington Simpson™ Pumps

HPX
Hydrocarbon
Processing Pump
ISO 13709/API 610 (OH2)



Complementary Pumps



Number One in the Industry

The Flowserve HPX pump meets or exceeds the rigorous requirements of ISO 13709/API 610 (OH2) latest edition. Engineered and built for reliable, safe performance, it also provides optimal emissions containment. Further, the HPX represents the most comprehensive range of hydraulic coverage available to the industry, thereby permitting precise selection for best operating efficiency.

Industry-Leading Design and Performance

The HPX pump is the industry leader for these reasons:

- Robust construction meets or exceeds ISO 13709/ API 610 (OH2) latest edition criteria.
- Stringent emissions containment with ISO 21049/API 682 seal chamber, which accommodates all seal models and styles, including advanced gas barrier seal technology
- Back pullout design
- Wide range of configurations and materials, including non-metallics and coatings
- Extensive hydraulic coverage

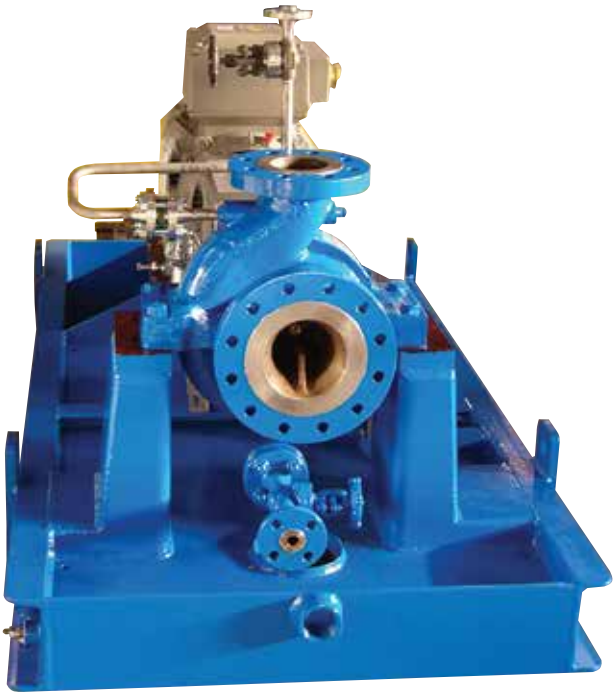
Typical Applications

- Petroleum refining, production and distribution
- Petrochemical and chemical processing
- Gas industry services
- Boiler circulation
- Water
- Reverse osmosis
- Biofuels
- Solar
- High-temperature applications
- General industrial

Complementary Pump Designs

HPX pumps may be used with other Flowserve models of API design. These include:

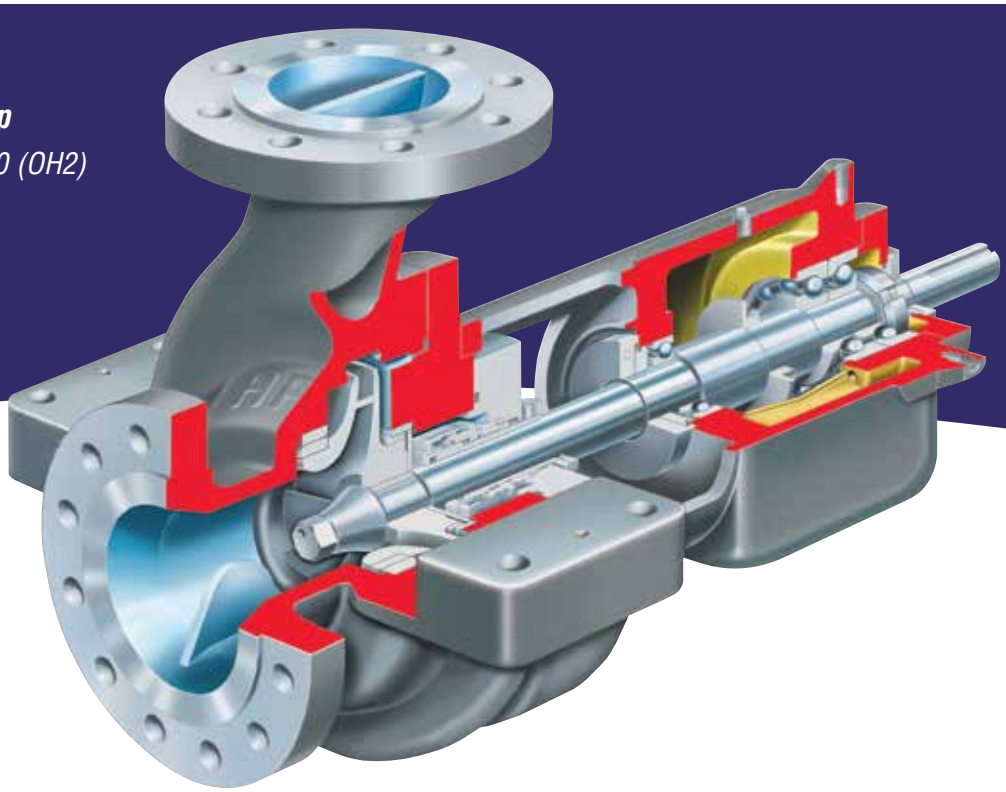
- Single- and two-stage, between bearings pumps
- Vertical, in-line pumps
- Multistage, between bearings pumps
- Vertical, double case pumps
- Specialty pumps



FLOWSERVE

HPX Hydrocarbon Processing Pump

ISO 13709/API 610 (OH2)



The HPX pump is the workhorse of the hydrocarbon processing industry, boasting unequaled versatility, reliability and safety. Designed to withstand the high pressures and temperatures often found in the oil and gas and hydrocarbon industries, the HPX is a horizontal end suction pump with a top discharge, overhung, centerline mounted configuration. It is fully compliant with ISO 13709/API 610 (OH2) latest edition design criteria and features an ISO 21049/API 682 compliant seal chamber.

Operating Parameters

- Rated flows to 2000 m^3/h (8800 gpm)
- Heads to 350 m (1100 ft)
- Standard pressures to 52 bar (760 psi)
- Temperatures from -160°C (-250°F) to 450°C (840°F)

Features and Benefits

Raised Face Flanges are to ASME B16.5 criteria for Class 300 or 600. Surface finish meets ISO 13709/API 610 standard. ISO and JIS flanges are available.

Centerline Supported Pump Casing withstands nozzle loads beyond ISO 13709/API 610 design requirements and minimizes shaft misalignment, extending rotor, bearing and seal life.

Pump Casing and Cover feature metal-to-metal fit with a fully confined, controlled compression gasket to ensure proper sealing and alignment.

Suction Nozzle Guide Vane reduces inlet vortexing and ensures uniform flow into the impeller to achieve a reliable NPSH margin.

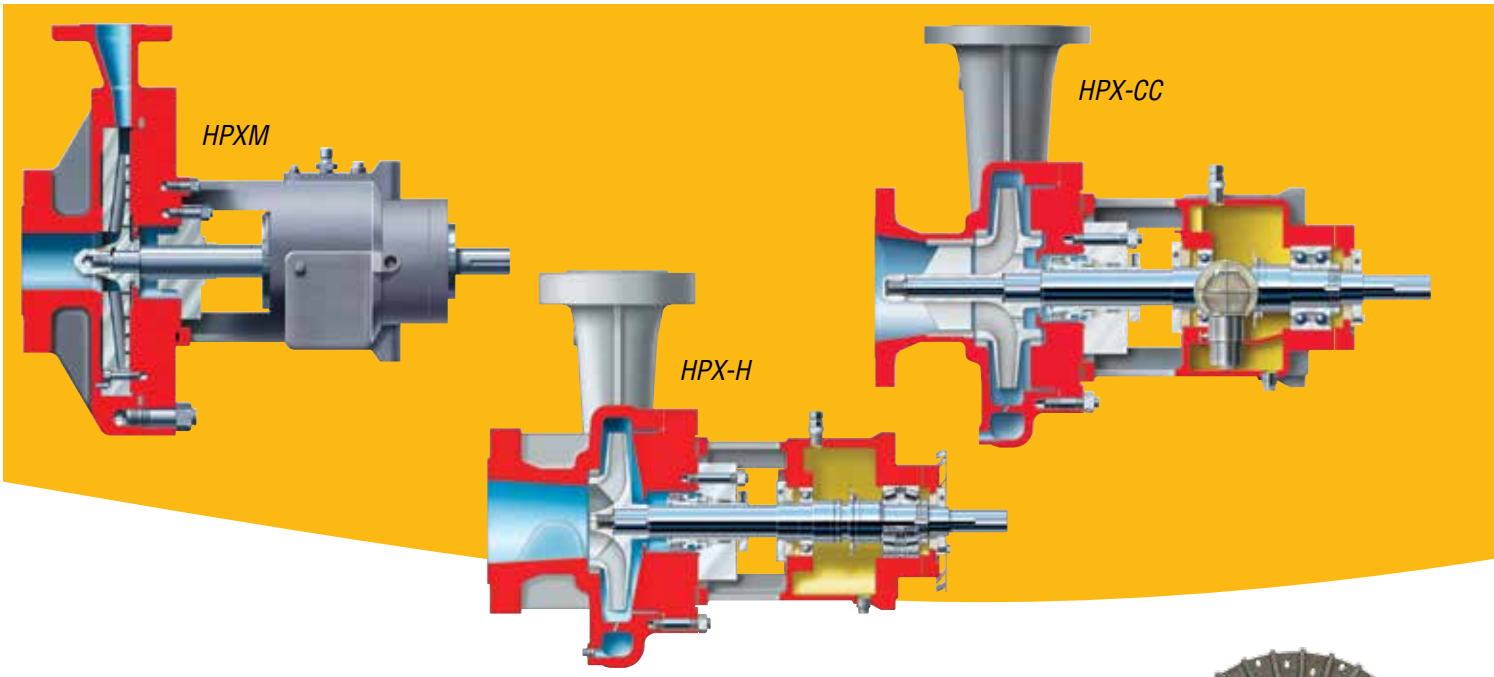
Back Pullout Design simplifies maintenance, as neither the motor or the piping is disturbed.

Precision Cast Impeller is dynamically balanced to limit vibration and assure smooth operation over a wide flow range. Impeller is positively secured by means of a set screw and a locknut, the threads of which are not exposed to the pumped liquid.

Renewable Wear Rings for both the casing and impeller reduce replacement parts cost. Secured by set screws or tack welds. Back wear ring is standard on all pump sizes. Optional arrangements are available depending on specific hydraulic/service conditions. Non-metallic wear rings are available.

ISO 21049/API 682 Seal Chamber accommodates a wide variety of seal configurations, including dual pressurized and unpressurized cartridge types for the most severe services. A full complement of API 610 seal flush piping plans is available.

Rugged Shaft Design is well within ISO/API shaft deflection and run-out criteria.



Heavy-Duty Bearing System

The bearing housing of the HPX is made of heavy-duty carbon steel. Standard labyrinth type oil seals retain oil and exclude atmospheric contaminants and moisture. Optional bearing isolators are available. Oil slinger lubrication mitigates “dirty oil” appearance while ensuring optimal bearing lubrication.

As standard, the HPX is equipped with single row, deep groove, radial bearings and duplex, single row, 40° angular contact thrust bearings. Special bearing arrangements are available for high suction pressures.



Special Configurations



HPXM — Low-Flow Configuration
With a multiple radial blade impeller and a volute insert, the HPXM provides best efficiency point hydraulic fits. It delivers a performance curve continuously rising to minimum flow in low-flow applications.

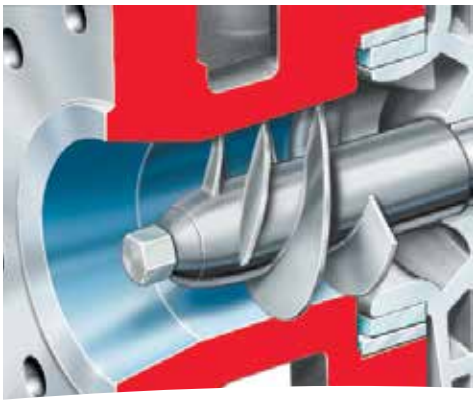
HPX-MP — Medium-Pressure Configuration
The HPX-MP incorporates a special bearing arrangement to support suction pressures up to 35 bar (500 psig) and maximum working pressures to 52 bar (760 psig).

HPX-H — High-Pressure Configuration
Engineered for discharge pressures to 150 bar (2175 psi), the HPX-H features a heavy-duty casing and a high axial thrust rotor design capable of supporting suction pressures to 75 bar (1088 psi).

HPX-T — Top Suction Nozzle Configuration
The HPX-T pump features a top/top nozzle configuration to accommodate customer-preferred piping layout.

HPX-CC — Coke Crusher Configuration
Incorporating a special cutter screw, the HPX-CC facilitates the handling of coke particles in suspension. By reducing their size, the cutter screw enables the coke particles to easily pass through the impeller.

HPX-SL — Slurry Configuration
The HPX-SL is equipped with a semi-open impeller suitable for handling stringy or fibrous liquids.





Optional Inducer

For applications with low NPSHA, the HPX can be fitted with an optional inducer (HPX-IND). This high suction specific speed, axial flow pumping device provides significant improvement in suction performance by reducing pump NPSHR.

Bearing Lubrication Options

Numerous bearing lubrication systems are available with the HPX pump:

- Oil mist and oil purge for continuous bearing lubrication
- Fan cooling for high operating or high ambient temperature applications
- Finned cooling insert for efficient water cooling
- Closed lubrication system with expansion chamber

Available RVX Upgrade

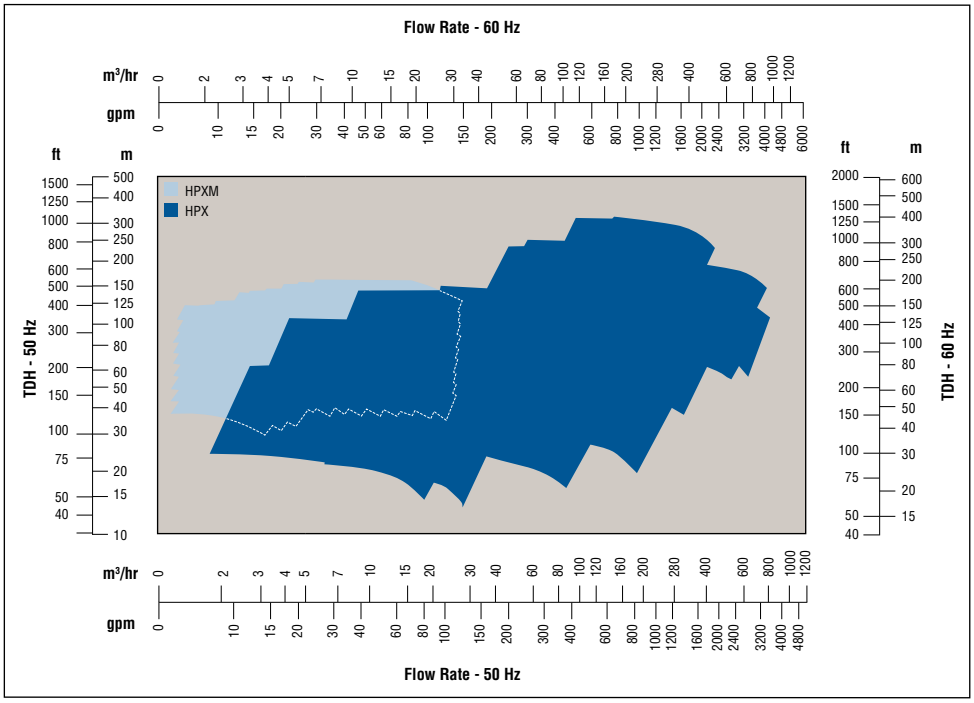
The RVX back pullout assembly addresses users' needs for improved pump reliability with reduced maintenance costs. Based on the HPX pump design, the RVX may be used to upgrade any old, existing OH2 to ISO 13709/API 610 latest edition. Plus, many components of the RVX and HPX are interchangeable, enabling users to reduce inventory carrying costs. To learn more, see bulletin PS-100-7.

Optional Split-Flow Design

Dual discharge design provides two sets of hydraulics within one pump. Available for new and existing units.

- Rated flows to 273 m^3/h (1200 gpm)
- Heads to 185 m (600 ft)

HPX and HPXM Hydraulic Range Chart



Global Service and Technical Support







Life Cycle Cost Solutions

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:

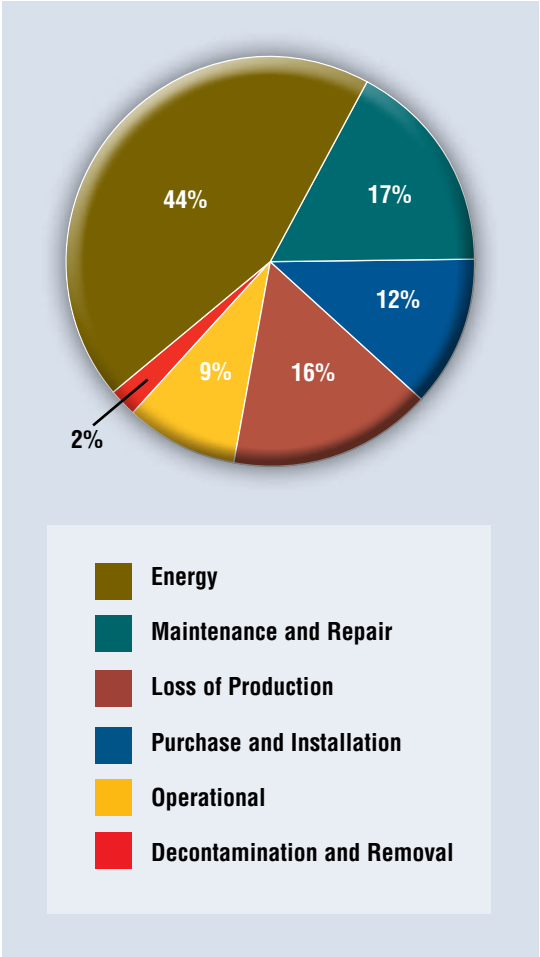
Capital Expenses
- Initial purchase
- Installation

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

Typical Pump Life Cycle Costs[1]



[1] 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.



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To find your local Flowserve representative:

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

USA and Canada
Flowserve Corporation
5215 North O'Connor Blvd.
Suite 2300
Irving, Texas 75039-5421 USA
Telephone: +1 937 890 5839

Europe, Middle East, Africa
Flowserve Corporation
Parallelweg 13
4878 AH Etten-Leur
The Netherlands
Telephone: +31 76 502 8100

Latin America
Flowserve Corporation
Martín Rodriguez 4460
B1644CGN-Victoria-San Fernando
Buenos Aires, Argentina
Telephone: +54 11 4006 8700
Telefax: +54 11 4714 1610

Asia Pacific
Flowserve Pte. Ltd.
10 Tuas Loop
Singapore 637345
Telephone: +65 6771 0600
Telefax: +65 6862 2329