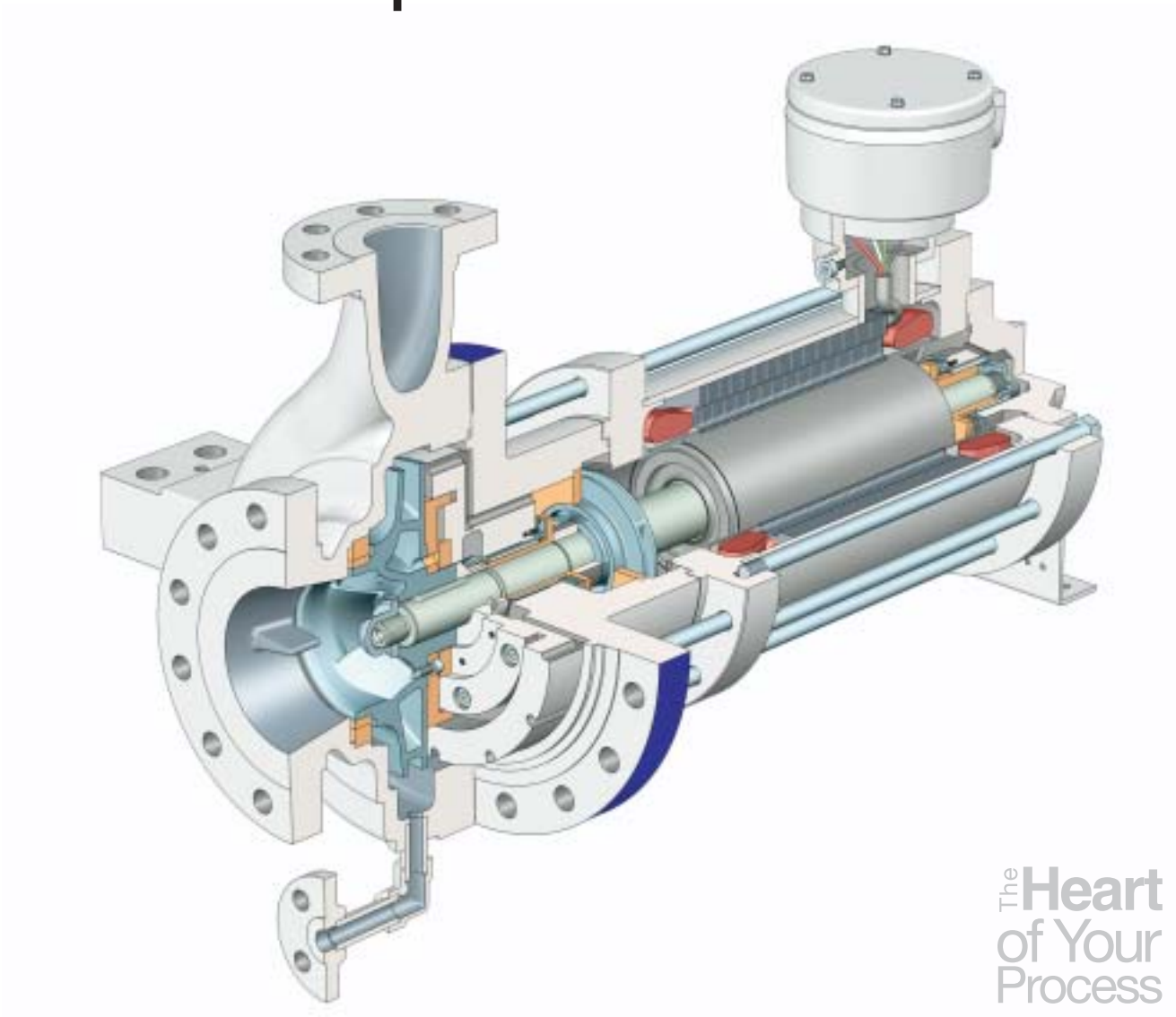
SULZER

OHC API 685 Canned Motor Process Pump



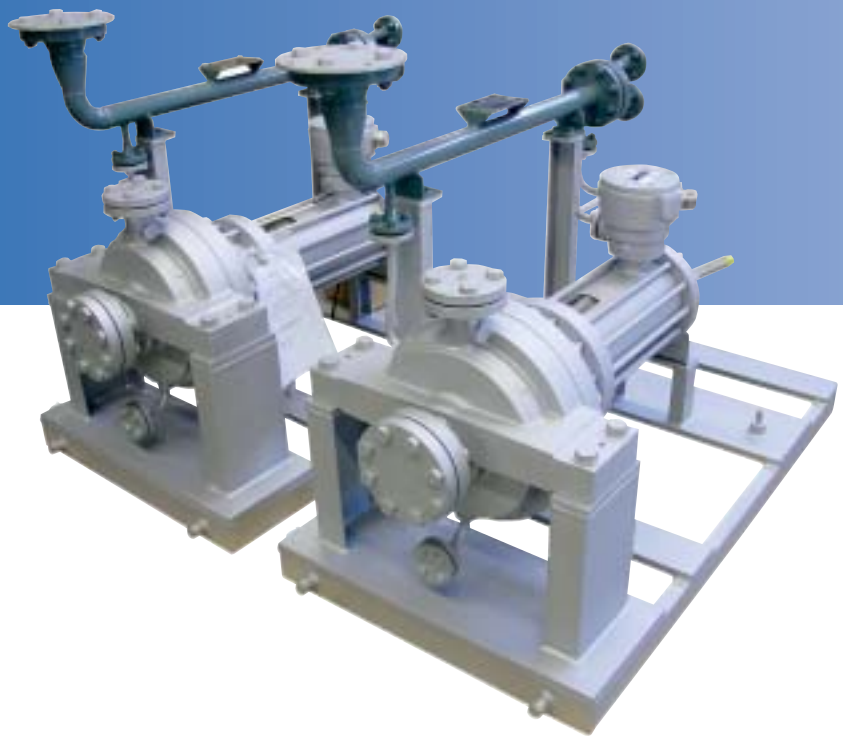
The Heart of Your Process

Sulzer Pumps

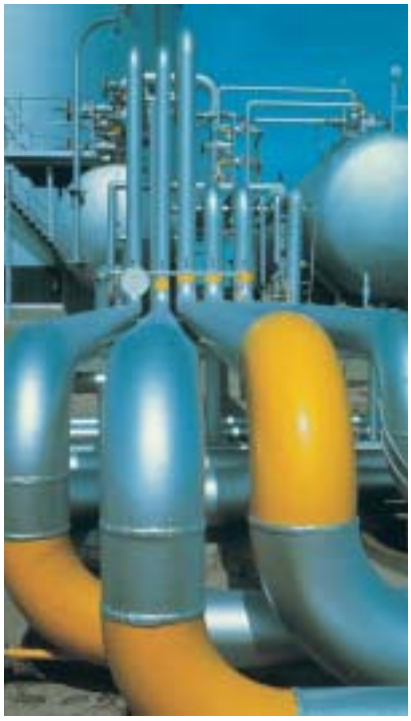
Sulzer Pumps combines more than 135 years of experience in pump development and manufacturing with a deep commitment to fully understand the needs of our customers.

Our detailed process and application knowledge has allowed us to develop innovative pumping solutions for our focus segments including tailor made systems if required. Our active research & development supports the customer oriented approach.

Sulzer Pumps has sales and service facilities in all the major markets of the world to provide fast and flexible response and support.



Extensive Product Range



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

- **Oil & Gas**
- **Hydrocarbon Processing**
- **Pulp and Paper**
- **Power Generation**
- **Food, Metals & Fertilizers**
- **Water and Wastewater**

Hydrocarbon Processing

Hydrocarbon extraction plants, refineries, petrochemical plants and gas plants operate sophisticated production processes requiring reliable pumping solutions. Continuous product innovations such as our new line of hermetically sealed, horizontal and vertical process pumps, are helping the industry improve its operational efficiency.

Sulzer Pumps, with its high-quality product line, is known for being able to consistently meet these expectations. 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

The market - and therefore our customers - requires specialty applications for each subsegment.

Product Development

The purchasing process for centrifugal pumps now also involves evaluation of life-cycle costs. Tightened emission laws and environmental awareness have forced mechanical seal systems to become more complex, sophisticated, and considerably more expensive. Seal systems life-cycle costs have grown to be a major portion of the pump's total life-cycle cost. Therefore, reliable, sealless centrifugal pumps are gaining broad acceptance in applications once dominated by sealed pumps.

For heavy duty refinery, petrochemical and other applications, API 685 is the driving force behind reliable sealless centrifugal pump design. The canned motor type like the OHC, is generally regarded as having higher leakage security than either sealed or magdrive sealless pumps. Further, the compact design and rugged integral rotor of the OHC make it the pump of choice for many heavy duty applications.

Leak-proof, reliable and enduring

OHC - Canned Motor Pump

Process pumps which are used in refineries and chemical plants very often have to satisfy the highest demands for sealing. Sulzer Pumps has therefore extended its process pump series OHH with a canned motor pump. With this model fluid transportation or delivery duties can be mastered in even the most difficult environment.

For increasingly higher demands on sealing and security - i.e. when the secondary containment system is not allowed to have rotating seals - Sulzer Pumps offers the OHC compliant with API standard 685. The OHC pump overcomes the most difficult and demanding pumping duties, for example:

- Poisonous, corrosive, and explosive fluids such as hydrofluoric acid, acrylic acid, or even gasoline
- Very cold and very hot liquids (-120°C/-185°F to +425°C/+800°F)
- Highly radioactive rated fluids
- Fluids with very low viscosity and high vapor pressure
- High-pressure circulation of liquid phase or supercritical gases

Benefits of the OHC

The OHC is a back pullout design so any pump or motor maintenance can be accomplished while leaving the casing installed in the piping.
The motor casing acts as full pressure secondary containment without the use of a mechanical seal.
Since the motor runs on product lubricated bearings, there are no external antifriction bearings and noise levels are far below those of sealed pumps with separate motors.
NPSH is uninfluenced by waste heat from the drive motor since the OHC can be furnished with a secondary circulation system.

As the OHH family is based on a modular system, the main hydraulic components are common and useable across the product range. Furthermore, it is possible to rebuild one configuration into another if required to accommodate application changes.

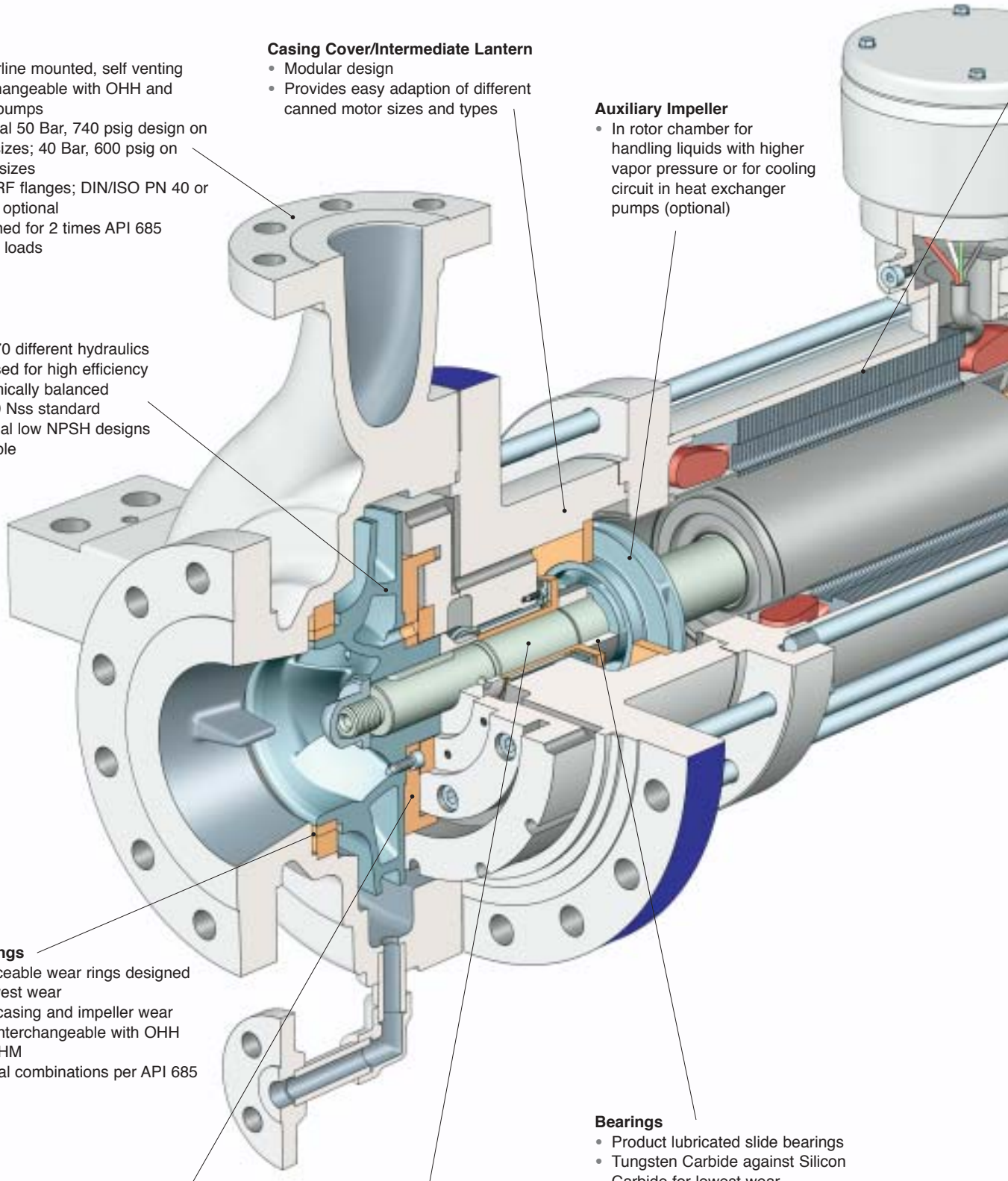
Design Features and Benefits

Casing
- Centerline mounted, self venting
- Interchangeable with OHH and OHM pumps
- Nominal 50 Bar, 740 psig design on most sizes; 40 Bar, 600 psig on larger sizes
- 300# RF flanges; DIN/ISO PN 40 or PN 64 optional
- Designed for 2 times API 685 nozzle loads

Casing Cover/Intermediate Lantern
- Modular design
- Provides easy adaption of different canned motor sizes and types

Auxiliary Impeller
- In rotor chamber for handling liquids with higher vapor pressure or for cooling circuit in heat exchanger pumps (optional)

Impeller
- Over 70 different hydraulics
- Enclosed for high efficiency
- Dynamically balanced
- 11,000 Nss standard
- Optional low NPSH designs available

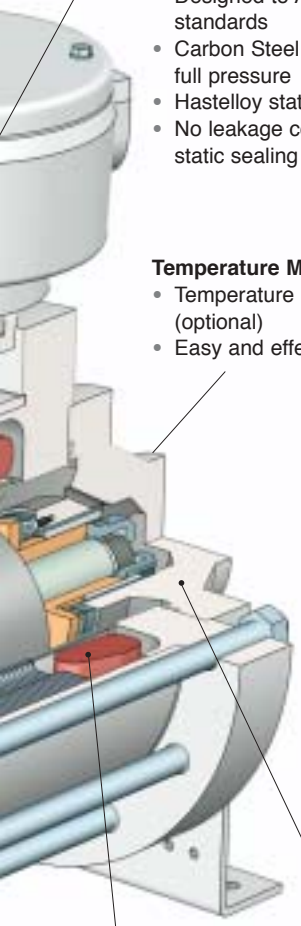


Wear Rings
- Replaceable wear rings designed for lowest wear
- Front casing and impeller wear rings interchangeable with OHH and OHM
- Material combinations per API 685

Bearings
- Product lubricated slide bearings
- Tungsten Carbide against Silicon Carbide for lowest wear
- Designed to API 685 requirements

Throttle Rings
- Residual thrust balance device
- Self compensating
- Easily replaceable throttle rings

Rotor Unit
- With overhung mounted impeller
- Lowest radial deflection thanks to long bearing distance
- Hydraulically balanced



Primary and Secondary Containment
- Considered the most reliable form of pressure containment in sealless pumps
- Designed to ASME and API 685 standards
- Carbon Steel secondary designed for full pressure
- Hastelloy stator liner for low losses
- No leakage control required due to static sealing

Temperature Monitoring
- Temperature monitoring of partial flow (optional)
- Easy and effective installation

Bearing End Cover
- Radial and axial rotor position monitor is optional

Electrical Canned Motor
- High efficiency electrical canned motor in insulation class H or C
- Fully compliant with Ex Proof regulation of ATEX
- Temperature control in winding (for overload monitoring) optional

Bearing Design

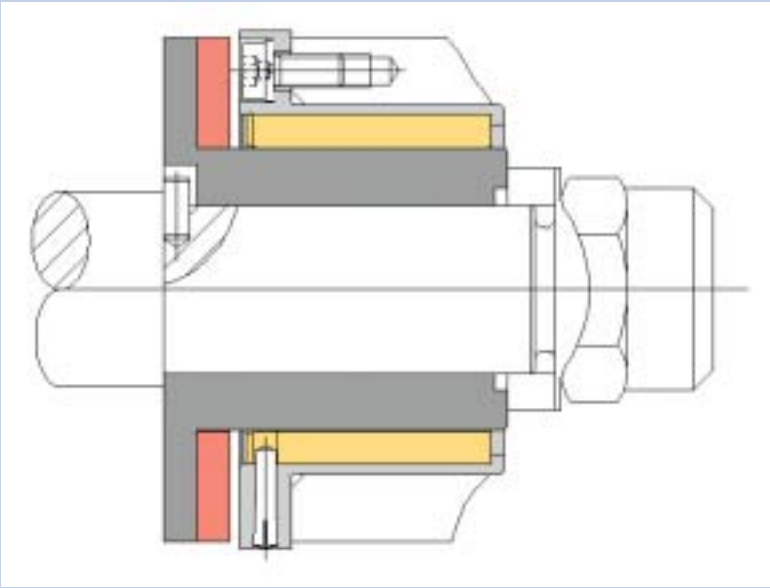
Canned motor pumps are inherently axially balanced since both ends of the shaft are exposed to nearly the same pressure.

In the OHC, the hydraulic thrust compensator takes most of the impeller generated axial thrust load; grooved thrust pads take the remainder.

The OHC rotor is supported in Silicon Carbide bearings with Teflon/Carbon residual thrust pads.

Shaft is protected by a Tungsten Carbide coated stainless steel sleeve at each bearing. This bearing material combination has been found to be much more forgiving in light hydrocarbon services than SiC vs SiC often found in magdrive pumps.

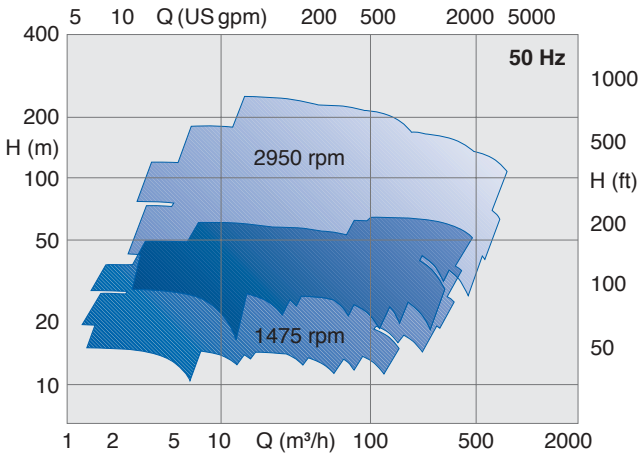
For very light hydrocarbons with very low viscosity, the OHC is turned vertically as shown on previous page.

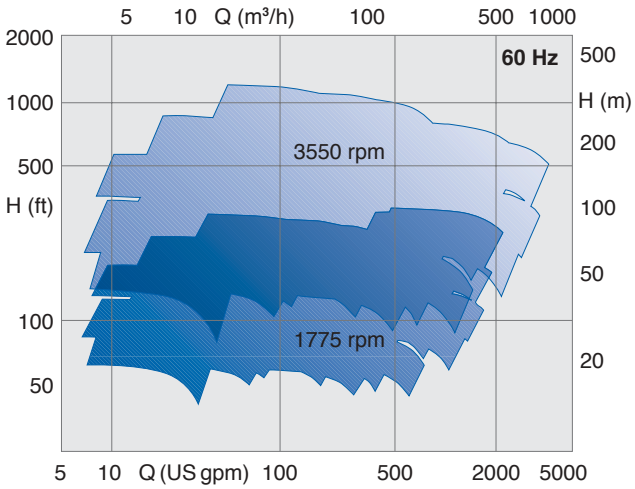


OHC Applications

- Aromatics
- Phosgene
- Carbon Dioxide Loading
- Ethane Loading
- LPG transfer or booster
- Dowtherm circulation
- Freon/134A refrigerant transfer
- Cryogenics
- Deethanizer reflux
- Demethanizer reflux
- Amine, Acids, Caustic, Sulphur

Performance Range

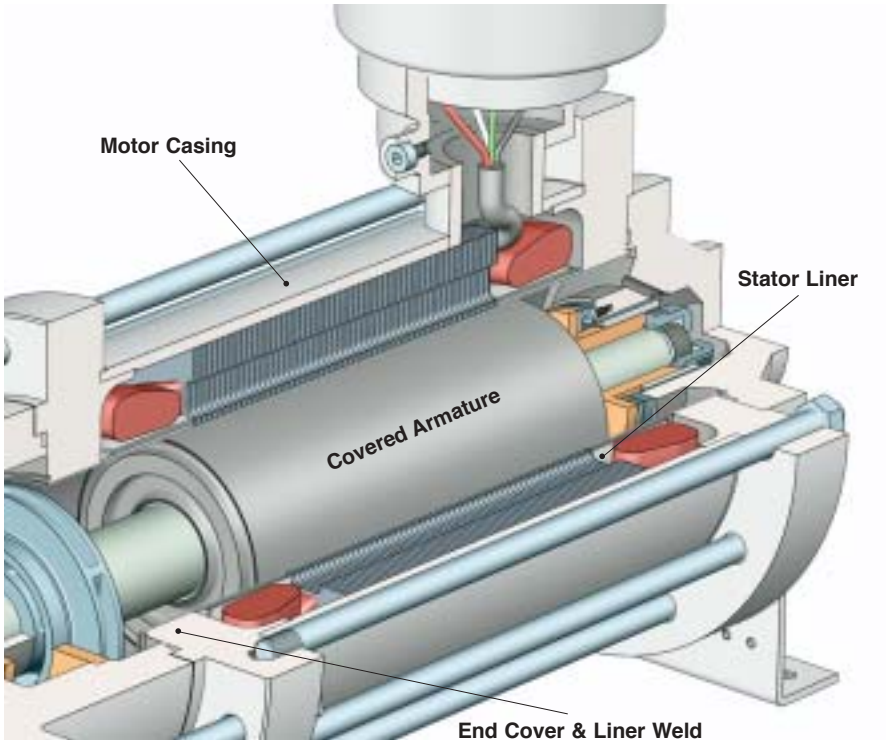




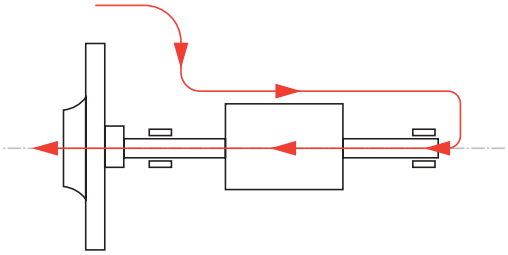
OPERATING DATA OHC		
Pump Sizes	25mm to 200mm	1 to 8 inches
Capacities	up to 700 m³/h	up to 3,100 usgpm
Heads	up to 330 m	up to 1,100 feet
Pressures	up to 52 bar	up to 740 psi
Temperatures	up to +425°C	up to +800°F

Secondary Containment

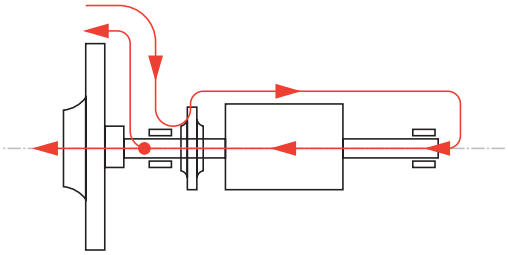
- Hastalloy stator liner is welded to SS stator endcovers to form a permanent pressure boundary.
- Armature cover is welded SS or Hastalloy depending upon application.
- Secondary containment is formed by CS motor casing, conduit box, and endcovers.
- If some foreign object causes a stator liner breach, the full pressure secondary containment will contain it.
- Motor tie bolts are not part of primary pressure boundary; they are for rigidity.
- A variety of instrumentation is available for pump protection, rotor position, and rotation direction.



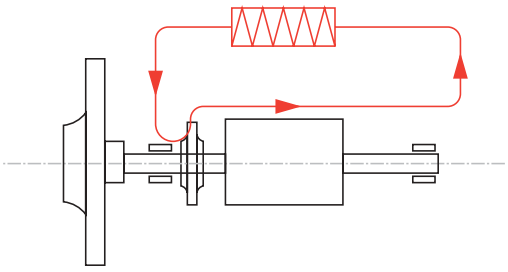
Circulation Flow Paths



- Standard flow is from impeller discharge through the motor and exiting into the impeller eye.



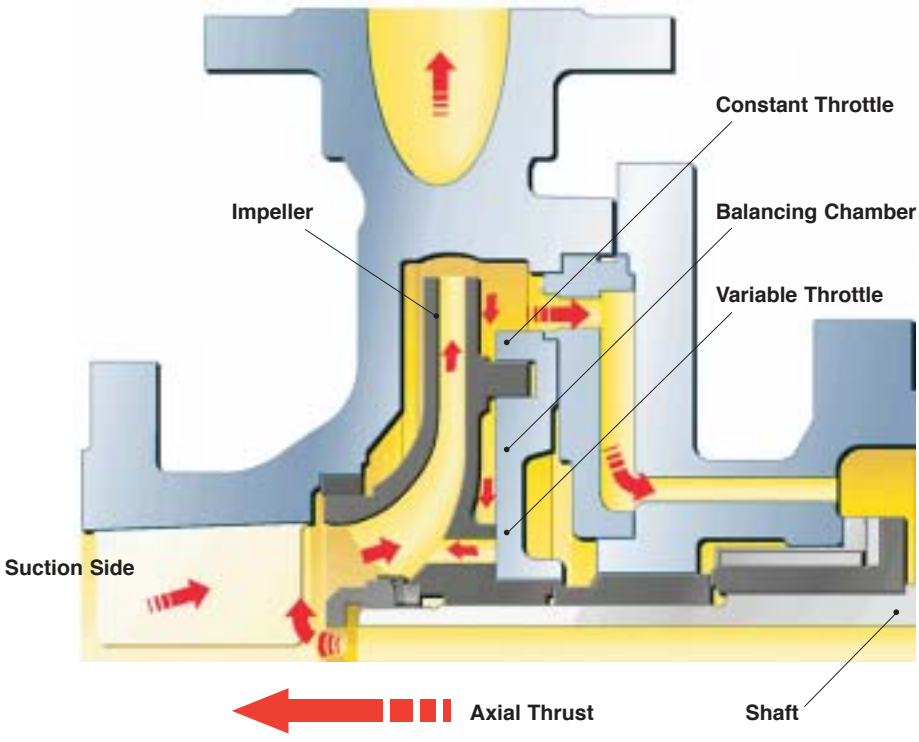
- For fluids near their vapor pressure, an auxiliary impeller is used to boost pressure within the motor cavity. Flow exits radially through the shaft behind the impeller into a pressurized zone to avoid flashing.



- Depending upon power rating and ATEX temperature class, either ceramic insulation, or auxiliary impeller and heat exchanger are used for high temperatures.

Axial Thrust Compensator

- Any increase in suction pressure forces rotor toward motor, closing “variable throttle”.
- Pressure behind impeller rises.
- That pressure forces rotor toward suction, which opens “variable throttle”.
- Compensator is therefore self-equalizing and virtually unaffected by wear.



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