

CombiChem

Centrifugal pumps according to ISO 5199 and ISO 2858 / EN 22858 (DIN 24256)



The SPX Johnson Pump Combi system is a modular programme of single stage centrifugal pumps with a high degree of interchangeability of parts between the different pump constructions.

The Combi pumps cover an extensive series of centrifugal pumps which can be supplied as horizontal, vertical and submerged pumps. A number of standards were taken into account in the designing of this pump series; EN 733 (DIN 24255), EN 22858 (ISO 2858 / DIN 24256), ISO 5199 and API 610.

Based in Charlotte, North Carolina, SPX Corporation (NYSE: SPW) is a global Fortune 500 multi-industry manufacturing leader. The company's highly-specialized, engineered products and technologies serve customers in three primary strategic growth markets: infrastructure, process solutions and diagnostic systems. Many of SPX's innovative solutions are playing a role in helping to meet rising global demand; particularly in emerging markets for electricity, processed foods & beverages and vehicle services. The company's products include thermal heat transfer equipment for power plants; power transformers for utility companies; process equipment for the food & beverage industry; and diagnostic tools and equipment for the vehicle service industry. For more information, please visit <http://www.spx.com>

CombiChem – No limits to reliability!

CombiChem is SPX Johnson Pump's solution for liquid transport in the chemical industry. It is one of the most outstanding pump types of the Combi-system. The Combi-system is a modular programme of single stage centrifugal pumps with a high degree of interchangeability of parts between the different pump constructions.

CombiChem represents a range of horizontal centrifugal pumps, designed to ISO 2858 / EN 22858 (DIN 24256), suitable for handling low viscosity, clean or slightly contaminated liquids.

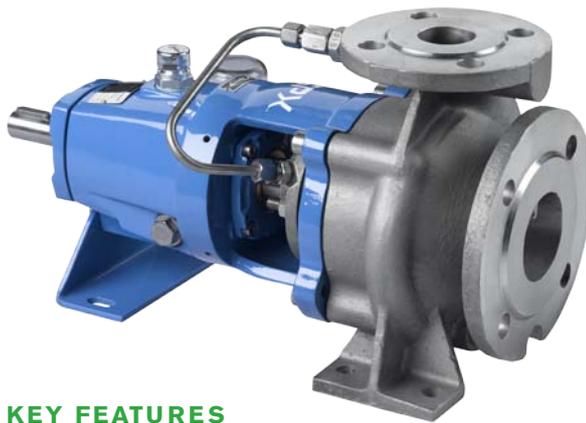
The design of CombiChem complies entirely to ISO 5199. The CombiChem offers a great variety of possible shaft sealings, bearing constructions and also a wide range of different materials, such as stainless steel, bronze, nodular cast iron or cast iron.

A leakfree version of the CombiChem is the CombiMag, a magnetic coupled centrifugal pump, especially developed for the chemical industry.



Typical product applications

From know-how to finding solutions

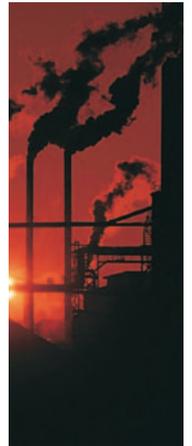


KEY FEATURES

- Suitable for a wide range of duties
- Available in several materials
- Only 4 bearing brackets for the whole range
- Mechanical seals according to EN 12756 (DIN24960)
- Single and double cartridge seals
- Back Pull Out principle
- Pump cover options for cylindrical bore and tapered bore

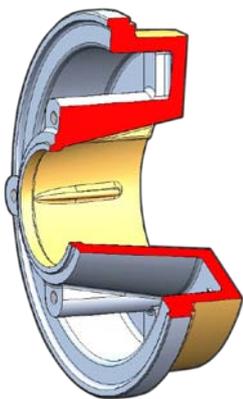
CHEMICAL INDUSTRY

The CombiChem is, as the name says, perfectly suited for operation in chemical industries. The pump has been designed entirely according to ISO 5199. The ISO 5199 standard defines important technical details of centrifugal pumps according to ISO 2858 / EN 22858 (DIN 24256), used in chemical industries.



GENERAL INDUSTRY

CombiChem's availability in several materials, the ample choice of shaft sealing options and the rigid bearing construction makes it a very reliable pump for general industrial purposes. Complying to ISO 2858, ISO 5199 and EN 22858 (DIN 24256): CombiChem offers you the best solution.



tapered bore seal chamber option

TAPERED BORE SEAL CHAMBER OPTION

The CombiChem pumps offer a tapered bore seal chamber option to improve the service life of the mechanical seal.

The conical seal chamber diverts solids and slurry away from the mechanical seal and provides for better cooling of the seal which will increase the life of the seal.

Ribs in the chamber effectively disrupt any vortex formation.

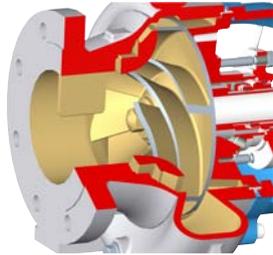
Features and *Benefits*

SUCTION CAPABILITIES

- smooth suction entry in pump casing
- smooth surface
- optimum NPSH
- anti rotation vane
- minimal flow distortion giving better suction capabilities

IMPELLER

- closed impeller with casing wear ring
- half-open impeller with wear plate



PUMP CASING

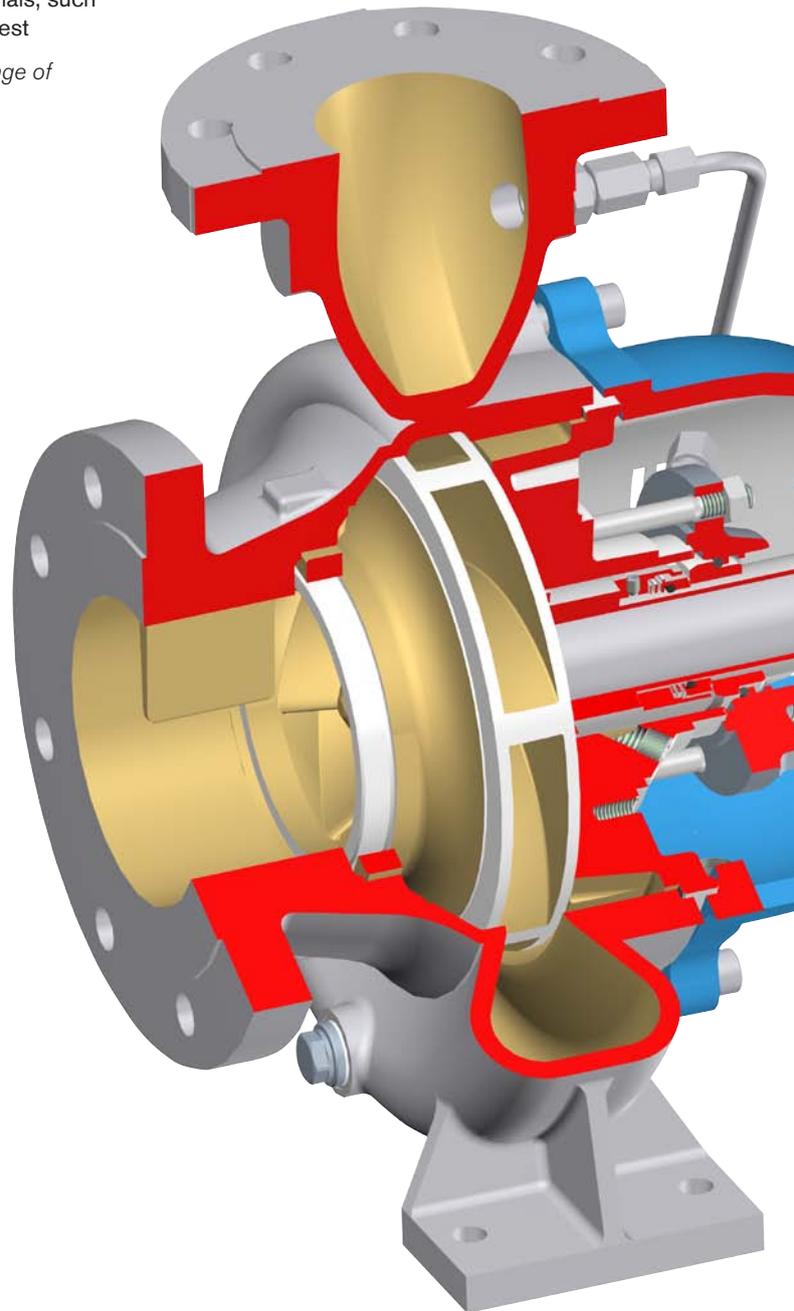
- flanges according to ISO 7005 PN 16 or ISO 7005 PN 20 (ANSI B16.5 150 lbs)
- max. working pressure 16 bar
- wide range of applications
- large drain opening
- complete and fast draining of the casing

IMPELLER LOCKING

- stainless steel impeller cap nut with flat gasket
- reliable locking

IMPELLER BACK VANES

- flat cover for hydraulic balancing
- back vanes for hydraulic balancing
- extended bearing life
- keeps solids away from shaft sealing area
- circulation flow over mechanical seal



FOOT

- machined foot
- exact positioning on baseplate and in pipework

SHAFT SEALING

- 7 possible mechanical EN-seal, plus cartridge seal options
- sealing rings and elastomers in several possible combinations
- sealing cover with quench and flush connections
- 3 possible gland packing options e.g. with cooling cover
- suitable for many applications
- suitable for many liquids
- also suitable for high temperatures
- Tapered bore seal chamber with or without flush plan

SHAFT

- stainless steel or steel alloy
- shaft deflection local to the shaft seal stays within 0,05 mm
- *prolonged seal life*
- *rigid, reliable shaft*
- shaft sleeve (extended impeller key ensures co-rotation of the shaft)
- *'dry' shaft: no contact between shaft and pumped liquid*

OIL LUBRICATION

- breather / filling plug on top
- oil bath
- oil sight glass
- constant level oiler
- large drain plug

BEARINGS

- bearing life is at least 17,500 hours for the entire Q-H curve up to $1.25 Q_{BEP}$
- *extended MTBF*
- oil bath lubricated or grease lubrication
- bearing lock-up by means of shaft nut with lock washer
- *very reliable bearing lock-up*
- rigid cast iron bearing bracket construction
- *minimum bearing movement*
- machined fits
- *exact alignment*
- adjustable bearings
- *clearances for half-open impeller and wear plate can be adjusted*

PUMP COVER

- flat gasket, fully chambered
- *no gasket blow-out*
- machined fits
- *perfect alignment of all components*
- integrated stuffing box/mechanical seal chamber with cylindrical bore
- *fewer parts*
- integrated pump cover with tapered bore seal chamber with flow-guiding ribs
- *optimize seal life through improved heat dissipation*

FORCES AND MOMENTS

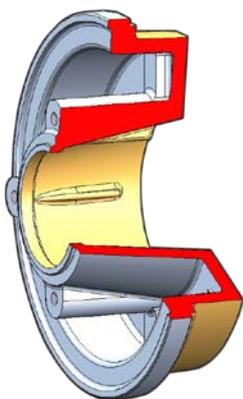
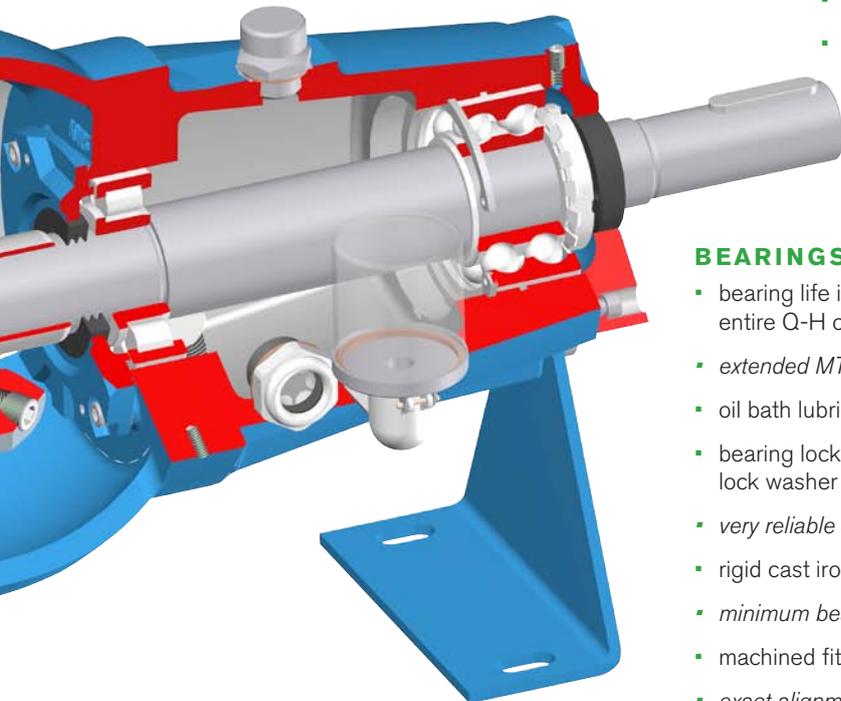
- the permissible forces and moments comply with the curves represented in ISO 5199

PUMP PERFORMANCE

- optimised volute design
- *high efficiency*
- smooth surfaces
- *minimal internal losses*
- closed impeller, half-open impeller with wear plate
- *wide variety of applications*

EASY AND LOW COST MAINTENANCE

- Back Pull Out principle
- *reduced maintenance downtimes, quick and easy impeller replacement*
- all gland packing options with shaft sleeve
- *no shaft damage from packing*
- mechanical seals according to EN 12756 (DIN 24960)
- *reduced maintenance costs*
- changeable wear ring
- *reduced maintenance costs*



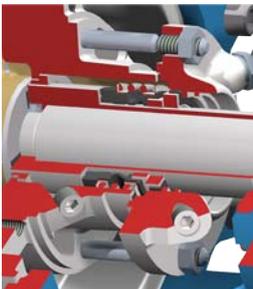
tapered bore seal chamber option

Shaft sealings

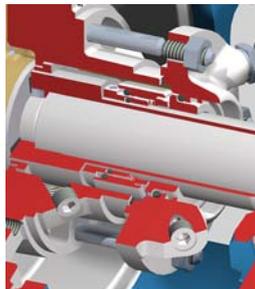
CombiChem has a great variety of possible shaft sealing options: mechanical seals as well as stuffing box packing. All configurations are equipped with shaft sleeve, so the pump shaft never comes into contact with the pumped liquid. The following shaft sealing configurations are available:



MECHANICAL SEAL OPTIONS:



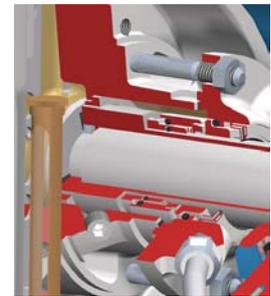
M2 MG12 / M7N
single mechanical seal
unbalanced



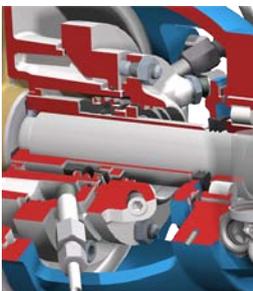
M3 HJ92N / HJ977GN
single mechanical seal
balanced



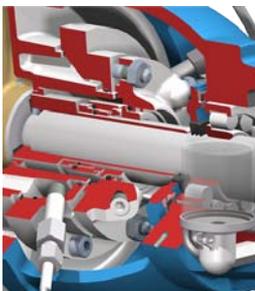
MQ2 MG12 / M7N
single mechanical seal,
dry-running protection
or pressure-less quench,
unbalanced



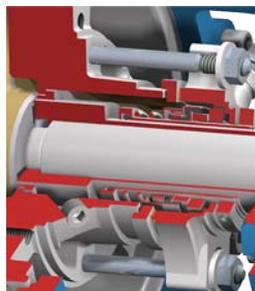
MQ3 HJ92N / HJ977GN
single mechanical seal, dry-
running protection or pressure-
less quench, balanced



MW2 MG12 / M7N
single mechanical seal,
cooling/heating jacket,
unbalanced

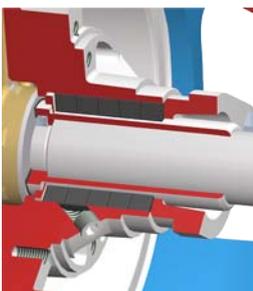


MW3 HJ92N / HJ977GN
single mechanical seal, cooling/
heating jacket, balanced

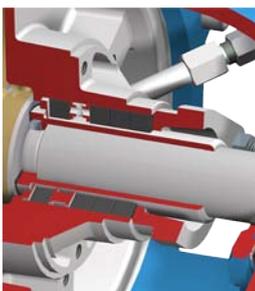


CARTRIDGE SEALS
single, single with quench
and double cartridge seals

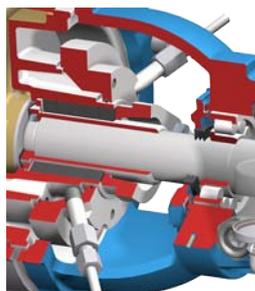
GLAND PACKING OPTIONS:



S2
stuffing box with shaft
sleeve



S3
stuffing box with shaft
sleeve and lantern ring

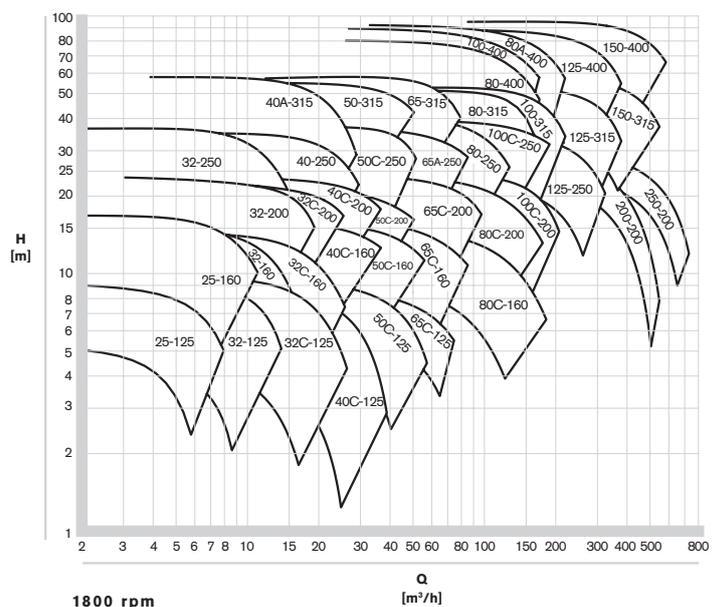
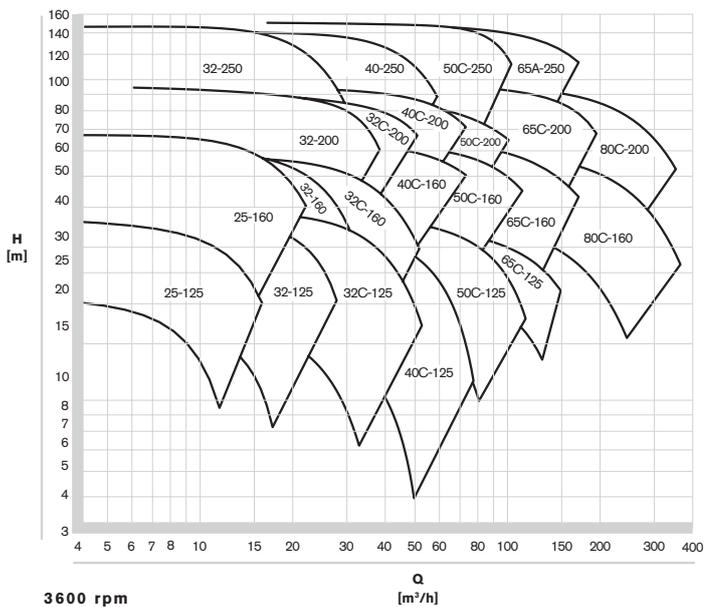
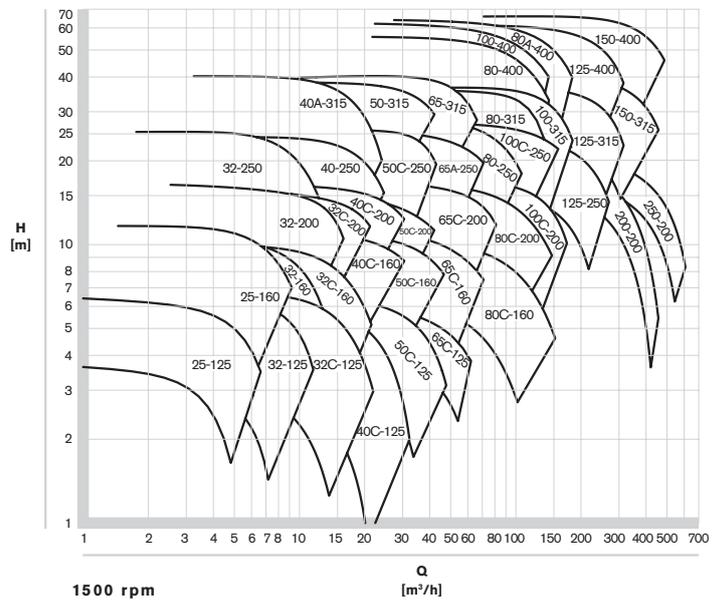
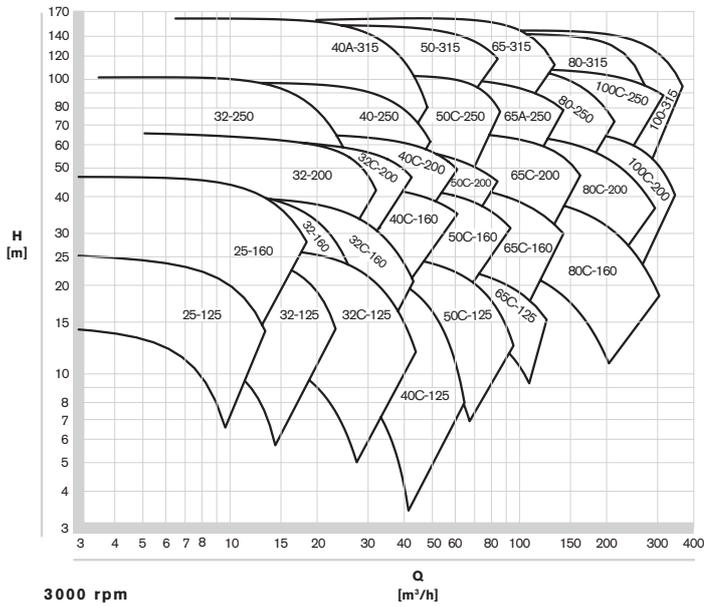


S4
stuffing box with shaft
sleeve, and cooling cover

Technical data

Max. capacity	800 m ³ /h
Max. head	160 m
Max. working pressure	1600 kPa (16 bar)
Max. temperature	-50 °C up to +200 °C
Max. speed	3600 rpm

Hydraulic performance data



Subject to alterations



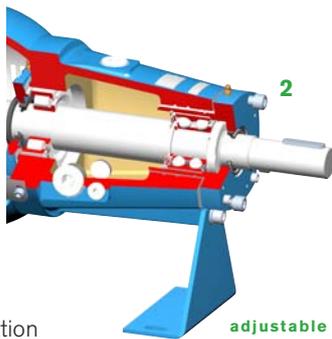
Bearing

The CombiChem has two bearing arrangements:

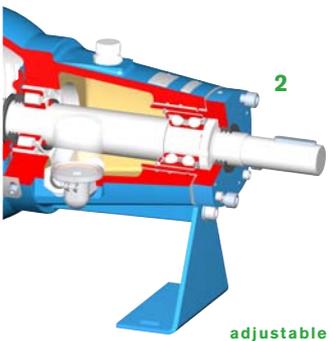
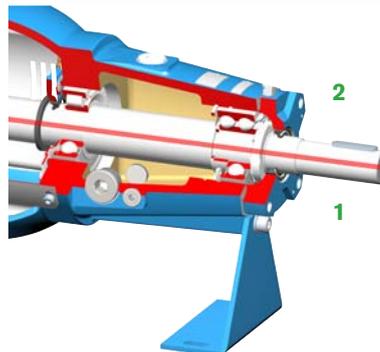
1. two deep-groove ball bearings (grease lubricated "sealed for life")
2. a double-row (two single – bearing group 4) angular contact ball bearing in combination with a roller bearing

Both versions can be provided grease lubricated as well as oil lubricated.

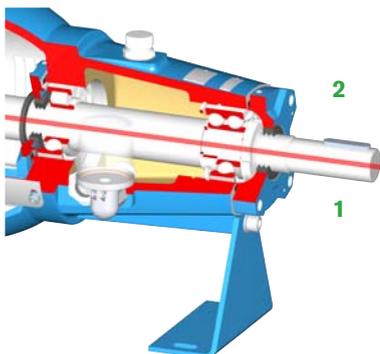
Adjustable bearings for half-open impeller.



Grease lubrication



Oil lubrication



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