



JOHNSON PUMP

An SPX Process Equipment Operation

SPX Process Equipment

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



CombiChem – No limits to reliability!

CombiChem is Johnson Pump's solution for liquid transport in the chemical industry. It is one of the most outstanding pump types of the Johnson Pump 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 construction 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.

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



CombiChem



CombiMag



Features

- Suitable for a wide range of duties
- Available in several materials
- Only 3 bearing brackets for the whole range
- Mechanical seals according to EN 12756 (DIN 24960)
- Mag-driven CombiMag is 100% leakproof
- Back Pull Out principle

From know-how to finding solutions

■ 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, used in chemical industries. The 100% leakproof version of CombiChem, the magdriven CombiMag, is the ultimate solution when it comes to transporting harmful or environmentally dangerous liquids.



■ 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.



Features and *benefits*

CombiChem

Material options

- available in cast iron, nodular cast iron, bronze and stainless steel
- *suitable for a wide range of applications*

Suction capabilities

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

Pump casing

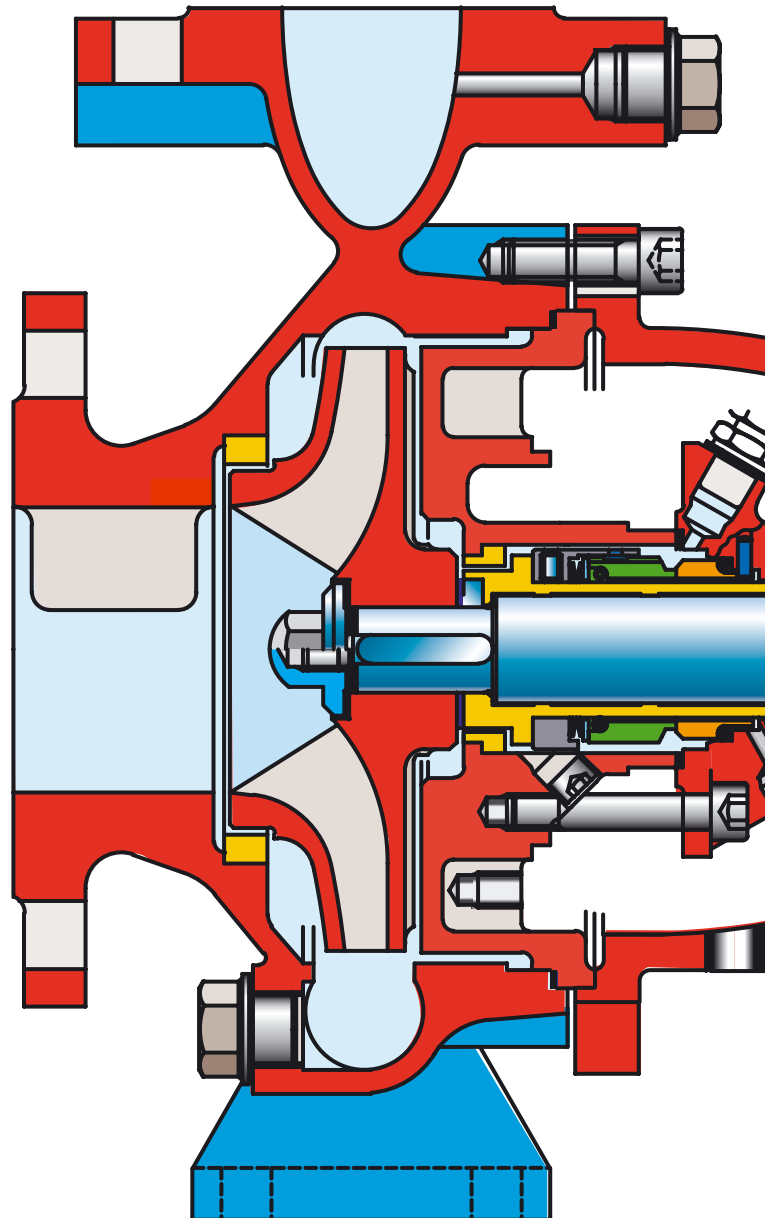
- flanges according to ISO 7005 PN 16 or ANSI B16.5 150lbs
- max. working pressure 16 bar
- large drain opening
- *wide range of applications*
- *complete and fast draining of the casing*

Impeller locking

- impeller cap nut with flat gasket
- *reliable locking*

Hydraulic balancing

- flat cover for hydraulic balancing
- back vanes for hydraulic balancing
- *extended bearing life*



Foot

- machined foot
- *exact positioning on base and in pipework*

Shaft

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

Shaft sealing

- 9 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*

Forces and moments

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

Pump performance

- optimised volute design
- closed impeller
- half open impeller
- smooth surfaces
- *high efficiency*
- *minimal internal losses*

Easy and low cost maintenance

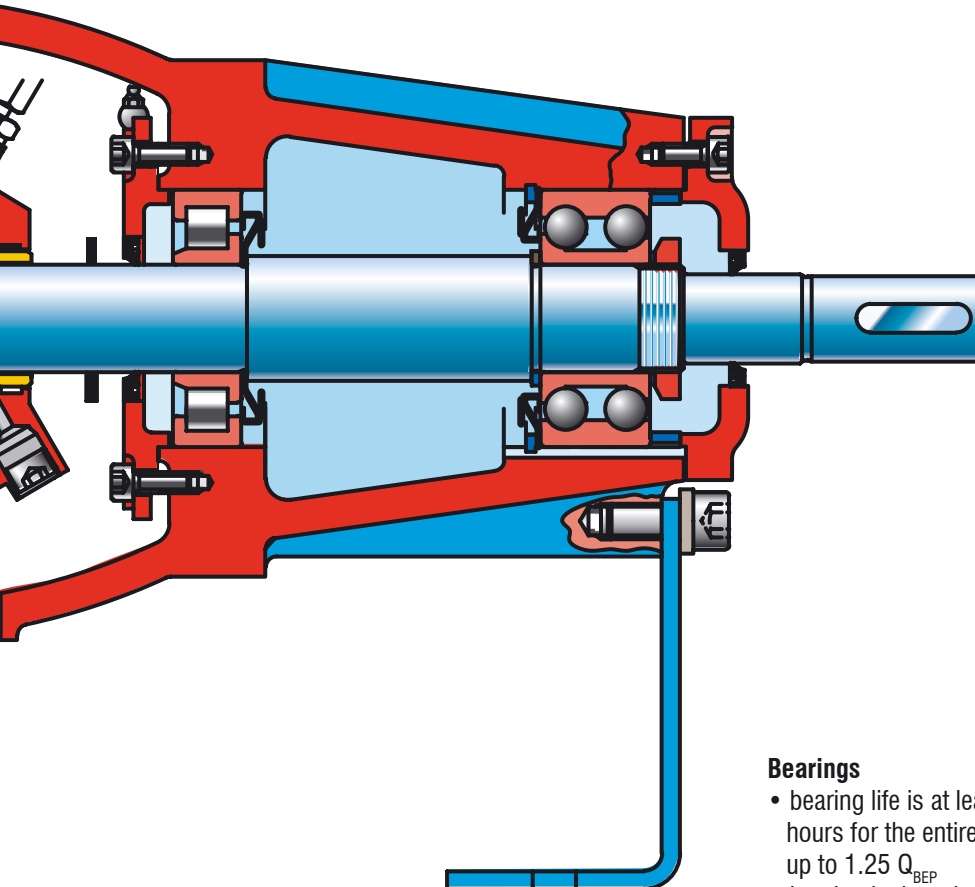
- Back Pull Out principle
- quick and easy impeller replacement
- all gland packing options with shaft sleeve
- mechanical seals according to EN 12756 (DIN 24960)
- changeable wear ring
- *easy to disassemble pump cover*
- *shorter down time*
- *economic maintenance*
- *extended pump life*

Bearings

- bearing life is at least 17,500 hours for the entire Q-H curve up to $1.25 Q_{BEP}$
- bearing lock-up by means of shaft nut with lock washer
- rigid cast iron bearing bracket construction
- adjustable bearings
- machined fits
- *extended MTBF*
- *very reliable bearing lock-up*
- *exact alignment*

Pump cover

- flat gasket, fully chambered
- machined fits
- integrated stuffing box/mechanical seal chamber
- *no gasket blow-out*
- *perfect alignment of all components*



Features and *benefits*

CombiMag

Hydraulic balancing

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- back vanes for hydraulic balancing
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Suction capabilities

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- smooth surface
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Pump casing

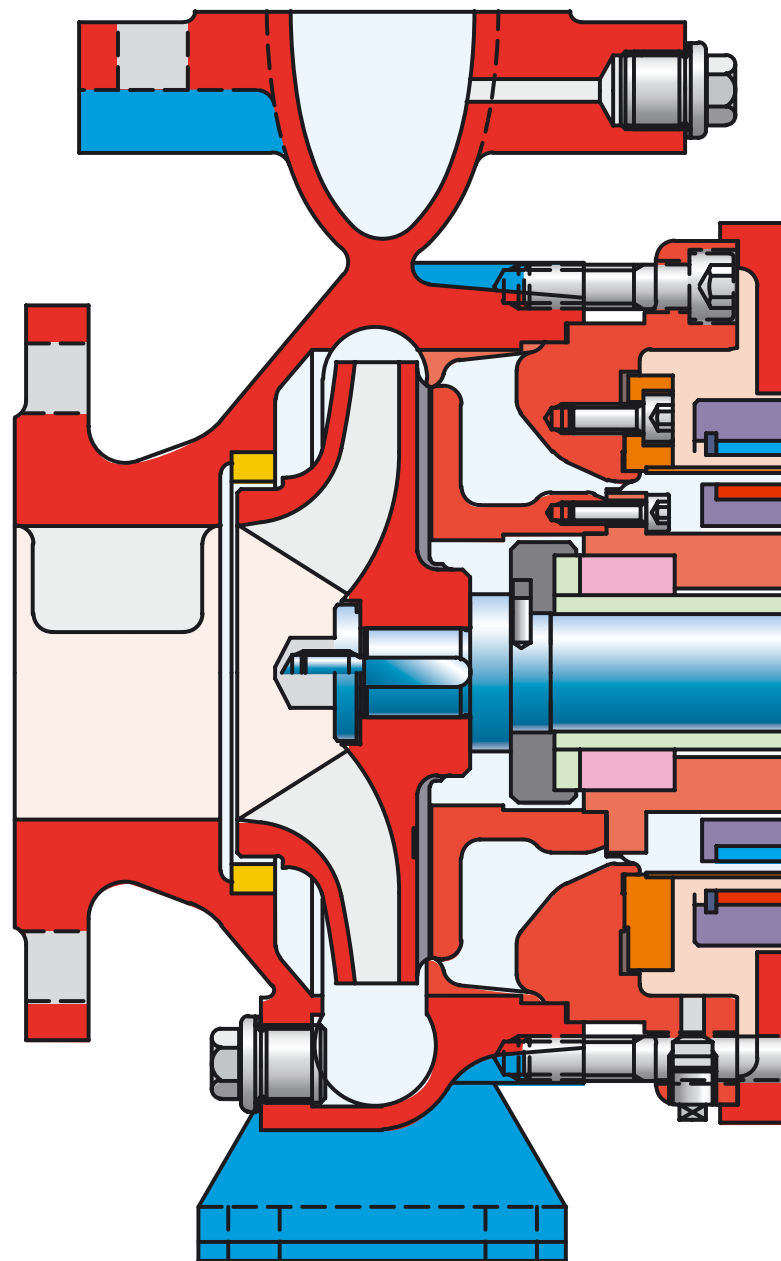
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- max. working pressure 16 bar
- large drain opening
- *wide range of applications*
- *complete and fast draining of the casing*

Impeller locking

- impeller cap nut with flat gasket
- *reliable locking*

Material options

- available in nodular cast iron and stainless steel
- *suitable for a wide range of applications*



Foot

- machined foot
- *exact positioning on base and in pipework*

Magnetic drive

- strong SamariumCobalt magnets
- inner magnetic rotor is hermetically encapsulated
- *very strong magnetic flux*
- *duty temperatures up to 200°C allowed*
- *material is permanently magnetic at the entire temperature range*
- *shock proof material*
- *no contact between the pumped liquid and the inner rotor material*

Slide bearings

- axial thrust and journal bearings
- silicon-free SiliconCarbide
- sleeve bearing locked up by means of shaft nut with lock washer
- *axial as well as radial loads are absorbed by these bearings*
- *material is inert for all possible liquids*
- *suitable for all liquids from pH0 to pH14*
- *trouble-free operation at all temperatures*

Roller bearings

- 2 deep-groove roller bearings
- grease or oil lubricated
- locked by means of locking ring and shaft nut
- *absorbs the radial loads*
- *reliable bearing at all duty temperatures*
- *very reliable bearing lock-up*

Easy and low cost maintenance

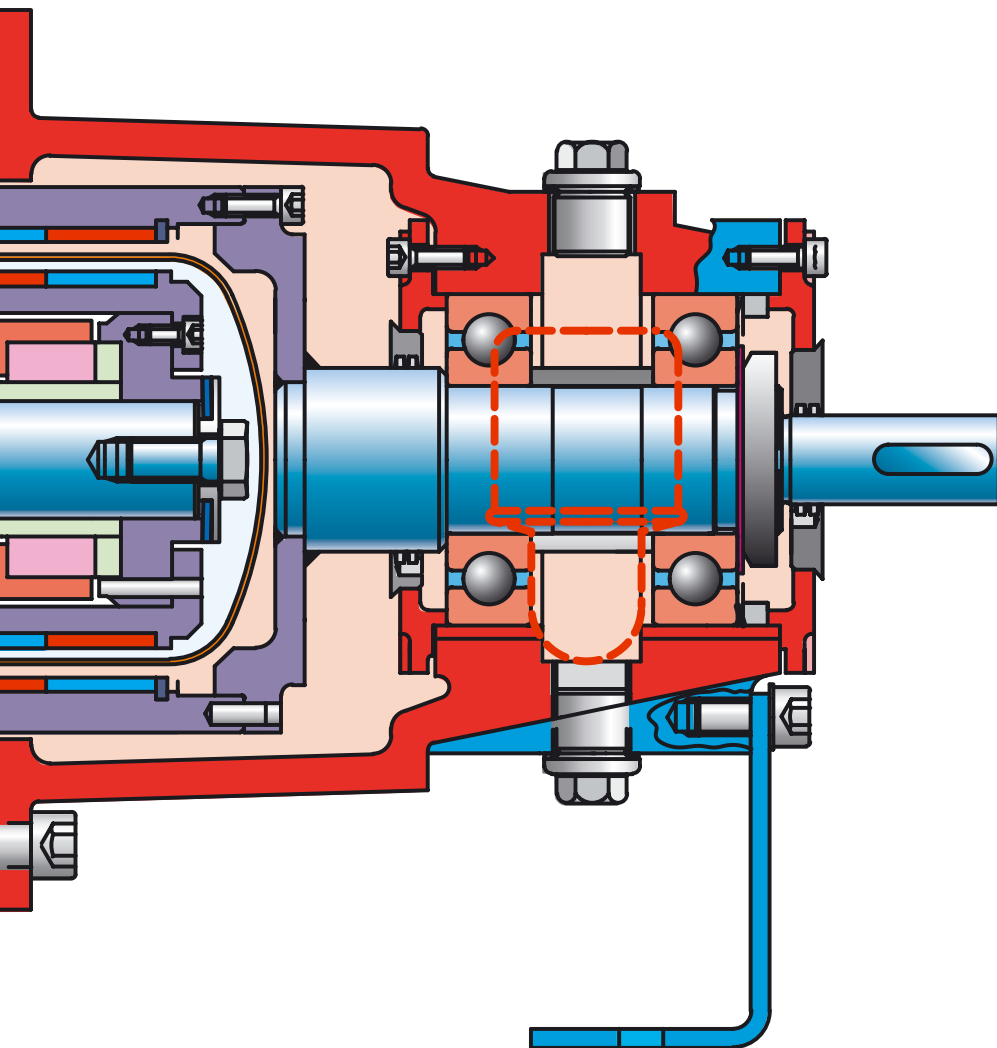
- Back Pull Out principle
- changeable wear ring
- *shorter down time*
- *economic maintenance*
- *extended pump life*

Forces and moments

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

Separation can

- Hastelloy C separation can
- flange connected to pump casing with O-ring
- *very low heat build-up*
- *leak proof sealing*



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. CombiMag's mag-drive can be considered as a 100% leakproof shaft sealing option of the CombiChem. The following shaft sealing configurations are available:

Mechanical seal options:

1. single mechanical seal unbalanced, MG12 & M7N
2. single mechanical seal balanced, HJ92N
3. single mechanical seal, dry-running protection or pressure-less quench, unbalanced, MG12 & M7N
4. single mechanical seal, dry-running protection or pressure-less quench, balanced, HJ92N
5. single mechanical seal, cooling/heating jacket, unbalanced, MG12 & M7N
6. single mechanical seal, cooling/heating jacket, balanced, HJ92N
7. single and double cartridge seals

Gland packing options:

8. stuffing box with shaft sleeve
9. stuffing box with shaft sleeve and lantern ring
10. stuffing box with shaft sleeve, and cooling cover

Magnetic coupling

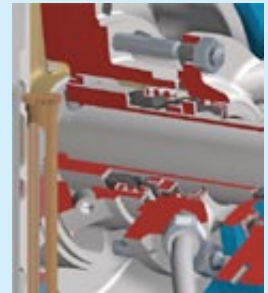
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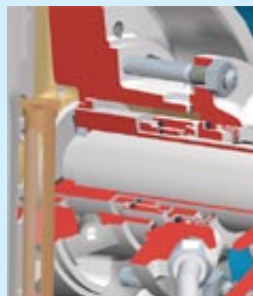
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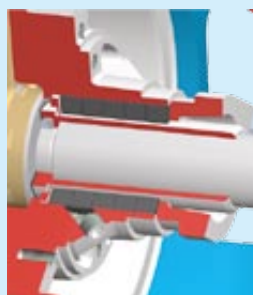
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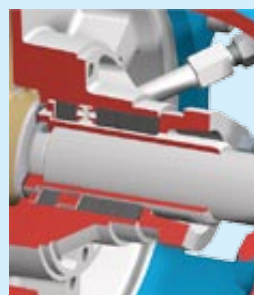
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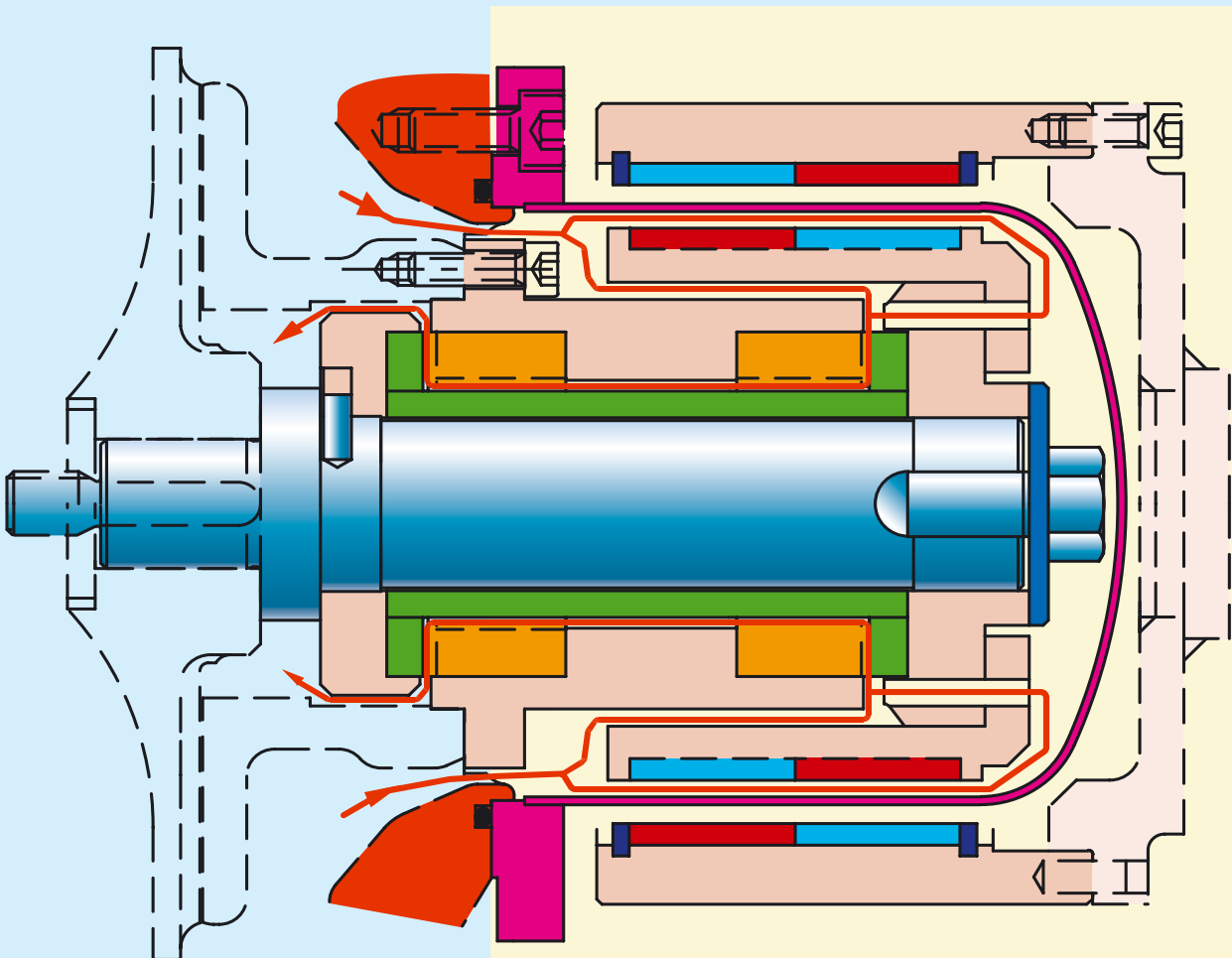
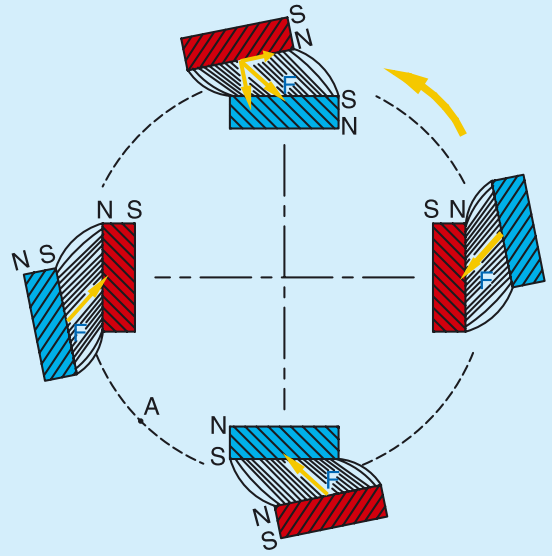
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Magnetic coupling

CombiMag is provided with a Hastelloy C or stainless steel separation can, which separates the pumped liquid entirely from the environment. The pump is 100% leakproof. The power from the driven pump shaft is transmitted to the impeller shaft by means of strong SamariumCobalt magnets. The pump shaft is provided with an outer rotor. This rotor is internally covered with magnets. The impeller shaft is connected to an inner rotor that is externally covered with magnets. When the driven shaft rotates the opposite magnet poles on inner and outer rotor attract each other. This causes the inner rotor to move, without slip.



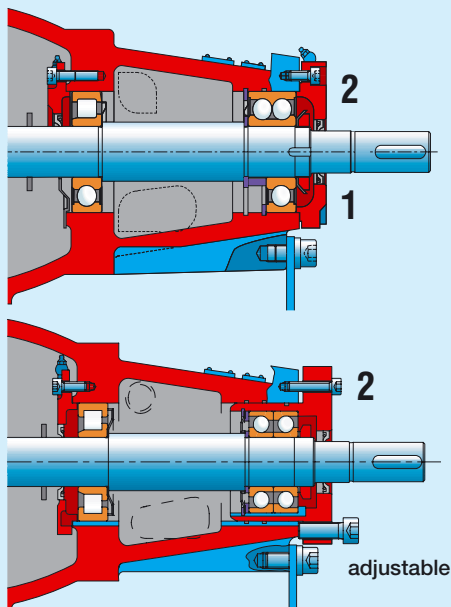
Bearing

CombiChem

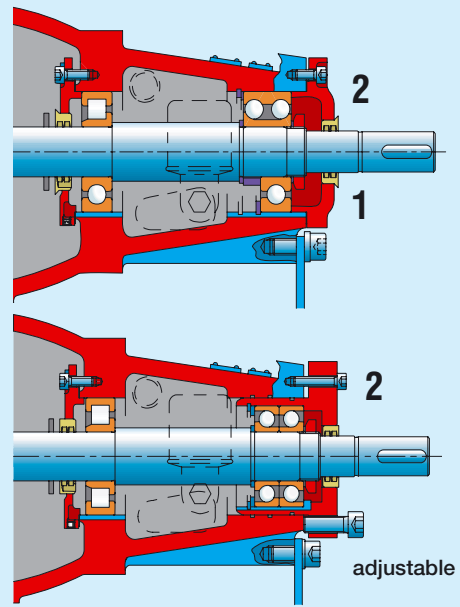
CombiChem has two bearing arrangements:

1. two deep-groove ball bearings
2. a double-row angular contact ball bearing in combination with a roller bearing

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



Grease lubrication

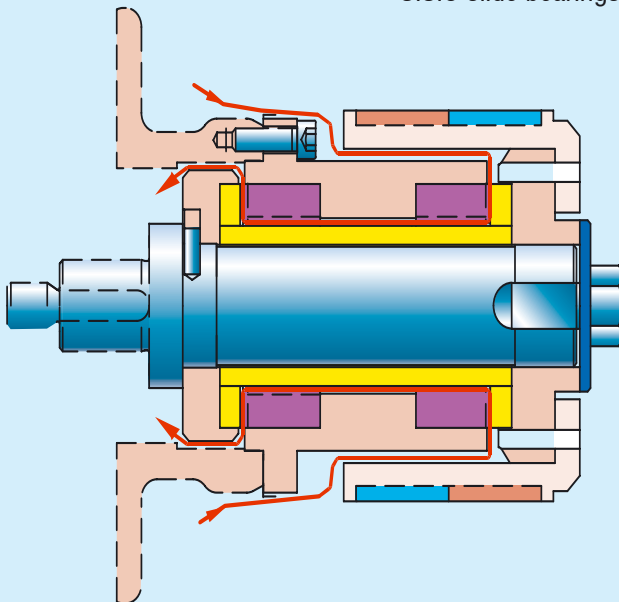


Oil lubrication

CombiMag

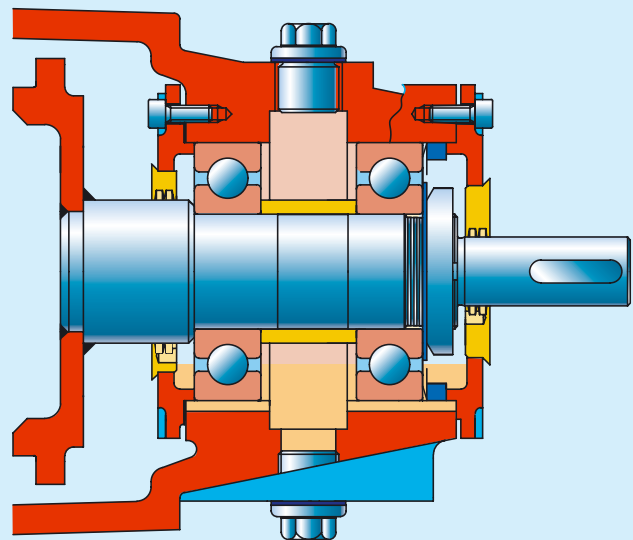
CombiMag has two types of bearings:

- two deep groove ball bearings for the 'dry' part
- SiSiC slide bearings for the 'wet' part



Slide bearings

The SiSiC slide bearings absorb thrust as well as the radial forces. They have a very good wear resistance and are lubricated by the pumped liquid. Special grooves are provided to ensure cooling.



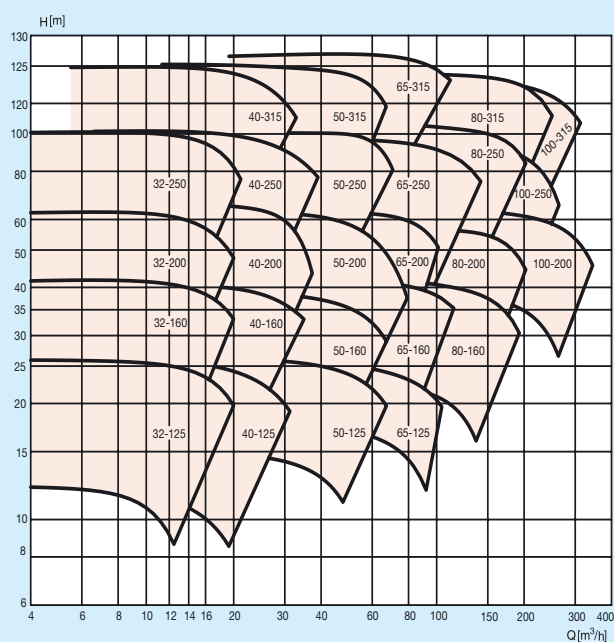
Ball bearings

The deep groove ball bearings can be provided grease lubricated as well as oil lubricated.

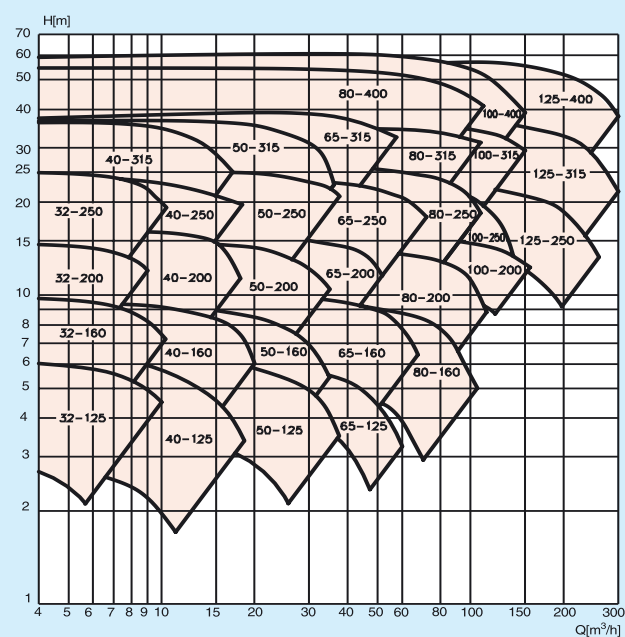
Technical data

Max. capacity	800 m ³ /h
Max. head	160 m
Max. working pressure	16 bar
Max. temperature	200 °C
Max. speed	3600 rpm

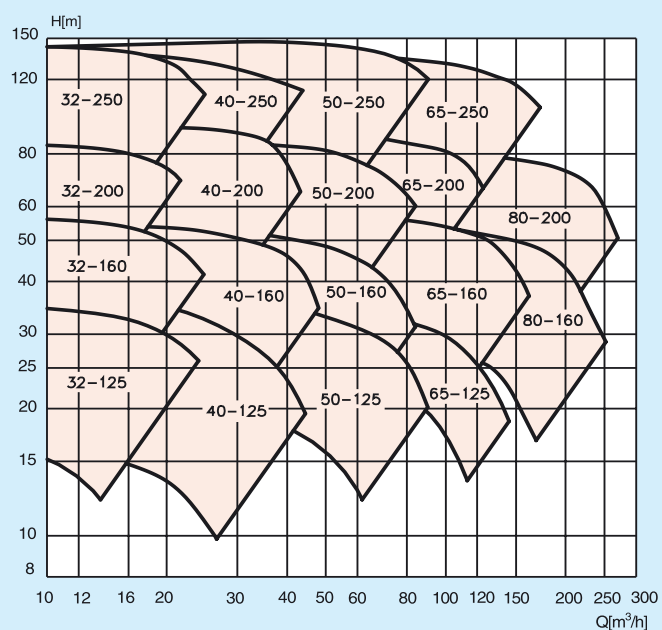
Hydraulic performance data



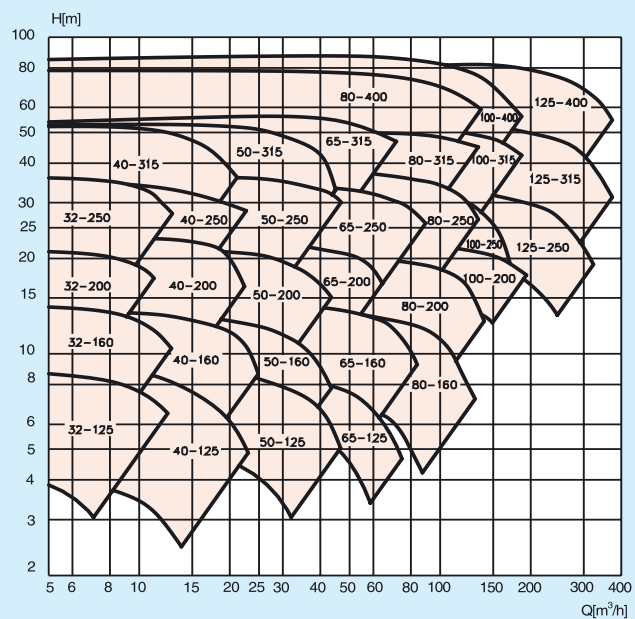
3000 rpm



1500 rpm



3600 rpm



1800 rpm



For more information about our worldwide locations, approvals and certifications, and local representatives, please visit www.johnson-pump.com and www.spxpe.com

Your local contact

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