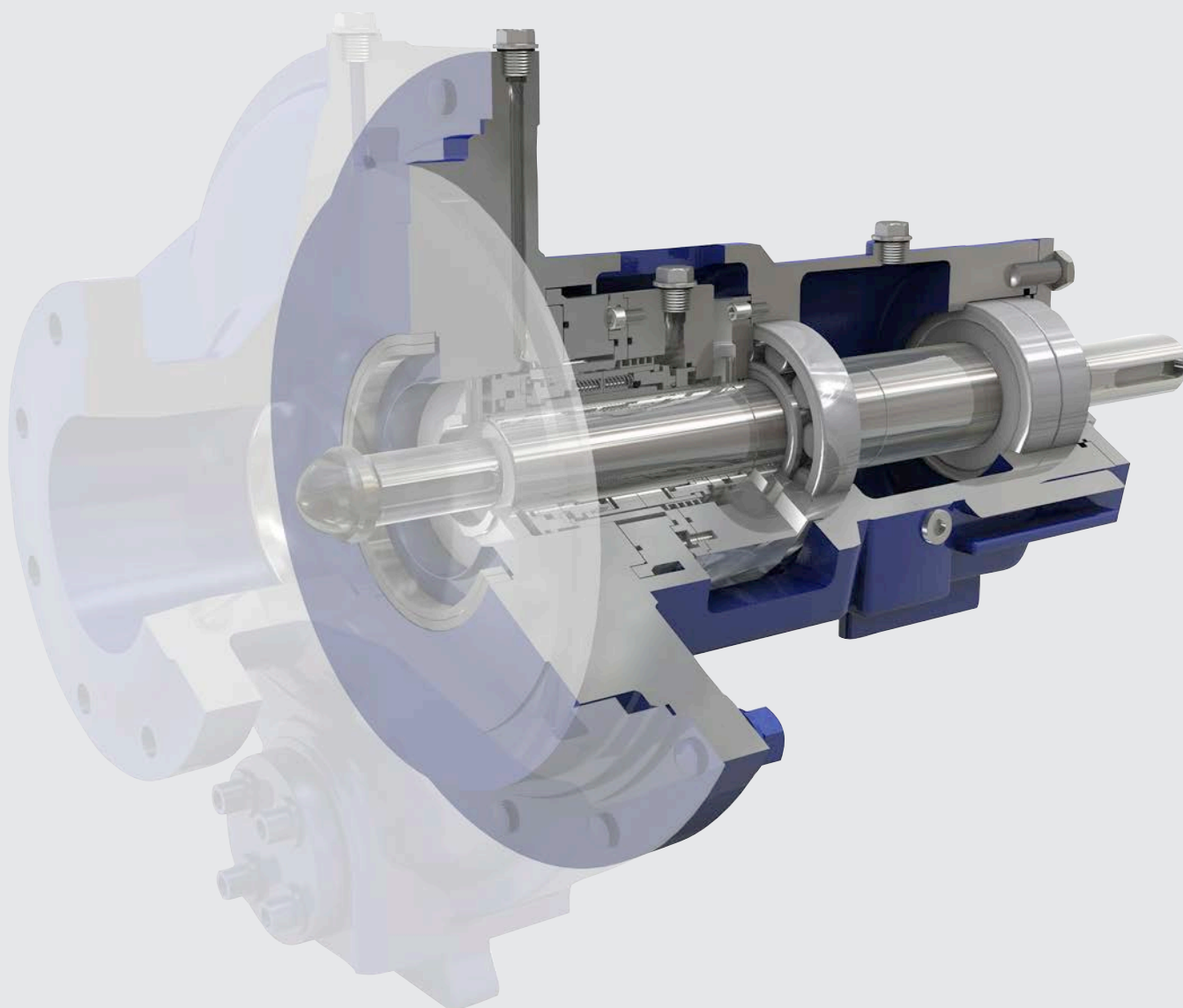


Upgrades for OH2 process pumps – with the **RPC Retrofit Kit from KSB**



We ensure your OH2 process pumps are kept up to date with the latest technology

Our service specialists provide standardised upgrades for single-stage horizontal process pumps – regardless of brand.

The RPC Retrofit Kit from KSB is the ideal solution for upgrading your horizontal process pumps: While pump casing, impeller and drive remain unaffected, all other pump components are replaced by new ones. The kit comprises a standardised, tried and tested bearing bracket as well as casing cover, shaft and impeller fastening elements. The design of these parts will be custom-made to match your pump. As needed the upgrade package also includes casing and impeller refurbishing.

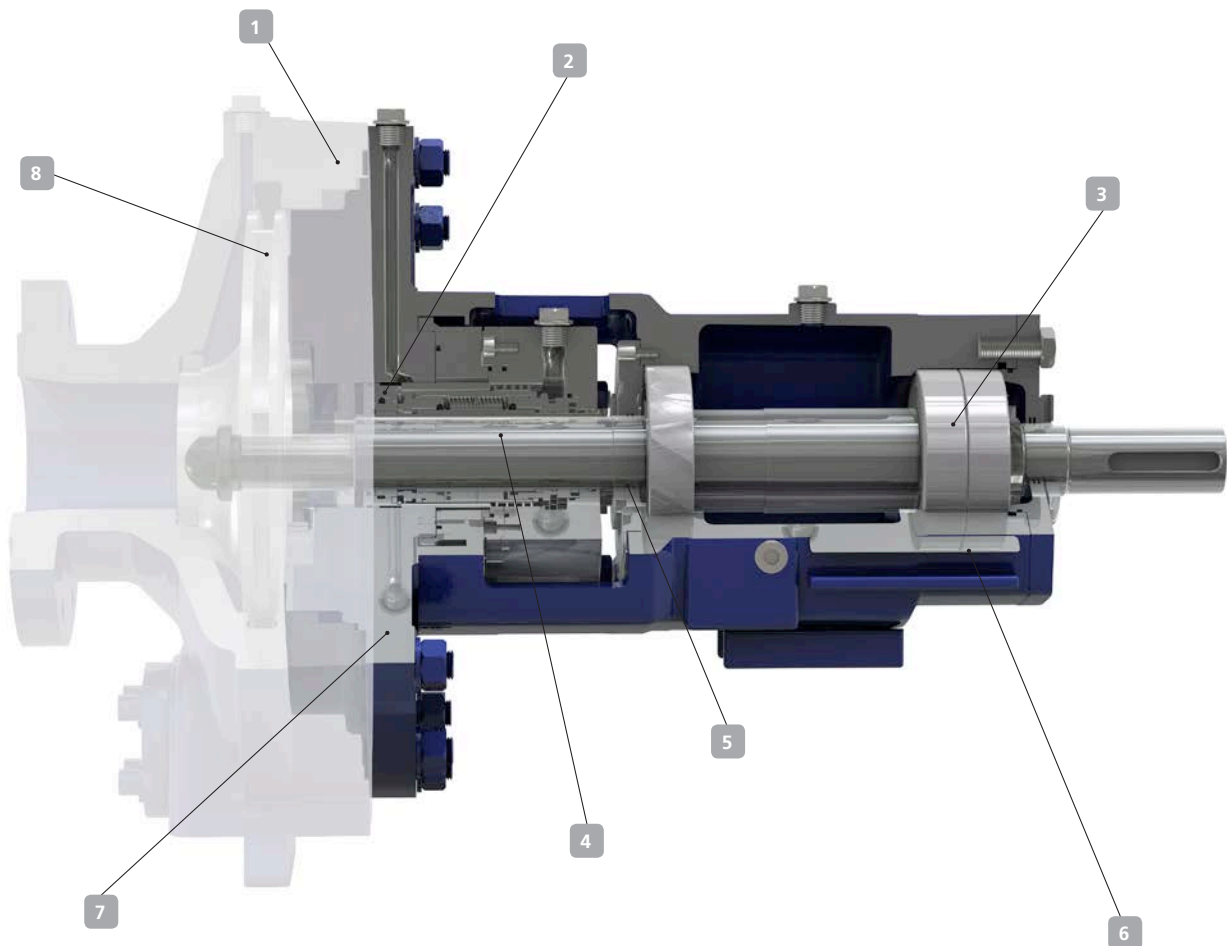
Four kit sizes allow your single-stage horizontal OH2 pumps to API 610 (or ISO 13709) to be retrofitted – regardless of brand. Modifications to the piping system are not required, though it is

sometimes necessary to shift the motor when retrofitting older pumps with short overall length.

The standardised seal chamber allows the installation of any single and double API 682 cartridge seal. We also employ the largest possible shaft diameter and fit heavy-duty bearings compliant with API 610 requirements to ensure smooth pump operation and an extended mechanical seal and bearing life.

KSB's RPC – an ideal solution with real benefits!

Reasons for upgrade	Our solution	Your benefit
Short mechanical seal and/or bearing life (in the case of older API pumps)	Maximum permissible shaft diameter to API 610 ensures optimal L3/D4 ratio, minimising shaft deflection and vibration	Long mechanical seal and bearing life
Non-compliance with legally required emission reduction since double mechanical seals cannot be fitted under existing installation conditions	Casing cover with standardised seal chamber to API 682, 3rd edition	Cartridge seals from all manufacturers can be installed
Mechanical problems (e.g. high vibration levels)	Heavy-duty 40° angular contact thrust bearings to comply with latest API 610 requirements	Smooth pump operation and low vibration levels
Leakages in casing gasket area	Installation of a confined, pre-loaded spiral-wound gasket with metal-to-metal contact between flanges	Minimisation of casing gasket leakages due to assembly errors
High storage costs owing to the variety of pump types and manufacturers	Use of components from the proven RPH series, irrespective of the manufacturer	Standardised stock of spare parts
Plans to eliminate the need for cooling water supply to gland packing and bearing bracket	Cast steel bearing bracket with integrated cooling fins and optional fan impeller protects the unit from overheating when ambient and fluid temperatures are high	No additional cooling water supply required



Features of the RPC Refinery Pump Cartridge

- 1 Confined, pre-loaded spiral-wound gasket with metal-to-metal contact
- 2 Seal chamber to API 610, 11th, for the installation of mechanical seals to API 682, 3rd edition
- 3 Heavy-duty 40° angular contact thrust bearings exceed API requirements
- 4 Max. shaft diameter for minimal deflection and maximum service life
- 5 Tried and tested labyrinth seals to KSB standard (INPROSEAL® optional)
- 6 Low-vibration cast steel bearing bracket with integrated cooling fins and optional fan impeller to protect the unit from overheating. Four different bearing bracket sizes cover almost all pump sizes.
- 7 Optional: cooled/heatable casing cover models; compatible with all API plans
- 8 Optional: hydraulic re-rate to match individual operating conditions

Your benefits:

- Extended service life
- No modifications to the piping system
- Cost savings since the pump casing, impeller and drive remain unaffected
- The hydraulic system can be inspected and re-rated if and where required
- Standardised stock of spare parts – irrespective of OEM

You have the choice: Inspection and upgrade at KSB or on site

In the KSB service centre

Our service specialists dismantle, clean and inspect casing and impeller. The upgrade is carried out at the KSB service centre.

Components and services at a glance:

- Inspection and dimensional check
- Rework on pump casing (flanges and fits)
- Impeller balancing
- Bearing bracket unit incl. constant-level oiler and labyrinth seals
- New casing cover (standard, S6) incl. nuts, bolts and spiral-wound gasket
- New shaft (standard, S6) incl. impeller fastening elements

- New casing wear rings (if required)
- Installation of mechanical seal (supplied by customer or KSB)
- Assembly, paintwork and preparation for shipment
- Optional: pressure test, hydraulic test

Documentation:

- Operating manual
- Sectional drawing incl. list of components
- Installation drawing
- Declaration of Conformity according to Directive 94/9/EC (ATEX) if required

In the plant

Pump casing and impeller are inspected on site. Following the receipt of the inspection report and the dimensional log, our service specialists will take care of planning and implementing the upgrade.

Components and services at a glance:

- Bearing bracket unit incl. constant-level oiler and labyrinth seals
- New casing cover (standard, S6) incl. nuts, bolts and spiral-wound gasket
- New shaft (standard, S6) incl. impeller fastening elements
- New casing wear rings (if required)

- Optional: on-site dismantling, inspection and assembly by KSB Service

Documentation:

- Operating manual
- Sectional drawing incl. list of components
- Installation drawing
- Declaration of Conformity according to Directive 94/9/EC (ATEX) if required



Options

- Overhaul of pump casing
- Material upgrade for casing, impeller, cover and shaft (material classes S6, S8, A8, C6, D1)
- Hydraulic re-rate to match individual operating conditions
- Cooled/heatable casing cover models
- Mechanical seal and barrier fluid system (e.g. plan 53A)
- Water-cooled bearing bracket for fluid temperatures $> 250^{\circ}\text{C}$
- Triple thrust bearing assembly for maximum inlet pressures
- Fan impeller incl. protective cover
- Coupling and coupling guard

Technical data

Sizes	B02	B03	B05	B06
Fluid temperature [°C]	-70 to +450	-70 to +450	-70 to +450	-70 to +450
Pump pressure [bar]	max. 51	max. 51	max. 51	max. 51
Drive power at n = 1.450 min ⁻¹ [kW]	max. 48	max. 98	max. 473	max. 1,234
Drive power at n = 1.750 min ⁻¹ [kW]	max. 58	max. 118	max. 570	max. 1,490
Drive power at n = 2.900 min ⁻¹ [kW]	max. 97	max. 196	max. 945	–
Drive power at n = 3.500 min ⁻¹ [kW]	max. 117	max. 237	max. 1,141	–

Dimensions

Sizes	B02	B03	B05	B06
Impeller diameter [mm]	180-360	180-450	280-450	520-710
Shaft diameter, seal chamber [mm]	50	60	80	100
Shaft diameter, coupling [mm]	32	42	60	95
Bearings	NU 211C3 7309 B-MUA	NU 213C3 7311 B-MUA	NU 316C3 7315 B-MUA	NU 324C3 7224 B-MUA
Overall length, discharge nozzle centre to shaft end [mm]	approx. 650	approx. 730	approx. 880	approx. 1,090

Shaft seal connections

Version	Mechanical seal with quench supply, single	Mechanical seal, double (unpressurised tandem arrangement)	Mechanical seal, double (pressurised tandem arrangement)	Mechanical seal, back-to-back	Mechanical seal, single (API 23)
KSB standard	<p>API 11/61 (62-DAMPF) (1CW-FL)</p>	<p>API 11/52/61 (2CW-CW)</p>	<p>API 02/53/61 (3CW-FB)</p>	<p>API 53/61 (3CW-BB)</p>	<p>API 23/61 (1CW-FL)</p>
API standard	<p>API 11/61 (62-DAMPF) (1CW-FL)</p>	<p>API 11/52/61 (2CW-CW)</p>	<p>API 02/53/61 (3CW-FB)</p>	<p>API 23/61 (1CW-FL)</p>	

Connection	≤ DN 50	≥ DN 80	Description
1M	NPT 1/2-14	NPT 1/2-14	Pressure gauge
3M	NPT 1/2-14	NPT 1/2-14	Pressure gauge
5B	NPT 1/2-14	NPT 1/2-14	Venting
6B	DN15 ASME B16.5	DN15 ASME B16.5	Fluid drain
7B	NPT 1/2-14	NPT 1/2-14	Cooling liquid drain
7E.1/A.1	NPT 1/2-14	NPT 1/2-14	Cooling liquid IN/OUT
7E.2/A.2	NPT 1/2-14	NPT 1/2-14	Cooling liquid IN/OUT
10B	NPT 1/2-14	NPT 1/2-14	Barrier fluid drain
10E.1/A.1	NPT 1/2-14	NPT 1/2-14 ¹⁾	Barrier fluid IN/OUT
10E.2/A.2	NPT 1/2-14	NPT 1/2-14 ¹⁾	Barrier fluid IN/OUT
11E.1	NPT 1/2-14	NPT 1/2-14	Flushing liquid IN
11E.2	NPT 1/2-14	NPT 1/2-14	Flushing liquid IN
12E.1/A.1	NPT 1/2-14	NPT 1/2-14	Circulation liquid IN/OUT
12E.2/A.2	NPT 1/2-14	NPT 1/2-14	Circulation liquid IN/OUT
13B	NPT 1/2-14	NPT 1/2-14	Oil drain
13D	NPT 1/2-14	NPT 1/2-14	Vent plug
24B	NPT 3/8-18	NPT 3/8-18	Quench liquid drain
24 E.1/A.1	NPT 3/8-18	NPT 3/8-18	Quench liquid IN/OUT
24 E.2/A.2	NPT 3/8-18	NPT 3/8-18	Quench liquid IN/OUT
27B	NPT 1/2-14	NPT 1/2-14	Buffer liquid drain
27 E.1/A.1	NPT 1/2-14	NPT 1/2-14 ¹⁾	Buffer liquid inlet/outlet
638	NPT 3/8-18	NPT 3/8-18	Constant-level oiler

¹⁾ NPT3/4-14 on bearing brackets B05 and B06

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