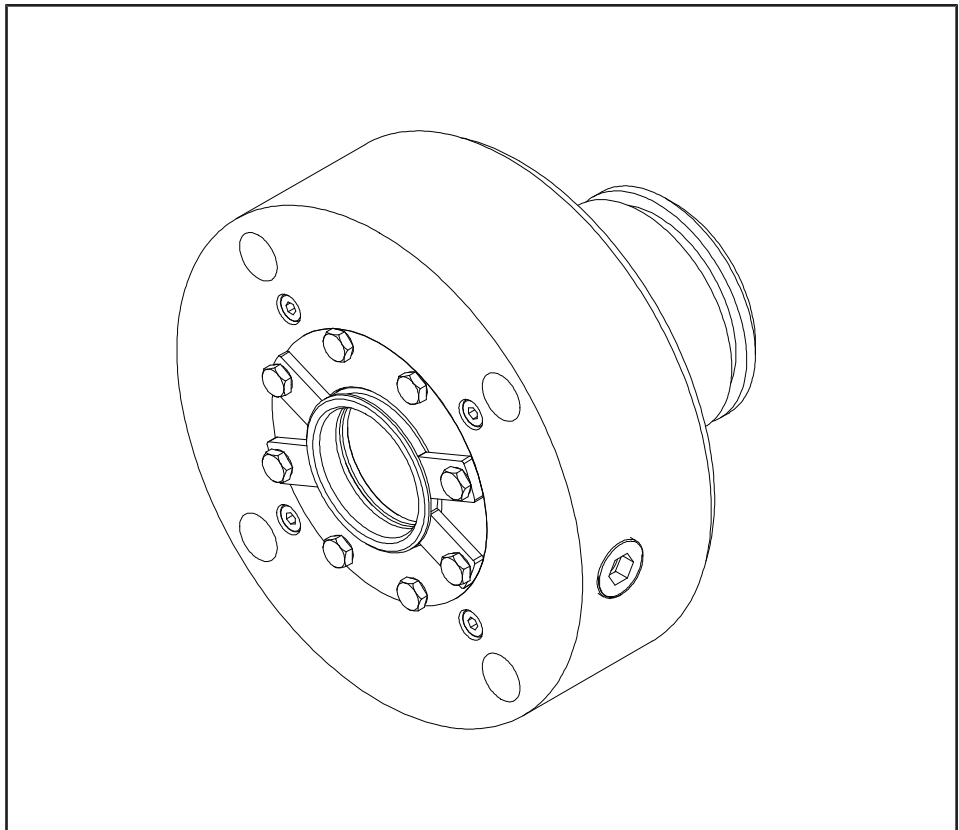


KSB Mechanical Seal

4RPS

for the RPH-RO Type Series

Supplementary Operating Manual



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Supplementary Operating Manual 4RPS

Original operating manual

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1 Supplementary Operating Manual

1.1 General

This supplementary operating manual accompanies the installation/operating manual. All information contained in the installation/operating manual must be observed.

Table 1: Relevant operating manuals

Type series	Reference number of the installation/operating manual
RPH-RO	1316.86

1.2 Operating data

Table 2: Operating properties

Characteristic		Value	
Cartridge seal		C047M1-4RPS	C073M1-4RPS
Pump		RPH-RO	RPH-RO
Bearing bracket		B03L	B05L
Material		Q1Q1VMG4	Q1Q1VMG4
Fluid handled		Seawater	Seawater
Maximum temperature	T [°C]	≤ 80	≤ 80
Maximum dynamic pressure	p [bar]	70	70
Maximum static pressure	p [bar]	100	100
Maximum speed	n [rpm]	3500	1750
Axial displacement	[mm]	± 1,5	± 1,5

1.3 Removing the mechanical seal

1.3.1 Removing a cartridge mechanical seal of the 4RPS seal series


The rules of sound engineering practice and the pump manufacturer's general provisions apply. Tidiness and cleanliness are essential for proper execution of the installation work.

- ✓ The operating manual for the pump is available.
 - ✓ The back pull-out unit of the pump has been placed in a clean and level assembly area.
1. Undo and remove hexagon head bolts 901.53. Engage assembly fixtures 96-3 in the groove of shaft sleeve 523. Lock them in this position with hexagon head bolts 901.53 on seal cover 471.
 2. Depending on the design, unscrew and remove the impeller screw or impeller nut, as applicable.
 3. Pull the impeller carefully off the pump shaft.
 4. Evenly loosen nuts 920.02 and take them off studs 902.02.
 5. Unbolt the casing cover from the bearing bracket. Carefully lift it off.
 6. Carefully and evenly pull the cartridge mechanical seal off the shaft.

Further dismantling of the mechanical seal is carried out at KSB.

1.4 Installing the mechanical seal

1.4.1 Installing a cartridge mechanical seal of the 4RPS seal series

	<p style="text-align: center;">CAUTION</p> <p>Use of grease or other permanent lubricants Torque transmission impeded/overheating of and damage to the pump!</p> <ul style="list-style-type: none"> ▷ Do not use grease or other permanent lubricants. Use soft soap to reduce friction. ▷ Do not coat seal faces with grease or oil.
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- ✓ The operating manual for the pump is available.
- ✓ Install the mechanical seal as shown in the installation drawing.
- ✓ The back pull-out unit of the pump has been placed in a clean and level assembly area.
- ✓ The original 4RPS cartridge mechanical seal is fully assembled and undamaged.
 1. O-rings 412.54 and 412.56 are fitted in the mechanical seal. A lubricant compatible with the elastomer material has been applied to the O-rings.
 2. O-ring 412.55 fully abuts seal cover 471.
 3. Slide the cartridge mechanical seal carefully onto the pump shaft.
 4. Carefully mount the casing cover on the bearing bracket. To do so, align and insert studs 902.02 through the holes in the seal cover.
 5. Carefully mount the impeller. Depending on the design, fasten with the impeller screw or impeller nut, as applicable.
 6. Screw nuts 920.02 evenly onto studs 902.02, tightening the screwed connections crosswise in several increments to fasten the seal at the pump cover.
 7. Remove hexagon head bolts 901.53. Swivel assembly fixtures 96-3 to disengage them. To store the assembly fixtures, fasten them in the disengaged position using the hexagon head bolts.

1.5 General assembly drawings with list of components

1.5.1 4RPS cartridge mechanical seal

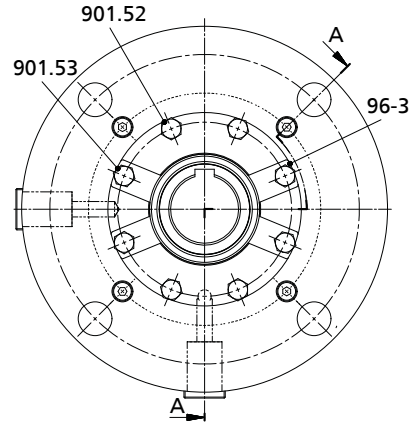


Fig. 1: Axis for the cross-section

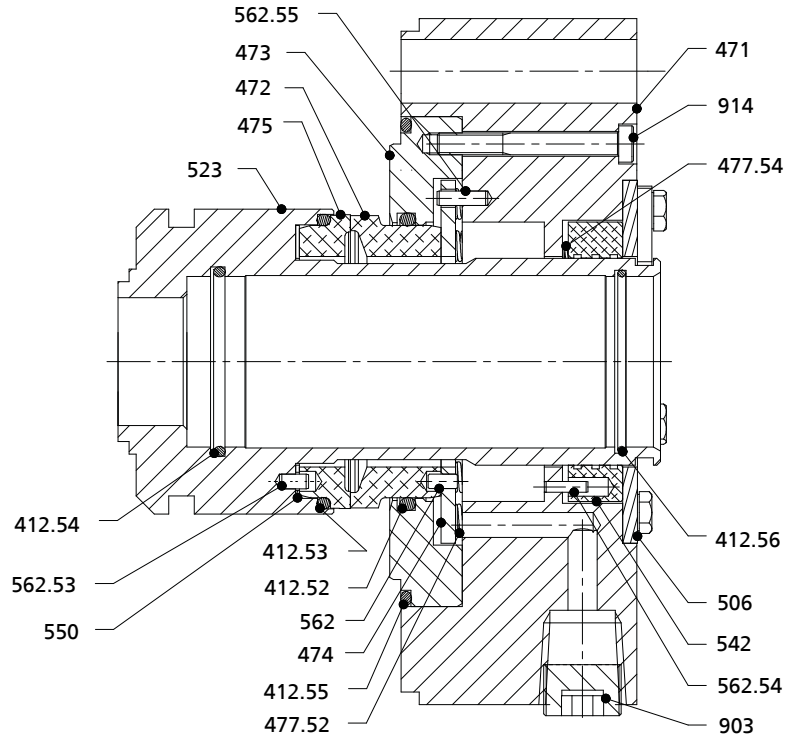


Fig. 2: Cross-section A

Table 3: List of components

Part No.	Description	Part No.	Description
96-3	Assembly fixture	506	Retaining ring
412.52/.53/.54/.55/.56	O-ring	523	Shaft sleeve
471	Seal cover	542	Throttling bush
472	Primary ring	550	Disc
473	Primary ring carrier	562.53/.54/.55	Parallel pin
474	Thrust ring	901.52/.53	Hexagon head bolt
475	Mating ring	903	Screw plug
477.52/.54	Spring for mechanical seal	914.52	Hexagon socket head cap screw

1.5.2 General assembly drawing with list of components

1.5.2.1 Bearing brackets B03 to B05

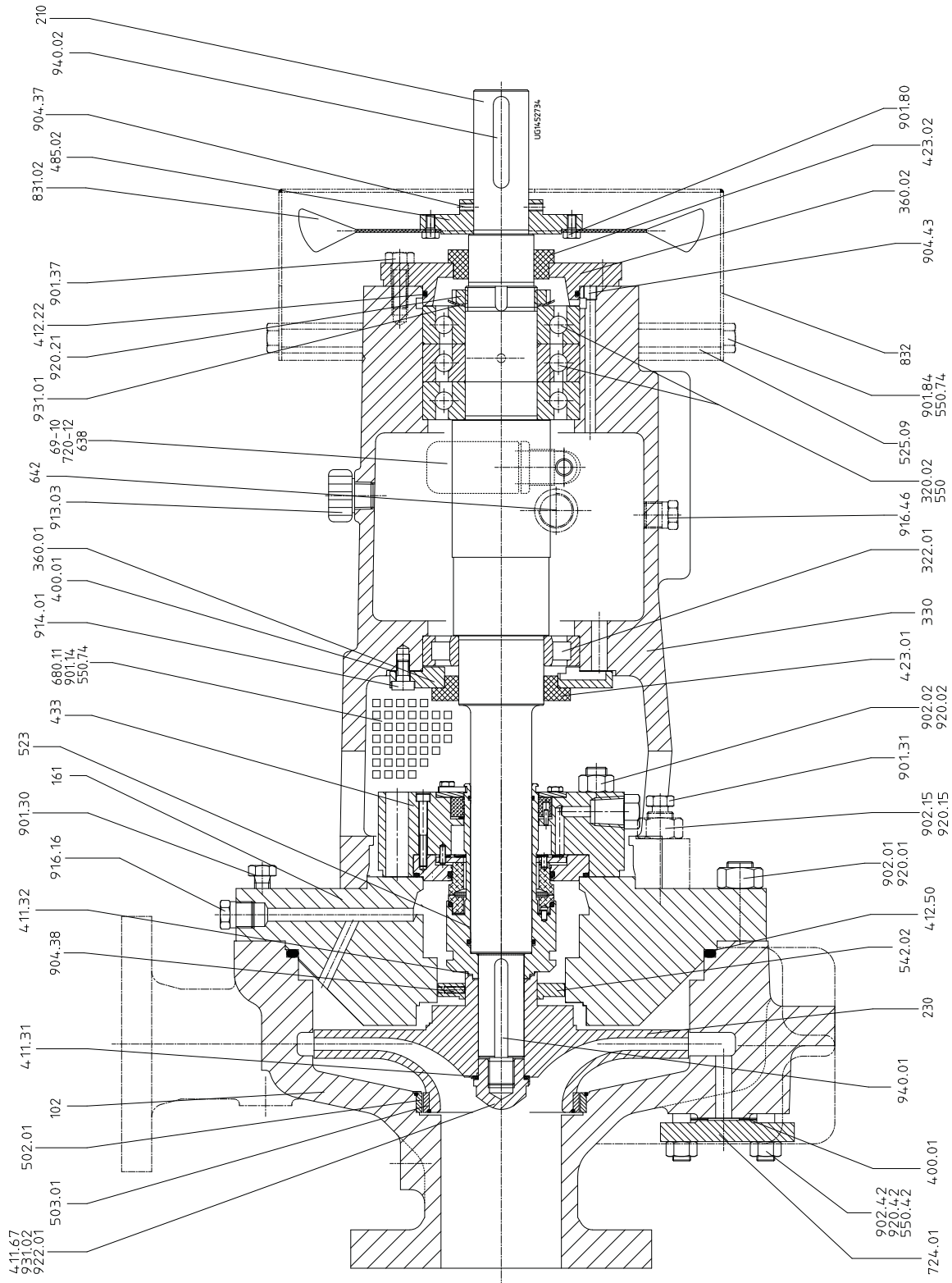


Fig. 3: Bearing brackets B03 to B05

1.5.2.2 Bearing brackets B06 and B07

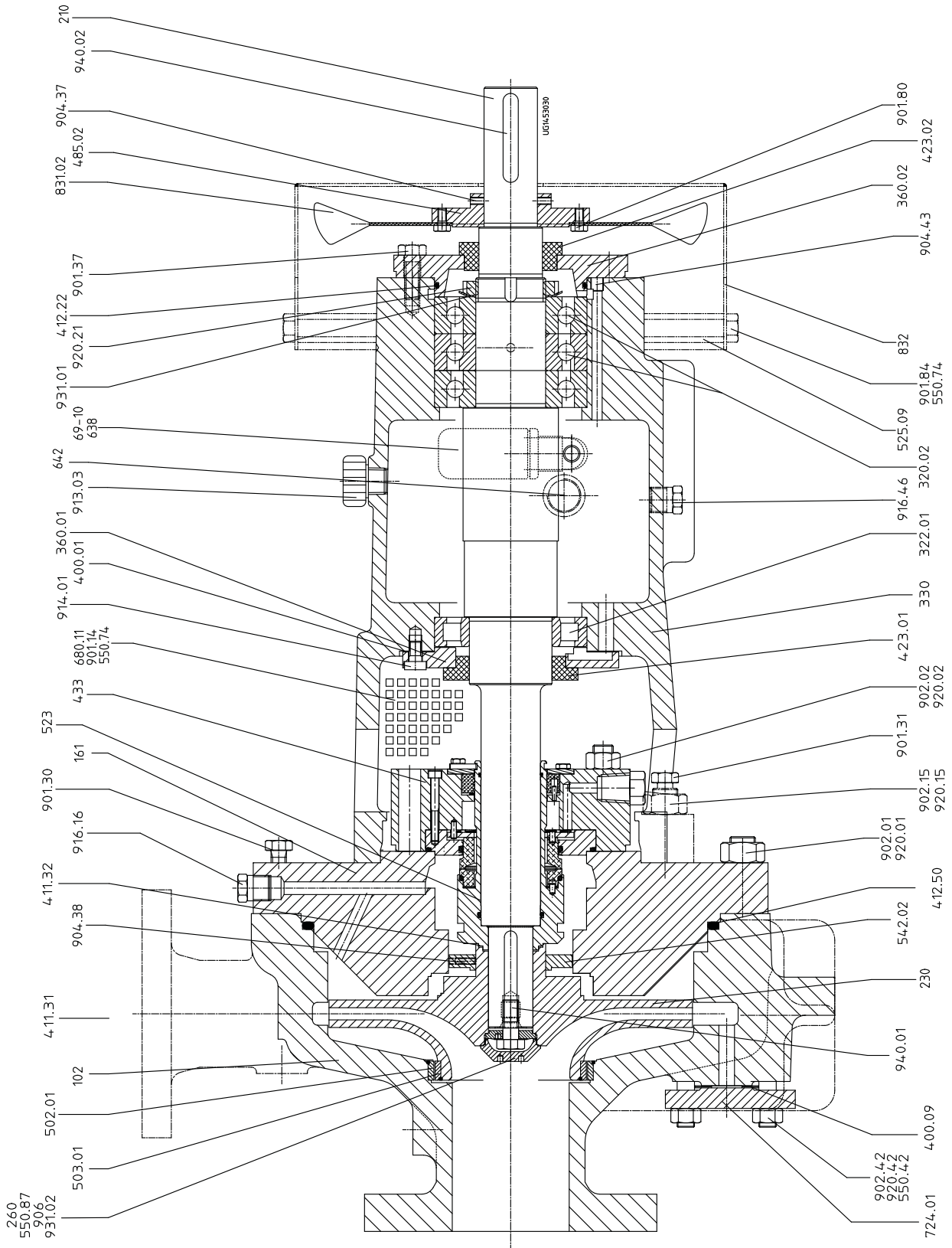


Fig. 4: Bearing brackets B06 and B07

Table 4: List of components

Part No.	Comprising	Description
102	102	Volute casing
	412.50	O-ring
	502.01	Casing wear ring
	902.01	Stud
	916.01	Plug
	920.01	Hexagon nut
161	161	Casing cover
	412.50	O-ring
	901.30	Hexagon head bolt
	902.15	Stud
	916.16	Plug
	920.15	Hexagon nut
210	210	Shaft
	920.21	Slotted round nut
	931.01	Lock washer
	940.01/.02	Key
230	230	Impeller
	411.31/.32/.67	Joint ring
	503.01	Impeller wear ring
	931.02	Lock washer
260 ¹⁾	260	Impeller hub cap
	550.87	Disc
	906	Impeller screw
320.02	320.02	Angular contact ball bearing
	550	Adjusting washer
322.01	322.01 ²⁾	Cylindrical roller bearing
330	330	Bearing bracket
	69.10	Protective cage
	360.01/.02	Bearing cover
	400.01	Gasket
	412.22	O-ring
	638	Constant level oiler
	642	Oil level sight glass
	710.21	Pipe
	901.31/.37	Hexagon head bolt
	913.03	Vent plug
	916.46	Plug
914.01	Hexagon socket head cap screw	
360.01/.02	360.01/.02	Bearing cover
	400.01	Gasket
	412.22	O-ring
	914.01	Hexagon socket head cap screw
400.09	400.09	Gasket
423.01/.02 ³⁾	423.01/.02	Labyrinth ring
433	433	Mechanical seal
	523	Shaft sleeve

- 1) For bearing brackets B06 and B07 only
 2) For bearing brackets B03 to B05 only
 3) On pumps with fan only

Part No.	Comprising	Description
502.01	502.01	Casing wear ring
503.01	503.01	Impeller wear ring
507.01/.02 ⁴⁾	507.01/.02 ⁴⁾	Thrower
	904.41/.42 ⁴⁾	Grub screw
542.02	542.02	Throttling bush
	904.38	Grub screw
550.42	550.42	Disc
638	638	Constant level oiler
680.11	680.11	Guard
	901.14	Hexagon head bolt
	550.74	Disc
724.01	724.01	Blind flange
831.02 ⁵⁾	831.02	Fan impeller
	832	Fan hood
	485.02	Fan hub
	904.37	Grub screw
902.42	902.42	Stud
920.42	920.42	Hexagon nut
922.01 ²⁾	922.01	Impeller nut
	931.02	Lock washer
99-9	99-9	Set of sealing elements, complete

4) On pumps without fan only
 5) Optional



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