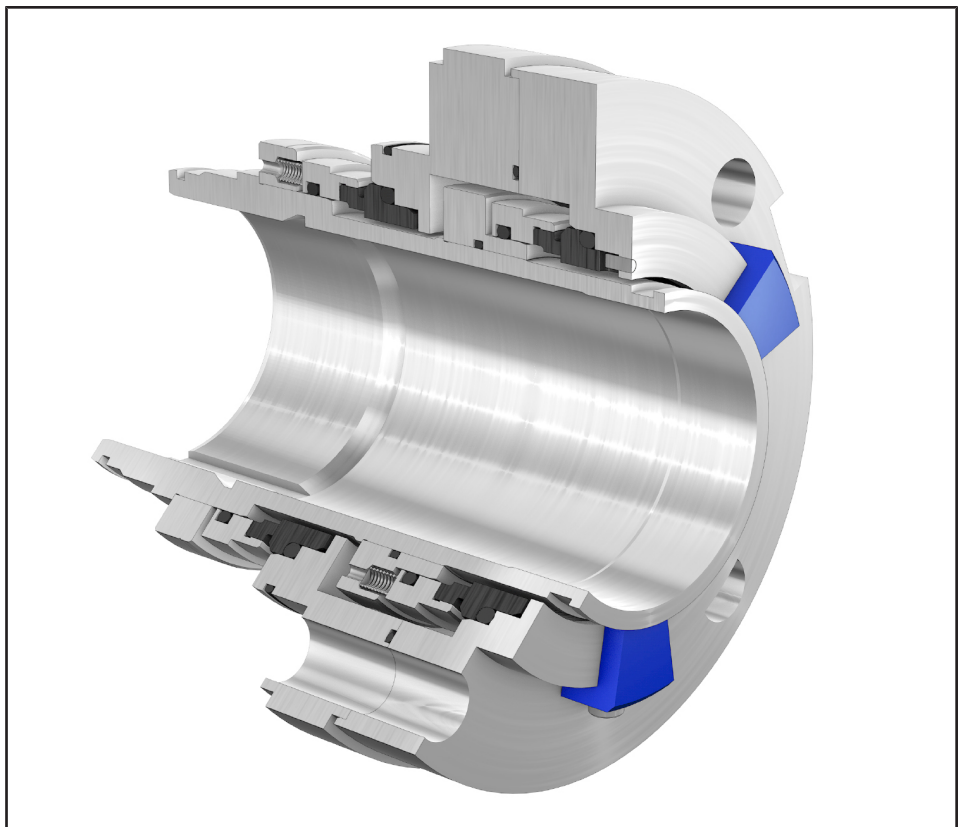


KSB Mechanical Seal

4RDQ

For the RDLO Type Series

Installation/Operating Manual



Legal information/Copyright

Installation/Operating Manual 4RDQ

Original operating manual

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1 General

1.1 Principles

This operating manual is valid for the type series and variants indicated on the front cover.

The operating manual describes the proper and safe use of this equipment in all phases of operation.

The order number and order item number of the pump clearly identify the mechanical seal via the corresponding material number in the pump's parts list and serve as identification for all further business processes.

In the event of damage, immediately contact your nearest KSB service facility to maintain the right to claim under warranty.

For any queries contact LPC_Mechanical.Seals@ksb.com

1.2 Target group

This operating manual is aimed at the target group of trained and qualified specialist technical personnel.

1.3 Other applicable documents


Table 1: Overview of other applicable documents

Document	Contents
Data sheet	Description of the technical data of the pump (set) in which the mechanical seal is installed.
General assembly drawing ¹⁾	Description of the mechanical seal as part of the sectional drawing of the pump
Sub-supplier product literature ¹⁾	Operating manuals and other product literature describing accessories and integrated machinery components

For accessories and/or integrated machinery components, observe the relevant manufacturer's product literature.

1.4 Symbols







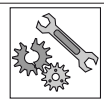
Table 2: Symbols used in this manual

Symbol	Description
✓	Conditions which need to be fulfilled before proceeding with the step-by-step instructions
▷	Safety instructions
⇒	Result of an action
⇔	Cross-references
1. 2.	Step-by-step instructions
	Note Recommendations and important information on how to handle the product

¹ If included in agreed scope of supply

1.5 Key to safety symbols/markings

Table 3: Definition of safety symbols/markings

Symbol	Description
 DANGER	DANGER This signal word indicates a high-risk hazard which, if not avoided, will result in death or serious injury.
 WARNING	WARNING This signal word indicates a medium-risk hazard which, if not avoided, could result in death or serious injury.
 CAUTION	CAUTION This signal word indicates a hazard which, if not avoided, could result in damage to the machine and its functions.
	Explosion protection This symbol identifies information about avoiding explosions in potentially explosive atmospheres in accordance with EU Directive 2014/34/EU (ATEX).
	General hazard In conjunction with one of the signal words this symbol indicates a hazard which will or could result in death or serious injury.
	Electrical hazard In conjunction with one of the signal words this symbol indicates a hazard involving electrical voltage and identifies information about protection against electrical voltage.
	Machine damage In conjunction with the signal word CAUTION this symbol indicates a hazard for the machine and its functions.



2 Safety

All the information contained in this section refers to hazardous situations.

In addition to the present general safety information the action-related safety information given in the other sections must be observed.

2.1 General

- This operating manual contains general installation, operating and maintenance instructions that must be observed to ensure safe operation of the system and prevent personal injury and damage to property.
- Comply with all the safety instructions given in the individual sections of this operating manual.
- The operating manual must be read and understood by the responsible specialist personnel/operators prior to installation and commissioning.
- The contents of this operating manual must be available to the specialist personnel at the site at all times.
- Information and markings attached directly to the product must always be complied with and kept in a perfectly legible condition at all times. This applies to, for example:
 - Arrow indicating the direction of rotation
 - Markings for connections
 - Fitting direction
- The operator is responsible for ensuring compliance with all local regulations not taken into account.

2.2 Intended use

- This product must only be operated within the limit values stated in the technical product literature for the ambient temperature, fluid handled, speed, density, pressure, temperature and in compliance with any other instructions provided in the operating manual or other applicable documents.

2.3 Personnel qualification and training

- All personnel involved must be fully qualified to install, operate, maintain and inspect the product this manual refers to.
- The responsibilities, competence and supervision of all personnel involved in transport, installation, operation, maintenance and inspection must be clearly defined by the operator.
- Deficits in knowledge must be rectified by means of training and instruction provided by sufficiently trained specialist personnel. If required, the operator can commission the manufacturer/supplier to train the personnel.
- Training on the product must always be supervised by specialist technical personnel.

2.4 Consequences and risks caused by non-compliance with this manual

- Non-compliance with these operating instructions will lead to forfeiture of warranty cover and of any and all rights to claims for damages.
- Non-compliance can, for example, have the following consequences:
 - Hazards to persons due to electrical, thermal, mechanical and chemical effects and explosions
 - Failure of important product functions
 - Failure of prescribed maintenance and servicing practices
 - Hazard to the environment due to leakage of hazardous substances

2.5 Safety awareness

In addition to the safety information contained in this operating manual and the intended use, the following safety regulations shall be complied with:

- Accident prevention, health regulations and safety regulations
- Explosion protection regulations
- Safety regulations for handling hazardous substances
- Applicable standards, directives and laws

2.6 Safety information for the user/operator

- Fit protective equipment (e.g. contact guards) supplied by the operator for hot, cold or moving parts, and check that the equipment functions properly.
- Do not remove any protective equipment (e.g. contact guards) during operation.
- Provide the personnel with protective equipment and make sure it is used.
- Contain leakages of hazardous fluids (e.g. explosive, toxic, hot) so as to avoid any danger to persons and the environment. Observe all legal requirements.
- The design of mechanical seals always produces a small amount of leakage.
- Higher leakage may occur especially in the running-in phase. The leakage must be drained off in a controlled way

2.7 Safety information for maintenance, inspection and installation

- Modifications or alterations of the mechanical seal require the manufacturer's prior consent.
- Use only original spare parts or parts/components authorised by the manufacturer. The use of other parts/components can invalidate any liability of the manufacturer for resulting damage.
- The operator ensures that maintenance, inspection and installation are performed by authorised, qualified specialist personnel who are thoroughly familiar with the manual.
- Only carry out work on the mechanical seal when the shaft is not rotating.

For mechanical seals installed in pump sets:

- The pump (set) must have cooled down to ambient temperature.
- Pump pressure must have been released and the pump must have been drained.
- When taking the pump set out of service always adhere to the procedure described in the manual.
- Decontaminate pumps which handle fluids posing a health hazard.
- As soon as the work has been completed, re-install and re-activate any safety-relevant devices and protective devices. Before returning the product to service, observe all instructions on commissioning.
- Observe the relevant sections of the corresponding pump operating manual.

2.8 Unauthorised modes of operation

Never operate the mechanical seal outside the limits stated in the data sheet and in this operating manual.

The warranty relating to the operating reliability and safety of the mechanical seal supplied is only valid if the mechanical seal is used in accordance with its intended use.


Any damage caused by dry running shall be excluded from the warranty.

3 Transport/Storage/Disposal


3.1 Checking the condition upon delivery

1. On transfer of goods, check each packaging unit for damage.
2. In the event of in-transit damage, assess the exact damage, document it and notify KSB or the supplying dealer and the insurer about the damage in writing immediately.



3.2 Transport


	<div style="background-color: #FFD700; padding: 5px;">CAUTION</div> <p>Improper transport Damage to the mechanical seal!</p> <ul style="list-style-type: none"> ▷ Only transport the mechanical seal in suitable packaging. ▷ Observe the weights, symbols and instructions indicated on the packaging. ▷ Use suitable, approved lifting accessories.
---	--

KSB's standard packaging is suitable for dry transport ,e.g. by truck, rail, air. Special packaging can be provided if specified in the contractual agreement.

	<div style="background-color: #FFD700; padding: 5px;">CAUTION</div> <p>Removing transport locks too early Damage to previously locked components during transport!</p> <ul style="list-style-type: none"> ▷ If transport locks are fitted, do not remove them too early.
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3.3 Storage/preservation

	<div style="background-color: #FFD700; padding: 5px;">CAUTION</div> <p>Improper storage Damage due to humidity, vermin, corrosion and contamination!</p> <ul style="list-style-type: none"> ▷ Avoid outdoor storage. ▷ Observe, check and record the storage conditions. ▷ Regularly check the packaging for any damage. ▷ Regularly check the humidity indicator of shrink-wrapped objects. The relative humidity should be < 50 %. ▷ If the relative humidity indicated for shrink-wrapped objects > 50 %, have the equipment repacked by the manufacturer.
	<div style="background-color: #FFD700; padding: 5px;">CAUTION</div> <p>Improper storage Impairment of O-rings' sealing function!</p> <ul style="list-style-type: none"> ▷ Do not store O-rings together with chemicals, solvents, fuels, acids, etc. ▷ Protect O-rings from light, in particular from direct sun exposure and strong artificial light high in ultraviolet rays. ▷ Check the O-rings for damage before they are fitted.

	<div>CAUTION</div> <p>Wet, contaminated or damaged openings and connections</p> <p>Damage to the mechanical seal!</p> <p>Risk of embrittlement! Damage to elastomers!</p> <ul style="list-style-type: none">▸ Only open screw plugs and connections at the mechanical seal at the time of installation.▸ Avoid opening screw plugs, connections and similar before that time.
---	--

We recommend taking the following measures for storing the mechanical seal:

For storing the mechanical seal observe standards ISO 2230 and DIN 7716.

Store the mechanical seal in its original packaging, placed on a level surface in a dry, protected room with constant conditions that meet the following requirements:

- Relative humidity < 65 %
- Temperature between 15 °C and 25 °C
- Moderately vented atmosphere
- Dust-free and vermin-free



If properly stored indoors, the equipment is protected for a maximum of 36 months. New mechanical seals are supplied by our factory duly prepared for storage.

3.4 Return to supplier

1. Remove the used mechanical seal from the system.
2. Always flush and clean the mechanical seal, particularly if it has been used for handling noxious, explosive, hot or other hazardous fluids.
3. If the mechanical seal has handled fluids whose residues could lead to corrosion damage in the presence of atmospheric humidity or could ignite upon contact with oxygen, the mechanical seal must also be neutralised and dried with anhydrous inert gas.
4. Always complete and enclose a certificate of decontamination when returning the mechanical seal. Always indicate any safety measures and decontamination measures taken.

	<div>NOTE</div> <p>If required, a blank certificate of decontamination can be downloaded from the following web site: www.ksb.com/certificate_of_decontamination</p>
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3.5 Disposal

	 WARNING
	<p>Fluids handled, consumables and supplies which are hot and/or pose a health hazard</p> <p>Hazard to persons and the environment!</p> <ul style="list-style-type: none">▸ Collect and properly dispose of flushing fluid and any fluid residues.▸ Wear safety clothing and a protective mask if required.▸ Observe all legal regulations on the disposal of fluids posing a health hazard.

1. Dismantle the mechanical seal.
Collect greases and other lubricants during dismantling.
2. Separate and sort the mechanical seal materials, e.g. by:
 - Metals
 - Plastics
 - Greases and other lubricants
3. Dispose of materials in accordance with local regulations or in another controlled manner.

4 Description

4.1 General description

- KSB mechanical seal

Mechanical seal for installation in pump sets and other rotating machinery in accordance with the manufacturer's instructions.

4.2 Designation

Example: C135M1-4RDQ

Table 4: Designation key

Code	Description	
C	Design	
	C	Cartridge seal
135	Nominal diameter	
M	Direction of rotation	
	M	Bi-directional with multi-spring arrangement
	S	Bi-directional with single spring
	L	Direction of rotation anti-clockwise
	R	Direction of rotation clockwise
1	Anti-twist lock of mating ring	
	0	Without lock
	1	With lock
4RDQ	Type series	
	4RDQ	Double cartridge seal in tandem arrangement

4.3 Materials

- Depending on the application
- See product literature of the pump
- Selection of suitable material variant on request

4.4 Design details

Design

- Cartridge seal
- Double seal arrangement
- Balanced
- Torque transmission via key
- Multi-spring arrangement

4.5 Configuration and function

Design Mechanical seal for installation in pump sets and other rotating machinery in accordance with the manufacturer's instructions.

KSB's mechanical seal 4RDQ is a double cartridge seal in tandem arrangement.

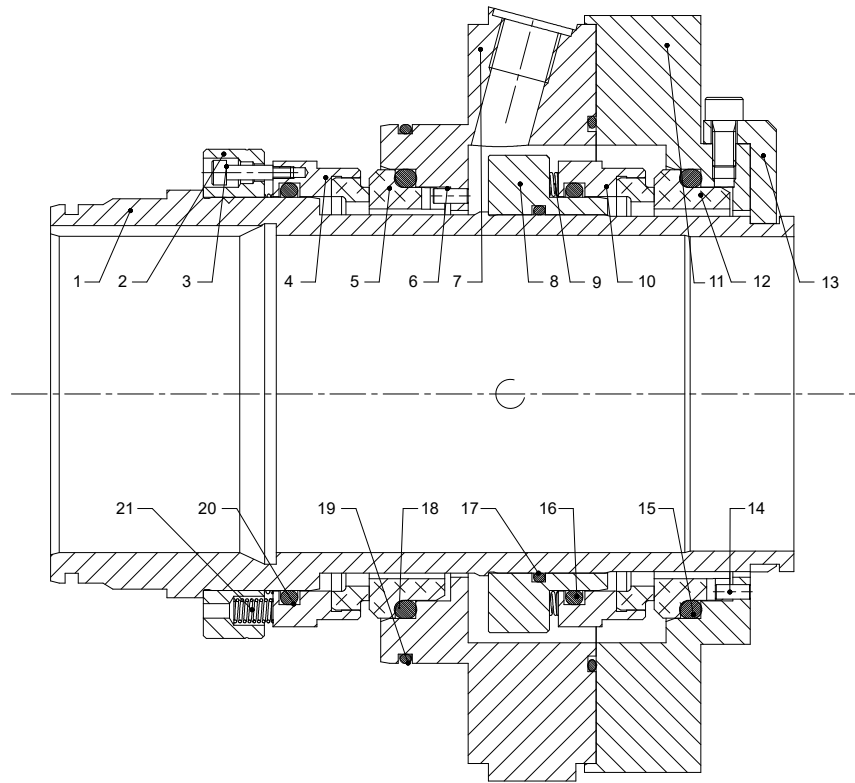


Fig. 1: Section_4RDQ_B-B

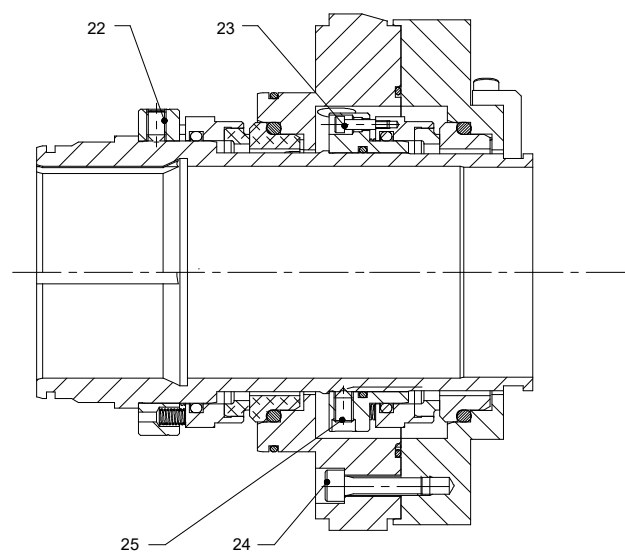



Fig. 2: Section_4RDQ_D-D



Function The inboard mechanical seal and the outboard mechanical seal are each equipped with a rotating primary ring (4 and 10) and a stationary mating ring (5 and 12). The primary rings run in axial contact with the mating rings. A liquid-filled sealing clearance, or sealing gap, is formed between the seal faces. Compression springs 21 and 9 press the primary ring against the respective mating ring. The compression springs ensure that the seal faces stay in contact, also during unpressurised operation. O-rings 15, 16, 17, 18 and 20 provide sealing between the primary rings and shaft sleeve 1 and between the mating rings and housing parts 7 and 11. O-ring 19 provides sealing between the seal cartridge and the pump casing. Torque transmission and positioning between the pump shaft and the shaft sleeve is ensured by the key. Torque is transmitted to the primary rings via torque-transmitting elements 2 and 8, screws 3 and 23 and grub screws 22 and 25. On versions with a pumping ring, the grub screw is replaced by a key. Parallel pins 6 and 14 serve as an anti-twist lock for the mating rings. Assembly fixture 13 secures the parts during transport.

The seal chamber must be completely vented. The same applies to the entire cooling circuit including cooler if fitted. To prevent vaporisation of the fluid in the sealing clearance, a sufficient margin to the fluid's vapour pressure must be maintained. Cooling using the mechanical seal cooler reduces the mechanical seal temperature and thus results in a sufficient margin to the vapour pressure. The cooling water quantity depends on the application parameters.

5 Installation/Dismantling

	<p>NOTE</p> <p>Priority shall be given to the installation instructions and/or installation sequence in the documents of the pump set into which this mechanical seal is to be installed. This also applies to the dismantling instructions and/or dismantling sequence.</p>
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5.1 Permissible aids

	<p>CAUTION</p> <p>Impermissible cleaning agents</p> <p>Damage to the seal faces at the mechanical seal!</p> <ul style="list-style-type: none"> ▷ For removing minor contamination use only paper tissues and ethyl alcohol. ▷ Do not use dirty cleaning cloths or cleaning cloths that leave behind lint.
	<p>CAUTION</p> <p>Impermissible assembly aids</p> <p>Sealing elements made of ethylene propylene diene rubber perishing or swelling up!</p> <ul style="list-style-type: none"> ▷ Never let sealing elements come into contact with mineral oil base lubricants. ▷ Use permissible lubricants only. ▷ Verify that the assembly aids are silicon-free.

- Lubricants²⁾
 - Permanent lubricants, such as non-mineral grease (Klüber Asonic HQ 72-102) are used for elastomers that do not serve to transmit the torque. Examples are mating rings with an anti-twist lock or primary rings that move axially relative to the pump components.
 - Non-permanent lubricants such as a soap solution, for example, are used for elastomers that serve as a sealing element and, in addition, transmit the torque. An example would be a mating ring without anti-twist lock.
- Recommended cleaning agent for seal faces and grub screws: ethyl alcohol
- Thread-locking agent: Loctite, No. 243
- Open-ended wrench, ring spanner, socket wrench (cleaned, no impact tools)
- Torque wrench (cleaned)





5.2 Prerequisites

- Shaft run-out to ISO 5199:
 - For shaft diameter ≤ 50 mm: 0.05 mm max.
 - For shaft diameter 50 to 100 mm: 0.08 mm max.
 - For shaft diameter > 100 mm: 0.10 mm max.
- Face run-out of the shaft in relation to the vertical connection surface of the casing:
 - For shaft speed ≤ 750 rpm: 0.2 mm max.
 - For shaft speed > 750 rpm to 1000 rpm: 0.15 mm max.
 - For shaft speed > 1000 rpm to 1500 rpm: 0.08 mm max.

²⁾ Lubricants must be compatible with all fluids used. They must not be aggressive to the secondary sealing elements.

- For shaft speed > 1500 rpm to 3000 rpm: 0.025 mm max.
- Permissible centre offset between the pump casing and the shaft:
 - Max. 0.2 mm for seals without pumping ring
 - Max. 0.1 mm for seals with pumping ring
- The seal faces are clean and have not been touched with fingers.
- The mechanical seal is in proper condition and complete.
- The elastomers are free from any contamination, cracks, softening, hardening, stickiness and discolouration.
- The mechanical seal has been placed down on a clean and level surface.

5.3 Installing the mechanical seal

	<div style="background-color: #FFD700; padding: 5px;">CAUTION</div> <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"> ▷ Never use grease or other permanent lubricants for fitting the torque-transmitting elements of a mechanical seal. ▷ Use soft soap to reduce any friction caused during assembly. ▷ Never coat the mechanical seal faces with grease or oil.
	<div style="background-color: #0070C0; color: white; padding: 5px;">NOTE</div> <p>For mechanical seals with internal pumping device the direction of rotation must be observed.</p>
	<div style="background-color: #0070C0; color: white; padding: 5px;">NOTE</div> <p>Do not re-use cup point grub screws! Used grub screws must be replaced by new cup point grub screws.</p>
	<div style="background-color: #0070C0; color: white; padding: 5px;">NOTE</div> <p>Cup point grub screws must not be re-used. Repeated tightening can impair reliable force transmission.</p>

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.

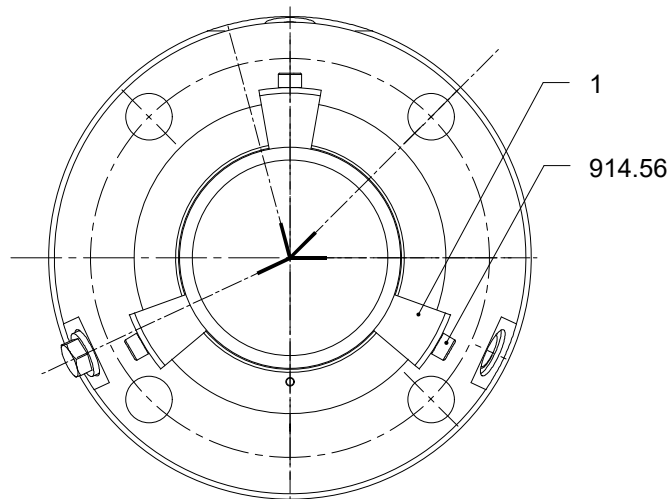


Fig. 3: Cross-section axis of 4RDQ

1	Transport lock	914.56	Hexagon socket head cap screw
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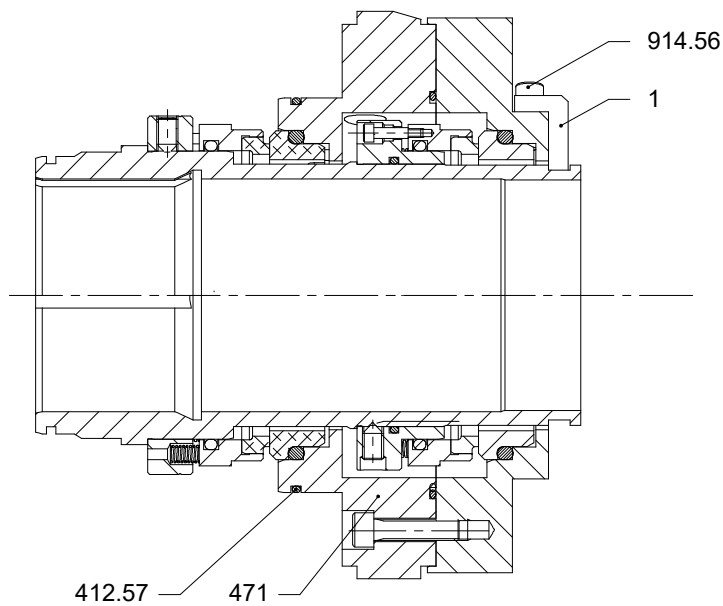




Fig. 4: Sectional drawing of 4RDQ

- ✓ The operating manual for the pump set is to hand.
 - ✓ The pump has been prepared in accordance with the operating manual for installing the mechanical seal.
 - ✓ The mechanical seal, shrink disc and assembly aids are available.
 - ✓ The installation drawing is to hand and has been consulted.
1. Properly remove any traces of corrosion or wear on mating components.
 2. Carefully guide the mechanical seal onto the shaft until seal cover 471 abuts the pump casing.
 3. Make sure that O-ring 412.57 is properly seated in the groove and is undamaged. Apply a suitable lubricant to the O-ring to hold it in place if required.
 4. Position the mechanical seal against the pump casing using studs.

5. Install the bearing and align the shaft as described in the pump operating manual.
6. Fit the mechanical seal to the pump casing using stud, discs and nuts. Tighten the fasteners crosswise in several increments.
7. Remove and store transport lock 1.
8. Fit the cover and stuffing box housing.
9. Carry out further installation instructions given in the pump's operating manual.

5.4 Removing the mechanical seal




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.

	<p>NOTE</p> <p>Do not re-use cup point grub screws! Used grub screws must be replaced by new cup point grub screws. (For version with locking sleeve only)</p>
	<p>NOTE</p> <p>Cup point grub screws must not be re-used. Repeated tightening can impair reliable force transmission.</p>



- ✓ The operating manual for the pump set is to hand.
 - ✓ The pump has been prepared for removing the mechanical seal in accordance with the pump's operating manual.
1. Fit transport lock 1 to the mechanical seal with hexagon socket head cap screw 914.56.
 2. Remove the bearing as described in the pump's operating manual.
 3. Properly remove any traces of corrosion at the shaft.
 4. Pull the entire seal cartridge off shaft 210.
 5. Completely remove the mechanical seal from the shaft.
 6. Carry out further dismantling instructions given in the pump's operating manual.

6 Operation

6.1 Safety instructions for operation

	<div style="background-color: #FFD700; padding: 5px;">CAUTION</div> <p>Unsuitable fluid to be sealed off Damage to the machinery!</p> <ul style="list-style-type: none"> ▸ Take appropriate measures to ensure that the fluid to be sealed off at the mechanical seal is in liquid condition no matter what the operating status of the pump. This applies in particular when starting up and stopping the pump. ▸ If the fluid to be sealed off forms deposits while the pump set cools down or during standstill of the pump set, the seal chamber must be flushed through with a clean liquid. The quantity and type of flushing liquid has to be defined by the operator for the specific material combination of the mechanical seal.
	<div style="background-color: #FFD700; padding: 5px;">CAUTION</div> <p>Excessive rise in temperature Damage to the mechanical seal! Dry running or damage to the elastomers, incrustations at the seal faces, etc.</p> <ul style="list-style-type: none"> ▸ Shut down the pump as described in the operating manual.
	<div style="background-color: #0070C0; color: white; padding: 5px;">NOTE</div> <p>If the operating limits indicated are observed and the instructions given in this manual are complied with, the mechanical seal can be expected to give trouble-free operation. If the values during operation are not within the specified limits, the mechanical seal must be removed from the system and sent to KSB for inspection.</p>

6.2 Emissions

	<div style="background-color: #FFA500; padding: 5px;">WARNING</div> <p>Incorrect handling of the fluid to be sealed off Risk of injury!</p> <ul style="list-style-type: none"> ▸ If the fluid to be sealed off and/or the buffer fluid have to meet the requirements of the German Hazardous Substances Regulations, the regulations on handling hazardous substances (safety data sheets to Directive 91/155/EEC) and the accident prevention regulations must be heeded.
	<div style="background-color: #0070C0; color: white; padding: 5px;">NOTE</div> <p>If a reduction in leakage cannot be observed or if other failures occur, the mechanical seal must be shut down, removed from the system and sent to KSB for inspection.</p>

**NOTE**

Any leakage must be drained off in a controlled way and safely disposed of. Components which may come into contact with the seal leakage must either be corrosion-resistant or must be adequately protected.

- For physical and technical reasons a mechanical seal cannot be leak-free.
- Leakage can be either in liquid or gaseous form. Its aggressiveness corresponds to that of the fluid to be sealed off.
- The quantity of leakage is influenced by several factors:
 - Seal selection
 - Manufacturing tolerances
 - Operating statuses
 - Smooth running of the pump
- In the running-in phase of the mechanical seal higher leakage can occur.

6.3 Operating limits**NOTE**

Always observe the operating limits in the product literature and the other applicable documents.

**NOTE**

The following values are limits that depend on the seal face materials and elastomer materials. As the characteristics influence each other, operation at minimum/maximum limits is not possible for all characteristics at the same time.

Table 5: Operating limits³⁾

Type series	Max. dynamic pressure	Max. static pressure	Minimum temperature	Maximum temperature	Permissible axial displacement	Max. sliding velocities Hard / Soft
[°C]	[bar]	[bar]	[°C]	[°C]	[mm]	[m/s]
4RDQ	16	24	-15	130	+/- 2,5	10

³⁾ Theoretical maximum limits. The limits depend on the material used. Maximum values must not occur simultaneously as they influence each other during operation.

7 Maintenance





7.1 Maintenance/inspection

**NOTE**

The operator is responsible for conducting checks.

- The mechanical seal requires little maintenance. Replace wear parts as necessary.
- Proper operation includes regular checks of the temperature and leakage (drainage) and of the mechanical seal's buffer fluid pressure and fill level.
- When a system maintenance inspection or pump maintenance inspection is conducted, the mechanical seal should also be inspected. The seal faces should be reworked and all elastomer joint rings and springs should be replaced by new ones. KSB is available for inspecting the mechanical seal.

8 Trouble-shooting

	<div data-bbox="507 241 702 286">  WARNING </div> <p>Improper work to remedy faults</p> <p>Risk of injury!</p> <ul style="list-style-type: none"> ▸ For any work performed to remedy faults, observe the relevant information given in this operating manual and/or in the product literature provided by the accessories manufacturer.
	<div data-bbox="507 501 587 546">NOTE</div> <p>Prior to conducting any work on the mechanical seal during the warranty period contact the manufacturer. KSB Service will be pleased to help you. Non-compliance with this instruction will lead to forfeiture of any and all rights to claims for damages.</p>
	<div data-bbox="507 716 587 761">NOTE</div> <p>For any failures you cannot remedy or whose cause cannot be identified, contact the responsible KSB service centre.</p>

What to do in the event of a fault/malfunction

- Determine and document the nature of the fault/malfunction.
- Monitor the development of leakage quantity. If necessary, shut down the pump as described in the operating manual.
A steady flow of leakage indicates mechanical seal damage.

Maintenance work, service work and installation work by KSB Service

- KSB Service GmbH | Service Center Pegnitz
E-mail: service-center.pegnitz@ksb.com

Contact for general queries:

- E-mail: LPC_Mechanical.Seals@ksb.com

Further contact addresses:

- <https://www.ksb.com/en-global/contact>

9 Related Documents

9.1 General arrangement drawings with list of components

9.1.1 4RDQ cartridge seal

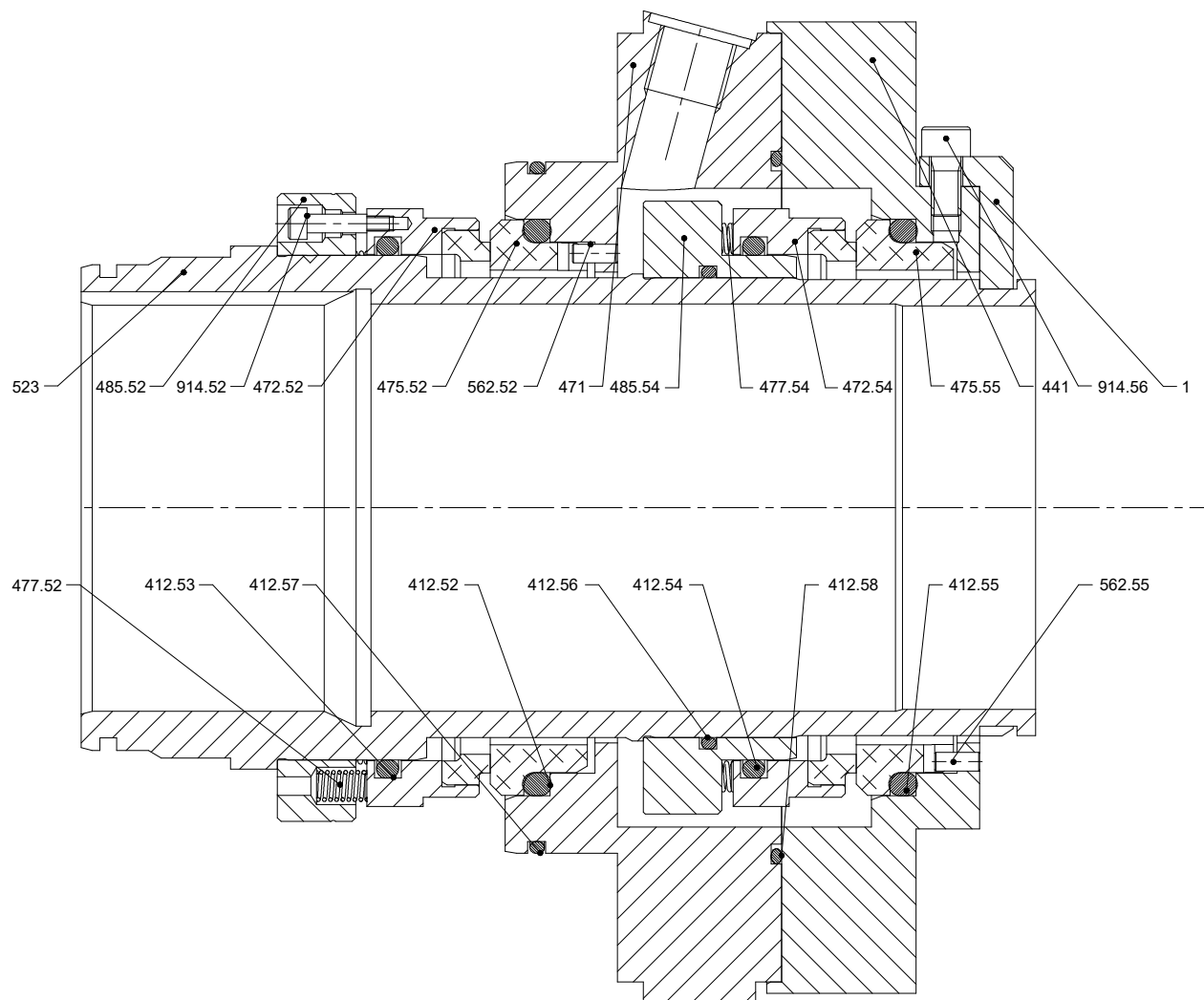


Fig. 5: 4RDQ general assembly drawing - view: B-B

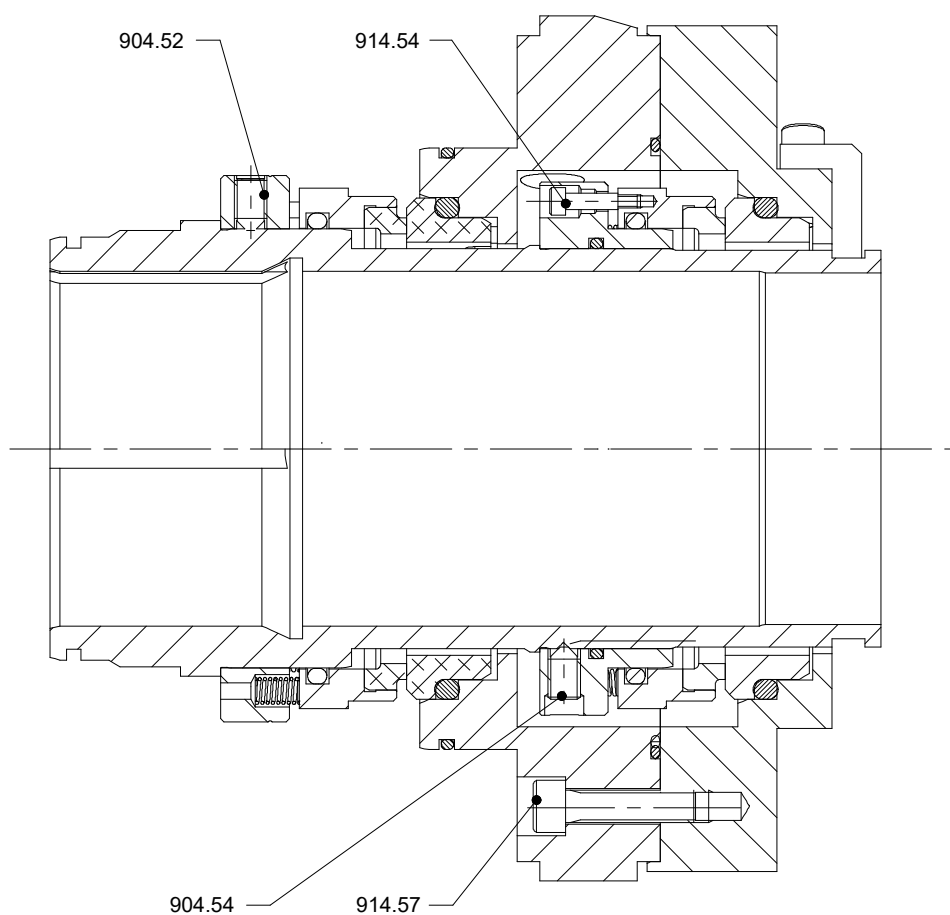


Fig. 6: 4RDQ general assembly drawing - view: D-D

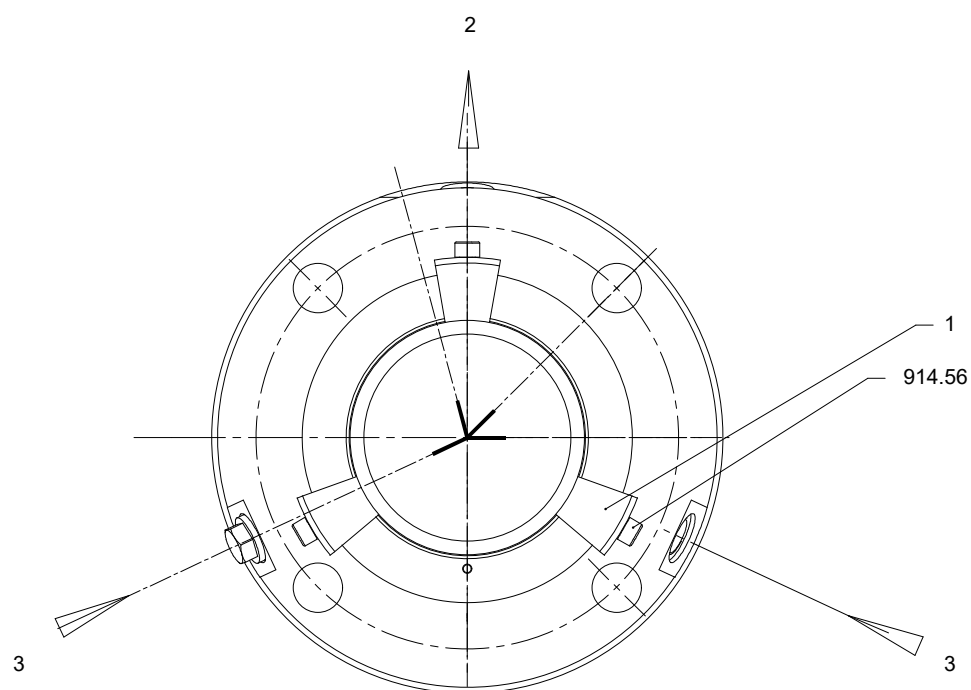


Fig. 7: 4RDQ general assembly drawing - view: Cross-section axis

Table 6: List of components

1	Transport lock	475.52/.55	Mating ring
2	Quench outlet	476	Mating ring carrier
3	Quench inlet	477.52/.54	Spring for mechanical seal
412.52/.53/.54/.55/.56/.57/.58	O-ring	485.52/.54	Torque-transmitting element
441	Shaft seal housing	523	Shaft sleeve
471	Seal cover	562.52	Parallel pin
472.52/.54	Primary ring	904.52/.54	Grub screw

10 Certificate of Decontamination

Type:
Order number /
Order item number⁴⁾:
Delivery date:
Application:
Fluid handled⁴⁾:

Please tick where applicable⁴⁾:



Corrosive



Oxidising



Flammable



Explosive



Hazardous to health



Seriously hazardous to health



Toxic



Radioactive



Bio-hazardous



Safe

Reason for return⁴⁾:
Comments:
.....

The product / accessories have been carefully drained, cleaned and decontaminated inside and outside prior to dispatch / placing at your disposal.

We herewith declare that this product is free from hazardous chemicals and biological and radioactive substances.

For mag-drive pumps, the inner rotor unit (impeller, casing cover, bearing ring carrier, plain bearing, inner rotor) has been removed from the pump and cleaned. In cases of containment shroud leakage, the outer rotor, bearing bracket lantern, leakage barrier and bearing bracket or intermediate piece have also been cleaned.

For canned motor pumps, the rotor and plain bearing have been removed from the pump for cleaning. In cases of leakage at the stator can, the stator space has been examined for fluid leakage; if fluid handled has penetrated the stator space, it has been removed.

- ☐ No special safety precautions are required for further handling.
☐ The following safety precautions are required for flushing fluids, fluid residues and disposal:

.....
.....

We confirm that the above data and information are correct and complete and that dispatch is effected in accordance with the relevant legal provisions.

.....
Place, date and signature

.....
Address

.....
Company stamp

⁴ Required field

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