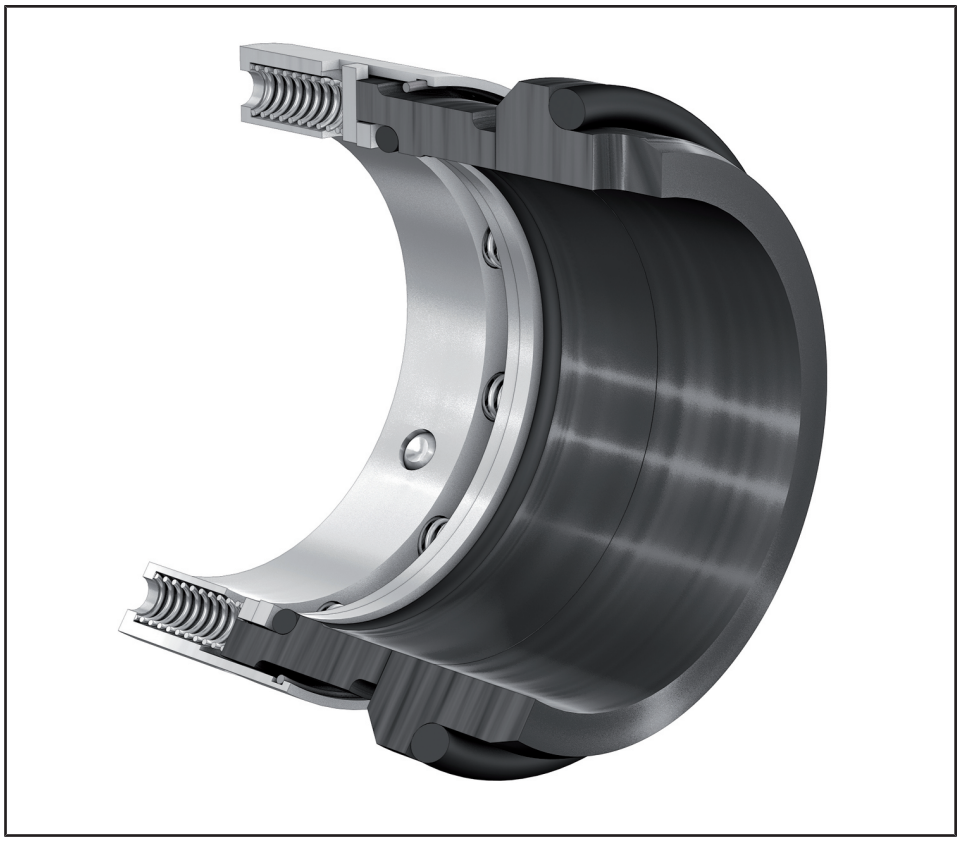
KSB Mechanical Seal

5A / 5B

Installation/Operating Manual



Contents

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 centre to maintain the right to claim under warranty.

For any queries: contact.ksbglrd@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 agreed to be included in the scope of supply

DANGER

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 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.

2.2 General

This operating manual contains general installation, dismantling, operating and maintenance instructions that must be observed to ensure safe handling and prevent personal injury and damage to property.

The safety information in all sections of this manual must be complied with.

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 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 in this operating manual.

2.3 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.
- The product must not be used in potentially explosive atmospheres.

2.4 Personnel qualification and training

All personnel involved must be fully qualified to transport, install, operate, maintain and inspect the product this manual refers to. The responsibilities, competence and supervision of all personnel involved in 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.

2.5 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

2.6 Safety awareness

In addition to the safety information contained in this 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

2.7 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

2.8 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 authorised by the manufacturer. The use of other parts can invalidate any liability of the manufacturer for resulting damage.
- The operator ensures that maintenance, inspection and installation is 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 casing 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.

2.9 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/Temporary 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

CAUTION

Improper transport

Damage to the mechanical seal!

- ▷ Only transport the mechanical seal in suitable packaging.
- ▷ Observe the weights, symbols and instructions indicated on the packaging.
- ▷ Use suitable, permitted lifting accessories.

KSB's standard packaging is suitable for dry transport by forwarding agents (truck, rail, air); special packaging can be provided if specified in the contractual agreement.

CAUTION

Removing transport locks too early

Damage to previously locked components during transport!

- ▷ If transport locks are fitted, do not remove them too early.

3.3 Storage/preservation

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

CAUTION

Improper storage

Damage during storage due to humidity, dirt or vermin! Corrosion of and damage to the mechanical seal!

- ▷ 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 checked and repacked by the manufacturer.

CAUTION

Generation and presence of ozone

Risk of embrittlement! Damage to elastomers!

- ▷ If the storage area is not sufficiently vented, avoid arc welding as well as the use of high-voltage equipment, electric motors and mercury vapour lamps.

CAUTION

Direct heat exposure

Damage to the mechanical seal!

Risk of embrittlement! Damage to elastomers!

- ▷ Protect the mechanical seal from heat sources such as sun, heaters and heat radiation.

CAUTION

UV light (ionising radiation)

Damage to the mechanical seal!

Risk of embrittlement! Damage to elastomers!

- ▷ Protect the mechanical seal from light sources such as sunlight, arc welding, fluorescent lamps or halogen lamps.

CAUTION

Wet, contaminated or damaged openings and connections

Damage to the mechanical seal!

Risk of embrittlement! Damage to elastomers!

- ▷ Only open any closed screw plugs and connections at the mechanical seal at the time of installation.
- ▷ Avoid opening screw plugs, connections and similar before that time.

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.

NOTE

If required, a blank certificate of decontamination can be downloaded from the following web site: www.ksb.com/certificate_of_decontamination

3.5 Disposal

⚠ WARNING

Fluids handled, consumables and supplies which are hot and/or pose a health hazard

Hazard to persons and the environment!

- ▷ 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: KU065M1-5A-RA

Table 4: Designation key

Code	Description	
K	Version	
	K	Short overall length
	N	Standard overall length
	S	Special overall length
U	Type	
	U	Unbalanced
	B	Balanced
065	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
5A	Type series, type	
	5A	Type U, without shaft shoulder
	5B	Type B, with shaft shoulder
RA	Mating ring protected against axial displacement	
	RA	With protection against axial displacement
	-[2)]	Without protection against axial displacement

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

- Mechanical seal in modular design
- To EN 12756
- Single mechanical seal or as combination (tandem arrangement (API Plan 52) or back-to-back arrangement (API Plan 53))
- Dynamic type
- Bi-directional

2) Blank

- Axial movability +/- 2.5 mm
- Torque transmission via cup point grub screws
- Multi-spring arrangement

5A:

- Unbalanced

5B:

- Balanced

4.5 Configuration and function

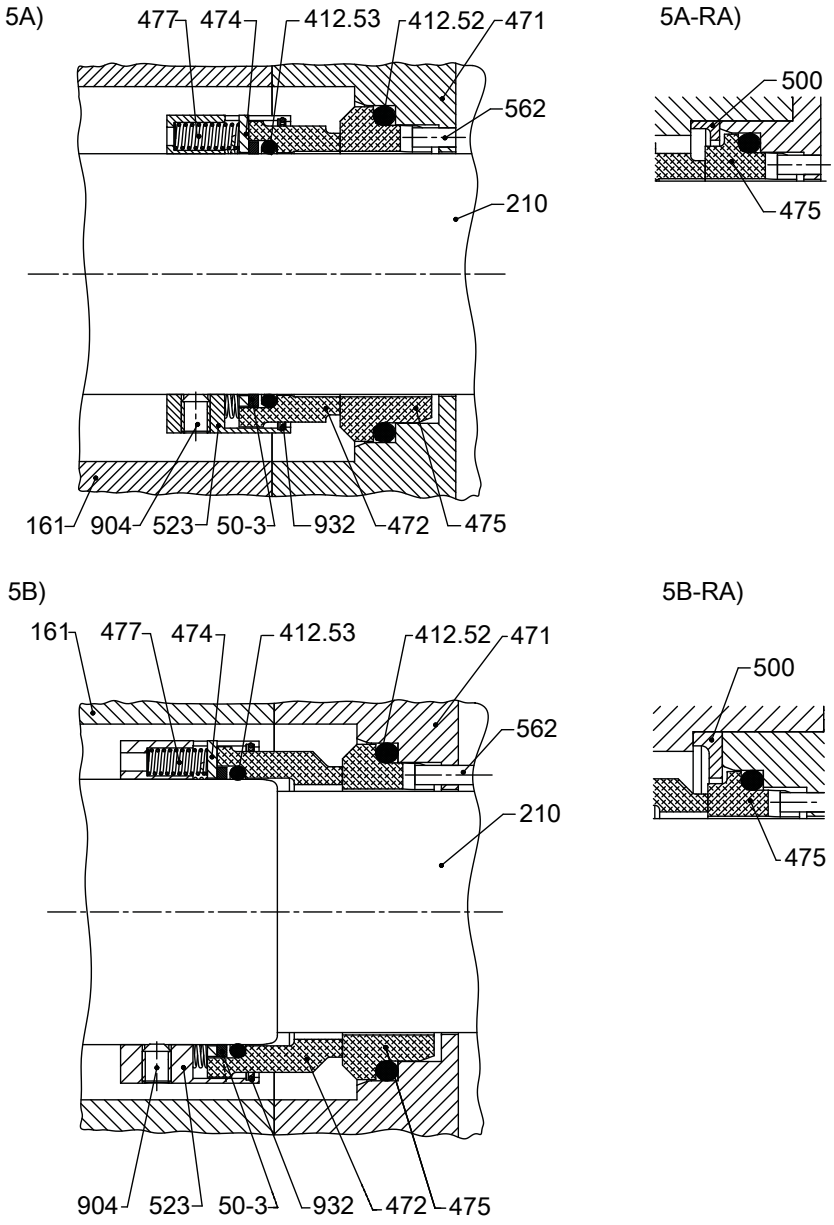


Fig. 1: Sectional drawing 5A, 5A-RA, 5B, 5B-RA

161	Casing cover	477	Spring for mechanical seal
210	Shaft	50-3	Backing ring
412.52/.53	O-ring	500	Ring
471	Seal cover	523	Shaft sleeve
472	Primary ring	562	Parallel pin
474	Thrust ring	904	Grub screw
475	Mating ring	932	Circlip

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

Type series 5A with nominal diameter D1 and installation dimension L1K is equivalent to version K (short design) and type U (unbalanced) in accordance with EN 12756.
Type series 5B with nominal diameter D1 is equivalent to version K (short design) and type B (balanced) in accordance with EN 12756.

Function Primary ring 472, which is the axially movable sealing ring, is pressed to mating ring 475 by springs 477. O-rings 412.52 and 412.53 are fitted for secondary sealing. Parallel pin 562, which is located in the centre of seal cover 471, transmits the friction torque and prevents mating ring 475 from rotating with the primary ring. Thrust ring 474 engages primary ring 472 and shaft sleeve 523, forcing them to rotate with shaft 210 without hindering the axial movability of primary ring 472. Shaft sleeve 523 is connected to shaft 210 via grub screws 904. The axial movability of primary ring 472 automatically compensates for wear and thermal expansion, maintaining permanent contact between primary ring and mating ring. Together with shaft sleeve 523, circlip 932 holds together the assembly rotating with shaft 210, which comprises primary ring 472, springs 477, thrust ring 474, backing ring 50-3 and O-ring 412.52. Versions with protection against axial displacement of mating ring 475 have a ring 500 clamped between seal cover 471 and casing cover 161; an adjusted mating ring 475 is used in this case. Versions without protection against axial displacement do not have ring 500 fitted.

5 Installation/Dismantling

5.1 Permissible aids

- Lubricants[3)]
  - 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 impact tools)
- Torque wrench (cleaned)

CAUTION

Impermissible cleaning agents

Damage to the seal faces at the mechanical seal!

- ▷ For removing minor contamination use only paper tissue and ethyl alcohol.
- ▷ Do not use dirty cleaning cloths or cleaning cloths that leave behind lint.

CAUTION

Impermissible assembly aids

Sealing elements made of ethylene propylene rubber perishing or swelling up!

- ▷ Never let sealing elements come into contact with mineral oil base lubricants.
- ▷ Use permissible lubricants only.
- ▷ Verify that the assembly aids are silicon-free.

5.2 Prerequisites

- Chamfered ends to EN 12756
- Installation dimensions to DIN EN 12756
- Surface roughness of pump components to DIN EN 12756
- Shaft run-out to ISO 5199:
  - Shaft diameter ≤ 50 mm: 0.05 mm max.
  - Shaft diameter 50 to 100 mm: 0.08 mm max.
  - Shaft diameter > 100 mm: 0.10 mm max.
- Face run-out of the shaft in relation to the vertical connection surface of the casing:
  - Shaft speed ≤ 750 rpm: 0.2 mm max.
  - Shaft speed > 750 rpm to 1000 rpm: 0.15 mm max.
  - Shaft speed > 1000 rpm to 1500 rpm: 0.08 mm max.
  - Shaft speed > 1500 rpm to 3000 rpm: 0.025 mm max.
- The seal faces are clean and have not been touched with fingers.

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

- 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

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.

CAUTION

Use of grease or other permanent lubricants

Torque transmission impeded / overheating of and damage to the pump!

- ▷ 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.

Example of an installation sequence for KSB pumps:

- ✓ The operating manual for the pump is on hand.
- ✓ The pump and/or machinery has been prepared in accordance with the manufacturer's instructions for installing the mechanical seal.
- ✓ Any corrosion or wear has been removed.
- ✓ The mechanical seal and assembly aids are on hand.
- ✓ The installation of the mechanical seal is carried out in accordance with the installation drawing.
- ✓ The back pull-out unit of the pump has been placed in a clean and level assembly area.
- ✓ The original mechanical seal is fully assembled and undamaged.

NOTE

If any installation instructions or an installation sequence are specified in the product literature of the pump/machinery into which the mechanical seal is to be installed, they must be observed.

1. Clean the seal faces with a suitable paper tissue and ethyl alcohol.
2. Wet O-ring 412.52 and the corresponding surface at the pump casing with permanent lubricant (e.g. Klüber Asonic HQ 72).
3. Position O-ring 412.52 on mating ring 475.
4. Mark the position of the groove on the rear side of mating ring 475 with anti-twist lock in a suitable place (not in the seal face area). Align the groove with parallel pin 962 in seal cover 471.
5. Press O-ring 412.52 together with mating ring 475 into the seat in the casing. If applicable, use a spacer sleeve and elastic intermediate element to protect the seal faces.
6. Check the seal face for any damage. Clean the seal face again if required.
7. For version 5A-RA or 5B-RA insert ring 500 between casing cover 161 and seal cover 471.
8. Connect seal cover 471 with casing cover 161.
9. Check that the mating ring is properly positioned (face run-out/perpendicular to shaft 210).
10. Wet O-ring 412.53 and the corresponding surface at the shaft / shaft protecting sleeve with a suitable, permanent lubricant.

11. Guide the rotating seal assembly onto shaft 210.
12. Observe/verify installation dimension L1K.
13. Degrease grub screws 904. Apply a drop of thread-locking agent. Screw the grub screws into shaft sleeve 523.
14. Tighten the grub screws with a torque wrench. Observe the installation dimension and tightening torque.

NOTE

Do not re-use cup point grub screws!
Used grub screws must be replaced by new cup point grub screws.

⇨ Cup point grub screws must not be re-used. Repeated tightening can impair the reliability of force transmission.

15. Carry out the installation instructions given in the operating manual of the pump/machinery.

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.

Example of a dismantling sequence for KSB pumps:

✓ The operating manual for the pump is on hand.

✓ The mechanical seal is accessible.

✓ The components have been placed down and secured in a horizontal position.

NOTE

If any dismantling instructions and/or a dismantling sequence are specified in the product literature of the pump/machinery into which the mechanical seal is to be installed, they must be observed.

1. Loosen grub screws 904. Pull the rotating assembly of the mechanical seal off the shaft / shaft protecting sleeve.
2. Carefully remove seal cover 471, including mating ring 475 and O-ring 412.52.
3. Jointly remove O-ring 412.52 and mating ring 475 from seal cover 471.
4. Carry out further dismantling instructions given in the operating manual of the pump/machinery.

5.5 Tightening torques

Table 5: Tightening torques

Threads	Tightening torques
	[Nm]
M5	4
M6	8
M8	15
M10	20
M12	25

6 Operation

6.1 Safety instructions for operation

CAUTION

Air intake via the seal faces

Dry running of the seal and consequential seal failure!

- ▷ For single seals the pressure in the seal chamber of the pump must always be higher than the ambient pressure.

CAUTION

Unsuitable fluid to be sealed off

Damage to the machinery!

- ▷ 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 machinery cools down or during standstill of the machinery, 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.

CAUTION

Excessive rise in temperature

Damage to the mechanical seal!

Dry running or damage to the elastomers, incrustations at the seal faces, etc.

- ▷ Shut down the pump for safety reasons.

NOTE

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.

6.2 Emissions

- 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.

NOTE

If a reduction in leakage cannot be observed or if other failures occur, the mechanical seal must be stopped for safety reasons, removed from the system and sent to KSB for inspection.

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.

⚠ WARNING

Incorrect handling of the fluid to be sealed off

Risk of injury!

- ▷ 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.

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 6: Operating limits (nominal diameter, sliding velocity, maximum pressure to be sealed off and temperature limits depending on the material combination and fluid.)

Type series	Nominal diameter		v[4]	Max. pressure to be sealed off			T[5]	
	Min.	Max.		Carbon/SiC	SiC/SiC	SiC/WC	Min.	Max.
	[mm]	[mm]	[m/s]	[bar]	[bar]	[bar]	[°C]	[°C]
5A	28	100	20	25	16	16	-30	+220
5B	28	100	20	40	20	20	-30	+220

Table 7: Maximum temperature of the buffer fluid for mechanical seal 5A/5B as double seal (back-to-back, tandem)

Buffer fluid	Maximum temperature of the buffer fluid
	[°C]
Fluid on oil basis	60
Fluid on water basis	80

NOTE

Take appropriate measures (e.g. cooling the vessel) to ensure that the buffer fluid does not exceed the temperature limits.

4) Sliding velocity
5) Fluid temperature

7 Maintenance

7.1 Maintenance/inspection

- If the mechanical seal is operated properly, it requires very little maintenance. Wear parts must be replaced as required.
- Proper operation includes regular checks of temperature and leakage (drainage) of the mechanical seal.
- When a system 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

⚠ WARNING

Improper work to remedy faults

Risk of injury!

- ▷ 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.

NOTE

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.

NOTE

For any failures you cannot remedy or whose cause cannot be identified, contact the responsible KSB service centre.

NOTE

Maintenance work, servicing work and installation work can be carried out by KSB Service or authorised workshops.

KSB Service GmbH | Service Centre Pegnitz
E-mail: service-center.sued@ksb.com

KSB Service LLC | Service Centre Abu Dhabi
E-mail: ksb@ksb.ae

Contact for general queries:
E-mail: TSS_PE_Mechanical.Seals@ksb.com

Further contacts see: www.ksb.com/contact.

What to do in the event of a failure

- Determine and document the nature of the fault/malfunction.
- Monitor the development of leakage quantity. Stop the pump if necessary. Consistent, flowing leakage indicates a mechanical seal damage.

9 Related Documents

9.1 Dimensions

9.1.1 5A

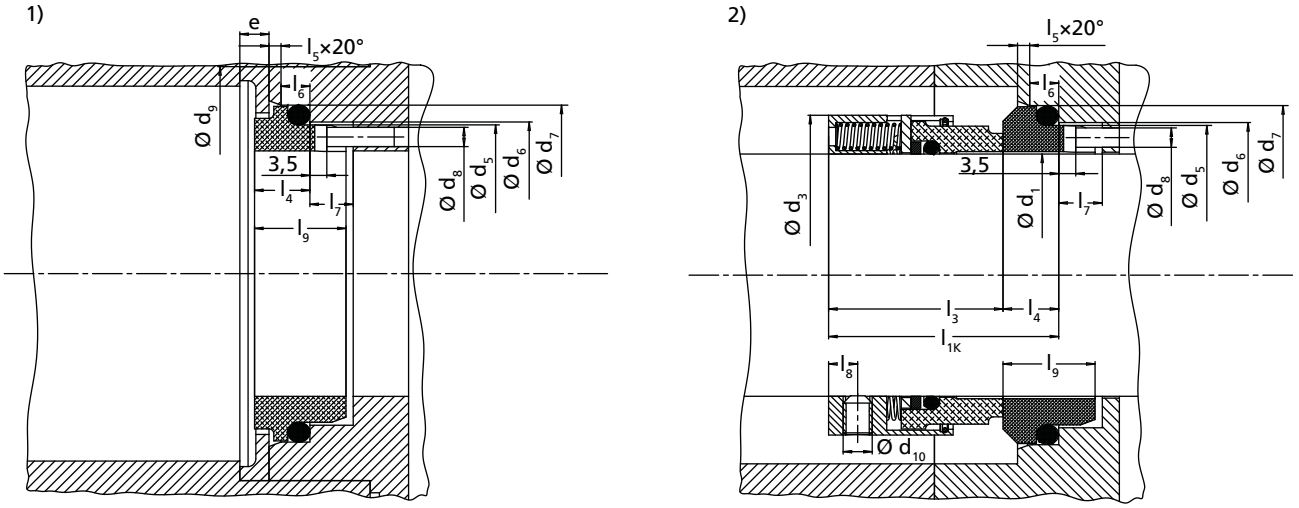


Fig. 2: Dimensions 5A

1	With seat lock
2	Without seat lock

Table 8: Dimensions 5A [mm]

d_1	d_3 [6]	d_6	d_7	d_8	d_9	d_{10}	e	l_1K [7]	l_2	l_3	l_4	l_5	l_6	l_7
028	42	37	43	3	48	M5 × 6	4	42,5	20	32,5	10	2	5	9
030	44	39	45	3	50	M5 × 6	4	42,5	20	32,5	10	2	5	9
032	46	42	48	3	53	M5 × 6	4	42,5	20	32,5	10	2	5	9
033	47	42	48	3	53	M6 × 6	4	42,5	20	32,5	10	2	5	9
035	49	44	50	3	60	M6 × 6	4	42,5	20	32,5	10	2	5	9
038	54	49	56	4	62	M6 × 8	6	45	23	34	11	2	6	9
040	56	51	58	4	65	M6 × 8	6	45	23	34	11	2	6	9
043	59	54	61	4	67	M6 × 8	6	45	23	34	11	2	6	9
045	61	56	63	4	70	M6 × 8	6	45	23	34	11	2	6	9
048	64	59	66	4	72	M6 × 8	6	45	23	34	11	2	6	9
050	66	62	70	4	75	M6 × 8	6	47,5	25	36	11,5	2,5	6	9
053	69	65	73	4	77	M6 × 8	6	47,5	25	36	11,5	2,5	6	9
055	71	67	75	4	86	M6 × 8	6	47,5	25	36	11,5	2,5	6	9
058	78	70	78	4	88	M6 × 10	6	52,5	25	41	11,5	2,5	6	9
060	80	72	80	4	91	M6 × 10	6	52,5	25	41	11,5	2,5	6	9
063	83	75	83	4	93	M6 × 10	6	52,5	25	41	11,5	2,5	6	9
065	85	77	85	4	96	M8 × 10	6	52,5	25	41	11,5	2,5	6	9
068	88	81	90	4	98	M8 × 10	6	52,5	28	40	12,5	2,5	7	9
070	90	83	92	4	103	M8 × 10	6	60	28	47,5	12,5	2,5	7	9
075	99	88	97	4	108	M8 × 12	6	60	28	47,5	12,5	2,5	7	9
080	104	95	105	4	120	M8 × 12	6	60	28	47	13	3	7	9

6) To determine the safety distance between rotating and stationary components these dimensions are recommended as maximum dimensions.

7) The mechanical seal manufacturer may supply a mechanical seal shorter than the dimension indicated. Any differences in length should be compensated by means of a spacer which should also be supplied by the manufacturer of the mechanical seal.

d_1	d_3[6)]	d_6	d_7	d_8	d_9	d_{10}	e	l_1K[7)]	l_2	l_3	l_4	l_5	l_6	l_7
085	109	100	110	4	125	M8 × 12	6	60	28	47	13	3	7	9
090	114	105	115	4	130	M8 × 12	6	65	28	52	13	3	7	9
095	119	110	120	4	135	M8 × 12	6	65	28	52	13	3	7	9
100	124	115	125	4	140	M8 × 12	6	65	28	52	13	3	7	9

9.1.2 5B

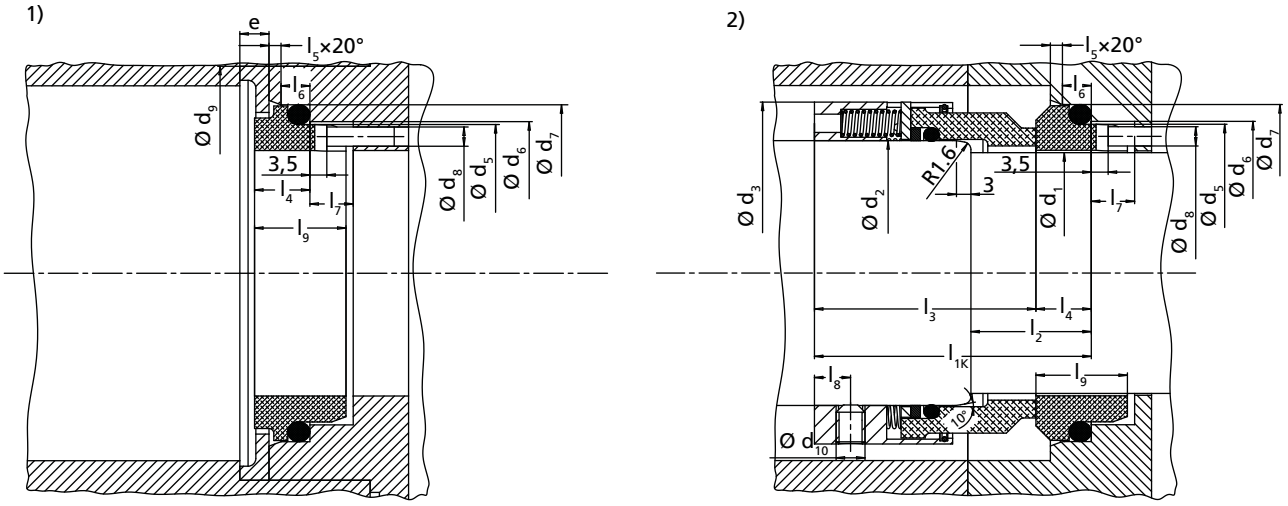


Fig. 3: Dimensions 5B

1	With seat lock
2	Without seat lock

Table 9: Dimensions 5B [mm]

d_1	d_2	d_3[8)]	d_6	d_7	d_8	d_9	d_{10}	e	l_1K[9)]	l_2	l_3	l_4	l_5	l_6	l_7
028	33	47	37	43	3	53	M6 × 6	4	50	20	40	10	2	5	9
030	35	49	39	45	3	60	M6 × 6	4	50	20	40	10	2	5	9
033	38	54	42	48	3	62	M6 × 8	4	50	20	40	10	2	5	9
035	40	56	44	50	3	65	M6 × 8	4	50	20	40	10	2	5	9
038	43	59	49	56	3	67	M6 × 8	6	52,5	23	41,5	11	2	6	9
040	45	61	51	58	4	70	M6 × 8	6	52,5	23	41,5	11	2	6	9
043	48	64	54	61	4	72	M6 × 8	6	52,5	23	41,5	11	2	6	9
045	50	66	56	63	4	75	M6 × 8	6	52,5	23	41,5	11	2	6	9
048	53	69	59	66	4	77	M6 × 8	6	52,5	23	41,5	11	2	6	9
050	55	71	62	70	4	86	M6 × 8	6	57,5	25	46	11,5	2,5	6	9
053	58	78	65	73	4	88	M6 × 10	6	57,5	25	46	11,5	2,5	6	9
055	60	80	67	75	4	91	M6 × 10	6	57,5	25	46	11,5	2,5	6	9
058	63	83	70	78	4	93	M6 × 10	6	62,5	25	51	11,5	2,5	6	9
060	65	85	72	80	4	96	M8 × 10	6	62,5	25	51	11,5	2,5	6	9
063	68	88	75	83	4	98	M8 × 10	6	62,5	25	51	11,5	2,5	6	9
065	70	90	77	85	4	103	M8 × 10	6	62,5	25	51	11,5	2,5	6	9
070	75	99	83	92	4	108	M8 × 12	6	70	28	57,5	12,5	2,5	7	9
075	80	104	88	97	4	120	M8 × 12	6	70	28	57,5	12,5	2,5	7	9
080	85	109	95	105	4	125	M8 × 12	6	70	28	57	13	3	7	9

8) To determine the safety distance between rotating and stationary components these dimensions are recommended as maximum dimensions.

9) The mechanical seal manufacturer may supply a mechanical seal shorter than the dimension indicated. Any differences in length should be compensated by means of a spacer which should also be supplied by the manufacturer of the mechanical seal.

d_1	d_2	d_3 [8)]	d_6	d_7	d_8	d_9	d_{10}	e	l_1K [9)]	l_2	l_3	l_4	l_5	l_6	l_7
085	90	114	100	110	4	130	M8 × 12	6	75	28	62	13	3	7	9
090	95	119	105	115	4	135	M8 × 12	6	75	28	62	13	3	7	9
095	100	124	110	120	4	140	M8 × 12	6	75	28	62	13	3	7	9
100	105	129	115	125	4	145	M8 × 12	6	75	28	62	13	3	7	9

10 Certificate of Decontamination

Type: .....

Order number/

Order item number[10]: .....

Delivery date: .....

Field of application: .....

Fluid handled[10]: .....

Please tick where applicable[10]:

☐ Radioactive

☐ Explosive

☐ Corrosive

☐ Toxic

☐ Harmful

☐ Bio-hazardous

☐ Highly flammable

☐ Safe

Reason for return[10]: .....

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, 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 adapter 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

10) Required fields

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