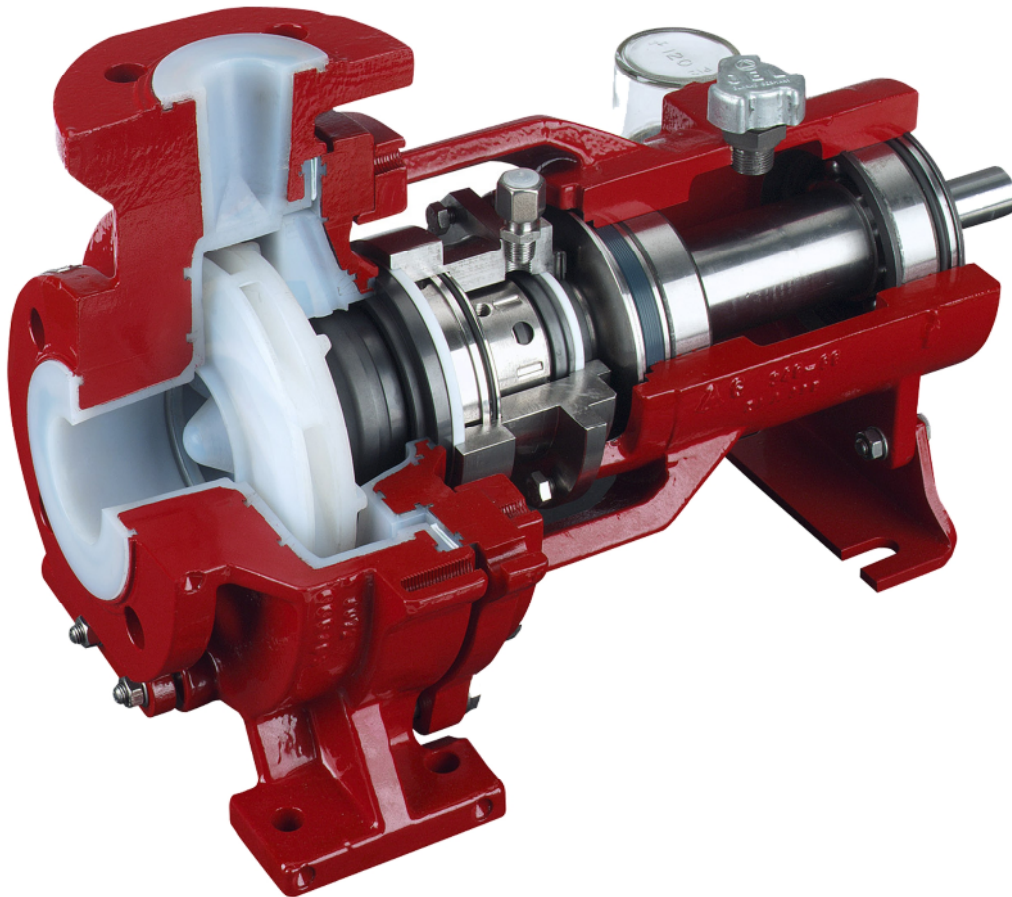


Series SCK

# Mechanical Seal RG-5

stationary, double,  
with quench or liquid sealed



**Keep for future use!**

This operating manual must be strictly observed before transport, installation, operation and maintenance

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## Relevant documents

- ◆ Operating manual SCK long-life grease and oil bath lubrication **9220-050-en**
- ◆ Operating manual mechanical seal of the manufacturer

## 1 Technical data

### Manufacturer :

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Authorised person acc. to machinery directive  
2006/42/EG: Gregor Kleining

### Designation :

Serie SCK mechanical seal  
◆ RG-5 stationary, double, with quench or liquid sealed in cartridge design

### Materials :

Seal housing: Stainless steel  
Wetted Parts: SSiC, FKM, FFKM, etc.  
see also data sheet

**Temperature range :** see installation and operating manual SCK, Section 1.

**Temperature classes :** see installation and operating manual SCK, Section 2.5.7.

## 2 Safety, transport and storage

The relevant sections in the adjacent installation and operating manuals apply to safety, transport and storage.

This installation and operating manual is only valid in conjunction with the installation and operating manuals of

SCK long-life grease and oil bath lubrication  
**9220-050-en**

### 2.1 Intended use

Double mechanical seals for plastic-lined pumps of the series SCK are suitable for the use of aggressive, toxic, pure and inflammable media.

**The instructions contained in the operating manual or contractual documentation are to be observed, if necessary consult the manufacturer.**

All the important features are documented in the data sheet included in the scope of delivery.

## 3 Product description

For a product description of the pump, see the installation and operating manual for the SCK series.

The **sectional drawing** shows a stationary, double mechanical seal RG-5, with quench or liquid sealed. See **Section 7**

All components which come into contact with the process medium are either lined with plastic or are made of other resistant materials, e.g. silicon carbide.

## 4 Commissioning / Shutdown

### 4.1 Initial commissioning

See installation and operating manual for the series SCK.

### 4.2 Mechanical seals

The design and material combination are specified in the data sheet.



The proper condition of the components and the protective facilities must be ensured to prevent any risk from escaping medium.

**The regulations and recommendations of the mechanical seal manufacturer must always be observed.**

#### 4.2.1 Use in an explosive area



Use in an explosive area means that only mechanical seals may be employed which permit observation of temperature.

The operating manual of the respective mechanical seal manufacturer is an integral part of this general operating manual.

This permits, amongst other things, the calculation of the expected surface temperature at the mechanical seal. The suitability for the permissible temperature class as per ATEX is hereby given.

#### **CAUTION:**

The permissible temperature class of the complete unit (pump, mechanical seal, coupling, motor) is determined by the lowest temperature class of the individual components.

Example: Pump **T4**, mechanical seal **T3**,  
coupling **T4**, motor **T4**

In both cases the unit may only be used in atmospheres which may ignite above the temperature class T3, i.e. >200 °C (>392°F).

#### 4.2.2 Mechanical Seal RG-5, with quench

The design and material combination are specified in the data sheet.

**A pump with a stationary mechanical seal with quench may only be started up when the quench system is in operation and the pump is filled with process medium.**

The pressure of the quench fluid must be max. 1 bar.

The admissible pressure for the storage container must also be observed.

If process water is used for quenching, a flow rate of approx. 40 l/h should be set. After a running-in phase of approx. 10 h the flow rate can be reduced so that the quench fluid emerges heated by about 20°C. A minimum flow rate of 5 l/h should be maintained.



Are the available connections correctly made?

**QE** - quench fluid inlet

**QA** - quench fluid outlet

See also sectional drawing in **Section 7**.

### 4.2.3 Mechanical Seal RG-5, liquid sealed

A pump fitted with a double mechanical seal must not be filled with a product before the available pressurisation system provided has been started up.

Otherwise damage could occur, e.g. opening of the wetted sealing gap, before start-up.

To guarantee safe operation, the pressure of the barrier fluid must be 1-2 bar above the pressure of the process medium at the mechanical seal at  $Q=0 \text{ m}^3/\text{h}$ . To guarantee safe operation, the pressure of the barrier fluid must be 1-2 bar above the pressure of the process medium at the mechanical seal at  $Q=0 \text{ m}^3/\text{h}$ .

The required sealing pressure can be determined as follows:

- 2/3 of the delivery pressure at  $Q = 0 \text{ m}^3/\text{h}$
- + supply pressure
- + 1 - 2 bar safety margin

The supply pressure is measured in bar at the pump suction nozzle. If no measuring point is available, the supply pressure can be calculated using the following formula.

Using the same formula, the delivery pressure at  $Q=0 \text{ m}^3/\text{h}$  can be determined with the pump characteristic curve.

$$p(\text{bar}) = \frac{H(\text{mFS}) \times \rho(\text{kg/dm}^3)}{10,2}$$

- $p$  = supply pressure or delivery pressure
- $H$  = supply height or delivery head
- $\rho$  = density

Are the available connections correctly made?



SE - barrier fluid inlet

SA - barrier fluid outlet

See also sectional drawing in [Section 7](#).

### 4.3 Improper operation and their consequences (examples)

Improper operation, even for brief periods, may result in serious damage to the unit.

In connection with explosion protection, potential sources of ignition (overheating, electrostatic and induced charges, mechanical and electric sparks) can result from these inadmissible modes of operation; their occurrence can only be prevented by adhering to the intended use.

For examples, see installation and operating manual SCK, [Section 6.6](#).

## 5 Maintenance



The regulations of the mechanical seal manufacturer must always be observed.

See also the installation and operating manual for the SCK series.

### 5.1 Mechanical Seal RG-5, with quench

Any quench fluid which has escaped must be replenished in good time.

A difference is made between open and closed quench systems.

It must be ensured with closed systems that the filling level is always adequate. The quench fluid can be enriched with the process medium through leaks and is therefore to be completely changed from time to time in line with the operating requirements.

If the filling level of the quench fluid has risen in a storage container provided, it must be replaced immediately.

### 5.2 Mechanical seal RG-5, liquid sealed

It is important to replenish in good time any barrier fluid which has escaped and to monitor the barrier fluid pressure

The minimum barrier fluid pressure must never be undershot as long as the pump housing is under pressure.

Refer also to the description of the pressurisation system used and [Section 4.2.2](#).

If the barrier fluid pressure is too high, this indicates a defect in the mechanical seal even though the mechanical seal on the atmosphere side is completely tight.

The pump must then be shut down so that no serious damage occurs.

Substantial damage generally occurs if the aggressive process medium enters the pressurisation system as a result of a drop in the barrier fluid pressure to below the minimum pressure.

If there is a risk of pressure surges in the plant, precautions must be taken to prevent damage. For example, the barrier fluid pressure can be increased up to the pressure limit of the mechanical seal used.

### 5.3 Dismantling of a stationary, double mechanical seal RG-5

Dismantling can be checked using the sectional drawings in [Section 7](#) and [Section 9](#) of the installation and operating manual SCK as well as the components available.

#### 5.3.1 Dismantling of back plate, impeller and RG-5

- Loosen assembly gauges **694/1**, push into the groove and tighten again with the hex. screw **901/8**.
- Undo hex. nut **920/6** with washers **554/6** of the bearing pedestal / back plate.
- Undo back plate (for instructions, see [Sections 4.2.1 and 7.7.4](#) in the installation and operating manual SCK).
- Move the back plate almost up to the impeller with light hammer blows.
- Unscrew the impeller **230** completely.

#### ➤ Bearing pedestal group 3:



Labyrinth disc 555 must be secured with two bolts **prior to the dismantling** of the impeller. For this purpose there are 2 bores Ø5mm in the bearing pedestal. The double mechanical seal is relieved of pressure as a result. See Dismantling [in Sections 7.7.1 and 7.7.5](#) in the installation and operating manual SCK.

Undo impeller **230** with a strap wrench or assembly wrench. **Right-hand thread!** Press the back plate off in the direction of the impeller as well.

- For assembly aid for impeller, see [Section 10.1](#) in the installation and operating manual SCK.
- Undo nuts **920/6** and pull out RG-5 completely.

### 5.4 Notes on assembly

- Only use original spare parts.
- Do not use any defective parts.
- The recommendations of the mechanical seal manufacturer are to be observed.
- Bearing pedestal group 3:  
Always make sure that when installing the mechanical seal the labyrinth disc is secured by 2 bolts.  
The bolts must be removed again after assembly of the impeller.
- Undo assembly gauge **694/1** after tightening the impeller, pull out of the groove and secure again with the hex. screw **901/8**.

## 6 Faults

Faults may result from inadmissible modes of operation. Such inadmissible modes of operation – even brief ones – may cause serious damage to the unit.

In connection with explosion protection, potential sources of ignition (overheating, electrostatic and induced charges, mechanical and electric sparks) can result from these inadmissible modes of operation; their occurrence can only be prevented by adhering to the intended use. See also [Section 2.1](#).

Should there be any uncertainty about the remedy to be applied, please inquire at the in-house pump office or at the pump manufacturer's.

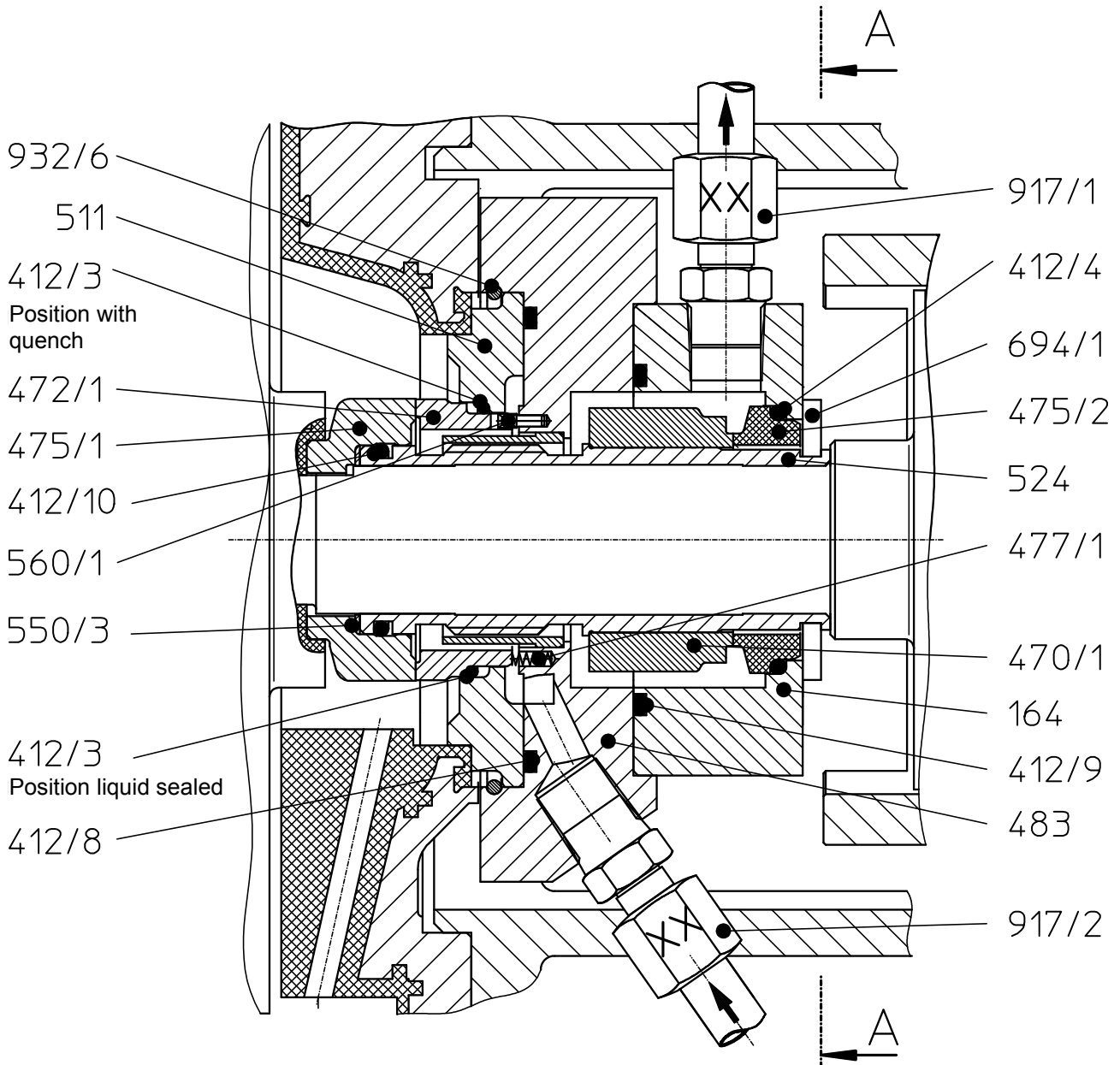
See also [Section 8](#) in the installation and operating manual of the SCK series.

## 7 Sectional drawing

### 7.1 Stationary, double mechanical seal RG-5, with quench or liquid sealed

**XX: QA** design „quench“= quench fluid outlet / venting

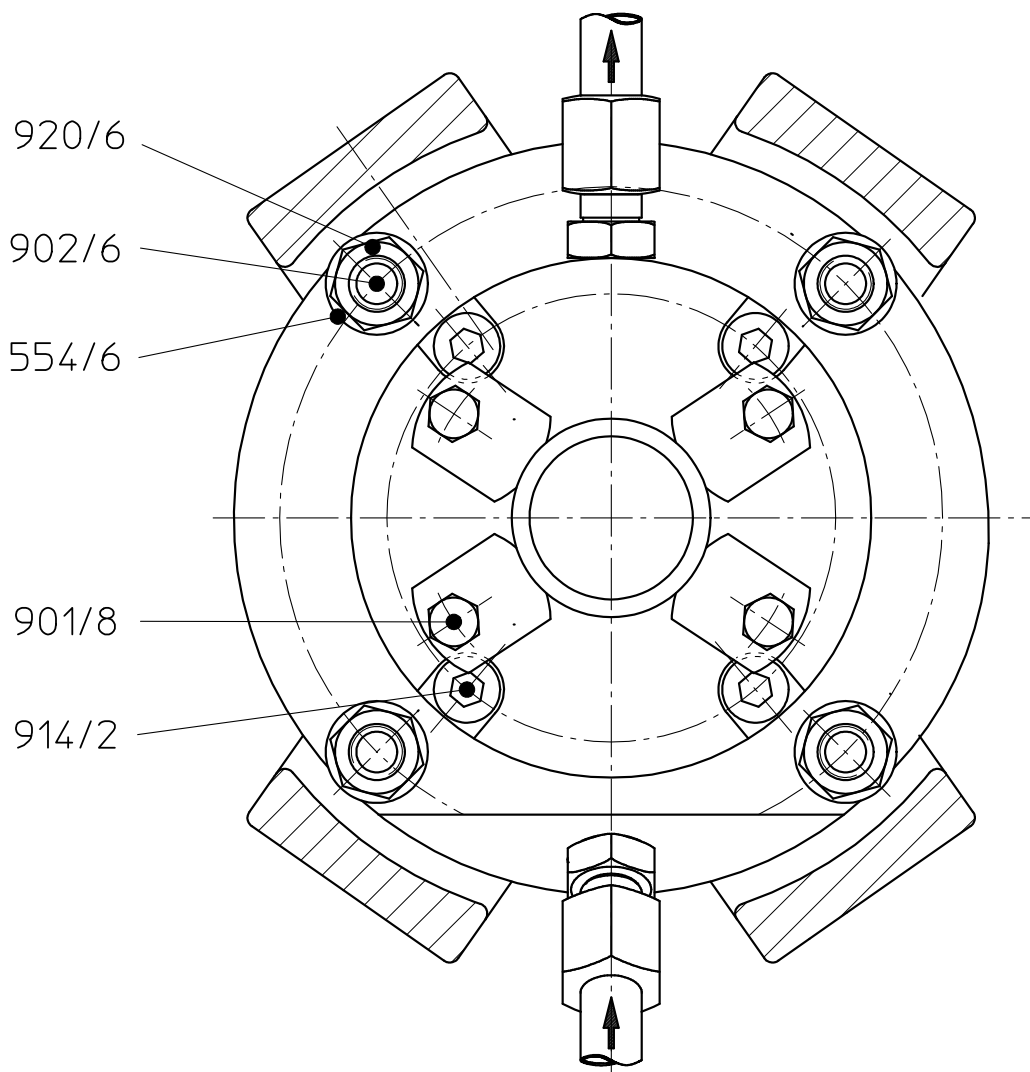
**XX: SA** design "liquid sealed" = barrier fluid outlet/ venting



**XX: QE** design „quench“= quench fluid inlet

**XX: SE** design "liquid sealed" = barrier fluid inlet

## 7.2 Section A - A



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## 7.3 Legend

<b>161</b>	back plate	<b>524</b>	shaft sleeve
<b>164</b>	seal housing cover	<b>550/3</b>	disc
<b>210</b>	shaft	<b>554/6</b>	washer
<b>412/x</b>	O-ring	<b>560/1</b>	stud
<b>470/1</b>	rotating unit	<b>694/1</b>	assembly gauge
<b>472/1</b>	seal face	<b>901/8</b>	hex. screw
<b>475/x</b>	mating ring	<b>902/6</b>	stud screw
<b>477/1</b>	spring	<b>914/2</b>	hex. socket screw
<b>483</b>	seal housing	<b>917/x</b>	screw-in pipe connector
<b>511</b>	centering ring	<b>920/6</b>	hex. nut
		<b>932/6</b>	circlip