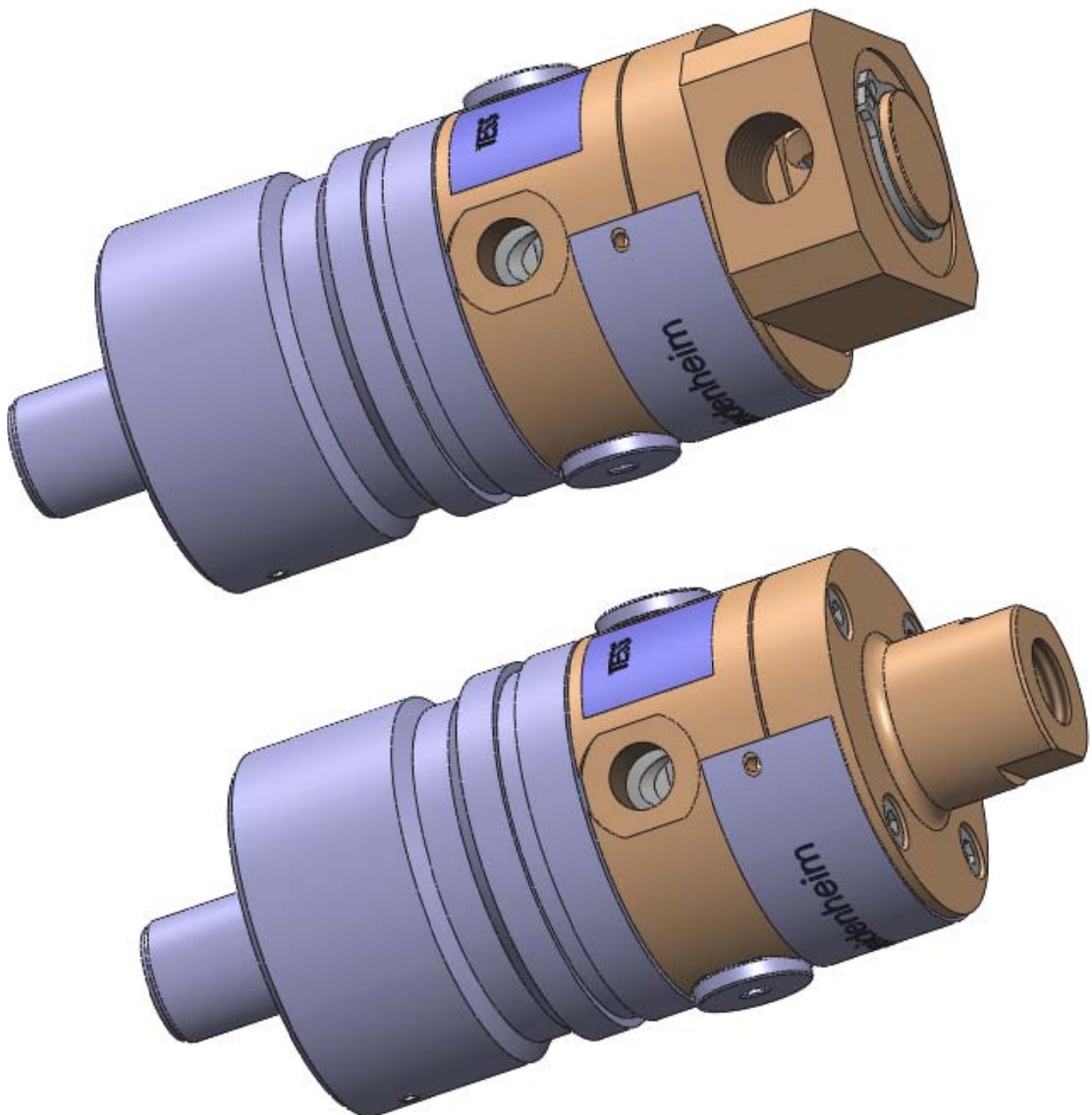


Operating Instructions for Maier Rotary Unions

Series K / KT





Preface



Keep this manual for future reference.

Editor

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Section	Contents	Designation
1	General part of the operating instructions	
2	Specifications and spare parts	



B General part of the operating instructions for Maier Rotary Unions K/KT

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1. General

1.1 Information on this manual

This manual is intended for use by the operators, the maintenance and the inspection staff. It is divided into the following sections:

- Section 1 "General Part of the Operating Instructions":
(pages with the designation B)
This section provides general information on the manual, on safety and on handling the product
- Section 2 "Specifications and Spare Parts":
(pages with the designation S)
This section provides product-specific data

The operators must read and fully understand this manual and observe all instructions it contains. Exclusion of liability: We shall not be responsible in any way for damages and interruptions or any type of consequences whatsoever resulting from the failure to read and/or observe the instructions contained in this manual.

Read chapter 3 and the specific safety instructions in the individual chapters with particular care.

We reserve the right to technical modifications, i.e. the components may actually differ from the information given in this manual to the extent to which such modifications are required to improve the rotary union or its accessories.

1.2 Explanations and symbols

Symbol	Used for	Explanation
•	List	List of facts or instructions. No specific sequence required.
1.	Instructions consisting of several individual steps	Instructions consisting of several steps must be followed exactly in the sequence listed. Failure to observe the instructions in the correct sequence may result in damages or accidents.
[1]	Item number	Item number of the component mentioned in the corresponding illustration.



2. Product description

2.1 Intended use

Maier rotary unions are high-precision devices which may only be used to connect pressurized pipes to rotating pressurized systems. Typical examples of such rotating pressurized systems are motor spindles or tool systems through the inside of which flow liquids or air in order to cool them, lubricate them or actuate or control them hydraulically or pneumatically. Series K rotary unions are designed for fluids such as cutting fluids or multi-purpose oils, series KT rotary unions for cutting fluids, multi-purpose oils, aerosols or compressed air. Other fluids are possible; please contact the manufacturer. Please refer to the section "Specifications and Spare Parts" for approved fluids and their qualities and limits; this information must be observed in the application.

Never modify the rotary union as this may cause hazards. Install, operate and maintain the rotary union only as described in these operating instructions. Christian Maier GmbH & Co. KG shall not be liable for any damage and interruption whatsoever caused by failure to adhere to the operating instructions.

Always comply with all national and local regulations applicable at the installation site as well as all regulations concerning safety and the prevention of accidents.

Use only genuine spare parts or standard norm parts explicitly approved by Christian Maier GmbH & Co. KG for repairs. If you use other parts, this may have adverse effects on the safety of the unit.

2.2 Reasonably foreseeable misuse

In the case of reasonably foreseeable misuse of the product, the manufacturer's warranty shall be void and the operator shall be fully responsible for the consequences.

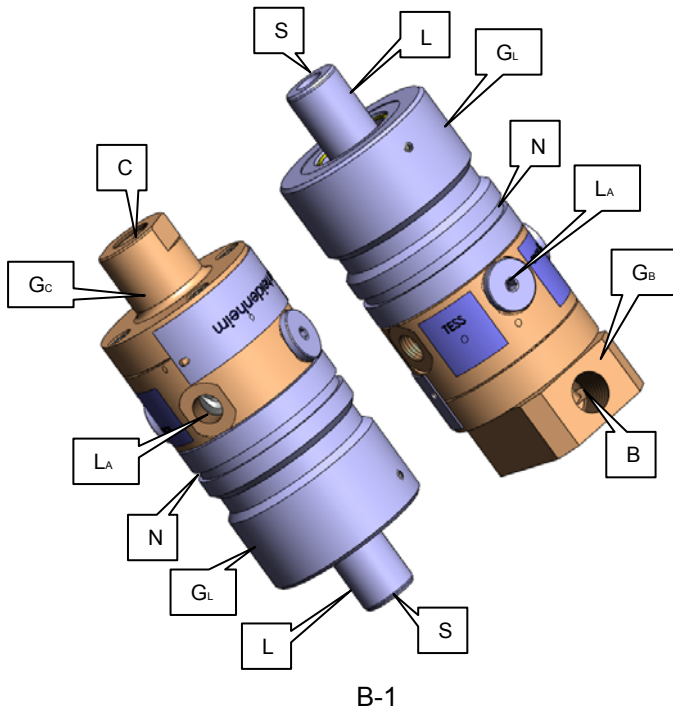
Reasonably foreseeable misuse includes, but is not limited to:

- failure to adhere to application data
- failure to adhere to fluid specifications
- failure to adhere to maintenance intervals
- failure to replace wearing parts
- failure to perform maintenance work
- maintenance work performed with errors
- additional components mounted and conversions without written approval
- use of spare parts other than genuine spare parts

B Operating Instructions for Rotary Unions K / KT

2. Product description

2.3 Components



- [B] Housing connections for the fluid radial
- [C] Housing connections for the fluid axial
- [GB] Housing with connection radial, rotatable by 360° (usually stationary)
- [GC] Housing with connection axial (usually stationary)
- [GL] Bearing housing (usually stationary)
- [L] Rotor (usually rotating)
- [S] Outlet fluid
- [LA] Leakage connection
- [N] Groove for axial fastening

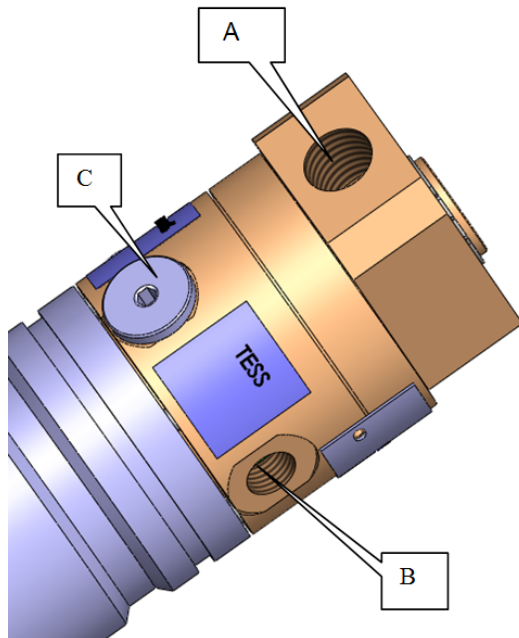
2.4 Function

Maier rotary unions are high-precision devices which may only be used to connect pressurized pipes to rotating pressurized systems. Typical examples of such rotating pressurized systems are motor spindles or tool systems through the inside of which flow liquids or air in order to cool them, lubricate them or actuate or control them hydraulically or pneumatically.

The connection to the stationary pressure system (housing connection) is obtained via the stationary part of the rotary union – the housing. Depending on the version, the following types can be distinguished:

B Operating Instructions for Rotary Unions K / KT

2. Product description

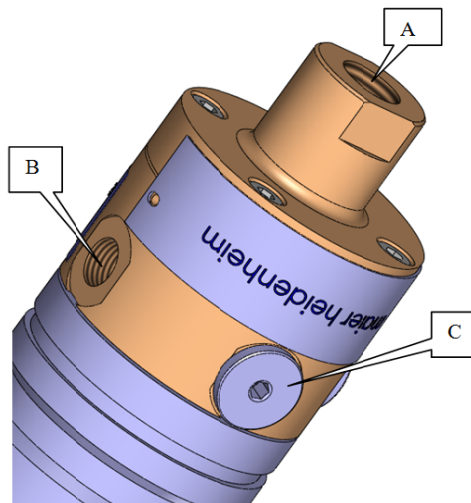


B-2

- **Version B / radial connection / with four leakage connections:** housing with a radial connection for supplying or removing the fluid to or from the rotating pressure system. The radial version features a fluid connection that can be rotated by any degree [A] and four leakage connections [B] at angles of 90° [B]. The additional leakage connections are factory-sealed with screw plugs [C] and can be used as required.
- The hose routing design does not have to be exactly defined. Since the fluid connection can be moved anywhere, the leakage connection [B] can always be at the bottom position in the case of horizontal installation. This is a prerequisite for trouble-free operation.
- For this reason, this version should always be selected for horizontal installation and if the hose routing has not yet been finalized.
- If leakage discharge is a problem, in particular in the case of tilting spindles, it is possible to connect two hoses simultaneously. This way, any leakage can be fully discharged from the rotary union, irrespective of the spindle position.
- For this reason, you should always use several leakage connections if the rotary union is installed radially in tilting spindles.

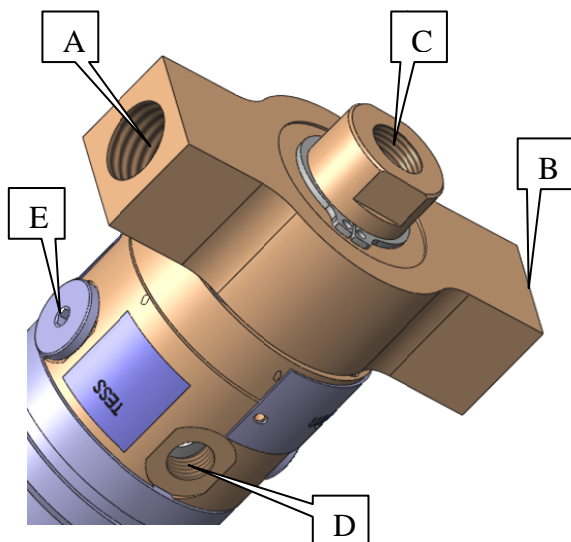
B Operating Instructions for Rotary Unions K / KT

2. Product description



B-3

- **Version C / axial connection / with four leakage connections:** housing with an axial connection for supplying or removing the fluid to or from the rotating pressure system.
- The fluid connection [A] is axial. There are no deflections of the flow of the fluid. Undercuts and changing diameters are avoided. Due to the above measures, the rotary union is perfectly suited for minimum quantity lubrication, externally mixed.
- [B] shows the leakage connections; there are three additional leakage connections at angles of 90°; each of the leakage connections is closed by means of a screw plug [C].
- If leakage discharge is a problem, in particular in the case of tilting spindles, it is possible to connect two hoses simultaneously. This way, any leakage can be fully discharged from the rotary union, irrespective of the spindle position.
- For this reason, you should always use several leakage connections if the rotary union is installed axially in tilting spindles.

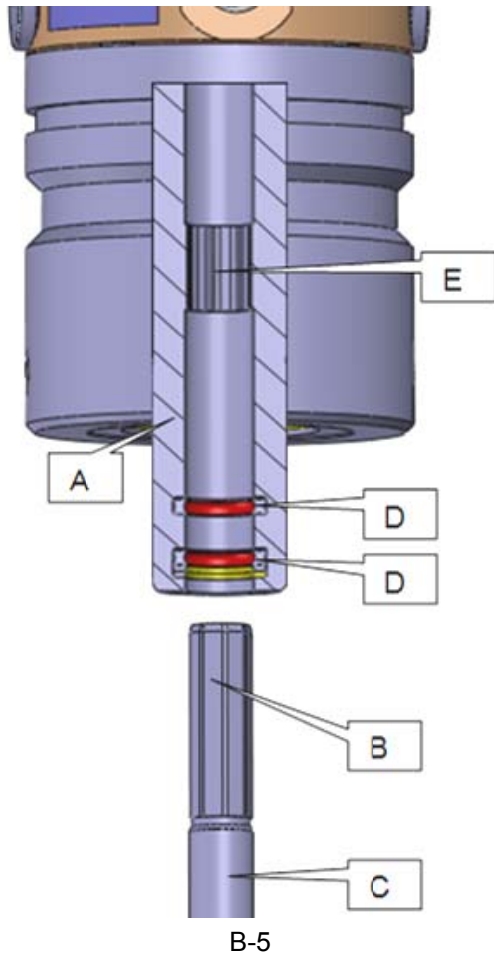


B-4

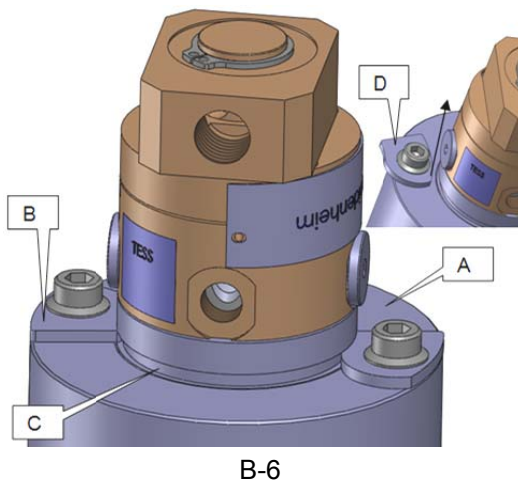
- **Version with one axial and two radial connections / with four leakage connections:** housing with two radial connections [A] & [B] and one axial connection [C] for supplying three fluids to the rotating pressurized system. The radial connection piece can be turned as required [A] & [B]. Both radial connections are equipped with check valves so that only the axial connection must be closed. The version with three connections has four leakage connections [D] arranged at angles of 90°. The additional leakage connections are factory-sealed with screw plugs [E] and can be used as required.
- This version is particularly suitable for three fluids which are permanently connected and which can be flexibly activated as required. For example, cutting fluid and air at the radial connections and aerosol at the axial connection.

B Operating Instructions for Rotary Unions K / KT

2. Product description



- **Rotor connection:** The connection to the rotating pressurized system is made by the rotating part of the rotary union – the rotor.
- The hole through which the fluid flows is located in the inside of the rotor.
- The figure at the side shows the part of the rotor protruding over the bearing housing [A].
- The inside of the rotor [E] holds the driving rod connection/transfer pipe [C]. The upper part of this driving rod connection is a polygonal piece [B] (an octagonal piece in the case of the standard version) which drives the rotor.
- Seals [D] are located in the front area of the rotor which seal the cylindrical part of the driving rod connection with reference to the rotor.
- The driving rod connection is a part of the tool clamp. It moves axially with the tool clamp each time the tool is changed.
- During the opening stroke, the polygonal piece must not move beyond the counter-piece in the rotor.
- See the section "Specifications and Spare Parts" of these operating instructions for opening stroke possibilities and polygonal piece versions.
- Driving rod connections can be ordered as accessories for the rotary union (contact Christian Maier GmbH & Co. KG).



- **Fastening of the rotary union:** The rotary union is centered by means of the cylindrical receptacle of the loosening unit [A] and fastened by means of two clamping pieces [B]. The clamping pieces are swiveled into the groove [C] fixated by means of screwing. This way, the rotary union is fixated axially.
- **Special property:** The clamping pieces do not have to be completely removed to dismount the rotary union. It is sufficient to loosen the screw connection, to swivel the clamping piece away and to fixate it! [D]
- This kit of clamping pieces is available as an accessory (product number 1193001-002).

INFORMATION



Please refer to our catalog and the corresponding outline drawing in the section "Specifications and Spare Parts" for further information.



3. Safety

3.1 Introduction

The rotary union was designed and built according to the latest technology and complies with the pertinent safety regulations. However, the rotary union may still cause hazards if it is not used as intended or if it used by untrained staff or in an incorrect way.

Never tamper with the rotary union or modify it in any way as this may adversely affect the safety and the performance of the rotary union. We shall not be liable for any damages resulting from unauthorized modification of the rotary union.

The owner/operator of the rotary union must check his safety concept in terms of the effects a failure of the rotary union may have on the environment. Make sure to take all additional safety measures required to protect persons and the environment.

3.2 General safety information

- Always keep the operating instructions at the installation site for quick and easy access.
- In addition to the instructions provided in this manual, you must also observe all the pertinent regulations and guidelines concerning workplace safety and prevention of accidents.
- Use only flexible elements for housing connections. Do not apply forces to the housing via the connections.
- Torque support is provided via the friction at the clamping pieces; however, if they are not mounted properly, the hose connection provides the torque support. When the bearings block in this case, the hose connection can burst. Caution: Fluid can escape under high pressure and at high temperatures! Provide a protection unit or a cover to protect against this hazard.
- Only perform work on the rotary union when the machine/system is at a standstill and the pressure released.
- Only operate the rotary union if it is in perfect technical condition. Only use the rotary union according to the instructions and specifications; never operate the unit outside of the framework of the specifications and performance data indicated. Be aware of all pertinent safety and danger aspects when operating the rotary union. Immediately repair any malfunctions or problems or have such malfunctions or problems repaired as they may interfere with the safety of the rotary union!
- The service life of counter-rotating parts is limited. Therefore, perform preventive repair of all seals and bearings as per section 8.2!
- If you need to dismantle safety devices for repair or maintenance of the rotary union, you must refit such devices immediately upon completion of the work and check the proper function of the devices!
- Retighten all screw connections that you may have loosened for maintenance or repair work! Refer to the section "Specifications and Spare Parts" for information on the tightening torques.

INFORMATION



Refer to the section "Specifications and Spare Parts" for additional information.



B Operating Instructions for Rotary Unions K / KT

3. Safety

3.3 Structure of the safety messages

3.3.1 Signal words

DANGER



Immediately imminent danger. Failure to observe the information will result in death or severe injuries.

WARNING



Possibly imminent danger! Failure to observe the information can result in death or severe injuries.

CAUTION!



Possibly imminent danger! Failure to observe the information may result in minor injuries.

NOTICE



Possibly imminent danger! Failure to observe the information may result in damage to property/equipment damage.

INFORMATION



Provides additional information

B Operating Instructions for Rotary Unions K / KT

3. Safety

3.3.2 Pictograms

**Warning: general hazards**

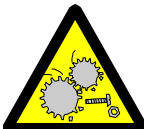
This warning pictogram highlights activities that involve several hazards.

**Warning: hot surfaces**

This warning pictogram highlights activities that involve hazards caused by hot surfaces.

**Warning: crushing hazard**

This warning pictogram highlights activities that involve hazards caused by rotating machine parts.

**Warning: equipment damage**

This warning pictogram highlights activities that involve damage to the rotary unions caused by incorrect operation.

3.4 Authorized staff

Only staff that has read and fully understood these operating instructions and that is fully aware of the dangers resulting from the unit as well as the appropriate safety precautions may work with Maier rotary unions. Such staff must have at least the knowledge of a trained locksmith or industrial mechanic who has experience with pressurized components.

Each person having to do with the installation, mounting, dismantling, commissioning, maintenance and repair of the rotary union or any other activities concerning the rotary union must have read and fully understood the operating instructions (and, in particular, all the safety messages) before taking up such activities. It is recommended that the owner of the rotary union have each person confirm this in writing.

3.5 Risk assessment and residual risks

Rotary unions are machine components that can be used in a large variety of machines and system. These products are not subject to the Machinery Directive 2006/42/EC – hazards caused by this product are treated by compliance with the pertinent directive 97/23/EC (Pressure Equipment Directive). Directive 94/9/EC (Explosion Protection Directive) additionally applies to "ATEX" certified rotary unions.

After installation of our rotary unions into systems/machines, these are subject to the Machinery Directive and may be subject to additional directives and legislation. The user of our products is responsible for complying with all pertinent directives and legislation as well as for performing a risk assessment in accordance with these directives. Depending on the actual installation situation and the actual use of our product, risks may arise that should be avoided by design measures, if possible.

An analysis carried out by Christian Maier GmbH & Co. KG Maschinenfabrik resulted in the aspects listed below which necessitate an additional risk assessment by the user after installation of our products in the system / machine:

- If hot parts are touched or if hot or hazardous fluids escape under high pressure or if rotating parts draw in persons, this may result in severe burns, cuts or crushing.
 - Possible measures: Mount a protective cover to the rotary union that prevents direct contact with hot parts, safely retains escaping fluid and avoids contact with rotating parts.
 - If a hood cannot be mounted, other suitable protective measures must be taken. Always use the housing connections provided for the safe discharge of leaking fluid.
- If the rotary union is not mounted properly and the bearing blocks, the rotary union can rotate along with the spindle; this may cause the hoses to be damaged and hot or hazardous fluids may escape under high pressure.
 - Always observe the design and mounting and operation information in chapter 5.
 - Ensure that the unit is regularly maintained as per chapter 8.

The user of our products must verify the applicability and effectiveness of the possible measures listed in the actual situation.

Dangers



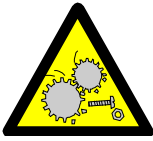
- Warning!
If you touch hot parts or come into contact with liquids escaping under high pressure, this may result in severe injuries and dangerous burns.
- ⇒ Mount a protective cover to the rotary union that prevents direct contact and safely retains escaping fluid.



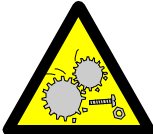
- Warning!
If the rotary union is not mounted properly and blocks, it may rotate along with the rotating tool in the case of malfunctions; this may cause the hoses to be damaged so that liquids can escape under high pressure.
- ⇒ Always observe the design and mounting information in chapter 5.
Monitor the bearings of the rotary union by means of a vibration pickup.
Ensure that the unit is regularly maintained as per chapter 8

B Operating Instructions for Rotary Unions K / KT

3. Safety



- Caution!
Damage to components caused by vibration and heat expansion.
⇒ Use only flexible hoses to connect the unit!



- Caution!
Danger of damage if the rotary union is not used as intended.
⇒ The specifications listed in this document are binding.
⇒ Never operate the unit beyond the application data specified!
⇒ Use only approved fluids and lubricants!
⇒ Christian Maier GmbH & Co. KG shall not be liable for any damage whatsoever caused by failure to adhere to limit values or use of unsuitable fluids and lubricants!



4. Storage

Storage

- It is recommended to store the rotary union in the protective package in which it was shipped.
- In the original packages, Maier rotary unions are not suited for a storage time of more than 6 months.
- In the case of extended shutdown or storage periods of rotary unions, it is recommended to use suitable corrosion protection film as provided, for example, by Cortec Corp. (www.CortecVCI.com).
- The storage room must be free from dust, sufficiently ventilated and not subject to major temperature changes (relative humidity below 65%, temperature between 15°C (59°F) und 30°C (86°F)).
- After a storage time of more than approx. 3 years or when the package has been damaged or the unit has been subjected to shocks, the rotary union must be checked in the factory or the nearest service center!
- If you want to preserve complete system components including the rotary union, make sure the corrosion protection measures are compatible with the materials and sealing elements used! Risk of chemical reactions and accumulations at sealing and bearing elements.
- After longer storage periods, verify that the rotary union can be easily rotated. Due to the closed rotating mechanical seal, there is slight friction and there may be friction noise which is harmless.

5. Information on design and mounting and operation

The following must be noted for fast and reliable mounting and commissioning, for safe operation of the rotary union and for ensuring that the warranty will not be void:

- Never operate the rotary union outside of the application and performance limits specified.
- For smooth operation of rotary union ensure concentricity and minimum run-out tolerance at the point where it is connected! See section 6.1 for more detailed information.
- The information on the admissible mounting position of the rotary union provided in the section "Specifications and Spare Parts" must be adhered to.
- Use hydraulic hoses between the supply system and the rotary union housing. This compensates for heat expansion and vibrations.
- Never apply torsional, tensile or pressure loads to the lines. Observe the minimum bend radius as specified by the manufacturer – if in doubt, contact your hose vendor. Section 6.2 provides examples of possible hose installation.
- In order to reliably seal the pressure line, use screw-in connections with Eolastic seal ED!
- Connect the leakage connection with a push-in fitting - sealed in the thread - for an 8 mm hose. Plug in a hose for the leakage with an inside diameter of at least 5.5 mm and make sure that all escaping leakage can be completely removed. A gradient must be available to ensure unobstructed removal of the leakage. Backpressure in the leakage line will cause premature failure.



B Operating Instructions for Rotary Unions K / KT

5. Information on design and mounting and operation

- Christian Maier GmbH & Co. KG recommends: Festo push-in fittings with G1/8 (ordering no.: QS-G1/8-8 #186098) or with 1/8" NPT (ordering no.: QB-1/8-5/16-U #533274) corresponding to the leakage connections
- It is recommended to use the leakage monitoring unit, product number 1193000. It is equipped with two switching outputs, one as a pre-alarm and one as an alarm if the limit amount of approx. 4 l/h of leaking liquid is exceeded. This allows the spindle to be protected from being flooded.
- Optional safety equipment:
Install a vibration pickup with connection to the machine controller in order to avoid bearing damage and consequential damage and enable preventive maintenance!
- The rotary union will only run smoothly in case of concentricity of the driving rod connection and coaxiality of the loosening unit and the pull rod connection. See section 6.1 of this chapter for detailed information.
- In order to ensure the reliability and service life of the seal in the rotary union, the quality of the fluid must comply with the specifications (see "Specifications and Spare Parts page", section 1 and section 3)!

INFORMATION



Refer to section 3.4 for additional information.

B Operating Instructions for Rotary Unions K / KT

6. Mounting

6. Mounting

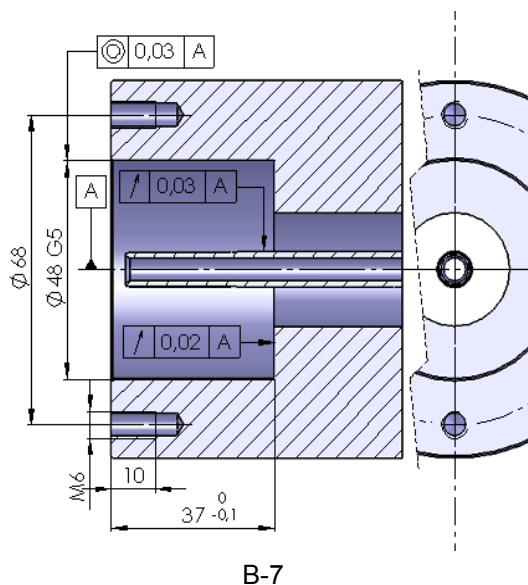
6.1 Mounting the rotary union to the spindle

INFORMATION



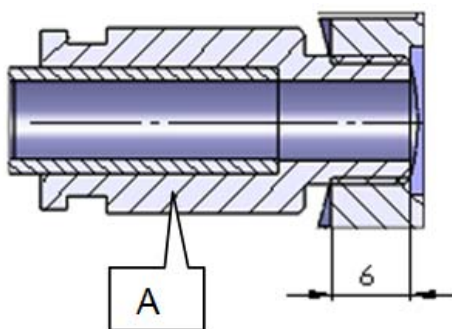
Use connection pieces with cutting edges. The rotor connection is sealed by means of the O rings at the rotor.

Mounting preparation and separation of inner pipe for duo (dual-passage) version



B-7

- Check the connection prerequisites as per this figure prior to mounting the rotary union to the spindle.
- The specified clearances, form and position tolerances must be adhered to in order to avoid wobbling of the rotor which will cause premature bearing failure.

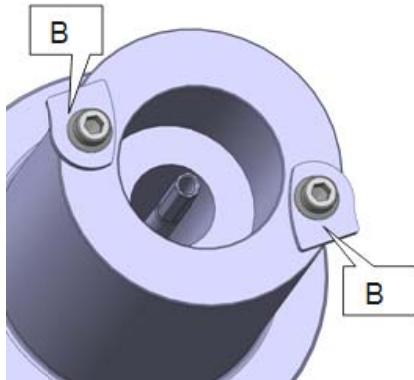


B-8

- Push-in fitting at leakage connection [A], screw in thread with Teflon coating for an 8 mm hose. **In the case of a leakage connection with cylindrical thread, make sure to note the maximum screw-in depth of 6 mm!**

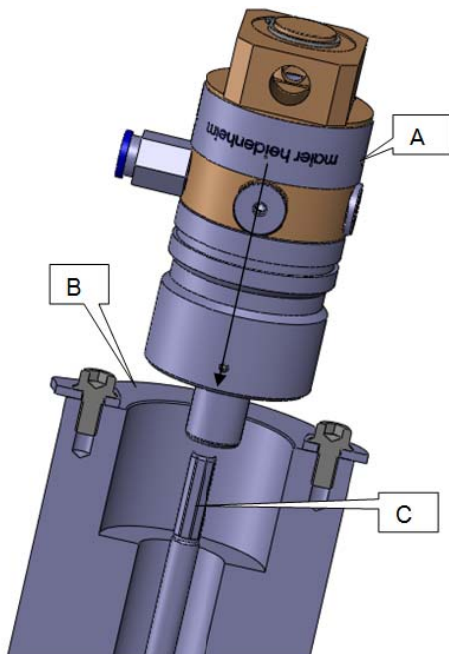
B Operating Instructions for Rotary Unions K / KT

6. Mounting



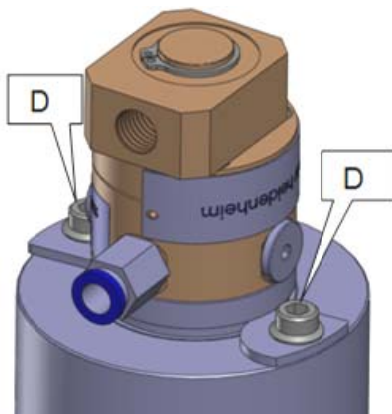
B-9

- Mount the clamping pieces [B] accessory Christian Maier GmbH & Co. KG product no. 1193001-002 to the loosening unit, turn the clamping pieces to the side so that the cylindrical receptacle for the rotary union is completely free!



B-10

- Carefully push the rotary union [A] into the receptacle of the loosening unit [B].
- Find the position of the driving surfaces of the driving rod connection [C] with reference to the driving surfaces of the rotor by slight movements.
- Push the rotary union into the loosening unit all the way until it contacts the front surface.



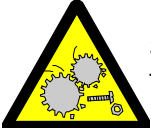
B-11

- Swivel the clamping pieces (figure 9 [B]) into the groove of the rotary union and tighten screws [D]. Observe the torque specifications for the screws used! (M6 property class 10.9 with 13 Nm, cylinder flange screw with hexagon socket and locking fins below the flange p.cl. 100 (contained in kit of Christian Maier GmbH & Co. KG) with 19 Nm).

B Operating Instructions for Rotary Unions K / KT

6. Mounting

NOTICE



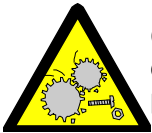
Smooth and trouble-free operation of the rotary union requires the connection conditions, figure 7, to be met!

INFORMATION



Observe the information in section 5!

NOTICE



Carefully avoid any type of damage to the rotary union during mounting. Due to the extremely small production tolerances, even minimum bends may damage the high-precision component and considerably reduce the service life.

B Operating Instructions for Rotary Unions K / KT

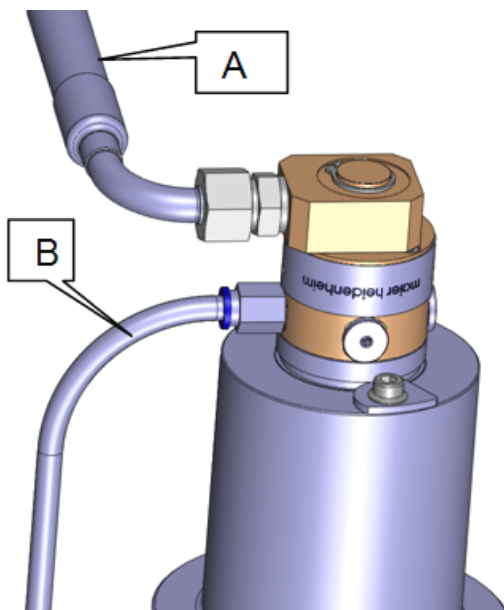
6. Mounting

6.2 Connecting the rotary union

INFORMATION

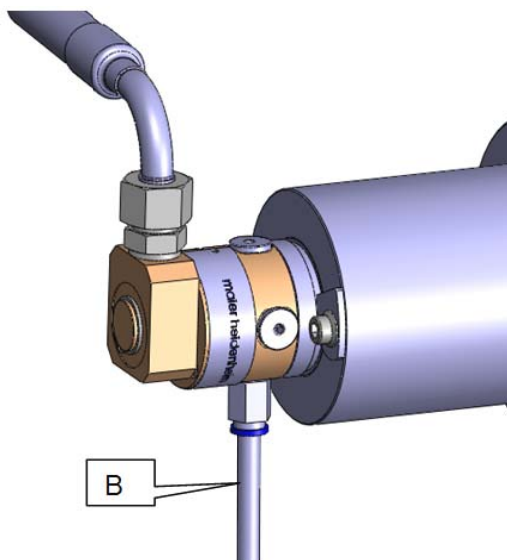


Also refer to chapter 5. for important information on this section.



B-12

- The figure shows a connection example with vertical arrangement.
- The pressure connections [A] at the rotary union must be able to move freely; they must not apply additional loads or tension to the rotary union!
- Ensure sufficient gradient for the leakage connection [B] and avoid bending or insufficient radii! It must be ensured that leakage can be removed without obstacles in any mounting position!

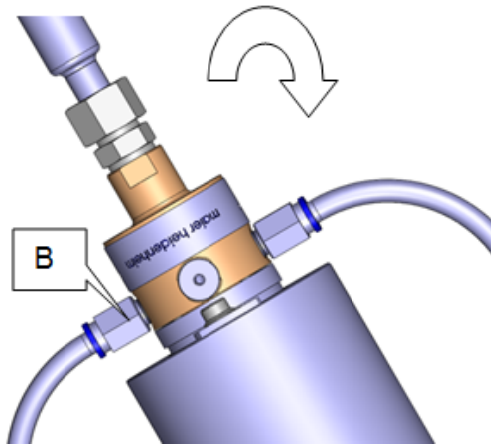


B-13

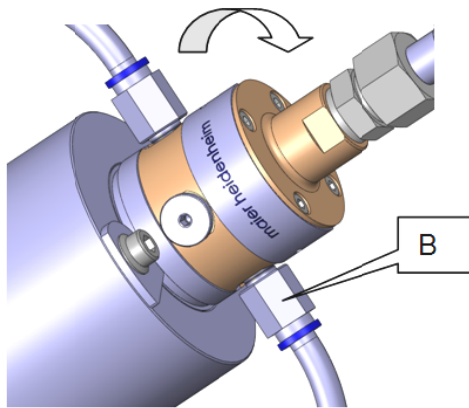
- The figure shows a connection example with horizontal arrangement.
- In such an arrangement, the leakage connection [B] should always be at the bottom so that the leakage can be removed unobstructed.

B Operating Instructions for Rotary Unions K / KT

6. Mounting



B-14



B-15

- Use a rotary union with for leakage connections in the case of tilting spindles or spindles with critical or uncertain leakage removal and connect the hoses accordingly. This way, any leakage can be fully discharged from the rotary union via one leakage connection [B], irrespective of the spindle position.
- The figures show two connected leakage connections for safe removal of leakage at a tilting spindle.

- Due to the gravitation, the leakage connections must always point down to ensure reliable leakage drain. The additional connection is factory-closed with a screw plug; the connection can be used as required.
- Connect the optional leak monitoring unit! Please inquire for further details!
- Connect the vibration pickup for bearing monitoring (option)! Please inquire for further details!

General information on connection lines

The following sections show examples of the design of the flexible connection elements:

- ↔ permissible movement (go for)
- ↔ impermissible movement (avoid)

B Operating Instructions for Rotary Unions K / KT

6. Mounting

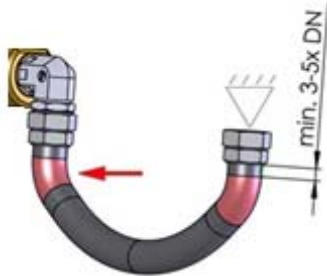


B-16



B-17

Do not compress or extend the lines.



B-18

To increase the service life, add a length of 3-5x DN per connection to the length calculated on the basis of the permissible bend radius.



B-19

Avoid connection offset. Take length changes into account in the case of bending.

B Operating Instructions for Rotary Unions K / KT

6. Mounting



B-20

Take into account limited degrees of freedom and the minimum permissible bend radius. Please contact your hose supplier



B-21



B-22

If possible, use fixed elbows, dual-line version, for bends.

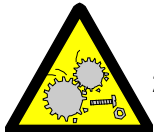
All degrees of freedom are possible without tension if the length is sufficient.



B-23

7. Operation

NOTICE



1. Damage to the K rotary union in the case of dry run.
The K rotary union must not run dry!
Exception: test run for a maximum of 30 minutes and at very low speed.
Rotary unions series KT may run dry.
2. Exceeding the permissible application data as per "Specifications and Spare Parts" causes damage to the rotary union. Make sure to meet the maximum application data as per "Specifications and Spare Parts", section 1.
Also observe 2.1 and section 2.2 in this section.

7.1 Commissioning

- During initial commissioning of the rotary union, minor amounts of drops of leaking fluid may occur during the breaking in period of the dynamic seal. The duration of the breaking in period depends on the speed and the pressure; usually, it is terminated after a few days.
- Breaking in cycle after approx. 6 months of standstill

25% of max. speed	5 minutes
Standstill	5 minutes
50% of max. speed	5 minutes
Standstill	5 minutes
max. Speed	

- The fluid must be filtrated as per "Specifications and Spare Parts", section 1.
- At the beginning, the rotary union may generate slight whistling noise during dry run. However, this is uncritical since the sliding surface must break in. Once you operate the rotary union with cooling lubricant, the noise will disappear.

7.2 During operation

Check the following:

- Quality of the fluid in the system
Document the checked data. Refer to the section "Specifications and Spare Parts" for the required values.
- Visible leakage at the leakage connection of the rotary union
Usually, the operating behavior of the rotating mechanical seal does not change suddenly. Slowly increasing leakage indicates seal failure. This allows you to acquire values concerning the operating behavior of the rotary union installed in the system.
- It is recommended to use a leakage monitoring unit. Replace the rotary union if the leakage exceeds a rate of approx. 4 liters per hour.
- The fluid should only be applied to the rotary union if it can also be removed via the tool; otherwise, the pressure may cause great forces which can damage the bearings. This means, for example, that you should use fluid only for tools with internal cooling and switch off the supply of fluid for tools without internal cooling.



B Operating Instructions for Rotary Unions K / KT

7. Operation

Troubleshooting

Problem	Reason	Remedy
Excessive amounts of leakage (approx. > 4 l/h) escape via the leakage opening on an ongoing basis	<ul style="list-style-type: none"> Rotating mechanical seal damaged or worn 	<ul style="list-style-type: none"> Replace the rotary union! Send the component to Christian Maier GmbH & Co. KG for diagnosis and, if applicable, repair. Check the quality of the fluid.
Noise and out-of-center run	<ul style="list-style-type: none"> Bearing worn Bearing damage 	<ul style="list-style-type: none"> Replace the rotary union
Whistling noise and slight friction of the rotary union	<ul style="list-style-type: none"> Rotary union not yet broken in KT rotary union has been operated without cooling lubricant for a long time so there is no lubricant film on the sealing surface 	<ul style="list-style-type: none"> Allow the rotary union to break in Apply cooling lubricant to the rotary union for a short time.
Excessive heating up of the bearing housing (bearing housing temperature permanently higher than 80°C)	<ul style="list-style-type: none"> Bearing defective Relief defective (KT only) Heating up caused by other components in the vicinity, e.g. spindle or electrical motor 	<ul style="list-style-type: none"> Find and remove the heat source! If the rotary union itself is the reason, replace it!
Leakage at sealing points	<ul style="list-style-type: none"> Sealing element damaged. Screw torque of connection insufficient 	<ul style="list-style-type: none"> If the leak is in the area of the driving rod, replace quad rings as per "Specifications and Spare Parts", section "Spare Parts". If the leak is at the connection fittings, tighten them as per manufacturer specifications.

8. Maintenance

INFORMATION



Christian Maier GmbH & Co. KG offers on site service by our experts and training of your service staff.

- Observe the safety messages in section 3.
- Maintenance may only be performed by authorized staff as per chapter 3.4.
- Only perform work on the rotary union when the machine/system is at a standstill and after the rotary union has cooled down.
- Always use personal protective equipment such as gloves, safety glasses, etc. when performing work on the rotary union to protect against escaping fluid.
- Allow the rotary union to cool down and make sure it is not under pressure before you take up work.
- Use only genuine spare parts.
- If you have removed protective equipment, refit such equipment after having finished your work and verify proper operation of such equipment.
- All screws must be tightened with the specified tightening torque (refer to section "Specifications and Spare Parts").

8.1 Maintenance plan

The rotary union is maintenance-free within 12 months in the case of normal operation (see "Specifications and Spare Parts"! **This requires compliance** with the specified mounting and operating conditions as well as the specifications for the fluids. The bearings feature lifetime grease lubrication and should be replaced after no more than three years (even if the unit is only stored or rarely operated).

Series K rotary unions can be used with up to 80 or up to 150 bar pressure of the fluid, depending on the version. The bearings used feature lifetime grease lubrication so they are maintenance free.

Interval	Activity	Explanation
Every 12 months	<ul style="list-style-type: none">• Check rotary union.	By customer service of Christian Maier GmbH & Co. KG.
Every 6 months	<ul style="list-style-type: none">• Check tightness	Replace the rotary union if the leakage exceeds a rate of approx. 4 liters per hour.



B Operating Instructions for Rotary Unions K / KT

8. Maintenance

8.2 Repair

8.2.1 Tools

- A torque wrench must be used for tightening screws with a specified tightening torque.

8.2.2 Repair work

8.2.2.1 Dismounting the rotary union from the spindle

Prerequisites:

- Unpressurize the rotary union
- Drain the fluid contained in the rotary union
- Remove the protective hood

Procedure:

WARNING



Risk of injury caused by escaping fluid under pressure.

The system must not be under pressure!

Make sure that shut-off fittings cannot be opened inadvertently or intentionally during repair work!

Always wear personal protective equipment, in particular protective glasses and gloves!

INFORMATION



Refer to the operating instructions for the complete system for any further information on properly performing the preparation work.

1. Dismount the housing connections.
2. Loosen the screws of the two clamping pieces using an Allen key.
3. Turn the clamping pieces to the outside so that the cylindrical receptacle for the rotary union is completely free.
4. Pull out the rotary union.

8.2.2.2 Having the rotary union repaired

Prerequisite

- The rotary union must have been dismantled from the spindle

INFORMATION



Series K and series KT rotary unions are high-precision, complex and delicate components which may only be dismantled and repaired by Christian Maier GmbH & Co. KG and its authorized partners. Reliable operation can only be ensured in this way.

8.3 Decommissioning and disposal



B Operating Instructions for Rotary Unions K / KT

8. Maintenance

At the end of the life cycle, rotary unions must be disposed or recycled by trained staff. See section 8.2.2.1 of this chapter for information on dismantling. Prior to disposing of the rotary union, you must remove the fluid, including all residues.

The rotary union to be scrapped must be dismantled in such a way that it can no longer be used for the purposes for which it was designed. It is not permitted to use parts of the rotary union for other purposes; the rotary union must be scrapped in its entirety. Christian Maier GmbH & Co. KG shall not be responsible for any damage whatsoever resulting from failure to observe this information.

Recycling of materials is essential. Each component must be delivered to controlled waste management companies. Rotary unions must not be disposed of with household waste! Observe all applicable disposal regulations.

The packaging material in which the rotary union is delivered by Christian Maier GmbH & Co. KG must be separated and disposed of in compliance with the applicable regulations.

Please note that it is recommended to return the unit in the original packaging for maintenance, i.e. it should be kept.

INFORMATION



See section 8.2 "Maintenance" for information on dismantling. Additional information may be found in the operating instructions for the complete system.

S Specifications and spare parts

Contents

1. Application data	2
2. Tightening torques for fastening screws	3
3. Fluids specifications	4
4. Driving rod connection (by customer)	5
5. Outline drawings	6
5.1 Outline drawing KT version B radial connection: (MB 10631)	6
5.2 Outline drawing KT version C radial connection: (MB 10617)	7
6. Spare parts	8



S Specifications and Spare Parts Series KT 21 B/C 078-20

1. Application data

1. Application data

	KT 21 B 078-20 KT 21 C 078-20
Version	Closed seal With Tess
Nominal diameter DN [mm]	7
Fluid	Cooling lubricant multi-purpose oils, Minimum quantity lubrication, air
Mounting position	Any; however, the position of the relief connection at the housing must allow for safe draining of leaking fluid.
Fluid temperature max. °C	50
Pressure PN, max. bar Cooling lubricant	80
Pressure PN, max. bar minimum quantity lubrication	10
Pressure PN, max. bar Dry air	10
Speed max. min ⁻¹	24 000
Channels	1
Filtration Micron	50
Cleanliness of fluid according to ISO 4406	-/16/13

Fluids also static, without flow





S Specifications and Spare Parts Series KT 21 B/C 078-20

2. Tightening torques for fastening screws

2. Tightening torques for fastening screws

Size	Property class	Tightening torques [Nm] at friction in thread and head seat $\mu = 0,14$ at 20°C screw temperature
M 6	8.8	10.0
M 6	10.9	16.5

The property class is indicated by the designation of the fastening element. If you use special screws, observe the specifications provided by the manufacturer of the screws as well as the thread properties of the counter-material.

Tighten the cylinder flange screws with hexagon socket and locking fins below the flange p.cl. 100 (included in Maier clamping piece kit) with 19 Nm!



S Specifications and Spare Parts Series KT 21 B/C 078-20

3. Fluids specifications

3. Fluids specifications

Series K rotary unions are designed for fluids such as cutting fluids or multi-purpose oils, series KT rotary unions for cutting fluids, multi-purpose oils, aerosols and compressed air. Other fluids including additives must be checked for compatibility with the materials used in the manufacturer's plant.

General

The quality of the fluid used plays a decisive role in the service life and reliability of a rotary union.

In the case of cutting fluids, the composition is particularly important. Insufficient quality of the fluid will result in heavy wear of the sealing and premature failure of the rotary union. Use only distilled water for mixing because tap water contains, for example, calcium and magnesium salts which are abrasive and have a negative impact on the service life of the seal. In addition, cutting liquids require sufficient filtration (see chapter 1, "Application data") so that abrasive substances such as metal particles from metal working cannot get into the rotary union. In such a case, there is a risk of abrasive particles reaching the seal chamber. This would considerably reduce the service life of the seal and require shorter maintenance intervals for your machine. In times of high demands on productivity, this may cause greater damage than in the past.

It is therefore essential to meet the specifications detailed in chapter 1 and observe the information provided in the "General part of the operating instruction"!

Approved temperatures

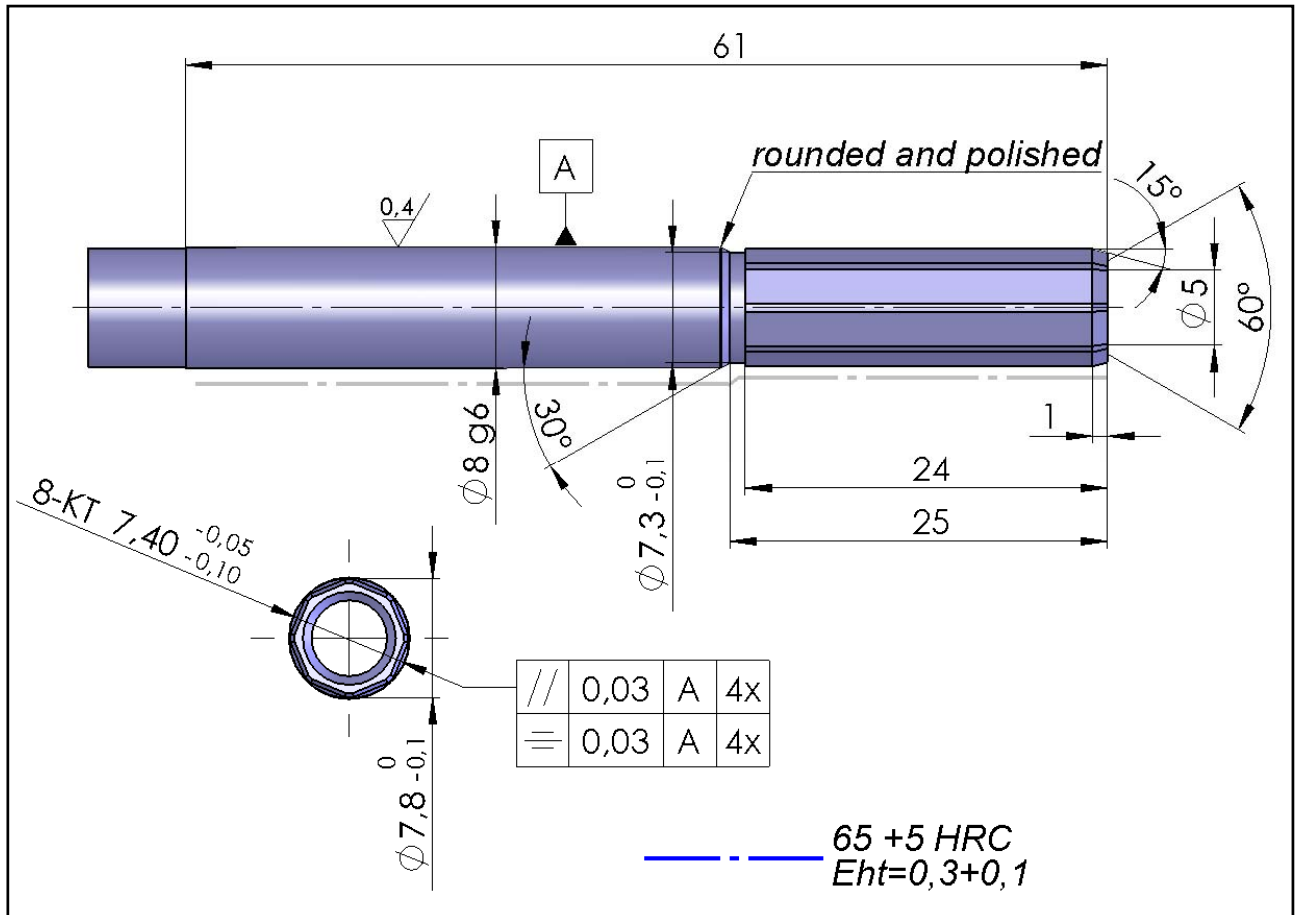
Series K rotary unions are suitable for cutting fluids and multi-purpose oils.

Series KT rotary unions are suitable for cooling lubricants, dry air and aerosols for minimum quantity lubrication.

The elastomers of the seals can be used at dry air up to a max. temperature of 80 °C (176 °F) and, in the case of cutting liquids, up to 100 °C (212 °F) max. However, for technical reasons, the temperature of the fluid must not exceed 50 °C (122 °F)!

Please inquire for other fluids or application conditions not listed!

4. Driving rod connection (by customer)

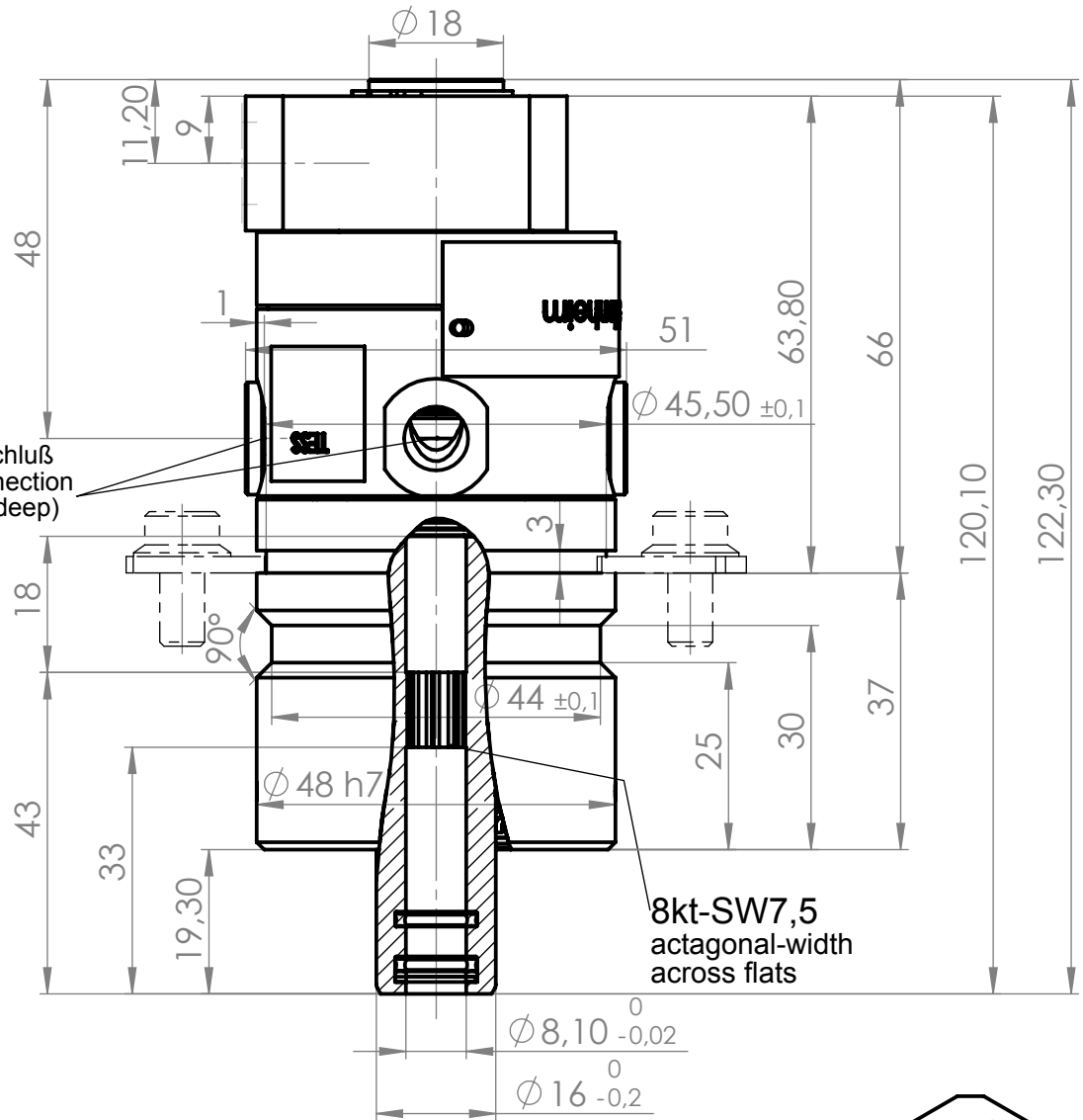


A wide variety of driving rods is available from Maier (accessories)!

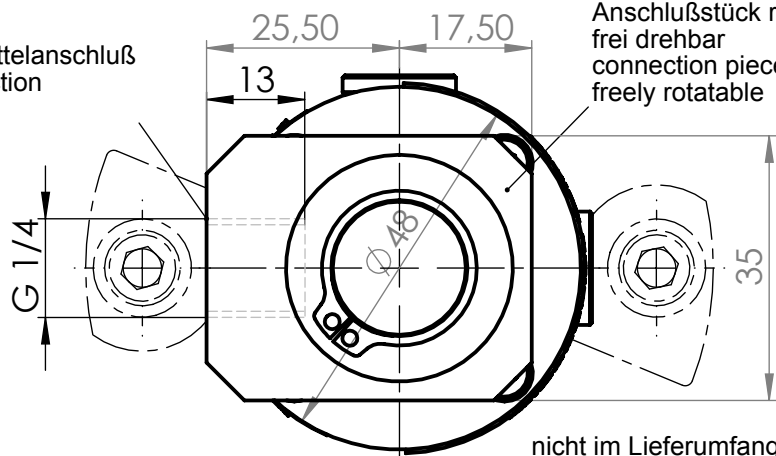
See the outline drawings on the following pages for mounting dimensions of the rotary unions.
Make sure to observe the loosening stroke and the coverage of the octagonal piece!

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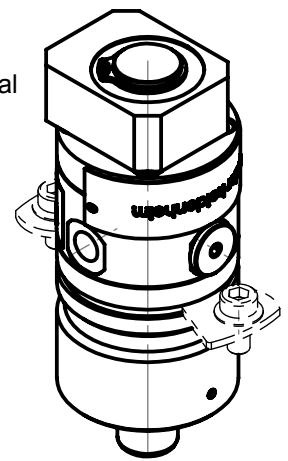
Leckageanschluß
leakage connection
G 1/8 (7 tief/deep)
4 x 90°



Kühlschmiermittelanschluß
coolant connection
radial



Anschlußstück radial
radial connection piece
frei drehbar
freely rotatable

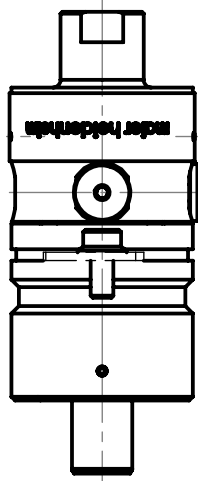


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not standard, can be obtained as an accessory

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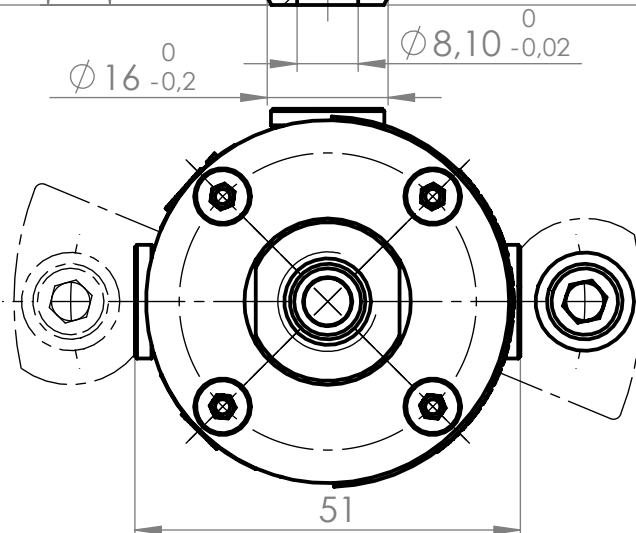
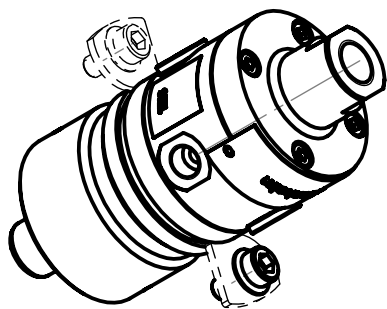
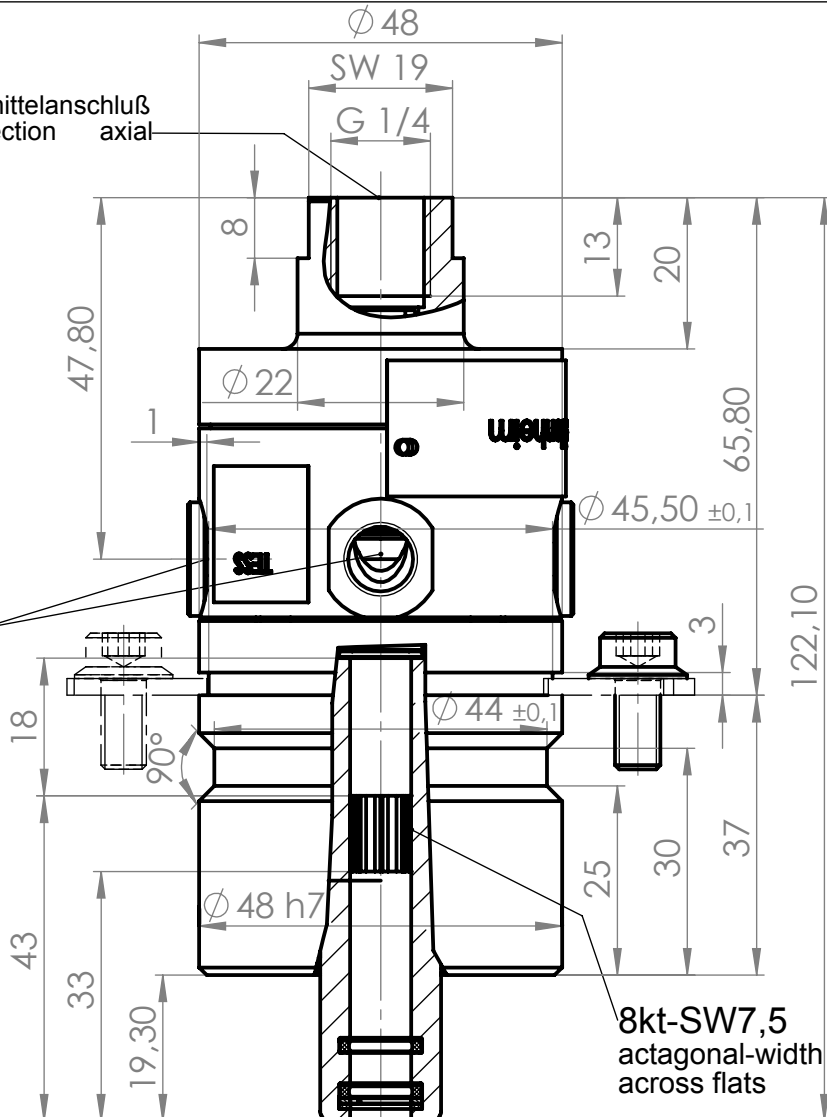
Str.-Pos	Sachnummer	Str.-Menge	ME	Benennung 1	Benennung 2	Bemerk.
				Freimaßtoleranz mittel nach DIN 7168		
				zul. arithm. Mittenrauhwert Ra in µm DIN ISO 1302 Reihe 2	Prüfplan-Nr.	Maßstab
				12,5/ 3,2/ 0,8/ 0,1/	Freigabestatus	1:1
				Datum Name	Benennung	
				Bearb. 11.11.10 wei	Dichtkopf rotary joint KT 21 B078-20	
				Gepr. 02.09.11 wei		
				Norm. 02.09.11 wei		
					Zeichn.-Nr. MB 10631	Bl. 1
A	s. Mittlg. v. 11.08.11	12.08.11	mil		Art.-Nr. 1118202-020	Entst.aus MB 10416
Zust.	Änderung	Datum	Name	Ers.für	Ers.durch	

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Kühlschmiermittelanschluß
coolant connection axial

Leckageanschluß
leakage connection
G 1/8 (7 tief/deep)
4 x 90°



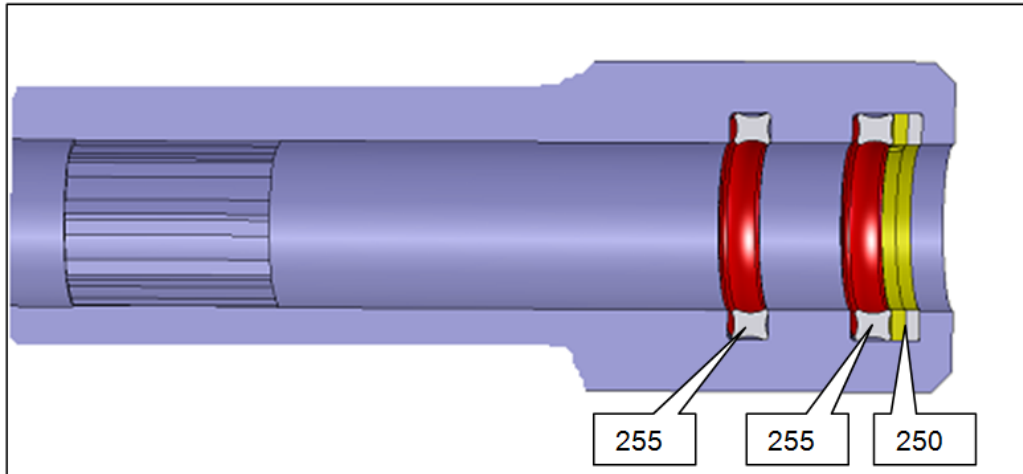
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				Freimaßtoleranz mittel nach DIN 7168	Prüfplan-Nr.	Maßstab
				zul. arithm. Mittenrauhwert Ra in μm DIN ISO 1302 Reihe 2	Freigabestatus	1:1
				12,5 / 3,2 / 0,8 / 0,1	freigegeben	
				Datum	Benennung	
				Bearb. 04.11.10 mil	Dichtkopf rotary joint	
				Gepr. 02.09.11 wei	KT 21 C078-20	
				Norm. 02.09.11 wei	Zeichn.-Nr. MB 10617	Bl. 1
A s. Mittlg. v.	11.08.11	mil		maier heidenheim	Art.-Nr. 1118208-020	Entst.aus MB 10415
Zust.	Änderung	Datum	Name		Ers.für	Ers.durch

6. Spare parts

Seals in the rotor to seal rotor - driving rod connection:



ITEM	PROD. #	Designation
250	3512341	Support ring
255	3512550	Quad ring