



## Rotating Unions



### Hybrid Series

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## 1 For your Safety

This chapter provides information on the safe handling of *DEUBLIN* rotating unions.

- For your own safety and the safety of other people read this operating manual carefully and completely prior to working on or with *DEUBLIN* rotating unions.
- This operating manual exclusively describes the rotating unions of the manufacturer *DEUBLIN*. In the further description/explanation the name “*DEUBLIN*” is left out for a better readability.
- Always use the latest version of the operating manual, available under [www.deublin.eu](http://www.deublin.eu).
- This operating manual is a material part of the specified rotating unions. The operator is responsible for the personnel to take note of this manual.
- The operator of the rotating unions shall not make any modifications or attachments to and retrofitting of the rotating union without the manufacturer’s consent.
- Please follow the additional instruction “Installation” for a secure and correct installation of the rotating union. The installation instruction is included with the delivered union.
- For safe and correct installation of the rotating union, you need to observe the additional “Installation” instructions, which is part of the scope of delivery of the rotating union.

### 1.1 Intended Use

The rotating unions in hybrid design use different sealing technologies and have a multi-channel structure. As a result, these rotating unions are suitable for carrying different types of media. The media may only be directed through the intended specific channels.

Please also see the connection diagram and model-specific installation drawing.

The so-called rotating unions are not approved for explosive environments and combustible flow media. Please see the catalogue or model-specific installation drawing for information on the application areas of the rotating unions.

The media used must meet specific criteria. Please refer to chapter 4.

#### 1.1.1 Example of Application

In this example, the principle of the rotating union is shown by means of a rotary-bearing two way version. The principle is the same as for other models in hybrid design.

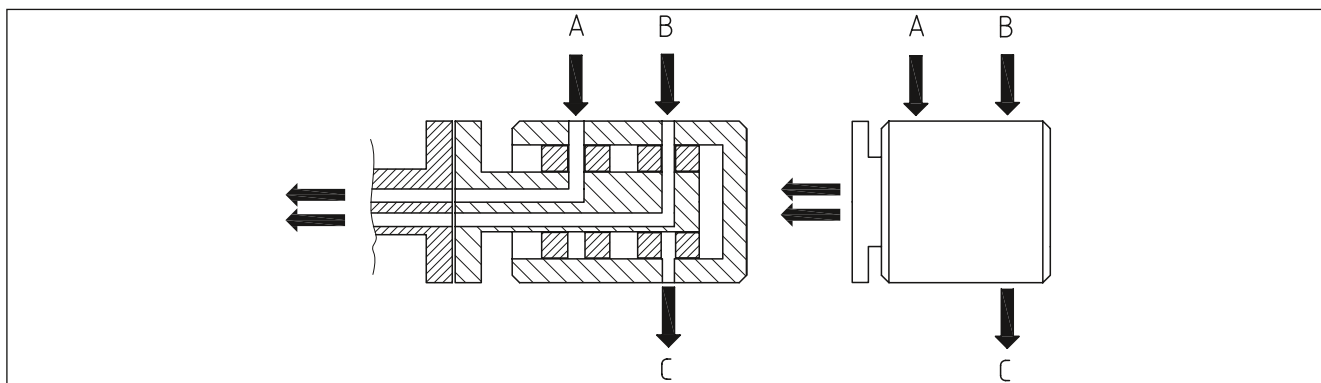


Fig. 1: Schematic diagram two-way version

A rotating union is installed at one end of the shaft, e.g. a two-way version as in this example. The two-way version has two channels (**A and B**), over which the machine is supplied with compressed air (**A**) and hydraulic oil (**B**). The leakage of the hydraulic channel is discharged in a controlled manner via a leakage pipe (**C**).

## 1.2 Misuse

This chapter provides information on known misuse of rotating unions in hybrid design. The rotating unions are not suitable for the areas and applications described herein. Use in such areas or for such applications constitutes a misuse endangering people and machines and is therefore prohibited.

### Prohibition for the following areas:

- Potentially explosive areas**  
The rotating unions in hybrid design shall not be used in potentially explosive areas, as they are not approved for the requirements in potentially explosive areas. Operation in such areas may cause explosions.
- Food**  
Food, cleaning and disinfectant residues cannot be removed from the rotating unions. People may suffer poisoning.

### Prohibition for the following applications:

- Conveying of combustible media or hydrocarbons**  
Combustible media or hydrocarbons may ignite or cause explosions.
- Connection to a piping system with excessive pressure**  
If excessive pressure is applied to the rotating unions, supply pipes can come off and cause personal injury or property damage.
- Operation without lubrication**  
Depending on the version of the rotating union, individual channels can be suitable for a dry run (operation without flow medium). Please refer to the information in the model-specific installation drawing. Misapplication due to failure to observe these instructions will result in damage to the bearing bushings, ball bearings and seals.
- Connection to fixed pipes**  
If connection is via fixed pipes, the rotating unions may leak and the ball bearings may get damaged.
- Conveying of media which are too hot**  
If the media exceed the maximum admissible temperature for the rotating union, the static seals (elastomeric seals) can be damaged which may result in leaky rotating unions and personal injury or property damage.

This list is not comprehensive and will be updated with results from product observation.

## 1.3 Safety Instructions

This chapter provides information on the hazards through rotating unions.

### 1.3.1 Hazards due to hot surfaces

The rotating unions are heated by the temperature of the medium. Skin contact with heated rotating unions can cause injuries.

- Use safety gloves and PPE (Personal Protective Equipment) protecting against heat when handling the rotating union.
- Attach a clearly visible danger sign visibly on/next to the rotating union in order to warn of danger.

### 1.3.2 Hazards by improper hoses

For the connection of the rotating union to the machine, you have to choose appropriate hoses for the respective medium, which meet, the specifications for the application.

If you use incorrect hoses, they may become porous or burst. This can cause personal injury and/or property damage to components of the machine.

- In case of the medium hydraulic oil, use hoses which are suitable for the maximum system pressure of the machine and the maximum temperature of the media.

### Hoses for leakage lines

If the cross-section of the hose used is smaller than that of the connection of the rotating union, an excessive pressure may develop in the hoses. Hoses may burst and cause serious injuries.

- Use hoses which fit the cross-section of the connections.

### 1.3.3 Hazards due to the media

When working on the rotating union, injuries can be caused by skin or eye contact with the media.

- Observe the safety instructions for the flow media. Observe the COSHH Safety Data Sheet for the flow media.

### 1.3.4 Hazards by faulty installation

If the rotating unions are installed incorrectly, hoses and connections may become leaky. The medium can escape. Depending on the medium, personal injury or property damage to the components of the machine may occur.

- Before installing the rotating union ensure that no feed pressure and no residual pressure is applied to the pipeline system of the machine.
- Install the rotating union on the machine using hoses only, in order to avoid stress on the rotating union.
- Install the hoses free from stress.
- Install the hoses to the rotating union prior to mounting it at the machine shaft.



## 1.4 Structure of Pictograms

This chapter provides information on the meaning of the pictograms used in the manual.



Warning

**Warning**

Potentially dangerous situation, which may result in death or serious injury.



Note

**Note**

Potentially harmful situation in which the product or surrounding objects can be damaged.



Info

**Application notes**

and other useful information.

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## 2 Information as to this Manual

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The copyright as to this manual remains with *DEUBLIN*. Subject to changes!

- You can download the latest version of this manual under [www.deublin.eu](http://www.deublin.eu).
- Always use the latest version of the operating manual.

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## 3 Information on the Name Plate

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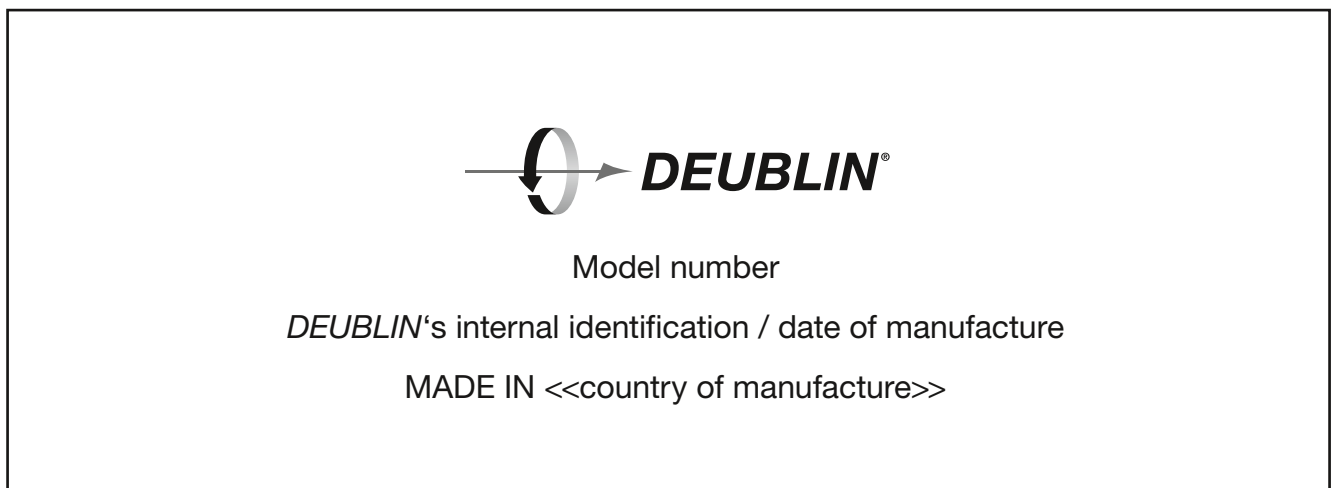


Fig. 2: Name plate

The coding of the model number is described in the catalogue. The model number corresponds to the order number.



## 4 Information on the Design

This chapter provides information as to which items have to be observed in the design in order to have a positive effect on the service life of the rotating union.



Info

You can obtain the drawings of the rotating unions from *DEUBLIN* in order to integrate the rotating union in your drawing. You need the model-specific installation drawing of your rotating unions for the safe planning and operation of your rotating unions.

The model-specific installation drawing of the relevant rotating union contains, e.g.:

- Tightening torques of the rotating union
- Technical specifications
- Tolerances
- Approved flow media per channel

### 4.1 Filtering of the Medium

Unfiltered flow media with a particle size greater than 60 µm will result in increased wear and tear of the rotating unions.

Only use the following classes for fluid flow media:

- Class 5 in accordance with ISO 4406:2017 Code 17/15/12 or
- Class 6 in accordance with NAS 1638

Determine the required filter performance values according to ISO 16889:2008, in order to achieve a maximum particle size of 60 µm.



Info

The larger the particles in the media, the higher the wear of the rotating union is. The larger the sum of the particles (dirt load), the higher the wear.

- Use a filter before the rotating unions, which filters particles larger than 60 µm from the flow medium.

### 4.2 Compressed Air Purity Classes

To ensure the longest possible service life of the rotating union, *DEUBLIN* recommends using a compressed air purity class according to ISO 8573-1:2010 [6:4:4]. This results in the following parameters for the compressed air:

Particles	Water	Oil
Mass concentration Cp [mg/m <sup>3</sup> ]	Pressure dewpoint [C°]	Concentration of total oil [mg/m <sup>3</sup> ]
0 < Cp ≤ 5	≤ +3	≤ 5

### 4.3 Specification of hydraulic oils

The hydraulic oil used must comply with the following specification: Mineral oils according to DIN 51524 (HL; HLP)/ ISO 6743/4 (HL, HM, HV) in the viscosity classes 10, 22, 32, 46, 68 and 100 mm<sup>2</sup>/s).

#### 4.4 Cooling fluid

Depending on the rotating union type, cooling fluids may also be approved as flow media (see model-specific installation drawing). When using cooling liquids, please observe the manufacturer's instructions with regard to maintenance/inspections in the manufacturer's data sheet as well as the relevant safety data sheet.

#### 4.5 Connecting Options of the Rotating Union at the Machine Shaft

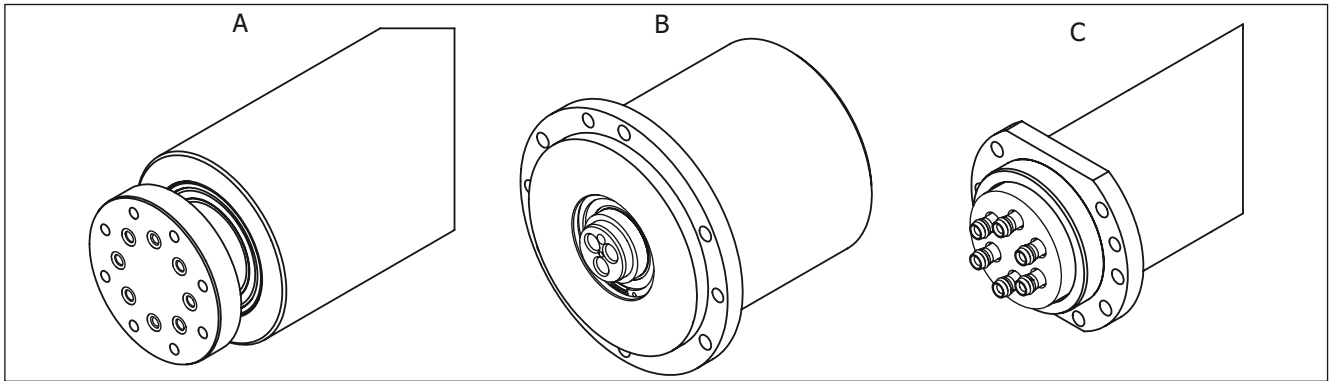


Fig. 3: Options for the installation on the machine

Depending on the model, the rotating unions are fastened to the machine shaft via the rotor (rotary bearing type **A**) or via the housing of the rotating union (housing-mounted version **B**). The housing-mounted version can also be designed with so-called connecting pipes on the rotor (**C**). These serve to compensate for misalignments between the machine shaft and the rotating union. Before installation, the rotating unions must be checked for possible damage to the O-ring or support ring.

The installed pin on the rotor serves the correct alignment of the rotating union to the machine and thus for the correct assignment of the media-specific channels. This pin may not be removed.

#### 4.6 Fitting Position of Rotating Union with Bearing Bushes



Note

##### **Damage of component due to incorrect fitting position**

If you do not install rotating unions with bearing bushes in a horizontal position, the rotating union may be damaged.

- Make sure the rotating union is mounted horizontally.
- Contact *DEUBLIN* if a different fitting position is required.

#### 4.7 Fit, Shape and Positional Tolerances

Functioning of the rotating unions is only ensured if you observe the specifications of *DEUBLIN* regarding design of fits, shape and positional tolerances. If you do not meet them, O-rings can be damaged, the medium can escape, for instance. Corresponding information can be found in the technical drawing of your rotating union.

- Make sure that all specifications by *DEUBLIN* on the installation of the rotating union in your machine are observed.



## 4.8 Prepare Installation of the Rotating Union

Sharp edges at the bore hole of the machine shaft can damage the O-rings of the rotating union.

- Provide the bore hole of the machine shaft with a chamfer of 30° in order to prevent the O-rings from being damaged when pressing them in.
- Round sharp edges off by polishing the junctions between shafts and rotating unions.
- Observe the requirements for the interface between the machine and the rotating union as described in the installation drawing.

## 4.9 Options of Hose Installation

The following examples show how to install the hoses at the rotating unions.

These connecting options ensure that the hoses do not transfer stress to the rotating unions when the machine shaft moves.

- Please pay attention to the chapter “1.3 Security Advices” regarding the design.

### 4.9.1 Connection of hose to the rotating union

The hoses must be installed without stress and bends so that they do not apply any forces to the rotating union, also when pressurised.

Connect the rotating unions with flexible hoses. Flexible hoses prevent lateral forces on the bearings of the rotating unions during operation.

Depending on the rotating union type, they can also have radial or axial hose connections. The following figures show examples of installation.



Fig. 4: Connect hoses with 90° elbows



Fig. 5: Connect hoses with straight connections



## 4.9.2 Connection of a drain line



Note

### Damage of component due to overpressurised drain line

If you connect the leakage connections of the rotating unions to pressurised pipes, the leakage cannot flow out. Leakage and flow media from the pressurised pipes is pressed into the rotating union. This damages the rotating union.

- Connect the hoses to drain lines which are not pressurised.

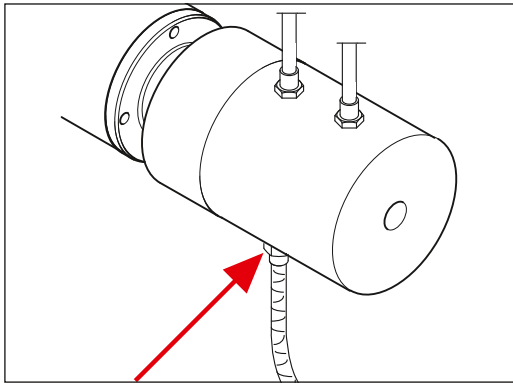


Fig. 6: Connection of drain line

During operation of the rotating union, depending on the type of sealing technology used, a function-dependent leakage can escape. In order to carry this off in a controlled way, the rotating union is to be fitted with one or several drain connections depending on the model.

- The leaking medium has to be conveyed pressureless back to the tank. The pressure in the drain line must not exceed 0.5 bar.

## 5 Installation

The union installation is described in an additional leaflet which is supplied with each rotating union. Please follow the additional instruction "Installation" for a secure and correct installation of the rotating union. The instruction "Installation" is available online via [www.deublin.eu](http://www.deublin.eu).

- Ensure that the person installing the rotating union receives the following information:
  - Position and location of the rotating union in the machine
  - Plan for connection of hoses
  - Position of leakage line
  - Information on the media

## 6 Information on the Operation



Note

### Component damage due to lack of lubrication

Some of the seals of the rotating union in hybrid design require lubrication by the flow medium. Please refer to the information in the model-specific installation drawing. If the relevant channels of the rotating union are operated without flow medium, then the seals are not lubricated and become damaged.

- Ensure that the relevant channel is operated with a flow medium.
- Switch off the plant/machine, if the rotating unions are operated without medium.
- Ensure that the rotating unions are operated at least with the minimum flow rate specified in the model-specific installation drawing.



Note

**Damage of component due to insufficient pressure**

If insufficient pressure is applied to the rotating union, the rotor and the housing are subject to excessive wear.

- Ensure that the rotating unions are operated at least with the minimum pressure specified in the model-specific installation drawing.



Hinweis

**Component damage due to long downtimes**

Before long downtimes of the rotating unions (> 2 weeks), these must be cleaned with adequate cleaning agents in order to prevent evaporation residues from the operating media on the sliding ring surfaces.

## 7 Storage



Note

**Damage of component due to incorrect storage**

If you store the rotating unions incorrectly, they become leaky or get damaged.

- Store the rotating unions in a dry area between 3 °C and 40 °C.
- Store rotating unions for one year at the most.
- After prolonged storage (> 2 months) the rotating union must be checked for leakage with the operating media applied, before installation.

## 8 Maintenance

This chapter provides information on how to extend the service life of the rotating unions by means of maintenance.

### 8.1 Maintenance Intervals

You can avoid early wear of the rotating unions, if you adhere to the maintenance intervals described herein.



Warning

**Risk of injury due to hot or cold surfaces**

The rotating unions are heated or cooled by the temperature of the medium.

Skin contact with these heated or cooled rotating unions can cause severe injuries.

- Before starting to work on the rotating union, allow the machine to cool down.
- Use safety gloves and PPE (Personal Protective Equipment) protecting against heat or cold depending on the application of the rotating unions.

## 8.2 Daily Inspection

Check the rotating unions for tightness.



### **Risk of injuries due to applied line pressure**

If you have to work on the rotating union and feed pressure of the medium is applied or there is residual pressure in the piping system of the machine, the medium can escape under pressure when releasing the connections. You and other people may suffer severe injuries.

- Ensure that no feed pressure is applied.
- Ensure that there is no residual pressure in the piping system.

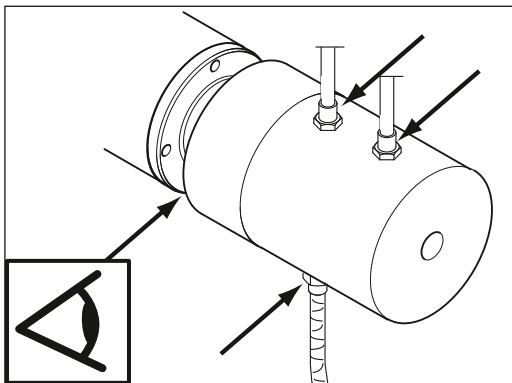


Fig. 7: Inspect visually

During operation of the machine, leakages may occur at the connections and hoses depending on the requirements to the rotating unions.

- Carry out daily visual inspections in order to check whether leakages occurred at the connections (see arrows).

If you detect leakage:

1. Stop the machine.
2. Replace the defective hoses with new ones.
3. Seal leaking connections.
4. If the rotating union is worn and leaks, replace it with a new one. Repair kits for various models can be obtained from *DEUBLIN*.

## 9 Trouble Shooting

This chapter provides the following information:

1. Which problem may occur?
2. What can be the cause of the problem?
3. How can you eliminate this problem?

### 9.1 Potential Causes for Errors and their Elimination



#### **Risk of injuries due to applied line pressure**

If you have to work on the rotating union and feed pressure of the medium is applied or there is residual pressure in the piping system of the machine, the medium can escape under pressure when releasing the connections. You and other people may suffer serious injuries.

- Ensure that no feed pressure is applied.
- Ensure that there is no residual pressure in the piping system.

Error	Potential causes	Elimination
Rotating union is leaky after installation	Incorrect installation	<ol style="list-style-type: none"> <li>1. Stop the machine.</li> <li>2. Ensure that the connections are sealed according to the manual "Installation".</li> <li>3. Ensure that all hoses are installed without stress.</li> <li>4. Ensure that all seal faces are clean.</li> </ol>
	Sealing surfaces of the rotating unions not in working position	<ol style="list-style-type: none"> <li>1. Check information about leakage volume in the model-specific installation drawing (for compressible and incompressible flow media).</li> <li>2. If the leakage is higher than indicated, apply several pulsing pressure surges on the relevant supply channel. Do not exceed the maximum pressure prescribed in the model-specific installation drawing.</li> </ol>
	Seal faces of the rotating union are damaged	<ol style="list-style-type: none"> <li>1. Pack rotating union.</li> <li>2. Send rotating union to <i>DEUBLIN</i> for overhaul/service.</li> </ol>
Rotating union leaks before the end of the expected service life	Rotating union is defective	
	Medium is contaminated	<ol style="list-style-type: none"> <li>1. Stop the machine.</li> <li>2. Drain medium.</li> <li>3. Send rotating union to <i>DEUBLIN</i> for overhaul/service, if required.</li> <li>4. Mount new filter.</li> <li>5. Flush the piping system of the machine.</li> <li>6. Refill with new medium.</li> </ol>
Rotating union runs untrue or wobbles	Rotating union is not designed for the respective application	<ol style="list-style-type: none"> <li>1. Ensure that the correct <i>DEUBLIN</i> Rotating Union is used.</li> <li>2. Contact <i>DEUBLIN</i> if required.</li> </ol>
	Thread and/or concentricity outside the admissible tolerance.	<ol style="list-style-type: none"> <li>1. Stop the machine.</li> <li>2. Remove rotating union.</li> <li>3. Manufacture new thread or flange.</li> <li>4. Install rotating union.</li> </ol>
	Rotating union is mounted incorrectly.	

## 9.2 Pack Rotating Union for Transport

The rotating union has to be protected against mechanical impact and humidity during transport to ensure that the rotating union will arrive at *DEUBLIN* without being damaged.



Warning

### Risk of injury by high weight

The rotating unions are heavy (depending on the model > 25 kg). If you lift the rotating unions on your own or without a lifting device, you and other people may suffer injuries.

- Always mount the rotating union with appropriate assistance.
- Use a crane or lifting device for transport and installation of the rotating union.

1. Dismount the rotating union in reverse order of the installation (see Installation).
2. Ensure that the rotating union is free from the respective media.
3. Use a cardboard box which is suitable for the weight of the rotating union.
4. Cushion the base of the cardboard box with a soft material, e.g. air bubble film.
5. Wrap the rotating union with a soft material, e.g. air bubble film.



6. Ensure that no packing material or dirt can penetrate the opening of the rotating union.
7. Position the rotating union in the middle of the cardboard box.
8. Fill the free space around the rotating union with newspaper or another suitable material.
9. Close the cardboard box by means of tape.

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## 10 Disposal

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Warning

### **Risk of injury by high weight**

The rotating unions are heavy (depending on the model > 25 kg). If you lift the rotating unions on your own or without a lifting device, you and other people may suffer injuries.

- Always mount the rotating union with appropriate assistance.
- Use a crane or lifting device for transport and installation of the rotating union.

### 10.1 Dispose of Packaging

- Dispose of the packaging (cardboard box and plastics) according to the national standards, regulations and directives.

### 10.2 Dispose of Rotating Union

Mainly, the rotating unions consist of metals, which can be reused within the reclamation of scrap. Decontaminate unions / parts and dispose of in an “Environmentally Friendly” way.

- Dismount the rotating union in reverse order to the installation (see Installation).
- Flush the rotating union.
- Collect the dirty flushing media.
- Dispose of the collected flushing media according to the national standards, regulations and directives.
- Comply with the specification of the hydraulic oil manufacturer.
- Dispose of the rotating union according to the national standards, regulations and directives.

In case of repair, *DEUBLIN* disposes of all used parts.

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## 11 Spare Parts

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The rotating unions have a limited service life and include wearing parts. Wearing parts are excluded from the warranty. All static and dynamic sealing elements of a component are considered wearing parts, as well as ball bearings.

Repair kits are available for some models of the rotating unions and can be obtained from *DEUBLIN*. Please ask your *DEUBLIN* Service.

You need special tools and repair instructions for repair of the rotating unions which can be obtained from *DEUBLIN* as well.



Info

### **Note**

If you do not want to repair your rotating union on your own, *DEUBLIN* will be pleased to help you. If requested, *DEUBLIN* will exchange all wearing parts and clean all components of the rotating union. Before repaired rotating unions leave the premises, they will be subjected to an operational check. The repaired rotating union is returned with a standard “*DEUBLIN* Warranty” valid for 12 months.

## Reliability

Many years' experience, ongoing liaison with customers, innovations sourced inhouse and from suppliers place *DEUBLIN* in a position providing reliable Rotating Unions at the highest level.

When it comes to concrete applications, maximum service life is guaranteed by matching the sealing to the respective medium.

The service life is also equally maximized by maintaining cleanliness when storing and handling the Rotating Union and by adhering to the guidelines issued by *DEUBLIN* in respect of the conditions on the customer's premises.

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