



## Rotating Unions



**Series**

**7000**

**for compressed air**



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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.
- 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.
- Always use the latest version of the operating manual, available from [www.deublin.eu](http://www.deublin.eu).
- 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.

### 1.1 Intended Use

The rotating unions of series 7000 supply the feeding of compressed air.

The admissible performance of the rotating unions depends upon the diameter of the pipe through which the consuming equipment is provided with compressed air.

<b>Series</b>	<b>7000</b>
<b>Media</b>	<b>Compressed Air</b>
$p_{\max.}$ [bar]	10
$n_{\max.}$ [min <sup>-1</sup> ]	see dimension sheet
$t_{\max.}$ [°C]	see dimension sheet
Leakage Rate	see dimension sheet

Details on the operating range of the rotating unions are provided in the catalogue and/or the model-specific installation drawing.

The rotating unions referred to are designed for non-potentially explosive environments and non-combustible media.

Each *DEUBLIN* rotating union may only be used for their specified application! It is technically precisely matched to:

- conveying fluid
- pressure
- operating temperature
- speed
- flow rate

The rotating unions of the series 7000 can be used as one-way or multi-passage version depending on the type of connection.

### 1.1.1 Example of Application

In this example, the principle of the rotating union is described on the basis of a two-way version with flanged rotor. Other models of series 7000 operate in the same way.

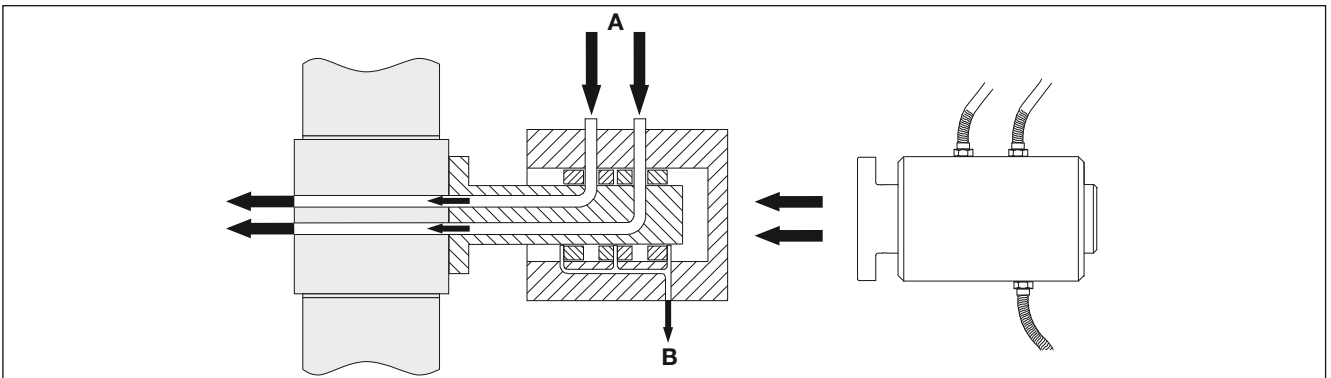


Fig. 1: Schematic diagram two-way version

A rotating union is installed at one end of the shaft, e.g. a two-way version as in this example. The latter is fitted with two pipes (A) through which the consuming equipment is supplied with compressed air. The medium leaking from the rotating union is carried off through a leakage line (B) in a controlled way.

### 1.2 Misuse

This chapter provides information on known misuse of rotating unions of the 7000 series. 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 of the 7000 series 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.
- 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.

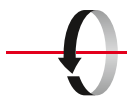
If you use incorrect hoses, they may become porous or burst. This can cause personal injury and/or property damage to components of the machine.

- Use hoses which are suitable for the maximum system pressure of the machine and the maximum temperature of the 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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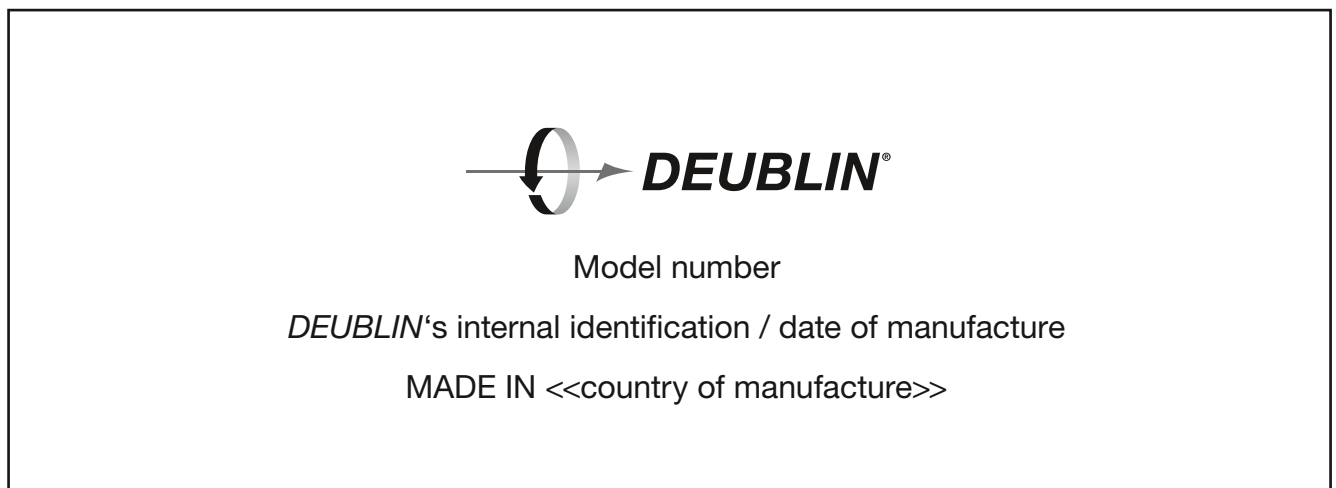
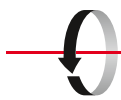


Fig. 2: Name plate

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 will need the model-specific installation drawing of your rotating unions for a secure set-up and operation of the rotating unions.

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

- torque moments of the union
- technical data
- tolerances
- approved media

### 4.1 Filtering of the Medium

Unfiltered media with a particle size of more than 60 µm result in increased wear of the rotating union.



Info

The larger the particles in the media, the higher the wear of the rotating union is. The higher the total of all particles (polluting load), the higher the wear is.

- Install a filter upstream of the rotating union which filters particles from the 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/m³]	Pressure dewpoint [C°]	Concentration of total oil [mg/m³]
0 < Cp ≤ 5	≤ +3	≤ 5

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

In order to seal a pressurized area to the outside the principle AERO-STATIC-GAP is used. The compressed air p1 under overpressure exhausts through a very narrow gap between rotor and bushing while at the same time the pressure reduces down to value p2. With this a certain amount of compressed air exhausts through leakage holes with very little pressure into the environment. The housing is supported by the ball bearing. High precision secures very small gap between rotor and bushing that is necessary to allow depletion of pressure.

The medium to be pumped is guided according to the number of channels of the union through one, two or several passages to the consumer. (fig. 3 – pic 1, 2 and 3)

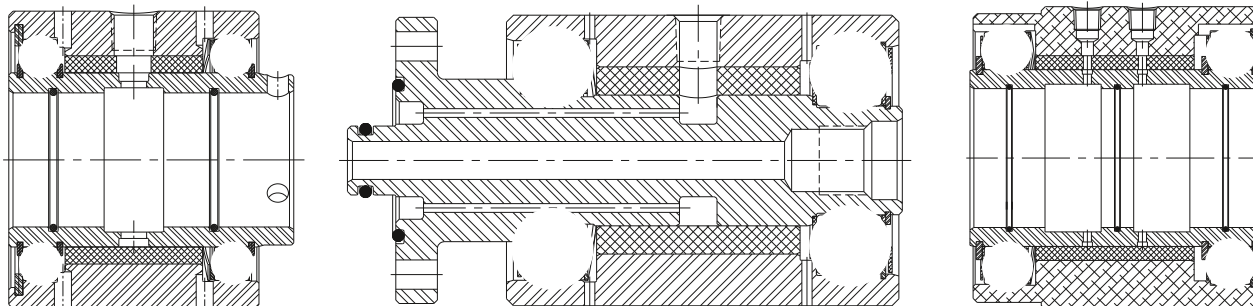


Fig. 3: Installation of the rotating union

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

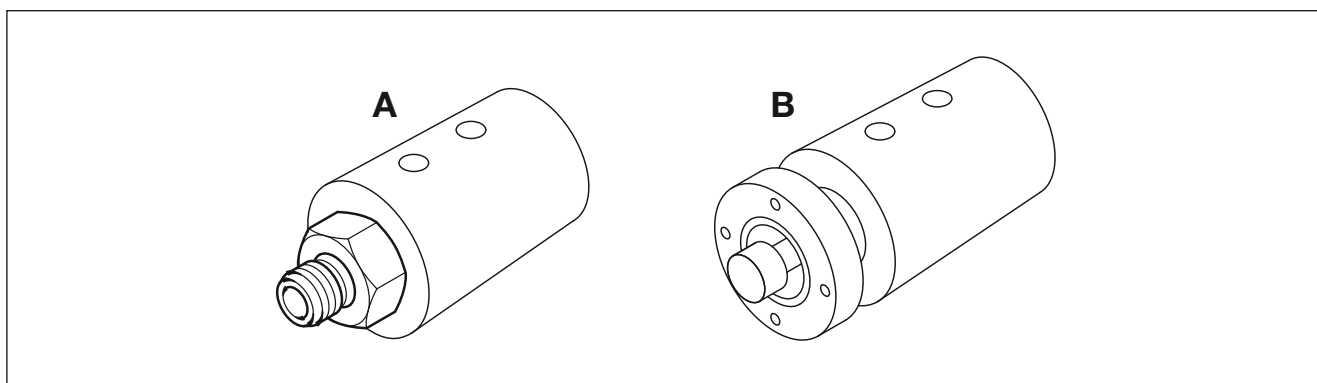


Fig. 4: Options for the installation on the machine shaft

The rotating unions can be fastened on the machine shaft by a threaded rotor **(A)** or by means of a flanged rotor **(B)** depending on the rotating union.

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

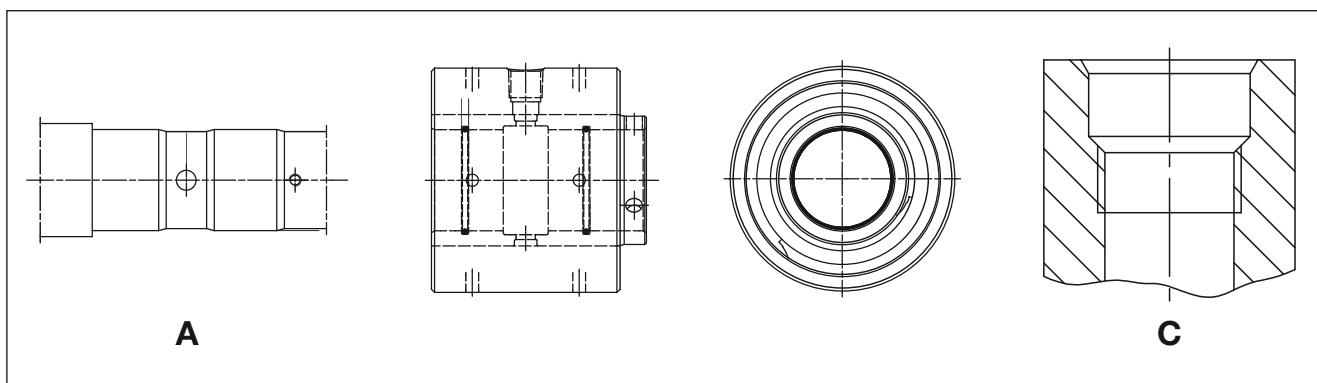


Fig. 5: Possible machine shafts

The rotating unions are being screwed at the shaft end or slid onto the shaft. Depending on the version of the shaft end, the rotor of the rotating union is connected by the draw bar **(A)** or by a threaded, piloted interface connection **(C)**.

The rotor provides the connection between the rotating union and the shaft. For this reason it is important to design the shaft and the transfer pipe with the corresponding accuracy and to observe the specifications of the model-specific installation drawing of the rotating union. Deviations may result in



leakages, vibration, and a shortened service life of the rotating unions.

The rotating unions can be installed on the shaft vertically (rotor pointing in a downwards direction) or horizontally.

#### 4.6 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.

#### 4.7 Prepare Installation of the Rotating Union

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

- Provide the bore hole of the roller 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.

#### 4.8 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 Safety Instructions” regarding the design.

##### 4.8.1 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. The following figures show examples of installation.



Fig. 6: Connect hoses with 90° elbows



Fig. 7: Connect hoses with straight connections

## 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
  - Information on the media

## 6 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 two years at the most.

## 7 Maintenance

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

### **7.1 Maintenance Intervals**

The *DEUBLIN* Rotating Union Series 7000 are maintenance free. Periodically check the maximum leakage quantity while the machine is running (visual check at the end of the rotary shaft seal or cover). Regular checks are necessary, if safety- or environmental risks are given due to malfunction of the *DEUBLIN* Rotating Union.

## 7.2 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.

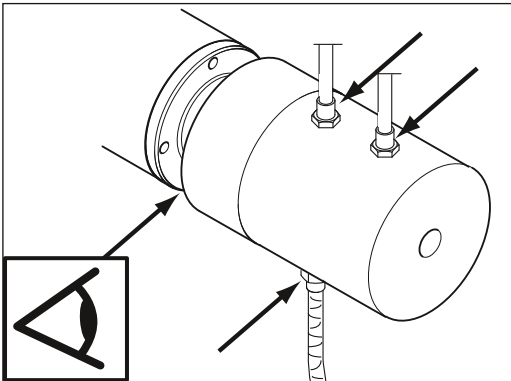


Fig. 8: Inspect visually

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

1. 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*.

## 8 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?

### 8.1 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.

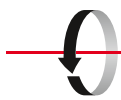
- Ensure that no feed pressure is applied.
- Ensure that there is no residual pressure in the piping system.

Error	Potential causes	Elimination
Rotating union is excessively leaking 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>
	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 is defective	
Rotating union excessively leaks before the end of the expected service life	Medium is contaminated	<ol style="list-style-type: none"> <li>1. Stop the machine.</li> <li>2. Check drain medium.</li> <li>3. Send rotating union to <i>DEUBLIN</i> for overhaul/service, if required.</li> <li>4. Mount new filter.</li> </ol>
	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>
Rotating union runs untrue or wobbles	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.	

## 8.2 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.

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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## 9 Disposal

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### 9.1 Dispose of Packaging

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

### 9.2 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).
- 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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## 10 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.

There are no spare parts for series 7000 available. Thus, professional overhauling/servicing may only be implemented at *DEUBLIN*.



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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