



Rotating Unions and Bearingless Rotating Unions with “Closed Seal” technology



- 1005-704-434-IC
- 1101-265-239-IC
- 1101-265-343-IC
- 1101-265-644-IC



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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 under 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 listed in this document are used to feed through various media. The exact operating data are to be taken from the following *DEUBLIN*-drawings:

- 1005-704-434-IC
- 1101-265-239-IC
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The rotating unions are designed for operation at an ambient temperature and a temperature of the medium starting from 3 °C up to max. 70 °C.

Definition of the media:

- Coolant – is an emulsion consisting of water and oil-based additives
- MQL – minimum quantity lubrication; min. 10 m l/h oil additive
- Hydraulic oil
- Lubricant
- Compressed Air

For information on operating parameters and dimensions of the rotating unions please refer to the catalogue or to the model-specific installation drawing.

The specified rotating unions are designed for non-explosive environments and non-inflammable media.

1.1.1 Application

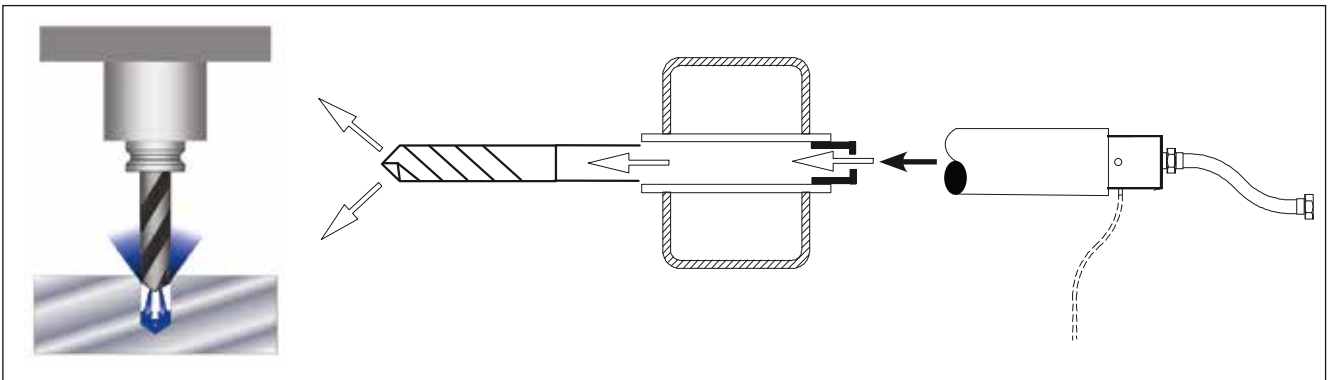


Fig. 1: Schematic diagram (single channel)

A rotating union is attached to one end of the spindle. The rotating union introduces the media into the shaft from where it is guided to the tool.

1.1.2 Application Cylinder

The subsequently described application is one example of numerous possible applications. This example shows the supply of a cylinder with the hydraulic oil medium.

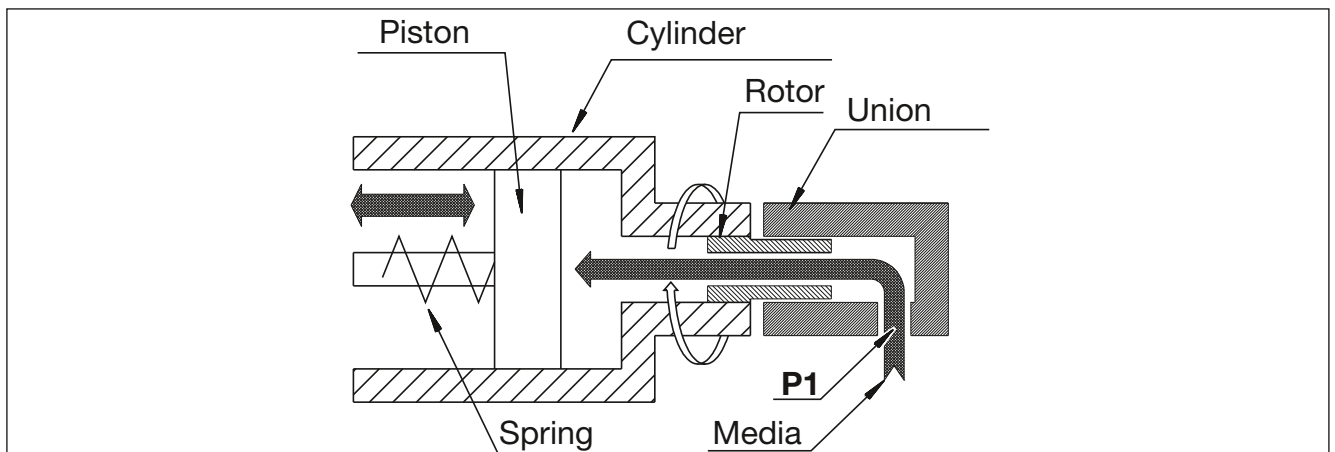


Fig. 2: Scheme showing force transferred to the cylinder

1.2 Misuse

This chapter provides information on known misuse of rotating unions.

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 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.

Outdoor operation

Inadequate protection against weather conditions can result in premature failure.

Prohibition for the following applications:

- Conveying of combustible media or hydrocarbons**
Combustible media or hydrocarbons may ignite or cause explosions.
- Food**
Food, cleaning and disinfectant residues cannot be removed from the rotating unions. People may suffer poisoning.
- 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.
- Application in ambient temperatures/with medium temperatures below 3 °C**
Rotating unions may be damaged if they are operated at temperatures (ambient or medium) below 3 °C.
- Operation at the maximum speed and with maximum pressure**
Speed and pressure must be adjusted to each another so that the rotating unions are not damaged or fail prematurely (see model-specific installation drawing).

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 Risk of injuries due to hot surfaces

The rotating unions may become hot during operation. If the skin makes contact with this heated rotating union, it can result in severe injuries.

- Before starting any works on the rotating unions, please allow the machine to cool down.
- Depending on the application case of the rotating unions, use safety gloves and PPE (Personal Protective Equipment) protecting against heat when handling the rotating union.

1.3.2 Hazards due to rotating of the union rotor

If you reach into the area of the union long hair or loose clothing might get caught in the rotor, it can result in severe injuries.

- Please ensure that it is impossible for persons to reach into the rotating rotor by accident.
- Please do not wear your long hair open, do not wear loose clothing, or pieces of jewellery when working on rotating components.

1.3.3 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 only hoses which are suitable for the media, the maximum system pressure and the maximum temperature for the machine.

1.3.4 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 media. Observe the COSHH Safety Data Sheet for the media.

1.3.5 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.
 - To ensure the safe and correct installation of the rotating union, observe the additional "Installation" instruction manual, which is included with the delivered union.
- Install the hoses to the rotating union prior to mounting it to the machine shaft. This does not apply to hoses with an SAE connection.
- Please make sure that the hoses for the media are connected in accordance with the channel configuration of the rotating union. Please observe the model-specific installation drawing regarding this.
- Install the rotating union to the machine using flexible hoses only, in order to avoid stress on the rotating union.
- Install the hoses free from stress.
- Install the rotating union in a way that the leaking medium can be carried away downward at the lowest point and that the drain line permanently slopes downwards at a minimum of 15°.

1.4 Structure of Pictograms

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

**Warning**

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

**Note**

Potentially harmful situation, in which the product or an object in its surroundings can be damaged.

**Application notes**

and other useful information.

2 Information as to this Manual

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.
- Always use the latest version of the operating manual.

3 Information on the Name Plate

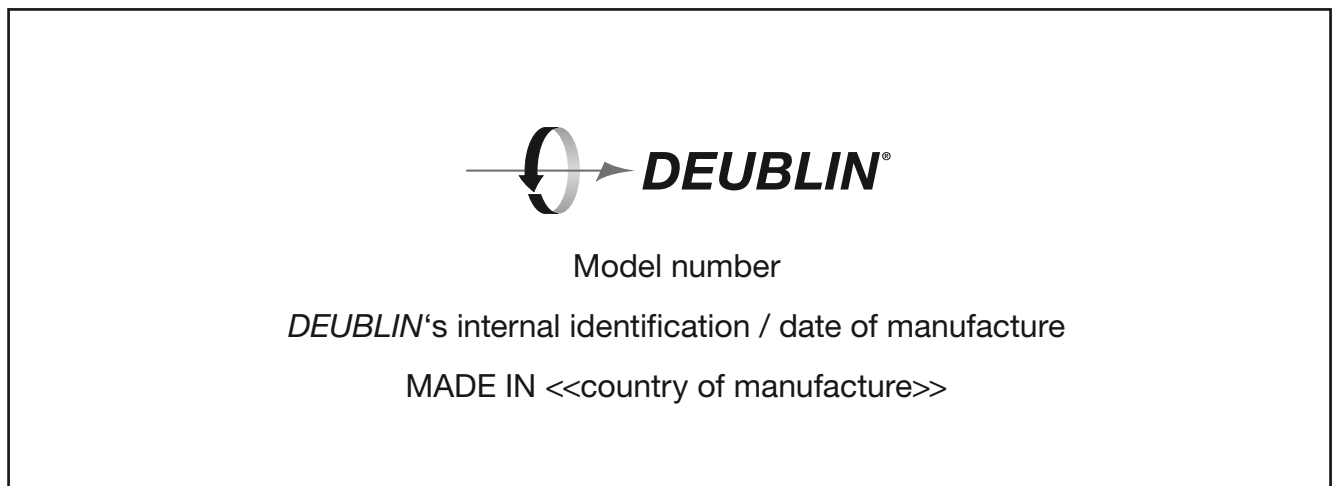


Fig. 3: Name plate

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 drawings and 3D data of the rotating unions from *DEUBLIN* in order to integrate the rotating union in your drawing.

The model-specific installation drawing of the corresponding rotating union contains all data required to install and operate the rotating union.

4.1 Filtering of the Medium

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

Please use the following classes of liquid 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 data according to standard ISO 16889:2008 to achieve a maximum particle size of 60 µm.



Info

The larger the amount of particles in the media, the higher the wear rate of the rotating union. The residual contamination load should be at a maximum of 100 mg/L respectively at a maximum of 50 mg/L when processing aluminium.

- Insert a filter in front of the rotating union which filters particles with a size of 60 µm and larger from the media.

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 ³]	Pressure dewpoint [C°]	Concentration of total oil [mg/m ³]
0 < Cp ≤ 5	≤ +3	≤ 5

4.3 Definition of Hydraulic Fluids / Lubricants

The oil that is used must correspond to the following definition: Mineral oils according to DIN 51524 (HL; HLP)/ ISO 6743/4 (HL, HM, HV) or lubricants according to DIN 51517 (C, CL, CLP) in viscosity classes 10, 22, 32, 46, 68 and 100 mm²/s).

4.4 Connecting Options of the Rotating Union at the Machine Shaft

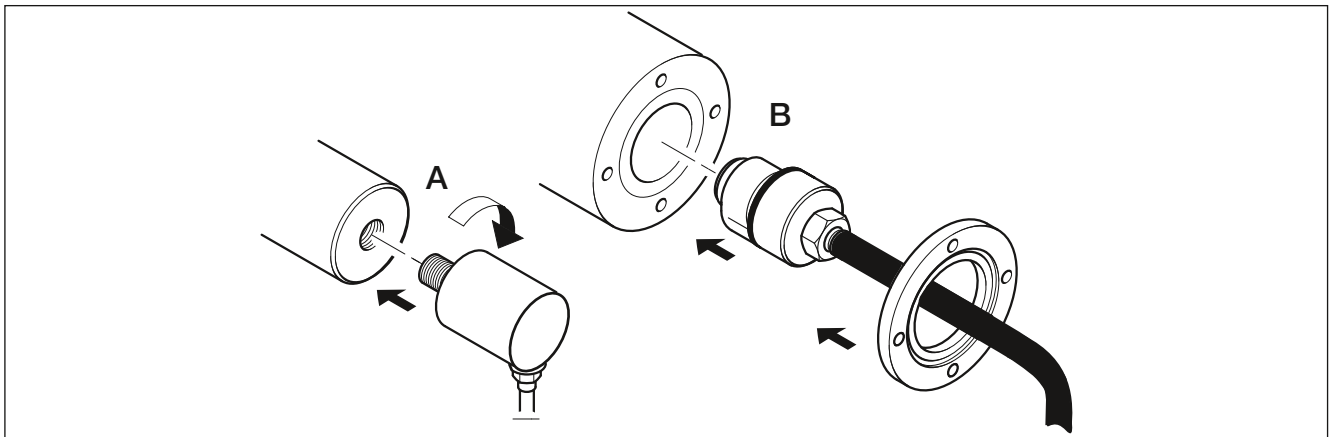


Fig. 4: Options for the installation on the machine shaft

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



Note

Component damage due to incorrect installation

When installing the rotating unions vertically with the rotor pointing in an upward direction, the union may be damaged.

- Please contact *DEUBLIN* if you wish to install rotating unions vertically with the rotor pointing in an upward direction.

Should you have any questions, please contact *DEUBLIN*.

4.5 Planning the Oiler Position



Info

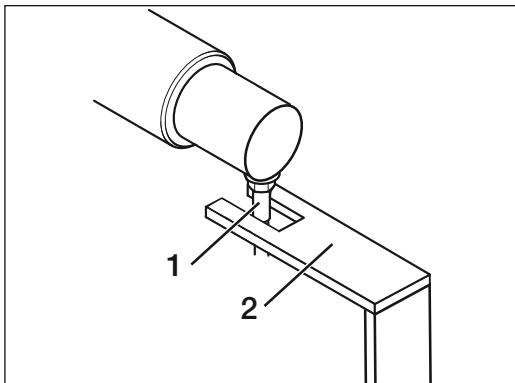
Not all rotating unions are equipped with an oiler. If your rotating unions do not have an oiler, you do not need to consider this chapter.



To allow for the refilling of the internal lubricating oil reservoir of the rotating unions with oil during maintenance, the oiler should be in an 11 o'clock or 1 o'clock position after installation, if possible.

Fig. 5: Correct positioning of the oiler

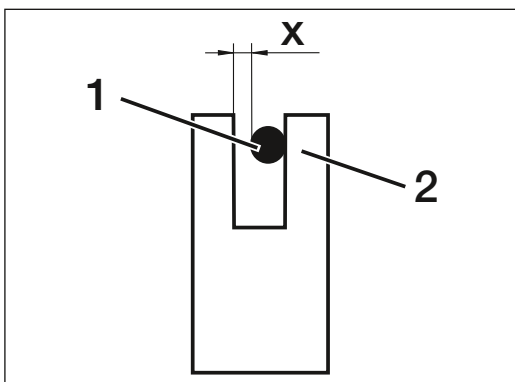
4.6 Using a locking element (mounted externally)



The rotating union must be secured against rotation during operation using an anti-rotation element **(2)**. In this connection, the metallic connector of the hoses **(1)** can be used as torque supports.

A fork head may e.g. be installed on-site to serve as an anti-rotation element at a hose connection.

Fig. 6: Example of a possible locking element



The connector of the hose **(1)** may in this example only touch against one side of the bracket **(2)** of the anti-rotation element so that a clearance **(X)** remains between the other side of the bracket and the hose connector.

Abb. 7: Top view torque support

4.7 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.
- For models where a leakage fitting is supplied, we recommend installing a leakage line.

4.7.1 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 installations.



If you wish to connect the rotating unions to the machine, you have to create the connection by using flexible hoses.

During operation, the flexible hoses prevent the development of lateral loads on the bearings of the rotating unions.

Fig. 8: Connect the hoses so that they run in a downward direction

Please observe the installation instructions supplied with the rotating union during installation.



If the hoses are to be guided away from the rotating unions vertically and bent by 90°, connect the hoses as shown.

The angled connector prevents lateral loads on the bearings in the event that the supply hose is pressurised.

Fig. 9: Hoses bent by 90°

4.7.2 Hose installation for vertically/horizontally installed rotating unions

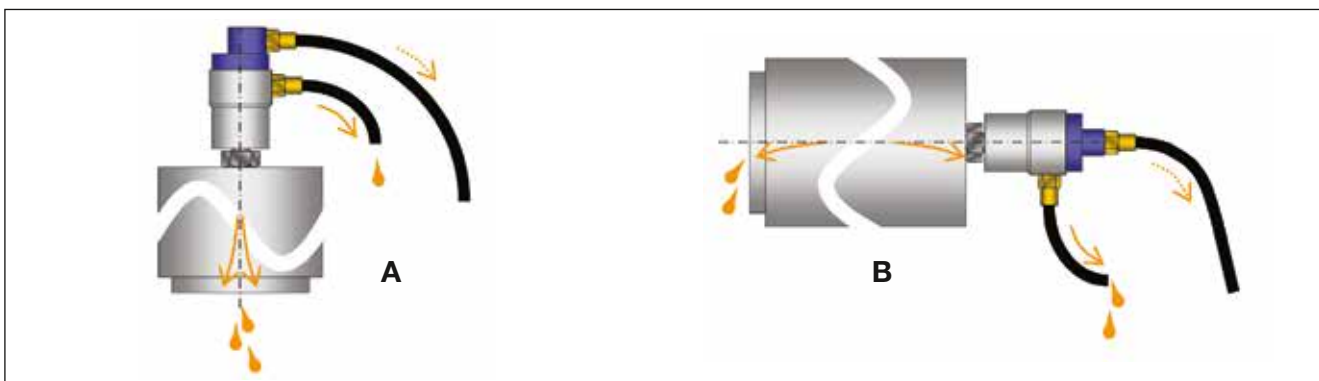


Fig. 10: Horizontal and vertical connection options

If the rotating unions are installed on the shaft vertically **(A)** or horizontally **(B)**, the supply lines should be guided as illustrated. This is the only way to ensure that no coolant will escape from the supply line into the rotating unions, for example, during a tool change.

4.7.3 Hose connection in case of additional axial movement of the machine shaft



If the rotating unions are installed to machine shafts with an oscillating (axial) movement, the hoses must be stress-free in both final positions. Here an example for supply lines connected radially and axially.

Fig. 11: Supply lines connected radially

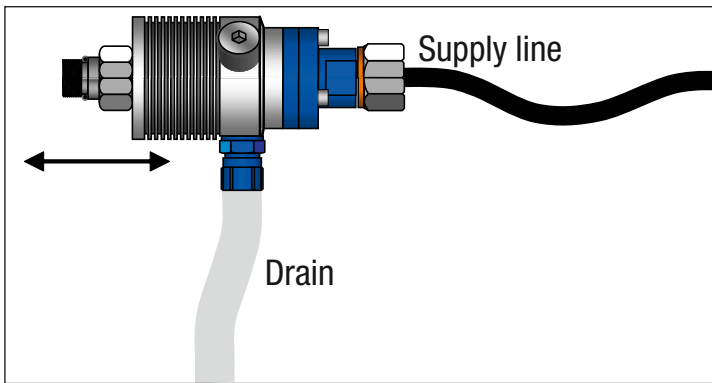


Fig. 12: Supply lines connected axially

4.7.4 Leakage connection for vertically installed rotating unions

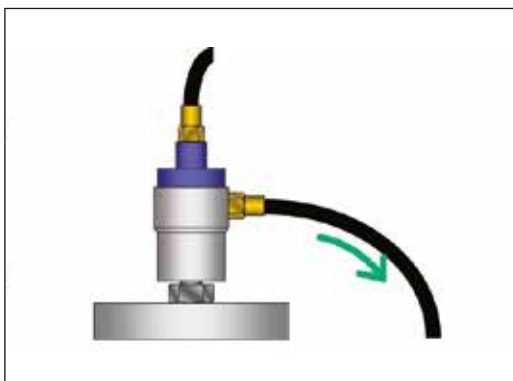


Fig. 13: Connecting the leakage hose

Lay the leakage hose in a downward angle (at least 15°) so that the leakage can be drained away.
 The internal diameter of the leakage hose has to be at least 8 mm.

4.7.5 Leakage connection for horizontally installed rotating unions

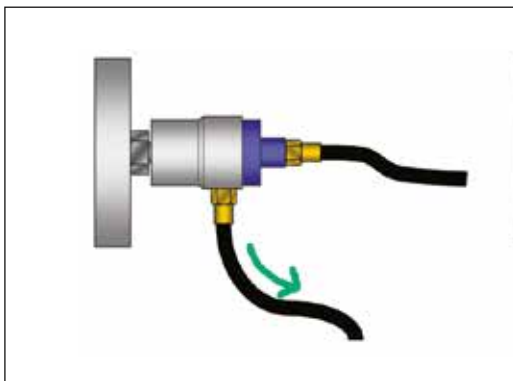


Fig. 14: Connecting the leakage hose

Position the rotating unions in a way that you are always able to connect the leakage line to a relief bore/channel at the 6 o'clock position (at the lowermost point).
 You must lay the leakage hose in a downward angle (at least 15°) so that the leakage can be drained away.

The internal diameter of the leakage hose has to be at least 8 mm.



If constant leakage in larger amounts is detected from the rotating unions with “Closed Seal” technology, this indicates that the seals are worn. In this case, the rotating union has to be replaced as quickly as possible.

5 Installation

The union installation is described in an additional manual 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 under 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
 - Information on the media
 - Plan for connection of hoses
 - Position of leakage line
 - Information on the leakage line (optional)
 - model-specific installation drawing

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 space 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.

Regular inspections are required if malfunctions of the *DEUBLIN* rotating union can cause risk to health or environment.



Info

Anti-friction bearings in rotating unions are lubricated for the entire duration of their service life. Subsequent lubrication is not required.

7.1 Daily Inspection

Check the rotating unions for tightness.



Warning

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.

7.2 Weekly/monthly maintenance



You must only carry out the maintenance works described herein if your rotating unions are equipped with an oiler (1).

Rotating unions with an oiler have an internal lubricating oil reservoir, which gradually releases oil for the lubrication of the components. This lubricating oil reservoir has to be refilled at least once per month. If the rotating unions are operated at high speeds, the oil reservoir has to be refilled after one week.

For the filling of the oil reservoir, you must use high-quality motor oil.



If your rotating union is equipped with an oiler (**arrow**) complete the following steps:

Apply four to five drops into the oiler by means of an appropriate push-type grease gun.

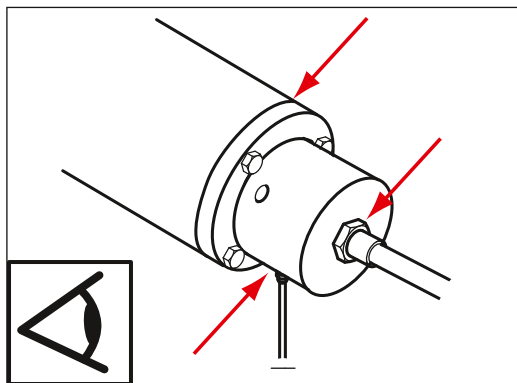
Fig. 15: Refilling the lubricating oil reservoir



Risk of injuries due to hot surfaces

The rotating unions may become hot during operation. If the skin makes contact with this heated rotating union, this can result in severe injuries.

- Before starting any works on the rotating unions, please allow the machine to cool down.
- Depending on the application case of the rotating unions, please use protective gloves and PPE (Personal Protective Equipment) to protect against heat or cold.



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, or return the union to *DEUBLIN* for overhaul / service.

Fig. 16: Inspect visually

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?



Info

Do not disassemble the rotating unions for repair.
This invalidates the warranty claim.

8.1 Potential Causes for Errors and their Elimination



Warning

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"> 1. Stop the machine. 2. Ensure that the connections are sealed according to the manual "Installation". 3. Ensure that all hoses are installed without stress. 4. Ensure that all seal faces are clean.
	Seal faces of the rotating union are damaged	<ol style="list-style-type: none"> 1. Pack rotating union. 2. Send rotating union to <i>DEUBLIN</i> for overhaul / service.
	Rotating union is defective	
	If applicable: O-rings on the rotor are damaged or positioned incorrectly.	<ol style="list-style-type: none"> 1. Stop the machine. 2. Drain medium. 3. Remove rotating union. 4. If the O-rings on the rotor are damaged, replace defective O-rings. 5. Ensure that the O-rings are positioned correctly (see model-specific installation drawing), correct the positions, if applicable.

Error	Potential causes	Elimination
Rotating union leaks before the end of the expected service life	Medium is contaminated	1. Stop the machine. 2. Drain medium. 3. Send rotating union to <i>DEUBLIN</i> for overhaul/service, if required. 4. Mount new filter. 5. Flush the piping system of the machine. 6. Fill in new medium.
	Rotating union is not designed for the respective application	1. Ensure that the correct <i>DEUBLIN</i> Rotating Union is used. 2. Contact <i>DEUBLIN</i> if required.
Rotating union runs untrue or wobbles	Thread and/or concentricity outside the admissible tolerance.	1. Stop the machine. 2. Remove rotating union. 3. Manufacture new thread or flange. 4. Install rotating union.
	Rotating union is mounted incorrectly.	
Rotating union shows leakage between shaft end i.e. transfer pipe and rotor.	Seals are damaged.	1. Decommission the machine. 2. Send rotating union for overhaul / service to <i>DEUBLIN</i> . 3. Check shaft end and transfer pipe for burrs, remove burr, if applicable.

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.

9 Disposal

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).
- Flush the rotating union.
- Collect the dirty flushing media.
- Dispose of the collected flushing media according to the national standards, regulations and directives.
- Please observe the instructions of the media manufacturer.
- Dispose of the rotating union according to the national standards, regulations and directives.

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

10 Spare Parts

The rotating unions have a limited service life and include wearing parts. All static and dynamic sealing elements of a component are considered wearing parts, as well as ball bearings. There are no spare parts to be ordered for the rotating unions.

The function of the rotating unions can only be provided for when all components are adjusted and aligned to each other. Thus, the professional overhaul / service should only be carried out by *DEUBLIN*.



Info

Note

Rotating unions and bearingless unions of this series cannot be repaired by the customer himself but must be sent to *DEUBLIN* for repair. 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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