



Rotating Unions and Bearingless Rotating Unions



**1115 series (only 1115-114-XXX, 1115-680-XXX),
1129 series (only 1129-775, 1129-051-482,
1129-340-339, 1129-440-339, 1129-490-489)
and 7000 series model 1139-810**

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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

Controlled Leakage rotating unions are designed to transfer compressed air through a spindle/shaft. 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:

- Compressed air – Class 4 in accordance with ISO 8573-1

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

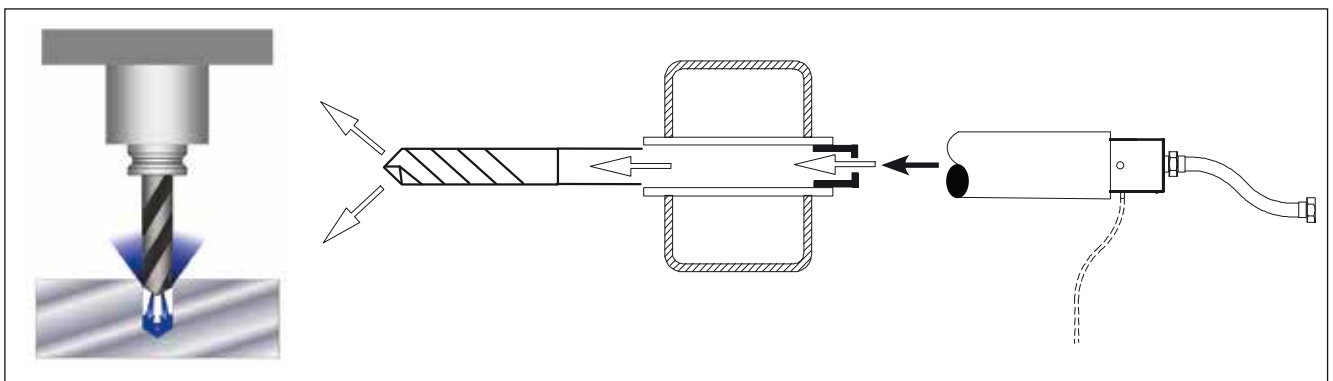


Fig. 1: Schematic diagram (single channel)

The rotating union is mounted onto a shaft. It transfers compressed air into the rotating shaft, which then transfers the air to the application.

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.

Use of hydraulic oils

The rotating unions of the series Controlled Leakage are not approved for hydraulic oils. If you are using rotating unions for hydraulic oils, the rotating unions will be damaged and hydraulic oil may splash out. Persons may be injured.

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 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

Compressed air can cause injuries, when working on the rotating unions.

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

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

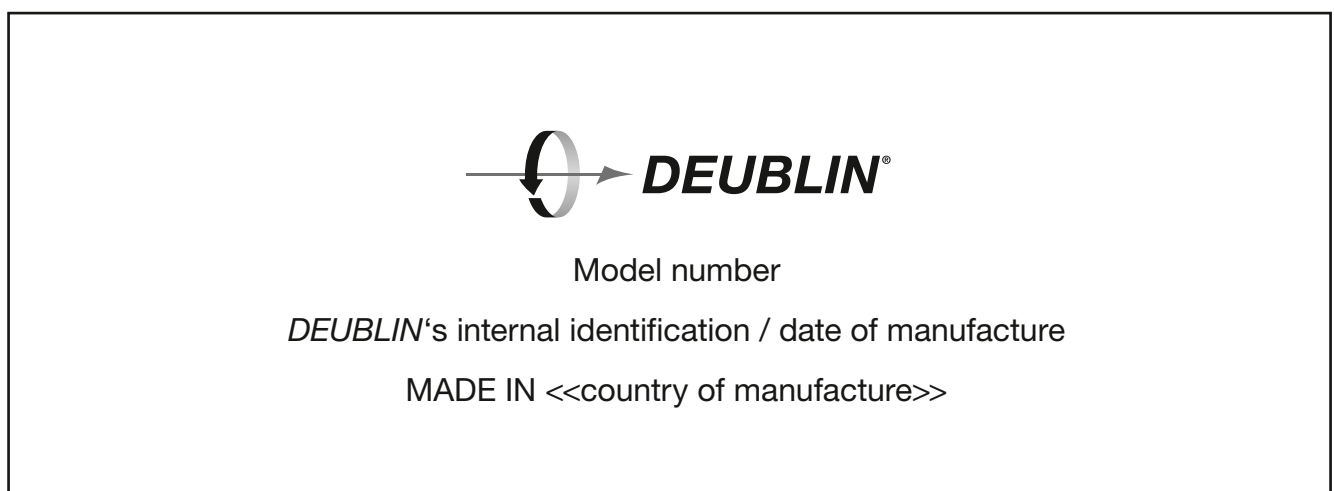


Fig. 2: Name plate

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

You will require the model-specific installation drawing of your rotating unions to implement it into your design and to operate the rotating unions in a safe manner.

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

4.1 Occurring axial force



Fig. 3: Overview over the model versions

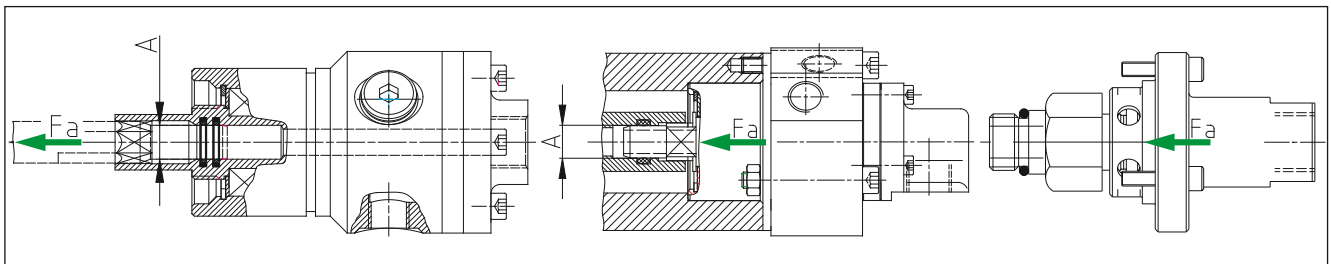


Fig. 4: Axial force

There are no axial forces that have to be additionally absorbed by the spindle bearing on rotor-supported and ATS-models.

In the case of housing-supported models and models without bearings, the medium pressure at the effective diameter (A) results in an additional axial force (Fa) that has to be absorbed by the spindle bearing.

You will find details on the model specific installation drawing. Alternatively, you can calculate the axial force as follows:

- Fa = Axial force
- A = Area (see model-specific installation drawing)
- p = Coolant pressure in bar

$$F_a = A \times p$$



4.2 Filtering of the Medium

Please use the following class for compressed air:

- Class 4 in accordance with ISO 8573-1

4.3 Connecting Options of the Rotating Union at the Machine Shaft

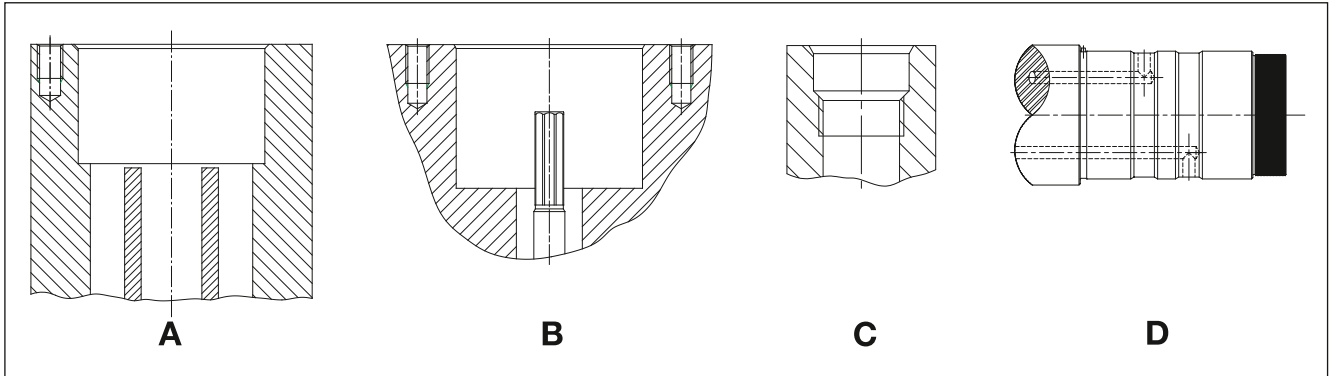


Fig. 5: Possible machine shafts

This shows 3 ways of connecting the rotating union's rotor to the end of the shaft (or draw bar). Depending on the version of the shaft end, the rotor of the rotating union is connected by:

- (A)** The support bore of the shaft
- (B)** External profile of the draw bar
- (C)** By a threaded, piloted interface connection
- (D)** By pushing ATS rotating unions over the shaft

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 (if fitted) 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 to 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.



Hinweis

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.



Warning

Risk of injury due to functional-related leakage

Any rotating union containing Controlled Leakage technology shows functional-related leakage. When shutting down the air compressor, the pressure in the piping system will gradually deplete. This can release devices as i.e. clamps.

- Thus flying parts can cause injuries.

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

4.4 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.

4.4.1 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. 6: 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. 7: Hoses bent by 90°

4.4.4 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. Example of supply lines connected radially and axially.

Fig. 8: Supply lines connected radially

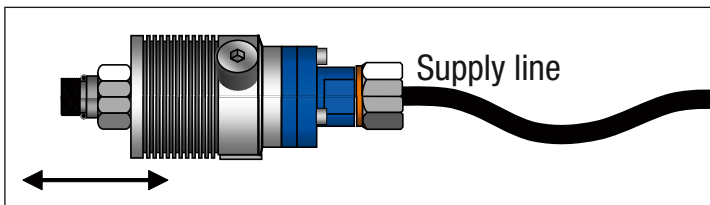


Fig. 9: Supply lines connected axially

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
 - model-specific installation drawing

6 Information on the Operation

As well as the already mentioned, no further information is available for operation. The rotating unions referred to are applicable for compressed air, class 4 in accordance with ISO 8573-1 and corresponding to the specifications given in *DEUBLIN* drawings.



7 Storage



Note

Damage of component due to incorrect storage

If you store the rotating unions incorrectly, they 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.

8 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.

8.1 Maintenance Intervals

Check rotating union for leak-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.

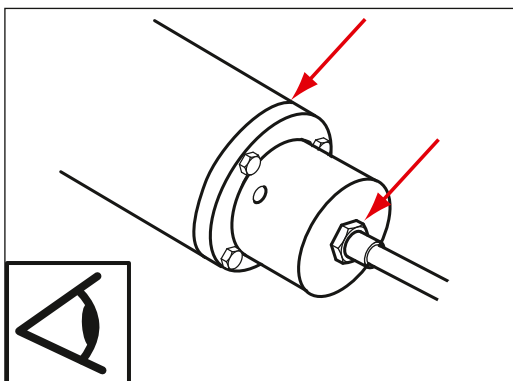


Warning

Risk of injury 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 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.



Carry out daily visual inspections in order to check whether leakages occurred at the connections (see arrows). The aforementioned refers to leakages not related to functional-related causes.

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, replace it with a new one, or return the union to *DEUBLIN* for overhaul / service.

Fig. 10: Inspect visually

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?



Info

Please do not open the rotating unions for repair works.
The aforementioned will forfeit the claim for material defect liability.

9.1 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 leaking after installation (not applicable for functional-related leakage).	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. 5. Ensure that connection fittings are correctly sealed.
	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.
Rotating union runs untrue or wobbles.	Thread and/or concentricity outside the admissible tolerance.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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.

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.

1. Dismount the rotating union in reverse order of the installation (see Installation).
2. Use a cardboard box which is suitable for the weight of the rotating union.
3. Cushion the base of the cardboard box with a soft material, e.g. air bubble film.
4. Wrap the rotating union with a soft material, e.g. air bubble film.
5. Ensure that no packing material or dirt can penetrate the opening of the rotating union.
6. Position the rotating union in the middle of the cardboard box.
7. Fill the free space around the rotating union with newspaper or another suitable material.
8. Close the cardboard box by means of tape.

10 Disposal

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

The rotating unions mainly consist of metals, which can be re-used within the recycling 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.

11 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 may only be carried out by *DEUBLIN*.



Info

Note

Rotating unions and bearingless unions of this series cannot be repaired by the customers themselves 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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