# FLENDER COUPLINGS

## RUPEX

3601en

Operating Instructions

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RWN, RWS

Edition 01/2019
Legal information

Warning notice system
This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠️ DANGER
indicates that death or severe personal injury will result if proper precautions are not taken.

⚠️ WARNING
indicates that death or severe personal injury may result if proper precautions are not taken.

⚠️ CAUTION
indicates that minor personal injury can result if proper precautions are not taken.

NOTICE
indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel
The product/system described in this documentation may be operated only by personnel qualified for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Flender products
Note the following:

⚠️ WARNING
Flender products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Flender. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks
All names identified by ® are registered trademarks of Flender GmbH. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability
We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.
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Introduction

1.1 About these instructions

These instructions describe the coupling and provide information about its handling - from assembly to maintenance. Please keep these instructions for later use.

Please read these instructions prior to handling the coupling and follow the information in them.

1.2 Text attributes

The warning notice system is explained on the back of the inner cover. Always follow the safety information and notices in these instructions.

In addition to the warning notices, which have to be observed without fail, you will find the following text attributes in these instructions:

1. Procedural instructions are shown as a numbered list. Always perform the steps in the order given.

• Lists are formatted as bulleted lists.
  – The dash is used for lists at the second level.

(1) Numbers in brackets are part numbers.

Note

A note is an important item of information about the product, the handling of the product or the relevant section of the instructions. The note provides you with help or further suggestions/ideas.

1.3 Copyright

The copyright for these instructions is held by Flender.

These instructions must not be used wholly or in parts without our authorisation or be given to third parties.

If you have any technical queries, please contact our factory or one of our service outlets (refer to Service and support (Page 55)).
Introduction

1.3 Copyright
2.1 General information

Instructions

These instructions are part of the delivery. Always keep these instructions close to the coupling. Please make sure that every person who is commissioned to work on the coupling has read and understood these instructions prior to handling the coupling and observes all of the points. Only the knowledge of these instructions can avoid faults on the coupling and ensure fault-free and safe operation. Non-adherence to the instructions can cause product or property damage or personal injury. Flender does not accept any liability for damage or operating failures that are due to non-adherence to these instructions.

State of the art

The coupling described here has been designed in consideration of the latest findings for demanding technical requirements. This coupling is state-of-the-art at the time of printing these instructions.

In the interest of further development, Flender reserves the right to make such changes to the individual components and accessories that increase performance and safety whilst maintaining the essential features.

Symbols

Table 2-1 General warnings

<table>
<thead>
<tr>
<th>ISO</th>
<th>ANSI</th>
<th>Warning</th>
</tr>
</thead>
<tbody>
<tr>
<td>⚡️</td>
<td>⚡️</td>
<td>Warning - hazardous electrical voltage</td>
</tr>
<tr>
<td>⚡️</td>
<td>⚡️</td>
<td>Warning - explosive substances</td>
</tr>
<tr>
<td>⚡️</td>
<td>⚡️</td>
<td>Warning - entanglement hazard</td>
</tr>
<tr>
<td>⚡️</td>
<td>⚡️</td>
<td>Warning - hot surfaces</td>
</tr>
<tr>
<td>⚡️</td>
<td>⚡️</td>
<td>Warning - substances that are harmful to health or are irritants</td>
</tr>
</tbody>
</table>
Safety instructions
2.1 General information

<table>
<thead>
<tr>
<th>ISO</th>
<th>ANSI</th>
<th>Warning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>---</td>
<td>Warning - corrosive substances</td>
</tr>
<tr>
<td></td>
<td>---</td>
<td>Warning - suspended load</td>
</tr>
<tr>
<td></td>
<td>---</td>
<td>Warning - hand injuries</td>
</tr>
<tr>
<td></td>
<td>Ex</td>
<td>ATEX certification</td>
</tr>
</tbody>
</table>

Explanation regarding Machinery Directive 2006/42/EC
The couplings described here are “components” in accordance with the Machinery Directive and do not require a declaration of incorporation.

ATEX Directive
The term "ATEX Directive" used in these instructions stands for the harmonisation legislation of the European Union in compliance with the declaration of conformance for equipment and protective systems for correct use in hazardous zones.

Protective clothing
In addition to the generally prescribed personal protective equipment (safety shoes, overalls, helmet, etc.), also wear suitable safety gloves and safety goggles when handling the coupling.

Using the coupling
The relevant work safety and environmental protection regulations must be complied with at all times during transport, assembly, installation, dismantling, operation and maintenance of the coupling.

Only qualified personnel may operate, assemble, maintain and repair the coupling. Information about qualified personnel can be found in the legal notes at the beginning of these instructions.

If lifting gear or load suspension devices are used for transporting, these have to be suitable for the weight of the coupling.

If the coupling has visible damage, it may not be assembled or put into operation.

The coupling may only be operated in a suitable housing or with touch protection according to applicable standards. This also applies to test runs and rotational direction checks.

Work on the coupling
Only carry out work on the coupling when it is not in operation and is not under load.
Secure the drive unit against being switched on accidentally. Attach a notice to the switch stating clearly that work is being carried out on the coupling. Ensure that the entire unit is not under load.

2.2 Intended use

Only use the coupling according to the conditions specified in the service and delivery contract and the technical data in the annex. Deviating operating conditions are considered improper use. The user or owner of the machine or plant is solely liable for any resulting damage.

When using the coupling please specifically observe the following:

- Do not make any modifications to the coupling that go beyond the permissible machining described in these instructions. This also applies to touch protection facilities.
- Only use original spare parts from Flender. Flender only accepts liability for original spare parts from Flender. Other spare parts are not tested and approved by Flender. Non-approved spare parts may possibly change the design characteristics of the coupling and thus impact active and/or passive safety. Flender will accept no liability or warranty whatsoever for damage occurring as a result of the use of non-approved spare parts. The same applies to any accessories that were not supplied by Flender.

If you have any queries, please contact our customer service (see Service and support (Page 55)).

2.3 Safety instructions for a coupling for use in potentially explosive atmospheres

2.3.1 Marking

You can find a description of the coupling parts in chapter Description (Page 17).

A coupling designed in accordance with the ATEX Directive has a marking on the coupling parts.

**Coupling part 1 (1) without electrically insulating buffers**

One of the following markings is visible on the outer diameter of coupling part 1:

- Flender GmbH
- D 46393 Bocholt
- RUPEX

<table>
<thead>
<tr>
<th>Company</th>
<th>Marking Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flender GmbH</td>
<td>II 2G Ex h IIC T6 ... T4 Gb X</td>
</tr>
<tr>
<td>D 46393 Bocholt</td>
<td>II 2D Ex h III C T85 °C ... 110 °C Db X</td>
</tr>
<tr>
<td>RUPEX</td>
<td>I M2 Ex h Mb X</td>
</tr>
</tbody>
</table>

<Year of manufacture>
**Coupling part 1 with electrically insulating buffers**

One of the following markings is visible on the outer diameter of coupling part 1:

- Flender GmbH II 2G Ex h IIB T6 ... T4 Gb X
- D 46393 Bocholt II 2D Ex h IIIC T85 °C ... 110 °C Db X
- RUPEX <Year of manufacture> I M2 Ex h Mb X

**Coupling part 2 (2)**

Coupling part 2 (2) is stamped with Ex.

**Undrilled or predrilled coupling**

A coupling part with Ex marking, the letter "U" and the Flender order number has been delivered undrilled or predrilled.

**Note**

**Undrilled or predrilled coupling with Ex marking**

Flender only supplies an undrilled or predrilled coupling with Ex marking on the condition that the customer assumes the responsibility and liability for correct finishing work in a declaration of exemption.

### 2.3.2 Conditions of use

**Note**

Note also the material-dependent permissible ambient temperature of the buffers (5) in accordance with section RUPEX buffers (5) (Page 71).

A coupling designed in accordance with the ATEX Directive is suitable for the following conditions of use:

- Equipment group I
  - Category M2
- Equipment group II
  - Category 2 and 3
  - Group of substances G, zone 1 and 2
  - Group of substances D, zone 21 and 22
  - Explosion group IIA, IIB and IIC
  - Explosion group IIA and IIB when electrically insulating buffers are used
Conditions of use for products with TX marking

The maximum ambient temperature stated in the following tables applies to the temperature in the direct vicinity of the coupling and the temperature of adjacent components.

1. Gases, vapours or mists
Check the ambient temperature for use of the coupling in the relevant temperature class.

Table 2-2  Temperature classes (TX) for explosive atmospheres as a result of gases, vapours or mists

<table>
<thead>
<tr>
<th>Max. ambient temperature</th>
<th>Temperature class</th>
</tr>
</thead>
<tbody>
<tr>
<td>80 °C</td>
<td>T4</td>
</tr>
<tr>
<td>70 °C</td>
<td>T5</td>
</tr>
<tr>
<td>55 °C</td>
<td>T6</td>
</tr>
</tbody>
</table>

2. Dust/air mixtures
Check the ambient temperature.

Table 2-3  Maximum surface temperature (TX) for an explosive atmosphere as a result of dust/air mixtures

<table>
<thead>
<tr>
<th>Max. ambient temperature</th>
<th>Max. surface temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>80 °C</td>
<td>110 °C</td>
</tr>
</tbody>
</table>

Notes concerning operation of the coupling in potentially explosive atmospheres

- Only use the coupling underground in mines in potentially explosive atmospheres together with drive motors that can be switched off in the event of the formation of an explosive atmosphere.
- Earth machines that are connected via the coupling with a leakage resistance of less than $10^6$ Ω.
- If you want to use a coated coupling in potentially explosive atmospheres, please note the requirements concerning the conductivity of the paint and the limitation on the paint layer thickness applied in accordance with EN 80079-36. No build-up of electrostatic charges is to be expected with a paint layer thickness of less than 200 μm.

2.4 General warning notices

DANGER

Danger due to bursting of the coupling
The coupling may burst if it is not used properly. There is a risk of fatal injury from flying fragments. Bursting of the coupling can lead to an explosion in potentially explosive atmospheres.
- Use the coupling for the purpose for which it is intended.
DANGER

Risk of explosion when using coupling parts without Ex marking
Coupling parts without Ex marking have not been approved for use in potentially explosive atmospheres. These coupling parts can lead to an explosion during operation.

● Only use couplings with Ex marking in potentially explosive atmospheres.

DANGER

Danger
Risk of injury due to the use of unsuitable and/or damaged components. The use of unsuitable and/or damaged components can lead to an explosion in potentially explosive atmospheres.

● Observe the information regarding conditions of use.

DANGER

Danger of explosion
Improper operation of the coupling can lead to an explosion in potentially explosive atmospheres.

● Please observe the notes concerning operation of the coupling in potentially explosive atmospheres.

DANGER

Danger from hot coupling parts
Risk of injury due to hot surfaces. Hot coupling parts can lead to an explosion in potentially explosive atmospheres.

● Wear suitable protective equipment (gloves, safety goggles).

● Ensure that the area is not at risk of explosion.

WARNING

Risk of chemical burns due to chemical substances
There is a risk of chemical burns when handling aggressive cleaning agents.

● Please observe the manufacturer's information on how to handle cleaning agents and solvents.

● Wear suitable protective equipment (gloves, safety goggles).

CAUTION

Physical injury
Risk of injury due to falling coupling parts.

● Secure the coupling parts to prevent them from falling.
Description

The RUPEX couplings described here are torsionally flexible, damping pin and bush couplings and are available in various types and sizes with axial backlash limitation. The couplings can be used in accordance with the ATEX Directive in potentially explosive atmospheres if they have a CE marking.

These instructions describe the assembly and operation of a RUPEX coupling arranged horizontally with a shaft-hub connection made by a cylindrical or conical bore with parallel key or by a pressurised oil interference fit. Please consult Flender if you want to use a different type of installation.

Application

RUPEX couplings with axial backlash limitation are designed for use in all kinds of machines. They are designed to withstand high torques and harsh operating conditions and are predominantly used in drives in which the motor does not have a separate thrust bearing.
Design

The illustration shows the various types with their constituent parts and their part numbers.

Figure 3-1  Types RWN and RWS with axial backlash limitation

The axial backlash limitation comprises parts 31, 32, 33, 34 and 35.

For applications in potentially explosive atmospheres, use set screws (33) and (34) made of a material that cannot generate any impact sparks, e.g. rigid PVC.
1 Bolt connection for sizes 285 to 400
2 Bolt connection for sizes 450 to 630
3 Bolt connection for sizes 710 to 1250
4 Bolt
5 Buffer
6 Washer
7 Hexagon nut, self-locking
8 Washer
11 Hexagon head screw
12 Locking ring

Figure 3-2 Bolt connection
Application planning

Check the delivery for damage and for completeness. Report any damage and/or missing parts to Flender immediately.

The coupling is delivered in individual parts and preassembled groups. Preassembled groups may not be dismantled.

4.1 Transport of the coupling

**WARNING**

Severe personal injury due to improper transport

Severe personal injury due to falling components or due to crushing. Damage to coupling parts possible due to use of unsuitable transport means.

- Only use lifting gear and load suspension devices with sufficient load bearing capacity for transport.
- Please observe the symbols applied on the packaging.

If not specifically contractually agreed otherwise, the packaging complies with the HPE Packaging Directive.

![Transport symbols](image)

Figure 4-1 Transport symbols

4.2 Storage of the coupling

**NOTICE**

Property damage due to improper storage

Negative changes to the physical properties of the coupling and/or coupling damage.

- Please observe the information about storing the coupling.
The coupling, unless not specifically ordered otherwise, is supplied with preservation and can be stored for up to 3 months.

**Note**

**Information about storing the coupling**

- Ensure that the storage room is dry (relative humidity < 65 %) and free of dust.
- Ensure that there is no condensation.
- Do not store the coupling together with corrosive chemicals, acids, caustic solutions, etc.
- If the coupling contains elastomer components, ensure that there are no devices in the storage room that produce ozone, such as fluorescent lights, mercury vapour lamps or high-voltage electrical equipment.
- Store the coupling on suitable supports or in suitable containers.

**Long-term storage**

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Property damage due to improper long-term storage</strong></td>
</tr>
<tr>
<td>Negative changes to the physical properties of the coupling and/or coupling damage.</td>
</tr>
<tr>
<td>• Note the handling instructions for long-term storage.</td>
</tr>
</tbody>
</table>

1. You can find the required type of preservative agent in the following table (types of preservative agents for long-term storage).
2. Remove the elastomer components. These must not come into contact with cleaning agents and long-term preservative agents.
3. Clean the coupling parts.
4. Apply the stipulated preservative agent.
5. Store the coupling parts and the elastomer components separately.

**Table 4-1  Types of preservative agents for long-term storage**

<table>
<thead>
<tr>
<th>Preservative agents</th>
<th>Features</th>
<th>Indoor storage</th>
<th>Outdoor storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil spray</td>
<td>Anti-corrosion agent</td>
<td>Up to 12 months</td>
<td>Up to 4 months</td>
</tr>
<tr>
<td>Tectyl 846 or similar</td>
<td>Long-term preservative agent on wax basis</td>
<td>Up to 36 months</td>
<td>Up to 12 months</td>
</tr>
<tr>
<td>Emulsion cleaner + VCI foil</td>
<td>Active system, reusable</td>
<td>Up to 5 years</td>
<td>Up to 5 years</td>
</tr>
</tbody>
</table>
Assembly

Assembly of the coupling comprises the following steps:

- Preparatory work (Page 23)
- Assembling the coupling (Page 29)
- Aligning the coupling (Page 32)

**DANGER**

**Danger due to bursting of the coupling**

If you do not observe the information stipulated here regarding assembly, this can lead to bursting of the coupling during operation. There is a risk of fatal injury from flying fragments. Bursting of the coupling can lead to an explosion in potentially explosive atmospheres.

- Please observe all the stipulations concerning assembly.

**Note**

**Information about the assembly of the coupling**

- Only use undamaged components for the assembly of the coupling.
- Follow the assembly sequence.
- Please ensure that there is sufficient space at the assembly location and that the location is tidy and clean in order to be able to assemble and maintain the coupling without any risk.
- If a dimension drawing has been created for the coupling, please observe the information it contains as a matter of priority.

### 5.1 Preparatory work

**Note**

Please consult Flender if you want to machine a conical finished bore.

Carry out the following steps if the coupling does not have a finished bore:

- Milling the parallel keyway (Page 24)
- Milling the parallel keyway (Page 25)
- Machining an axial locking mechanism (Page 25)
- Balancing the coupling (Page 28)
Note

The customer is responsible for execution of the finishing work on the coupling. Flender shall have no liability whatsoever for claims under warranty arising from finishing work that has not been carried out adequately.

5.1.1 Milling the parallel keyway

The diameter of the finished bore depends on the shaft used.

Recommended assigned fits

In the following table you can find the recommended assigned fits for bores with a parallel key connection. The assigned fit m6 / H7 is especially suitable for a host of applications.

Table 5-1 Recommended assigned fits for bores with parallel key connection

<table>
<thead>
<tr>
<th>Description</th>
<th>Push fit</th>
<th>Press fit</th>
<th>Interference fit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not suitable for reversing operation</td>
<td>Suitable for reversing operation</td>
<td></td>
</tr>
<tr>
<td>Shaft tolerance</td>
<td>j6</td>
<td>h6</td>
<td>h6</td>
</tr>
<tr>
<td>Bore tolerance</td>
<td>H7</td>
<td>J7</td>
<td>K7</td>
</tr>
</tbody>
</table>

Procedure

1. Remove the retaining ring (31) and the set screws (34) with the nuts (35).
2. Remove the bolts (4) and/or (30) and the buffers (5). For further information, refer to section Replacing wearing parts (Page 44).
3. Remove the preservation and clean the coupling parts 1 (1) and/or 2 (2) to be machined.
4. Clamp the coupling to the areas marked with □ in the diagram below.

5. Machine the finished bore in accordance with the diagram below.

**Note**

**Diameter of the finished bore**

The diameter of the finished bore may not exceed the specified maximum diameter.
- Please observe the maximum diameters specified in section Speeds, geometry data and weights (Page 65).

![Diagram of tolerances for finished bore](image)

Figure 5-1  Tolerances for the finished bore in coupling part 1 (1) or 2 (2)

### 5.1.2 Milling the parallel keyway

**Position of the parallel keyway**

Arrange the parallel keyway in the centre between two adjacent buffer fitting holes or bolt fitting holes.

**Applicable standards**

- If the coupling is intended for use under normal operating conditions, mill the parallel keyway according to DIN 6885/1 ISO JS9.
- If the coupling is intended for reversing operation, mill the parallel keyway according to DIN 6885/1 ISO P9.
- If you want to mill a parallel keyway that does not correspond to DIN 6885/1, please consult Flender.

### 5.1.3 Machining an axial locking mechanism

The coupling part is secured by a set screw or an end plate to prevent axial movements.
Please consult Flender if you want to use an end plate.

Note the following when using a set screw:

- Diameter and axial position of the tapped hole in the hub
- Position of the tapped hole with respect to the parallel keyway
- Selection of the set screw

Diameter and axial position of the tapped hole in the hub

The axial position of the tapped hole is in the centre of the hub.

The diagram below shows the dimensions for drilling the parallel keyway through the tapped hole.

![Diagram of tapped hole and parallel keyway dimensions](image)

1. Hole for the set screw with dog point according to ISO 4028

Figure 5-2 Dimensions for drilling the parallel keyway

The following tables contain the values for the diameter of the tapped hole depending on the finished bore.

Table 5-2 Tapped hole, tightening torque and width A/F for type RWN

<table>
<thead>
<tr>
<th>Finished bore over</th>
<th>Finished bore up to</th>
<th>Tapped hole d₁</th>
<th>Tapped hole d₂</th>
<th>Tightening torque Tₐ</th>
<th>Width across flats</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>Nm</td>
<td>Hexagon socket wrench mm</td>
</tr>
<tr>
<td>48</td>
<td>65</td>
<td>M10</td>
<td>7</td>
<td>2.5</td>
<td>15</td>
</tr>
<tr>
<td>65</td>
<td>95</td>
<td>M12</td>
<td>8.5</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td>95</td>
<td>110</td>
<td>M16</td>
<td>12</td>
<td>4</td>
<td>70</td>
</tr>
<tr>
<td>110</td>
<td>150</td>
<td>M20</td>
<td>15</td>
<td>5</td>
<td>130</td>
</tr>
<tr>
<td>150</td>
<td>230</td>
<td>M24</td>
<td>18</td>
<td>6</td>
<td>230</td>
</tr>
<tr>
<td>230</td>
<td>600</td>
<td>M30</td>
<td>24</td>
<td>7</td>
<td>470</td>
</tr>
</tbody>
</table>
Apply the recommended tightening torques in accordance with the stipulations in section Tightening procedure (Page 70).

Table 5-3  Tapped hole, tightening torque and width A/F for type RWS

<table>
<thead>
<tr>
<th>Finished bore over mm</th>
<th>Tapped hole up to mm</th>
<th>d₁ mm</th>
<th>d₂ mm</th>
<th>t mm</th>
<th>Tightening torque Tₐ Nm</th>
<th>Width across flats Hexagon socket wrench mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>48 75</td>
<td>M8</td>
<td>5.5</td>
<td>2</td>
<td>8</td>
<td>4</td>
<td>58</td>
</tr>
<tr>
<td>75 95</td>
<td>M12</td>
<td>8.5</td>
<td>3</td>
<td>25</td>
<td>6</td>
<td>95</td>
</tr>
<tr>
<td>95 110</td>
<td>M16</td>
<td>12</td>
<td>4</td>
<td>70</td>
<td>8</td>
<td>110</td>
</tr>
<tr>
<td>110 150</td>
<td>M20</td>
<td>15</td>
<td>5</td>
<td>130</td>
<td>10</td>
<td>150</td>
</tr>
<tr>
<td>150 230</td>
<td>M24</td>
<td>18</td>
<td>6</td>
<td>230</td>
<td>12</td>
<td>230</td>
</tr>
<tr>
<td>230 600</td>
<td>M30</td>
<td>24</td>
<td>7</td>
<td>470</td>
<td>14</td>
<td>600</td>
</tr>
</tbody>
</table>

Apply the recommended tightening torques in accordance with the stipulations in section Tightening procedure (Page 70).

Position of the tapped hole with respect to the parallel keyway

The tapped hole for the set screw is positioned on the parallel keyway.

Selection of the set screw

⚠️ CAUTION

Physical injury

Danger of injury from protruding set screw.

● Please observe the information about selecting the set screw.

Use set screws with dog point in accordance with ISO 4028. The size of the set screw is determined by the bore made. The set screw should fill out the tapped hole as much as possible and must not protrude beyond the hub.
5.1.4 Balancing the coupling

Notes on balancing the coupling

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damage to coupling part 1 (1) or 2 (2) or to retaining ring (31)</td>
</tr>
</tbody>
</table>

If you completely drill through the flange on coupling part 1 (1) or 2 (2) or on the retaining ring (31), then coupling part 1 (1) or 2 (2) or the retaining ring is no longer allowed to be used for operation.

- Please observe the stipulations about machining the balancing hole.

Please note the following when balancing the coupling:

- Select the balancing quality according to the application (but at least G16 in accordance with DIN ISO 21940).

- Observe the balancing specification according to DIN ISO 21940-32.

- Machine the balancing bore on a large radius with adequate clearance to the buffer fitting holes, the bolt fitting holes and the outer circumference.

- Balance the coupling parts in two planes. Balance the coupling part 2 (2) together with the axial backlash limitation. The axial backlash limitation comprises parts 31, 32, 33, 34 and 35.

![Diagram](image)

- Balancing bore
- Coupling part 1
- Coupling part 2 with axial backlash limitation
- Marking

Figure 5-3 Position of the balancing bore for two-plane balancing

Procedure

1. Fit the bolts (30) and buffers (5). For further information, refer to section Replacing wearing parts (Page 44).

2. Fit the retaining ring (31).

3. Tighten the screws (32) to the specified tightening torque $T_A$ (see Tightening torques and widths A/F (Page 68)).
4. Screw the set screws (33) into the retaining ring (31). All the set screws (33) must be inserted to the same depth.
5. Secure the set screws (33) with the nuts (35).
6. Screw the set screws (34) into the coupling part 2 (2). All the set screws (34) must be inserted to the same depth.
7. Secure the set screws (34) with the nuts (35).
8. Balance the coupling as illustrated in the diagram above.
9. Mark the retaining ring (31) and the coupling part 2 (2).

5.2 Assembling the coupling

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property damage</td>
</tr>
<tr>
<td>Damage to the elastomer components from cleaning agents.</td>
</tr>
<tr>
<td>• Ensure that the elastomer components do not come into contact with cleaning agents.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property damage</td>
</tr>
<tr>
<td>Damage to the shaft end, the coupling parts and/or the parallel key.</td>
</tr>
<tr>
<td>• Note the handling instructions regarding assembly of the coupling parts.</td>
</tr>
</tbody>
</table>

Assembly of the coupling comprises the following steps:
• Assembling coupling parts with shaft and hub connected by a parallel key (Page 29)
• Assembling coupling parts with shaft and hub connected by a pressurised oil interference fit (Page 30)
• Assembling the axial backlash limitation (Page 31)

5.2.1 Assembling coupling parts with shaft and hub connected by a parallel key

Procedure
1. Remove the retaining ring (31).
2. Unscrew the set screw out of coupling parts 1 (1) and/or 2 (2) until it is no longer possible for there to be a collision with the parallel key or the shaft.
3. Clean the bores and shaft ends.
4. Coat the bores of coupling parts 1 (1) and/or 2 (2) and the shafts with MoS$_2$ assembly paste (e.g. Microgleit LP 405).
5. Mount the retaining ring (31) on the shaft before fitting the coupling part 1 (1). Make sure that the retaining ring (31) cannot obstruct mounting of the coupling part 1 (1).

6. Mount the coupling parts 1 (1) and/or 2 (2) on the shaft.

**Note**

**Coupling parts with conical bore**

Mount the coupling parts 1 (1) and/or 2 (2) with conical bore and parallel keyway on the shaft in cold condition. Secure the coupling parts with suitable end plates without pulling the coupling parts further onto the cone (fitting dimension = 0).

**Note**

**Coupling parts with cylindrical bore**

To make assembly easier, you can heat coupling parts 1 (1) and/or 2 (2) with cylindrical bore up to a maximum of 150 °C if required. Note when doing this the temperature range of the buffers (5) (see section RUPEX buffers (5) (Page 71)). Remove the buffers (5) if necessary. For further information, refer to section Replacing wearing parts (Page 44). Protect adjacent components against damage and heating to temperatures above 80 °C.

7. When securing with a set screw the shaft must not protrude or be set back from the inner side of the hub. Drill the parallel key in the shaft through the tapped hole in the hub. Please observe the relevant information in section Machining an axial locking mechanism (Page 25).

8. Clean the parts to remove any impurities.

9. Secure the coupling parts 1 (1) and/or 2 (2) with a set screw or an end plate.

10. Tighten up the set screw or the screw to attach the end plate to the specified tightening torque $T_A$ (for the set screw please see section Machining an axial locking mechanism (Page 25)).

11. If you have removed the buffers (5), reinstall them. For further information, refer to section Replacing wearing parts (Page 44).

5.2.2 Assembling coupling parts with shaft and hub connected by a pressurised oil interference fit

**Procedure**

1. Remove the retaining ring (31).

2. Remove the buffers (5). For further information, refer to section Replacing wearing parts (Page 44).

3. Remove the screw plugs (101) and/or (201) from the coupling parts 1 (1) and/or 2 (2).

4. Clean, degrease, de-oil and dry the hub bores and shaft ends.

5. Clean and dry the oil channels and the oil circulation grooves.

6. Protect adjacent components against damage and heating to temperatures above 80 °C.
7. Mount the retaining ring (31) on the shaft before fitting the coupling part 1 (1). Make sure that the retaining ring (31) cannot obstruct mounting of the coupling part 1 (1).

8. Heat up the coupling parts 1 (1) and/or 2 (2) to the temperature specified in the dimension drawing.
   Make sure that no dirt or contaminants can soil the bores again during the heating process.

9. Mount the coupling parts 1 (1) and/or 2 (2) quickly on the shaft according to the instructions in the dimension drawing.

10. Secure the coupling parts to stop them from moving until they have cooled down.

11. Allow the coupling parts to cool down to the ambient temperature.

12. Use an end plate to secure the coupling parts that have a non-self-locking, tapered pressurised oil interference fit.

13. In order to protect the oil channels of the coupling parts 1 (1) and/or 2 (2) against corrosion, fill them with a suitable pressurised oil and seal the oil channels with the screw plugs (101) and/or (201).

14. Assemble the buffers (5). For further information, refer to section Replacing wearing parts (Page 44).

5.2.3 Assembling the axial backlash limitation

Procedure

1. If the motor does not have any axial location bearings, you need to determine the axial backlash of the rotor. If you do not find any marking on the shaft nor any other information pertaining to the axial backlash, you can determine the mid-point of the rotor axial backlash by performing a trial run.

2. Hold the shaft in the axial position that corresponds to the mid-point of the rotor axial clearance.

3. Move the machines to be coupled together, taking the dimension S into account. The values for the dimension S can be found in section Speeds, geometry data and weights (Page 65).

4. Fit the retaining ring (31). Observe any markings that might be provided.

5. Apply a few drops of liquid screw locking agent (e.g. Loctite 243) to the screws (32).
6. Tighten the screws (32) to the specified tightening torque $T_A$ (see section Tightening torques and widths A/F (Page 68)).

7. Adjust the axial backlash of the coupling with the set screws (33) and (34) to approximately half the calculated motor axial clearance, making sure that the dimension $*$ is equal in size on both sides. Note the permissible deviation for the dimension $S$ (for dimension $S$ see section Speeds, geometry data and weights (Page 65)).

![Diagram of adjusting the axial backlash of the coupling]

Figure 5-4 Adjusting the axial backlash of the coupling

Example

Axial backlash of the electric motor = 8 mm
Axial backlash of the coupling = 4 mm
Axial backlash per coupling part (dimension $*$) = 2 mm

5.3 Aligning the coupling

While aligning, hold the shaft in the axial position that corresponds to the mid-point of the rotor axial clearance.

5.3.1 Purpose of alignment

The shafts that are joined by the coupling are never on an ideal precise axis but have a certain amount of misalignment.

Misalignment in the coupling leads to restoring forces that can stress adjacent machine parts (e.g. the bearings) to an unacceptable extent.
The misalignment values in operation result from the following:

- Misalignment due to assembly
  Incorrect position due to a lack of precision when aligning
- Misalignment due to operation
  Example: Load-related deformation, thermal expansion

You can minimise misalignment by aligning after assembly. A lower misalignment in the coupling has the following advantages:

- Reduced wear of the elastomer components
- Reduced restoring forces
- Misalignment reserves for operation of the coupling

You can find the maximum permitted shaft misalignment values during operation in section Shaft misalignment values during operation (Page 68).

## 5.3.2 Possible misalignment

**Figure 5-5 Possible misalignment**

1. Axial misalignment ($\Delta K_a$)
2. Angular misalignment ($\Delta K_w$)
3. Radial misalignment ($\Delta K_r$)

### 5.3.2.1 Axial misalignment

Set the axial misalignment $\Delta K_a$ to a value within the permissible tolerance range of dimension $S$.

You can find the values for dimension $S$ in section Speeds, geometry data and weights (Page 65).
5.3.2.2 Angular misalignment

Determine the value ΔS (ΔS = S_{max} - S_{min}). The determined value ΔS may not exceed the value ΔS_{perm}.

You can find the values for ΔS_{perm} in section Shaft misalignment values during operation (Page 68).

If required, you can calculate the angular misalignment ΔKw as follows:

ΔKw [rad] = ΔS / DA
ΔKw [deg] = (ΔS / DA) · (180 / π)

If required, you can calculate the permissible angular misalignment ΔKw_{perm} as follows:

ΔKw_{perm} [rad] = ΔS_{perm} / DA
ΔKw_{perm} [deg] = (ΔS_{perm} / DA) · (180 / π)

DA in mm see section Speeds, geometry data and weights (Page 65)
ΔS_{perm} see section Shaft misalignment values during operation (Page 68)

5.3.2.3 Radial misalignment

Determine the value ΔKr. The determined value ΔKr may not exceed the value ΔKr_{perm}.

You can find the permissible radial misalignment ΔKr_{perm} in section Shaft misalignment values during operation (Page 68).

5.3.2.4 Axial backlash

Check the adjusted axial backlash. It must be at least large enough to allow the coupling to compensate for the resultant angular deviation.

Tighten the nuts (35) to the specified tightening torque T_A (see section Tightening torques and widths A/F (Page 68)).
Commissioning

**DANGER**

Danger due to igniting deposits

During use in potentially explosive atmospheres deposits from heavy metal oxides (rust) can ignite due to friction, impact or friction sparks and lead to an explosion.

- Ensure through the use of an enclosure or other suitable measures that the deposition of heavy metal oxides (rust) on the coupling is not possible.

In order to ensure safe commissioning, carry out various tests prior to commissioning.

**Testing before commissioning**

**DANGER**

Danger

Overload conditions can occur during the commissioning of the coupling. The coupling can burst and metal parts can be flung out. There is a risk of fatal injury from flying fragments. Bursting of the coupling can lead to an explosion in potentially explosive atmospheres.

- Carry out the tests prior to commissioning.
- Do not touch the rotating coupling.

1. Check the tightening torques of the screws of the coupling in accordance with section Tightening torques and widths A/F (Page 68).
2. Check the tightening torques of the foundation bolts of the coupled machines.
3. Check whether suitable enclosures (ignition protection, coupling guard, touch protection) have been installed and that the function of the coupling has not been adversely affected by the enclosure. This also applies to test runs and rotational direction checks.
7.1 Normal operation of the coupling

The coupling runs quietly and shock-free during normal operation.

7.2 Faults - causes and rectification

A form of behaviour which is different to normal operation is classed as a fault and has to be rectified immediately.

Look out specifically for the following faults during coupling operation:

- Unusual coupling noise
- Sudden occurrence of shocks

7.2.1 Procedure in the event of malfunctions

**DANGER**

Danger due to bursting of the coupling

There is a risk of fatal injury from flying fragments. Bursting of the coupling can lead to an explosion in potentially explosive atmospheres.

- Switch off the unit at once if any malfunctions occur.
- Note during the maintenance work the possible causes of faults and the notes on rectifying them.

Proceed as described below if there is a malfunction of the coupling during operation:

1. De-energise the drive immediately.
2. Initiate the required action for repair, taking into consideration the applicable safety regulations.

If you cannot determine the cause or if you cannot carry out repair work with your own means, request one of our customer service technicians.

7.2.2 Identifying the fault cause

Faults occur frequently due to application errors or they occur due to operational circumstances such as wear of wearing parts or changes to the system.
The faults and fault causes listed below only serve as an indication for troubleshooting. In the case of a complex system be sure to include all the system components in the search for the fault.

<table>
<thead>
<tr>
<th>Fault</th>
<th>Cause</th>
<th>Rectification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sudden changes in the noise level and/or sudden occurrences of shocks</td>
<td>Wear of wearing parts</td>
<td>Follow the instructions given in section Replacing wearing parts (Page 40).</td>
</tr>
<tr>
<td>Changed alignment</td>
<td></td>
<td>Follow the instructions given in section Correcting the changed alignment (Page 41).</td>
</tr>
<tr>
<td>Coupling not suitable for the operating conditions. Check the possible causes given in section Unsuitable coupling (Page 39).</td>
<td></td>
<td>Use a coupling that is suitable for the operating conditions.</td>
</tr>
<tr>
<td>Incorrect assembly of the coupling. Check the possible causes given in sections Assembly-related causes (Page 39) and Specific installation-related and maintenance-related causes (Page 40).</td>
<td></td>
<td>Reassemble the coupling in accordance with these instructions. Please observe all the stipulations and requirements given in chapter Assembly (Page 23).</td>
</tr>
<tr>
<td>Incorrect maintenance of the coupling. Check the possible causes given in sections Maintenance-related causes (Page 40) and Specific installation-related and maintenance-related causes (Page 40).</td>
<td></td>
<td>Please observe all the stipulations and requirements given in chapter Servicing (Page 43).</td>
</tr>
</tbody>
</table>

**WARNING**

**Physical injury**

Injury from rotating parts.
- Only carry out work on the coupling when it is not moving.
- Secure the drive unit against being operated accidentally.
- Attach a notice to the switch stating clearly that work is being carried out on the coupling.
- Before starting any work, make sure that the unit is free from loads.

**Intended use**

The coupling is only approved for the applications specified in these instructions. Please observe all the stipulations in section Intended use (Page 13).

**7.2.2.1 Possible faults**

Table 7-1 Table of faults
### 7.2 Faults - causes and rectification

<table>
<thead>
<tr>
<th>Fault</th>
<th>Cause</th>
<th>Rectification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presence of vibration</td>
<td>Coupling not suitable for the operating conditions.</td>
<td>Use a coupling that is suitable for the operating conditions.</td>
</tr>
<tr>
<td></td>
<td>Check the possible causes given in section Unsuitable coupling (Page 39).</td>
<td></td>
</tr>
<tr>
<td>Incorrect assembly of the coupling.</td>
<td>Check the possible causes given in sections Assembly-related causes (Page 39) and Specific installation-related and maintenance-related causes (Page 40).</td>
<td>Reassemble the coupling in accordance with these instructions.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Please observe all the stipulations and requirements given in chapter Assembly (Page 23).</td>
</tr>
<tr>
<td>Incorrect maintenance of the coupling.</td>
<td>Check the possible causes given in sections Maintenance-related causes (Page 40) and Specific installation-related and maintenance-related causes (Page 40).</td>
<td>Please observe all the stipulations and requirements given in chapter Servicing (Page 43).</td>
</tr>
</tbody>
</table>

#### 7.2.2.2 Possible causes

**Unsuitable coupling**

- Important information on the description of the drive unit and the environment were not available when the coupling was chosen.
- System torque too high and/or torque dynamics not permissible.
- System speed too high.
- Application factor not selected correctly.
- Chemically aggressive environment not taken into consideration.
- Coupling not suitable for the ambient temperature.
- Diameter and/or assigned fit of the finished bore not permissible.
- Width across corners of the parallel keyways greater than the width across corners of the parallel keyways in accordance with DIN 6885/1 for the maximum permissible bore.
- Shaft-hub connection incorrectly sized.
- Maximum permissible load conditions not taken into consideration.
- Maximum permissible overload conditions not taken into consideration.
- Dynamic load conditions not taken into consideration.
- Coupling and the machine and/or drive train form a critical torsional, axial or bending vibration system.

**Assembly-related causes**

- Damaged parts installed.
- Shaft diameter outside the stipulated tolerance range.
• Coupling parts interchanged and hence not assigned to the specified shaft.
• Stipulated locking elements to prevent axial movements not installed.
• Stipulated tightening torques not adhered to.
• Bolts inserted dry or greased.
• Flange surfaces of screwed connections not cleaned.
• Alignment and/or shaft misalignment values not set in accordance with the instructions.
• Coupled machines were not correctly connected to the foundation so that a shifting of the machines leads to an impermissible displacement of the coupling parts.
• Coupled machines not earthed adequately.
• Coupling guard used is not suitable.

**Maintenance-related causes**

• Stipulated maintenance intervals not adhered to.
• Spare parts that were used were not original spare parts from Flender.
• Flender spare parts that were used were old or damaged.
• Leak in the area of the coupling not detected so that chemically aggressive substances damage the coupling.
• Indications of faults, such as noise or vibration, were not heeded.
• Stipulated tightening torques not adhered to.
• Alignment and/or shaft misalignment values not set in accordance with the instructions.

**Specific installation-related and maintenance-related causes**

• Buffers (5) not fitted.
• Fitted buffers (5) heated up excessively when applying heat to the coupling parts.
• Buffers (5) of different types or age are used.
• Buffers (5) not replaced as sets.
• Mounting position of marked components not taken into account during installation.

### 7.2.3 Correcting faults

#### 7.2.3.1 Replacing wearing parts

Buffers (5) are subject to wear and this wear can result in torsional backlash.
Procedure

1. Check the wear on the buffers (5) (see section Maximum permissible torsional backlash (Page 44)).
2. Replace the buffers (5) where appropriate (see section Replacing wearing parts (Page 44)).

7.2.3.2 Correcting the changed alignment

A changed alignment of the coupling during operation often occurs when the coupled machines shift towards one another. A cause of this can be loose foundation bolts.

Procedure

1. Correct the cause for the change in alignment.
2. Check the wearing parts for wear and replace them as required.
3. Check the locking elements that prevent axial movements and correct these as required.
4. Realign the coupling.
Operation

7.2 Faults - causes and rectification
8.1 Maintenance intervals

**Danger due to bursting of the coupling**

The coupling can burst if the maintenance intervals are not adhered to. There is a risk of fatal injury from flying fragments. Bursting of the coupling can lead to an explosion in potentially explosive atmospheres.

- Please observe all the stipulations concerning maintenance of the coupling in this section.

**Danger due to bursting of the coupling**

The coupling can burst if the maximum permitted torsional backlash is exceeded. There is a risk of fatal injury from flying fragments. Bursting of the coupling can lead to an explosion in potentially explosive atmospheres.

- Note also the actual wear of the elastomer components.

**Warning**

**Physical injury**

Injury from rotating parts.

- Only carry out work on the coupling when it is not moving.
- Secure the drive unit against being operated accidentally.
- Attach a notice to the switch stating clearly that work is being carried out on the coupling.
- Before starting any work, make sure that the unit is free from loads.

Check the torsional backlash between the coupling halves at the specified maintenance intervals. The maximum permissible torsional backlash for the various coupling sizes can be found in section Maximum permissible torsional backlash (Page 44).

<table>
<thead>
<tr>
<th>Type</th>
<th>Initial maintenance</th>
<th>Follow-up maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>RWN</td>
<td>3 months after commissioning</td>
<td>Every 12 months</td>
</tr>
<tr>
<td>RWS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note**

**Shorter maintenance intervals**

If necessary, set shorter maintenance intervals depending on actual wear.
8.2 Maximum permissible torsional backlash

In order to calculate the torsional backlash, rotate one coupling part without applying torque up to the stop. Mark both of the coupling halves in the way shown in the diagram below. Turn the coupling part in the opposite direction up to the stop. The markings on both halves will then move apart. The distance between the markings corresponds to the torsional backlash.

![Diagram of markings for calculating torsional backlash]

Figure 8-1 Markings for calculating the torsional backlash

<table>
<thead>
<tr>
<th>Size</th>
<th>285</th>
<th>360</th>
<th>450</th>
<th>560</th>
<th>710</th>
<th>900</th>
<th>1 120</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>320</td>
<td>400</td>
<td>500</td>
<td>630</td>
<td>800</td>
<td>1 000</td>
<td>1 250</td>
</tr>
<tr>
<td>Maximum permissible torsional backlash $\Delta S_v$ [mm]</td>
<td>6.0</td>
<td>7.0</td>
<td>8.5</td>
<td>10.0</td>
<td>12.0</td>
<td>13.5</td>
<td>15.0</td>
</tr>
</tbody>
</table>

8.3 Replacing wearing parts

⚠️ DANGER

Danger due to bursting of the coupling

If you do not observe the information stipulated here regarding replacement of wearing parts, this can lead to bursting of the coupling during operation. There is a risk of fatal injury from flying fragments. Bursting of the coupling can lead to an explosion in potentially explosive atmospheres.

- Please observe all the stipulations concerning the replacement of wearing parts.

⚠️ DANGER

Danger due to impact sparks

Set screws (33) and (34) made of unsuitable material can cause explosions.

- For applications in potentially explosive atmospheres, use set screws (33) and (34) made of a material that cannot generate any impact sparks, e.g. rigid PVC.
NOTICE

Property damage
If you replace parts 30, 31, 32, 33, 34 and 35 of the axial backlash limitation, you might need to remachine the parts.
- Contact Flender.

Replace the buffers (5) if the maximum permissible torsional backlash has been reached. The method used to replace the buffers (5) and remove the bolts (4) and (30) varies according to the coupling size.
- Up to coupling size 400
  Replacing buffers (5) up to coupling size 400 (Page 45)
- From coupling size 450 to 630
  Replacing buffers (5) as of coupling size 450 to 630 (Page 46)
- From coupling size 710
  Replacing buffers (5) as of coupling size 710 (Page 47)

8.3.1 Replacing buffers (5) up to coupling size 400

Procedure

1. Remove the screws (32).
2. Place the retaining ring (31) on the hub.
3. Remove the hexagon nuts (7).
4. Remove the bolts (4) and (30) with the washers (6) and the buffers (5) through the buffer fitting holes.
5. Pull the buffers (5) off the bolts (4) and (30).
6. Clean the bolts (4) and (30), the washers (6), the buffer fitting holes and the bolt fitting holes in the coupling parts 1 (1) and/or 2 (2).
7. Mount new buffers (5) on the bolts (4) and (30).
   Please observe the information in section Use and storage of the buffers (5) (Page 70) when replacing the buffers (5).
8. Insert the bolts (4) with the washers (6) and the buffers (5) through the buffer fitting holes into the bolt fitting holes of the coupling part 1 (1). Observe any markings that might be provided.
9. The bolt fitting holes in the coupling part 2 (2) and the bolts (30) are labelled sequentially. Insert the bolts (30) with the washers (6) and the buffers (5) through the buffer fitting holes into the matching bolt fitting holes of the coupling part 2 (2).
10. Secure the bolts (4) and (30) with new hexagon nuts (7) of the same quality.
11. Tighten the hexagon nuts (7) to the specified tightening torque $T_A$ (see section Tightening torques and widths A/F (Page 68)).
12. Fit the retaining ring (31). Observe any markings that might be provided.
13. Apply a few drops of liquid screw locking agent (e.g. Loctite 243) to the screws (32).

14. Tighten the screws (32) to the specified tightening torque $T_A$ (see section Tightening torques and widths A/F (Page 68)).

### 8.3.2 Replacing buffers (5) as of coupling size 450 to 630

**NOTICE**

**Blockage of cross bore of bolts (4) and (30)**

The liquid screw locking agent can seal the cross bore of the bolts (4) and (30). Pressing out the bolts (4) and (30) with grease then becomes difficult or completely impossible.

- Apply only a small quantity of the liquid screw locking agent to the screws (11).

When removing the bolts (4) and (30), please observe the information in section Pressing out bolts (Page 48).

**Procedure**

1. Remove the screws (32).
2. Place the retaining ring (31) on the hub.
3. Remove the hexagon head screws (11) and the washers (8).
4. Remove the bolts (4) and (30) with the buffers (5) through the buffer fitting holes.
5. Pull the buffers (5) off the bolts (4) and (30).
6. Clean the bolts (4) and (30), the washers (6), the buffer fitting holes and the bolt fitting holes in the coupling parts 1 (1) and/or 2 (2).
7. Mount new buffers (5) on the bolts (4) and (30). Please observe the information in section Use and storage of the buffers (5) (Page 70) when replacing the buffers (5).
8. Insert the bolts (4) with the washers (6) and the buffers (5) through the buffer fitting holes into the bolt fitting holes of the coupling part 1 (1). Observe any markings that might be provided.
9. The bolt fitting holes in the coupling part 2 (2) and the bolts (30) are labelled sequentially. Insert the bolts (30) with the washers (6) and the buffers (5) through the buffer fitting holes into the matching bolt fitting holes of the coupling part 2 (2).
10. Push the washers (8) onto the screws (11).
11. Apply a small quantity of liquid screw locking agent (e.g. Loctite 243) to the screws (11).
12. Secure the bolts (4) and (30) with the screws (11) and washers (8).
13. Tighten the screws (11) to the specified tightening torque $T_A$ (see section Tightening torques and widths A/F (Page 68)).
14. Fit the retaining ring (31). Observe any markings that might be provided.
15. Apply a few drops of liquid screw locking agent (e.g. Loctite 243) to the screws (32).
16. Tighten the screws (32) to the specified tightening torque $T_A$ (see section Tightening torques and widths $A/F$ (Page 68)).

8.3.3 Replacing buffers (5) as of coupling size 710

You can use the following methods to replace the buffers (5) on couplings of size 710 or larger.

- Replacing buffers (5) without removing the bolts (4) (Page 47)
- Replacing buffers (5) with removal of the bolts (4) and (30) (Page 47)

8.3.3.1 Replacing buffers (5) without removing the bolts (4)

The procedure described here applies exclusively to the bolts (4).
In order to replace the buffers (5) on the bolts (30), you must first remove the bolts (30).

**Procedure**

1. Remove the locking rings (12) and the washers (6).
2. Pull out the buffers (5) through the buffer fitting holes.
3. Clean the bolts (4) and the buffer fitting holes in the coupling part 2 (2).
4. Mount new buffers (5) on the bolts (4). Please observe the information in section Use and storage of the buffers (5) (Page 70) when replacing the buffers (5).
5. Secure the buffers (5) with the washers (6) and the locking rings (12).

8.3.3.2 Replacing buffers (5) with removal of the bolts (4) and (30)

**NOTICE**

**Blockage of cross bore of bolts (4) and (30)**

The liquid screw locking agent can seal the cross bore of the bolts (4) and (30). Pressing out the bolts (4) and (30) with grease then becomes difficult or completely impossible.

- Apply only a small quantity of the liquid screw locking agent to the screws (11).

**Procedure**

1. Remove the screws (32).
2. Place the retaining ring (31) on the hub.
3. Remove the bolts (4) and (30). Please observe the relevant information in section Pressing out bolts (Page 48).
4. Remove the locking rings (12) and the washers (6).

5. Pull the buffers (5) off the bolts (4) and (30).

6. Clean the bolts (4) and (30), the washers (6), the locking rings (12), the buffer fitting holes and the bolt fitting holes in the coupling parts 1 (1) and/or 2 (2).
   If old bolts (4) and (30) are to be reused, the tapped holes and cross bores must be completely free of any residues of grease or liquid screw locking agent.

7. Mount new buffers (5) on the bolts (4) and (30). Please observe the information in section Use and storage of the buffers (5) (Page 70) when replacing the buffers (5).

8. Secure the buffers (5) with the washers (6) and the locking rings (12).

9. Insert the bolts (4) with the buffers (5) into the bolt fitting holes of the coupling part 1 (1). Observe any markings that might be provided.

10. The bolt fitting holes in the coupling part 2 (2) and the bolts (30) are labelled sequentially. Insert the bolts (30) with the washers (6) and the buffers (5) through the buffer fitting holes into the matching bolt fitting holes of the coupling part 2 (2).

11. Push the washers (8) onto the screws (11).

12. Apply a small quantity of liquid screw locking agent (e.g. Loctite 243) to the screws (11).

13. Secure the bolts (4) and (30) with the screws (11) and washers (8).

14. Tighten the screws (11) to the specified tightening torque $T_A$ (see section Tightening torques and widths A/F (Page 68)).

15. Fit the retaining ring (31). Observe any markings that might be provided.

16. Apply a few drops of liquid screw locking agent (e.g. Loctite 243) to the screws (32).

17. Tighten the screws (32) to the specified tightening torque $T_A$ (see section Tightening torques and widths A/F (Page 68)).

### 8.3.4 Pressing out bolts

The bolts (4) and (30) for coupling sizes 450 to 1 250 have cross bores that make it easier to press out the bolts (4) and (30).

### 8.3.4.1 Pressing out bolts (4) and (30) with the "demounting box"

Flender can supply a "demounting box" which is a hydraulic press-out fixture for removing bolts. Flender can supply the demounting box on request.

**Note**

**Separate operating instructions**

If you use the "demounting box" to remove the bolts (4) and (30), please observe the operating instructions BA 3600.1, "Demounting box for extraction of RUPEX bolts".
8.3.4.2 Pressing out bolts (4) and (30) with grease

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk of injury from flying bolts (4) and (30)</td>
</tr>
</tbody>
</table>
Loose bolts (4) and (30) can become detached from the coupling and fly through the air like a projectile.
- Secure the bolt axially by placing the washer (8) over screw (11) before you insert the screw (11) into the tapped hole of the bolt.

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk of crush injuries as a result of bolt (4) and (30) suddenly working loose</td>
</tr>
</tbody>
</table>
If bolt (4) and (30) suddenly works loose, the screw (11) and the washer (8) can be abruptly set in motion.
- While you are pressing out bolts, do not place your hands in the area around bolt (4) and (30), screw (11) or washer (8).

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk of injury</td>
</tr>
</tbody>
</table>
When you are pressing out the bolts (4) and (30), grease can escape under high pressure. If bolt (4) and (30) suddenly works loose, fragments can become detached and fly through the air at high speed.
- Wear safety goggles.

Procedure

1. Remove the screws (32).
2. Place the retaining ring (31) on the hub.
3. Remove the hexagon head screws (11) and the washers (8).
4. Clean the tapped holes of the bolts (4) and (30) until they are free of all residues.
5. Fill the tapped hole of a bolt (4) or (30) to 90 % with commercially available machine grease (e.g. Fuchs Renolit H443-HD-88).
6. Wrap screw (11) in Teflon tape or Teflon sealing cord.
7. Place a washer (8) as an axial locking element over screw (11).
8. Insert the screw (11) with the washer (8) into the bolt (4) or (30) and tighten manually by two to three turns.
9. Using a spanner, continue turning the screw (11) slowly into the thread so that the grease is pressed evenly through the cross bore between the bolt (4) or (30) and the bolt fitting hole of the coupling part 1 (1) and/or 2 (2). The bolt (4) or (30) is released suddenly and makes a loud noise.
10. Repeat the process in the order specified for all the installed bolts (4) and (30).
8.3.4.3 Potential problems when pressing out bolts (4) and (30) with grease

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Possible solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolt (4) or (30) is not released despite the fact that the screw is fully inserted.</td>
<td>Pressure is too low to release the bolt (4) or (30).</td>
<td>● Use a longer screw (11) (minimum strength class 8.8). ● Fill more grease into the tapped hole of the bolt (4) or (30).</td>
</tr>
<tr>
<td>Bolts (4) or (30) are difficult or impossible to release.</td>
<td>Liquid locking agent for screws (11) has sealed the cross bore.</td>
<td>Clean the tapped hole and the cross bore of the bolt (4) or (30).</td>
</tr>
<tr>
<td>Grease is escaping. Bolt (4) or (30) is not released.</td>
<td>The tapped hole is not sufficiently sealed.</td>
<td>1. Remove the screw (11). 2. Seal the screw (11) again in Teflon tape or Teflon sealing cord. 3. Press out the bolt (4) or (30) again with grease.</td>
</tr>
</tbody>
</table>

8.4 Removing coupling part 1 (1) or 2 (2)

The procedure to be followed depends on the existing shaft-hub connection:
- Removing coupling part 1 (1) or 2 (2) with shaft and hub connected by a parallel key (Page 50)
- Removing coupling part 1 (1) or 2 (2) with shaft and hub connected by a pressurised oil interference fit (Page 51)

8.4.1 Removing coupling part 1 (1) or 2 (2) with shaft and hub connected by a parallel key

⚠️ WARNING

Danger from burners and hot coupling parts
Risk of injury due to burners and hot surfaces. Burners or hot coupling parts can lead to an explosion in potentially explosive atmospheres.
- Wear suitable protective equipment (gloves, safety goggles).
- Ensure that the area is not at risk of explosion.

Procedure

1. Remove the screws (32).
2. Place the retaining ring (31) on the hub. Make sure that the retaining ring (31) cannot obstruct removal of the coupling part 1 (1) and secure it in position to prevent it from falling.
3. Move the coupled machines apart.
4. Secure the coupling parts to prevent them from falling.
5. Remove the axial locking element (set screw, end plate).
6. Use a suitable pulling fixture.
7. Heat up the coupling part 1 (1) and/or 2 (2) using a burner above the parallel keyway along its length to maximum 80 °C.
   Note when doing this the permissible temperature range of the buffers (5) (refer to section RUPEX buffers (5) (Page 71)). Remove the buffers (5) if necessary.
8. Pull off the coupling part 1 (1) and/or 2 (2). Use suitable lifting gear when doing this.
9. Check the hub bore and the shaft for damage and protect them against corrosion.
10. Replace any damaged parts.

When reinstalling the coupling parts please observe the information in chapters Assembly (Page 23) and Commissioning (Page 35).

8.4.2 Removing coupling part 1 (1) or 2 (2) with shaft and hub connected by a pressurised oil interference fit

⚠️ DANGER

Oil pressure in excess of maximum permissible value
The coupling can burst. There is a risk of fatal injury from flying fragments. Bursting of the coupling can lead to an explosion in potentially explosive atmospheres.
- Do not exceed the maximum oil pressure specified in the dimension drawing.
- Keep the oil pressure constant in all oil channels during the entire procedure.

⚠️ DANGER

Danger as a result of improper handling of fixtures and pumps
Failure to handle fixtures and pumps properly can result in injuries. The coupling can burst. There is a risk of fatal injury from flying fragments. Bursting of the coupling can lead to an explosion in potentially explosive atmospheres.
- Please observe the manufacturer's information on handling the following tools:
  - Pulling fixtures
  - Pumps
WARNING

Risk of injury as a result of coupling components or the pulling fixture working loose

Coupling components or pulling fixtures can work loose and fall when dismantling work is in progress.

- Use suitable hoisting gear to hold the coupling part 1 (1) or 2 (2) and the pulling fixture in position.
- Attach an axial locking element if the pressurised oil interference fit is tapered.

Note

Leaking oil

1. When dismantling the coupling part, catch any oil which escapes.
2. Dispose of the oil according to the valid regulations.

Tools required

- One oil pump with pressure gauge (at least 2500 bar) per oil channel.
  Or:
  One motor-driven oil pump. One connection that can be closed independently is required for each oil channel.
  Refer to the dimension drawing for the number of oil channels.
- With a stepped bore:
  A motor-driven pump at the oil channel located at the point of transition from the smaller to the larger bore. A large quantity of oil per unit of time is needed here.
- Suitable connections and pipes.
- Suitable pulling fixture.
  Or:
  Retaining plate with retaining screws or threaded spindles with nuts. Material of the screws and spindles must have at least property class 10.9; material of the nuts depending on the material of the screws or spindles.
- Hydraulic cylinder with oil pump. Note displacement and pressure of the hydraulic cylinder. Refer to the dimension drawing for the required axial force.

Procedure

1. Remove the screws (32).
2. Place the retaining ring (31) on the hub. Make sure that the retaining ring (31) cannot obstruct removal of the coupling part 1 (1) and secure it in position to prevent it from falling.
3. Move the coupled machines apart.
4. Remove the buffers (5). For further information, refer to section Replacing wearing parts (Page 44).
5. Use a suitable pulling fixture.
6. Secure the coupling part 1 (1) or 2 (2) and the pulling fixture in position to prevent them from falling.

7. Remove the screw plugs (101) or (201) from the oil channels.

8. Deaerate an oil pump and connect it to the oil channel in the centre.

9. Pressurise the oil pump to the pressure specified in the dimension drawing until oil starts to escape from the adjacent connections or the front faces. Keep the pressure constant.

10. Deaerate the next oil pump and connect it to the adjacent oil channel.

11. Repeat steps 9 and 10 on the remaining oil channels.

12. If so much oil escapes when pressure is applied that the pump cannot maintain the pressure, use a higher-viscosity oil.

13. Pressurise the hydraulic cylinder if oil escapes from both front faces as a closed oil ring. Make sure that the coupling part 1 (1) or 2 (2) is pulled immediately off the shaft in a swift, smooth movement.

**Note**

**Removal in several strokes**

If several strokes of the hydraulic cylinder are required to remove the part, make sure that the shaft end is positioned between two oil channels after each individual stroke.

14. Dismantle the oil pumps and the pulling fixture from the coupling part 1 (1) or 2 (2).

15. Check the hub bore and the shaft for damage and protect them against corrosion.

16. Replace any damaged parts.

When reinstalling the coupling parts please observe the information in chapters Assembly (Page 23) and Commissioning (Page 35).
Servicing

8.4 Removing coupling part 1 (1) or 2 (2)
Service and support

Contact

When ordering spare parts, requesting a customer service technician or in the case of technical queries, please contact our factory or one of our customer service addresses:

Flender GmbH
Schlavenhorst 100
46395 Bocholt
Germany
Tel.: +49 (0)2871/92-0
Fax.: +49 (0)2871/92-2596
Flender GmbH (http://www.flender.com)
Disposal

Disposal of the coupling

Dispose of the coupling parts according to applicable national regulations or recycle them.
11.1 Ordering spare parts

By stocking the most important spare parts at the installation site you can ensure that the coupling is ready for use at any time.

Note

Original spare parts

Only use original spare parts from Flender. Flender only accepts liability for original spare parts from Flender.

Other spare parts are not tested and approved by Flender. Non-approved spare parts may possibly change the design characteristics of the coupling and thus impact active and/or passive safety.

Flender will accept no liability or warranty whatsoever for damage occurring as a result of the use of non-approved spare parts. The same applies to any accessories that were not supplied by Flender.

You can find the available spare parts for the coupling described here at Spare parts drawing and spare parts list (Page 61).

You will find our contact data for ordering spare parts in Service and support (Page 55).

Information required when ordering spare parts

- Flender order number with item
- Flender drawing number
- Coupling type and size
- Part number (refer to Spare parts drawing and spare parts list (Page 61))
- Dimensions of the pare part, for example:
  - Bore
  - Bore tolerance
  - Parallel keyway and balancing
- Special dimensions, for example, flange connection dimensions, intermediate sleeve length or brake drum dimensions
Spare parts

11.1 Ordering spare parts

- Any special properties of the spare part, such as, for example:
  - Temperature resistance
  - Electrical insulation
  - Operating fluid
  - Use in potentially explosive atmospheres
- Quantity
11.2 

Spare parts drawing and spare parts list

1 Types RWN and RWS with axial backlash limitation
2 Bolt connection for coupling sizes 285 to 400
3 Bolt connection for coupling sizes 450 to 630
4 Bolt connection for coupling sizes 710 to 1250

Figure 11-1 Spare parts drawing for types RWN and RWS with axial backlash limitation
Note

Arrangement of the buffers

The buffers (5) are arranged on one side in the coupling part 1 (1) up to coupling size 360. With coupling size 400 or larger, the buffers (5) are arranged alternately in coupling part 1 (1) and coupling part 2 (2).

The bolts (30) are always located in the bolt fitting holes of coupling part 2 (2).

Table 11-1   Spare parts list for types RWN and RWS with axial backlash limitation

<table>
<thead>
<tr>
<th>Part number</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Coupling part 1</td>
</tr>
<tr>
<td>2</td>
<td>Coupling part 2</td>
</tr>
<tr>
<td>4</td>
<td>Bolt</td>
</tr>
<tr>
<td>5</td>
<td>Buffer</td>
</tr>
<tr>
<td>6</td>
<td>Washer</td>
</tr>
<tr>
<td>7</td>
<td>Hexagon nut, self-locking</td>
</tr>
<tr>
<td>8</td>
<td>Washer</td>
</tr>
<tr>
<td>11</td>
<td>Hexagon head screw</td>
</tr>
<tr>
<td>12</td>
<td>Locking ring</td>
</tr>
<tr>
<td>30</td>
<td>Bolt</td>
</tr>
<tr>
<td>31</td>
<td>Retaining ring</td>
</tr>
<tr>
<td>32</td>
<td>Screw</td>
</tr>
<tr>
<td>33</td>
<td>Set screw$^{1)}$</td>
</tr>
<tr>
<td>34</td>
<td>Set screw$^{1)}$</td>
</tr>
<tr>
<td>35</td>
<td>Nut</td>
</tr>
<tr>
<td>100</td>
<td>Set screw ISO 4028</td>
</tr>
<tr>
<td>101</td>
<td>Screw plug$^{2)}$</td>
</tr>
<tr>
<td>200</td>
<td>Set screw ISO 4028</td>
</tr>
<tr>
<td>201</td>
<td>Screw plug$^{2)}$</td>
</tr>
</tbody>
</table>

$^{1)}$ For applications in potentially explosive atmospheres, use set screws (33) and (34) made of a material that cannot generate any impact sparks, e.g. rigid PVC.

$^{2)}$ Screw plugs (101, 201) are only used in combination with a pressurised oil interference fit.

Figure 11-2  Screw plug
Note

If you replace parts 30, 31, 32, 33, 34 and 35 of the axial backlash limitation, you might need to remachine the parts.

- Contact Flender.
Spare parts

11.2 Spare parts drawing and spare parts list
Technical data

A.1 Speeds, geometry data and weights

In this section you can find dimension drawings and technical data for RUPEX couplings of the following types:

- Types RWN and RWS with axial backlash limitation (Page 65)

A.1.1 Types RWN and RWS with axial backlash limitation

![Figure A-1 Types RWN and RWS with axial backlash limitation](image)

Table A-1 Type RWN with axial backlash limitation

<table>
<thead>
<tr>
<th>Size</th>
<th>Speed</th>
<th>Maximum bore</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( n_{\text{max}} )</td>
<td>D1</td>
<td>D2</td>
</tr>
<tr>
<td>rpm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td>285</td>
<td>2 650</td>
<td>100</td>
<td>110</td>
</tr>
<tr>
<td>320</td>
<td>2 350</td>
<td>110</td>
<td>120</td>
</tr>
<tr>
<td>360</td>
<td>2 100</td>
<td>120</td>
<td>130</td>
</tr>
<tr>
<td>400</td>
<td>2 050</td>
<td>140</td>
<td>140</td>
</tr>
<tr>
<td>450</td>
<td>1 800</td>
<td>160</td>
<td>160</td>
</tr>
</tbody>
</table>
Technical data

A.1 Speeds, geometry data and weights

<table>
<thead>
<tr>
<th>Size</th>
<th>Speed</th>
<th>Maximum bore</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>D1 D2 DA ND1 ND2 NL1 P S U1 U2 m</td>
<td></td>
</tr>
<tr>
<td></td>
<td>rpm</td>
<td>mm mm mm mm mm mm mm mm mm mm</td>
<td>kg</td>
</tr>
<tr>
<td>500</td>
<td>1 600</td>
<td>180 180 500 290 290 200 90 4 ... 7 52 52 235</td>
<td></td>
</tr>
<tr>
<td>560</td>
<td>1 450</td>
<td>140 140 560 250 250 220 120 4 ... 8 68 68 295</td>
<td></td>
</tr>
<tr>
<td>630</td>
<td>1 280</td>
<td>140 140 630 250 250 240 120 4 ... 8 68 68 375</td>
<td></td>
</tr>
<tr>
<td>710</td>
<td>1 150</td>
<td>160 160 710 290 290 260 140 5 ... 9 80 80 545</td>
<td></td>
</tr>
<tr>
<td>800</td>
<td>1 000</td>
<td>180 180 800 320 320 290 140 5 ... 9 80 80 705</td>
<td></td>
</tr>
<tr>
<td>900</td>
<td>900</td>
<td>220 220 900 360 360 320 160 5 ... 10 90 90 965</td>
<td></td>
</tr>
<tr>
<td>1 000</td>
<td>810</td>
<td>240 240 1 000 395 395 350 160 5 ... 10 90 90 1 240</td>
<td></td>
</tr>
<tr>
<td>1 120</td>
<td>700</td>
<td>200 200 1 120 360 360 380 180 6 ... 11 100 100 1 650</td>
<td></td>
</tr>
<tr>
<td>1 250</td>
<td>650</td>
<td>230 230 1 250 410 410 420 180 6 ... 11 100 100 2 100</td>
<td></td>
</tr>
</tbody>
</table>

1) Maximum bore for parallel keyway in accordance with DIN 6885/1.

2) Weight applies to one coupling with maximum bore.

Table A-2 Type RWS with axial backlash limitation

<table>
<thead>
<tr>
<th>Size</th>
<th>Speed</th>
<th>Maximum bore</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>rpm</td>
<td>D1 D2 DA ND1 ND2 NL1 P S U1 U2 m</td>
<td>kg</td>
</tr>
<tr>
<td>285</td>
<td>3 900</td>
<td>110 120 285 164 175 110 60 3 ... 6 32 30 45</td>
<td></td>
</tr>
<tr>
<td>320</td>
<td>3 500</td>
<td>125 130 320 180 192 125 60 3 ... 6 32 30 58</td>
<td></td>
</tr>
</tbody>
</table>
## Technical data

### A.1 Speeds, geometry data and weights

<table>
<thead>
<tr>
<th>Size</th>
<th>Speed</th>
<th>Maximum bore</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>rpm</td>
<td>D1</td>
<td>D2</td>
</tr>
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<td>2800</td>
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<td>170</td>
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<tr>
<td>500</td>
<td>2200</td>
<td>190</td>
<td>190</td>
</tr>
<tr>
<td>560</td>
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<td>260</td>
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<td>460</td>
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<tr>
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<td>340</td>
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<td>515</td>
</tr>
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<td></td>
<td>370</td>
<td>370</td>
<td>560</td>
</tr>
<tr>
<td>1200</td>
<td>1250</td>
<td>270</td>
<td>270</td>
</tr>
<tr>
<td></td>
<td>300</td>
<td>300</td>
<td>460</td>
</tr>
<tr>
<td></td>
<td>360</td>
<td>360</td>
<td>540</td>
</tr>
<tr>
<td></td>
<td>400</td>
<td>400</td>
<td>610</td>
</tr>
</tbody>
</table>

1) Maximum bore for parallel keyway in accordance with DIN 6885/1.

2) Weight applies to one coupling with maximum bore.
A.2 Shaft misalignment values during operation

The following table shows the maximum permissible shaft misalignment values $\Delta S_{\text{perm}}$ and $\Delta K_{r\text{perm}}$. The values are rounded and specified in mm.

Table A-3 Maximum permissible shaft misalignment values during operation

<table>
<thead>
<tr>
<th>Size</th>
<th>Coupling speed [rpm]</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>250</td>
<td>500</td>
<td>750</td>
<td>1 000</td>
<td>1 500</td>
<td>2 000</td>
<td>3 000</td>
<td>4 000</td>
</tr>
<tr>
<td>285</td>
<td>0.95</td>
<td>0.65</td>
<td>0.55</td>
<td>0.45</td>
<td>0.4</td>
<td>0.3</td>
<td>0.25</td>
<td></td>
</tr>
<tr>
<td>320</td>
<td>1.05</td>
<td>0.75</td>
<td>0.6</td>
<td>0.5</td>
<td>0.4</td>
<td>0.35</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td>360</td>
<td>1.15</td>
<td>0.8</td>
<td>0.65</td>
<td>0.55</td>
<td>0.45</td>
<td>0.4</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td>400</td>
<td>1.25</td>
<td>0.85</td>
<td>0.7</td>
<td>0.6</td>
<td>0.5</td>
<td>0.45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>450</td>
<td>1.35</td>
<td>0.95</td>
<td>0.8</td>
<td>0.7</td>
<td>0.55</td>
<td>0.45</td>
<td></td>
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</tr>
<tr>
<td>500</td>
<td>1.5</td>
<td>1.05</td>
<td>0.85</td>
<td>0.75</td>
<td>0.6</td>
<td>0.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>560</td>
<td>1.65</td>
<td>1.15</td>
<td>0.95</td>
<td>0.8</td>
<td>0.65</td>
<td>0.55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>630</td>
<td>1.85</td>
<td>1.3</td>
<td>1.05</td>
<td>0.9</td>
<td>0.75</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>710</td>
<td>2.05</td>
<td>1.45</td>
<td>1.15</td>
<td>1</td>
<td>0.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>800</td>
<td>2.25</td>
<td>1.6</td>
<td>1.3</td>
<td>1.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>900</td>
<td>2.5</td>
<td>1.75</td>
<td>1.45</td>
<td>1.25</td>
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<td></td>
<td></td>
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<tr>
<td>1 000</td>
<td>2.75</td>
<td>1.95</td>
<td>1.6</td>
<td>1.35</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 120</td>
<td>3.05</td>
<td>2.15</td>
<td>1.75</td>
<td>1.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 250</td>
<td>3.4</td>
<td>2.4</td>
<td>1.95</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

You can calculate the numerical values in the table and their intermediate values as follows:

$$\Delta K_{r\text{perm}} = \Delta S_{\text{perm}} = (0.1 + DA / 1000) \cdot 40 / \sqrt{n}$$

Coupling speed $n$ in rpm
DA in mm (see Speeds, geometry data and weights (Page 65))
Radial misalignment $\Delta K_{r\text{perm}}$ in mm

The values in column "250 rpm" of the table above apply for speeds of $< 250$ rpm.

A.3 Tightening torques and widths A/F

Use bolts of strength class 8.8

Table A-4 Tightening torques and widths A/F of bolt connection

<table>
<thead>
<tr>
<th>Size</th>
<th>Tightening torque</th>
<th>Width A/F external hexagon</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$T_A$</td>
<td>SW</td>
</tr>
<tr>
<td></td>
<td>Part 7, 11</td>
<td>Part 7, 11</td>
</tr>
<tr>
<td></td>
<td>Nm</td>
<td>mm</td>
</tr>
<tr>
<td>285</td>
<td>100</td>
<td>24</td>
</tr>
<tr>
<td>320</td>
<td>100</td>
<td>24</td>
</tr>
</tbody>
</table>
Apply the recommended tightening torques in accordance with the stipulations in section Tightening procedure (Page 70).

Table A-5  Tightening torques and widths A/F of axial backlash limitation

<table>
<thead>
<tr>
<th>Size</th>
<th>Tightening torque</th>
<th>Width A/F external hexagon</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( T_A )</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Part 7, 11</td>
<td>SW Part 7, 11</td>
</tr>
<tr>
<td></td>
<td>Nm</td>
<td>mm</td>
</tr>
<tr>
<td>360</td>
<td>170</td>
<td>27</td>
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<td>400</td>
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<td>450</td>
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<td>560</td>
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<tr>
<td>710</td>
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<td>800</td>
<td>580</td>
<td>36</td>
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<td>900</td>
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<td>36</td>
</tr>
<tr>
<td>1000</td>
<td>600</td>
<td>36</td>
</tr>
<tr>
<td>1120</td>
<td>1150</td>
<td>46</td>
</tr>
<tr>
<td>1250</td>
<td>1150</td>
<td>46</td>
</tr>
</tbody>
</table>

---

Apply the recommended tightening torques in accordance with the stipulations in section Tightening procedure (Page 70).
Tightening procedure

Tighten fastening screws to the specified tightening torque in accordance with the following table:

<table>
<thead>
<tr>
<th>Scattering of the torque applied at the tool</th>
<th>Tightening procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>±5 %</td>
<td>• Hydraulic tightening with mechanical screwdriver</td>
</tr>
<tr>
<td></td>
<td>• Torque-controlled tightening with a torque wrench or a torque wrench that gives a signal</td>
</tr>
<tr>
<td></td>
<td>• Tightening with a precision mechanical screwdriver with dynamic torque measurement</td>
</tr>
</tbody>
</table>

Table A-6  Tightening procedure

The tightening torques apply to screws/bolts with untreated surfaces that are not oiled or are only lightly oiled, and for screws/bolts that are used with a liquid screw locking agent in accordance with these instructions. Use with lubricant paint or lubricant is not permitted.

Buffers (5)

A.5.1  Use and storage of the buffers (5)

Note the following concerning the use and storage of the buffers (5):

- Storage possible for up to 5 years
- Protect against direct sunlight, artificial light with a high UV-content and extreme temperatures
- Avoid contact with aggressive media
- Only replace complete sets
- Only use buffers (5) of the same type and age

### A.5.2 RUPEX buffers (5)

<table>
<thead>
<tr>
<th>Material</th>
<th>Hardness</th>
<th>Comment</th>
<th>Marking</th>
<th>Ambient temperature</th>
<th>Approved for explosion group</th>
</tr>
</thead>
<tbody>
<tr>
<td>NBR 80 Shore A</td>
<td>80 Shore A</td>
<td>Standard</td>
<td>Black buffer</td>
<td>-30 °C to +80 °C</td>
<td>IIA, IIB, IIC</td>
</tr>
<tr>
<td>NBR 65 Shore A</td>
<td>Special, soft, shifting of the resonant speed, rated torque reduced</td>
<td>Black buffer with green dot on front face</td>
<td>-30 °C to +80 °C</td>
<td>IIA, IIB, IIC</td>
<td></td>
</tr>
<tr>
<td>NBR 90 Shore A</td>
<td>Special, hard, shifting of the resonant speed</td>
<td>Black buffer with magenta dot on front face</td>
<td>-30 °C to +80 °C</td>
<td>IIA, IIB, IIC</td>
<td></td>
</tr>
<tr>
<td>NBR 639</td>
<td>Special, electrically insulating</td>
<td>Green buffer</td>
<td>-30 °C to +80 °C</td>
<td>IIA, IIB</td>
<td></td>
</tr>
<tr>
<td>NR 80 Shore A</td>
<td>Special, low-temperature use</td>
<td>Black buffer with white dot on front face</td>
<td>-50 °C to +50 °C</td>
<td>IIA, IIB, IIC</td>
<td></td>
</tr>
<tr>
<td>HNBR 80 Shore A</td>
<td>Special, high-temperature use</td>
<td>Black buffer with red dot on front face</td>
<td>-10 °C to +100 °C</td>
<td>Not approved</td>
<td></td>
</tr>
</tbody>
</table>
Technical data

A.5 Buffers (5)
B.1 EU declaration of conformity

EU declaration of conformity

Product:
FLENDER RUPEX® Couplings
Types RWN and RWS
with axial backlash limitation

Name and address of the manufacturer:
Fender GmbH
Schlavenhorst 100
46395 Bocholt
Deutschland – Germany

This declaration of conformity is issued under the sole responsibility of the manufacturer.

This declaration refers to the product mentioned above.

The object of the declaration described above is in conformity with the relevant legislation of the Union:

Harmonised standards or other technical specifications on which the declaration of conformity is based:
EN 1127-1 : 2011
EN ISO 80079-38 : 2017

The notified body, DEKRA EXAM GmbH, code number 0158, has received the technical documentation.

Signed for and on behalf of:
Fender GmbH

Bocholt, 2019-01-01

Dr. Tim Sadek, Vice President, Applications Couplings