# FLENDER COUPLINGS

## RUPEX

Operating Instructions 3602en
Edition 01/2019

RWB, RBS

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## 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.

Flender GmbH
Alfred-Flender-Straße 77
46395 BOCHOLT
GERMANY

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# Table of contents

## Tables



## Figures

# Introduction 1

## 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.

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**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.

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## 1.3 Copyright



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

# Safety instructions

# 2

## 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

| ISO | ANSI | Warning |
|---|---|---|
|  |  | Warning - hazardous electrical voltage |
|  | | Warning - explosive substances |
|  | --- | Warning - entanglement hazard |
|  | --- | Warning - hot surfaces |
|  | --- | Warning - substances that are harmful to health or are irritants |

| ISO | ANSI | Warning |
|---|---|---|
|  | --- | Warning - corrosive substances |
|  | --- | Warning - suspended load |
|  | --- | Warning - hand injuries |
|  | | ATEX certification |

## 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 19).

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 | CE | II 2G Ex h IIC 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 1 with electrically insulating buffers

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

| | | |
|---|---|---|
| Flender GmbH | CE | 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 3

Coupling part 3 is not stamped.

### 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 75).

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

| Max. ambient temperature | Temperature class |
|---|---|
| 80 °C | T4 |
| 70 °C | T5 |
| 55 °C | T6 |

### 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

| Max. ambient temperature | Max. surface temperature |
|---|---|
| 80 °C | 110 °C |

## 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.
- The supplier of the assembly is responsible for ensuring that the brake system and all of its components are designed in accordance with the relevant directive.

## 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 3

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

Types RWB and RBS are designs that feature a brake drum or brake disk (coupling part 3).

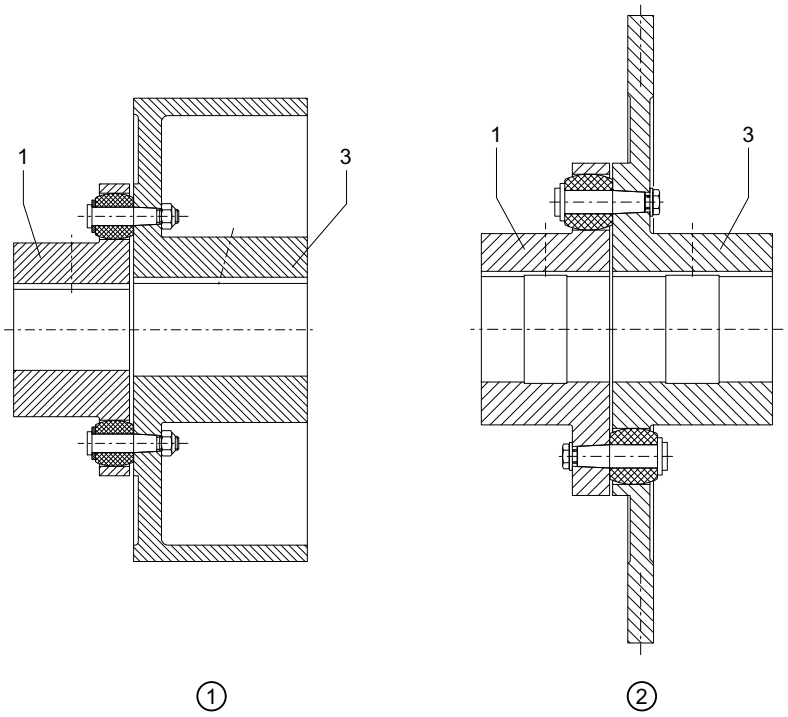
These instructions describe the assembly and operation of a RUPEX coupling arranged horizontally with a shaft-hub connection made by a cylindrical or conical bore with parallel key or by a pressurised oil interference fit. Please consult Flender if you want to use a different type of installation.

## Application

RUPEX couplings are designed for use in all kinds of machines. They are designed to withstand high torques and harsh operating conditions.

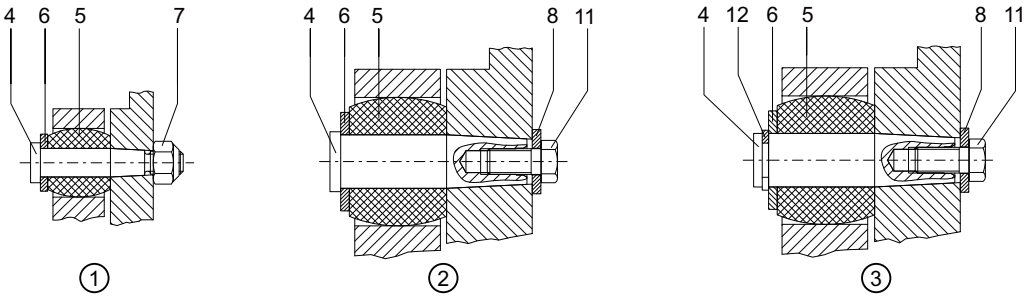
## Design

The diagrams show the various types with their constituent parts and their part numbers.




① Types RWB and RBS with brake drum
② Types RWB and RBS with brake disk
1 Coupling part 1
3 Coupling part 3 (brake drum or brake disk)

Figure 3-1 Types RWB and RBS




① Bolt connection for sizes 144 to 400
② Bolt connection for sizes 450 to 630
③ Bolt connection for sizes 710 to 1000
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

# 4

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.

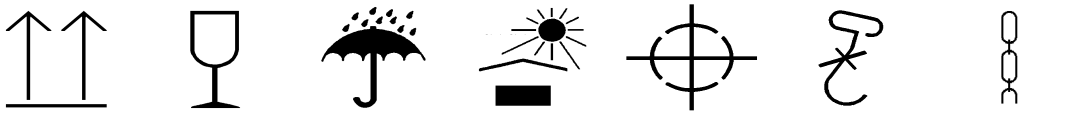



Figure 4-1 Transport symbols

## 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

**NOTICE**

**Property damage due to improper long-term storage**

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

- Note the handling instructions for long-term storage.

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

| Preservative agents | Features | Indoor storage | Outdoor storage |
|---|---|---|---|
| Oil spray | Anti-corrosion agent | Up to 12 months | Up to 4 months |
| Tectyl 846 or similar | Long-term preservative agent on wax basis | Up to 36 months | Up to 12 months |
| Emulsion cleaner + VCI foil | Active system, reusable | Up to 5 years | Up to 5 years |

# Assembly 5

Assembly of the coupling comprises the following steps:

- Preparatory work (Page 25)
- Assembling the coupling (Page 32)
- Aligning the coupling (Page 34)

**⚠ 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 26)
- Milling the parallel keyway (Page 27)
- Machining an axial locking mechanism (Page 28)
- Balancing the coupling (Page 30)

**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

| Description | Push fit | | Press fit | | Interference fit | | |
|---|---|---|---|---|---|---|---|
| | Not suitable for reversing operation | | | | Suitable for reversing operation | | |
| **Shaft tolerance** | j6 | h6 | h6 | k6 | **m6** | n6 | h6 |
| **Bore tolerance** | H7 | J7 | K7 | H7 | **H7** | H7 | M7 |

### Procedure

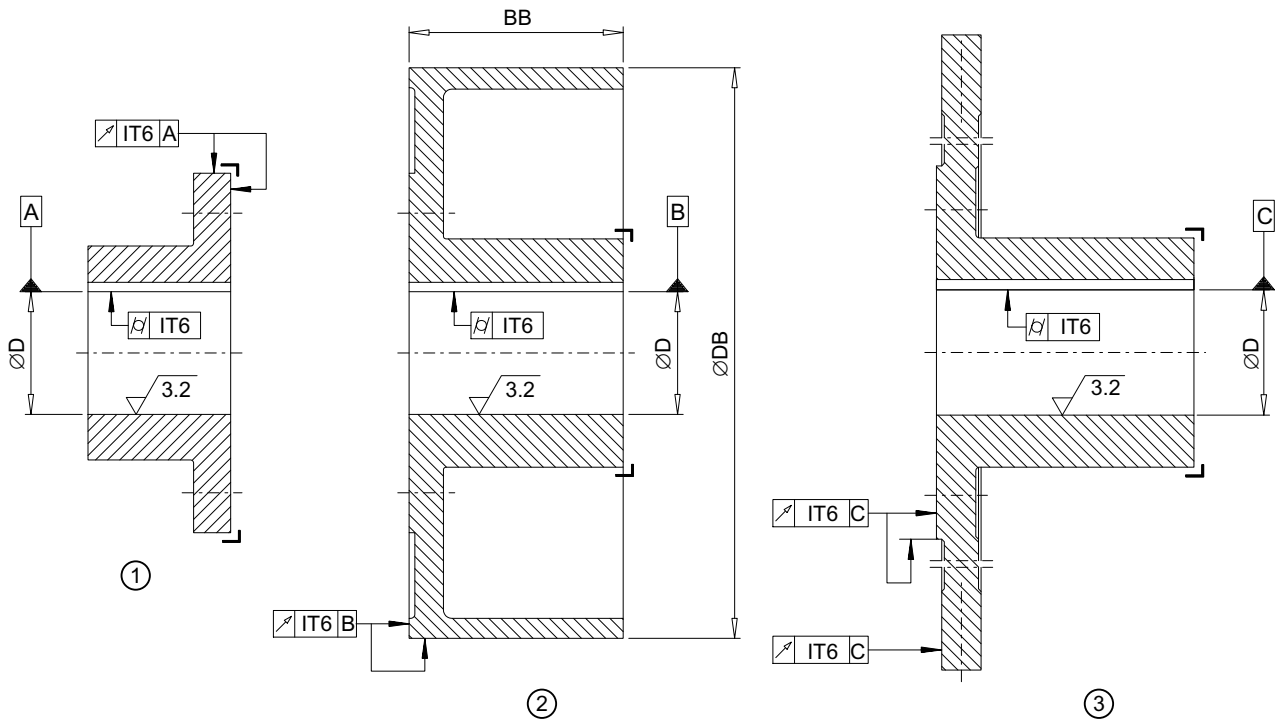
1. Remove the bolts (4) and the buffers (5). For further information, refer to section Replacing wearing parts (Page 46).
2. Remove the preservation and clean the coupling parts 1 (1) and/or 3 (3) to be machined.
3. Clamp the coupling to the areas marked with ⌜ in the diagram below.
4. Machine the finished 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).




① Coupling part 1
② Coupling part 3 (brake drum)
③ Coupling part 3 (brake disk)

Figure 5-1 Tolerances for finished bore

## 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 in coupling part 1 (1).
- If the coupling is intended for use in reversing operation, mill the parallel keyway according to DIN 6885/1 ISO P9 in coupling part 1 (1).
- Mill the parallel keyway in coupling part 3 (3) in accordance with 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.

For types RWB and RBS with brake drum, machine the tapped hole in coupling part 3 (3) as shown in the following diagram.

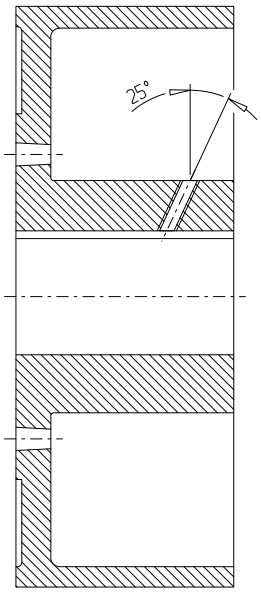



Figure 5-2 Angular position of the set screw hole in coupling part 3 (brake drum)

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 RWB

| Finished bore | | Tapped hole | Tightening torque | Width across flats |
|---|---|---|---|---|
| over<br>mm | up to<br>mm | $d_1$ | $T_A$<br>Nm | Hexagon socket wrench<br>mm |
| 8 | 30 | M6 | 4 | 3 |
| 30 | 38 | M8 | 8 | 4 |
| 38 | 65 | M10 | 15 | 5 |

| Finished bore | | Tapped hole | Tightening torque | Width across flats |
|---|---|---|---|---|
| over<br>mm | up to<br>mm | $d_1$ | $T_A$<br>Nm | Hexagon socket wrench<br>mm |
| 65 | 95 | M12 | 25 | 6 |
| 95 | 110 | M16 | 70 | 8 |
| 110 | 150 | M20 | 130 | 10 |
| 150 | 230 | M24 | 230 | 12 |
| 230 | 600 | M30 | 470 | 14 |

Apply the recommended tightening torques in accordance with the stipulations in section Tightening procedure (Page 74).

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

| Finished bore | | Tapped hole | Tightening torque | Width across flats |
|---|---|---|---|---|
| over<br>mm | up to<br>mm | $d_1$ | $T_A$<br>Nm | Hexagon socket wrench<br>mm |
| 8 | 30 | M6 | 4 | 3 |
| 30 | 75 | M8 | 8 | 4 |
| 75 | 95 | M12 | 25 | 6 |
| 95 | 110 | M16 | 70 | 8 |
| 110 | 150 | M20 | 130 | 10 |
| 150 | 230 | M24 | 230 | 12 |
| 230 | 640 | M30 | 470 | 14 |

Apply the recommended tightening torques in accordance with the stipulations in section Tightening procedure (Page 74).

## 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.

As set screws use threaded studs in accordance with ISO 4029 with a toothed cup point. 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.

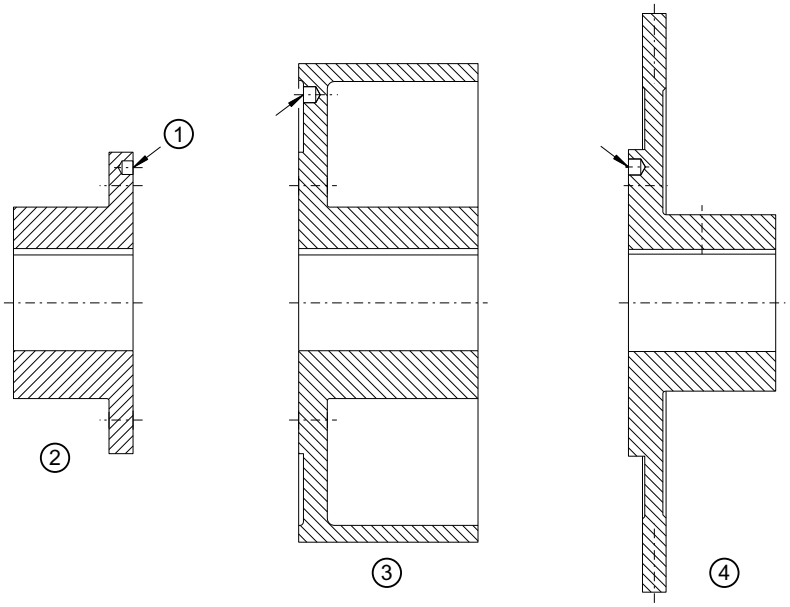
### 5.1.4 Balancing the coupling

#### Notes on balancing the coupling

| NOTICE |
| --- |
| **Damage to coupling part 1 (1) or coupling part 3 (3)**<br>If you completely drill through the flange on coupling part 1 (1), then coupling part 1 (1) is no longer allowed to be used for operation. If you damage the braking surface on coupling part 3 (3), then coupling part 3 (3) is no longer allowed to be used for operation.<br>• Please observe the stipulations about machining the balancing hole. |

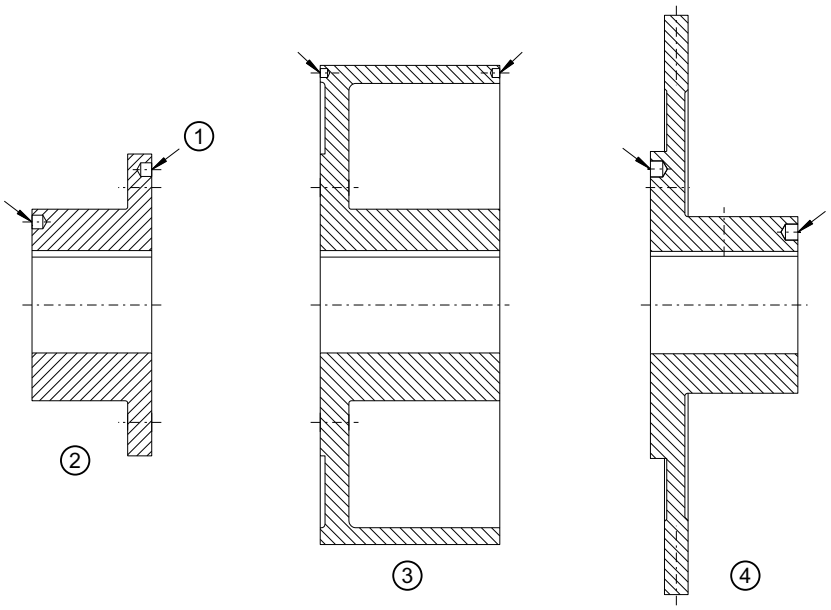
Please note the following when balancing the coupling:

- 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.




① Balancing bore
② Coupling part 1
③ Coupling part 3 (brake drum)
④ Coupling part 3 (brake disk)

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




① Balancing bore
② Coupling part 1
③ Coupling part 3 (brake drum)
④ Coupling part 3 (brake disk)

Figure 5-4 Position of the balancing bore for two-plane balancing

**Note**

A better balancing result can be achieved by balancing with bolt (4) fitted. When balancing all parts together, mark the bolt (4) and the bolt fitting hole.

## 5.2 Assembling the coupling

**NOTICE**

**Property damage**

Damage to the elastomer components from cleaning agents.

- Ensure that the elastomer components do not come into contact with cleaning agents.

**NOTICE**

**Property damage**

Damage to the shaft end, the coupling parts and/or the parallel key.

- Note the handling instructions regarding assembly of the coupling parts.

The procedure for assembling the coupling parts varies depending on the selected shaft-hub connection.

- Assembling coupling parts with shaft and hub connected by a parallel key (Page 33)
- Assembling coupling parts with shaft and hub connected by a pressurised oil interference fit (Page 34)

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

### Procedure

1. Unscrew the set screw out of coupling parts 1 (1) and/or 3 (3) until it is no longer possible for there to be a collision with the parallel key or the shaft.
2. Clean the bores and shaft ends.
3. Coat the bores of coupling parts 1 (1) and/or 3 (3) and the shafts with $MoS_2$ assembly paste (e.g. Microgleit LP 405).
4. Mount the coupling parts 1 (1) and/or 3 (3) on the shaft.

   **Note**

   **Coupling parts with conical bore**

   Mount the coupling parts 1 (1) and/or 3 (3) 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 3 (3) 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 75)). Remove the buffers (5) if necessary. For further information, refer to section Replacing wearing parts (Page 46). Protect adjacent components against damage and heating to temperatures above 80 °C.

5. Secure the coupling parts 1 (1) and/or 3 (3) with a set screw or an end plate. When securing with a set screw, the shaft must not protrude or be set back from the inner side of the hub.
6. 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 28)).
7. If you have removed the buffers (5), reinstall them. For further information, refer to section Replacing wearing parts (Page 46).

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

#### Procedure

1. Remove the buffers (5). For further information, refer to section Replacing wearing parts (Page 46).
2. Remove the screw plugs (101) and/or (301) from the coupling parts 1 (1) and/or 3 (3).
3. Clean, degrease, de-oil and dry the hub bores and shaft ends.
4. Clean and dry the oil channels and the oil circulation grooves.
5. Protect adjacent components against damage and heating to temperatures above 80 °C.
6. Heat up the coupling parts 1 (1) and/or 3 (3) to the temperature specified in the dimension drawing.
   Make sure that no dirt or contaminants can soil the bores again during the heating process.
7. Mount the coupling parts 1 (1) and/or 3 (3) quickly on the shaft according to the instructions in the dimension drawing.
8. Secure the coupling parts to stop them from moving until they have cooled down.
9. Allow the coupling parts to cool down to the ambient temperature.
10. Use an end plate to secure the coupling parts that have a non-self-locking, tapered pressurised oil interference fit.
11. In order to protect the oil channels of the coupling parts 1 (1) and/or 3 (3) against corrosion, fill them with a suitable pressurised oil and seal the oil channels with the screw plugs (101) and/or (301).
12. Assemble the buffers (5). For further information, refer to section Replacing wearing parts (Page 46).

## 5.3 Aligning the coupling

### 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:

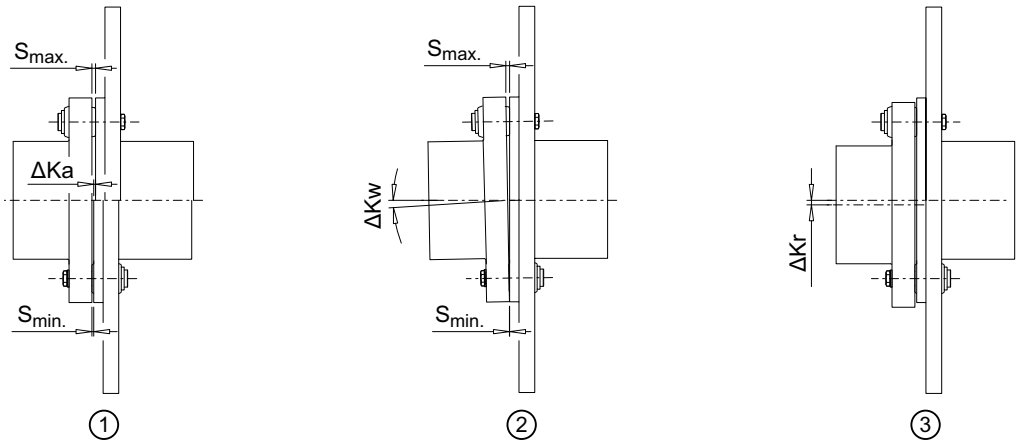
- Misalignment due to assembly
  Incorrect position due to a lack of precision when aligning
- Misalignment due to operation
  Example: Load-related deformation, thermal expansion

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 72).

## 5.3.2 Possible misalignment




① Axial misalignment (ΔKa)
② Angular misalignment (ΔKw)
③ Radial misalignment (ΔKr)

Figure 5-5 Possible misalignment

### 5.3.2.1 Axial misalignment

Set the axial misalignment ΔKa 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 ($\Delta S = S_{max} - S_{min}$). The determined value ΔS may not exceed the value $\Delta S_{perm}$.

You can find the values for $\Delta S_{perm}$ in section Shaft misalignment values during operation (Page 72).

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

ΔKw [rad] = ΔS / DA

$\Delta Kw\ [deg] = (\Delta S / DA) \cdot (180 / \pi)$

If required, you can calculate the permissible angular misalignment $\Delta Kw_{perm}$ as follows:

$\Delta Kw_{perm}\ [rad] = \Delta S_{perm} / DA$

$\Delta Kw_{perm}\ [deg] = (\Delta S_{perm} / DA) \cdot (180 / \pi)$

DA in mm see section Speeds, geometry data and weights (Page 65)

$\Delta S_{perm}$ see section Shaft misalignment values during operation (Page 72)

#### 5.3.2.3 Radial misalignment

Determine the value ΔKr. The determined value ΔKr may not exceed the value $\Delta Kr_{perm}$.

You can find the permissible radial misalignment $\Delta Kr_{perm}$ in section Shaft misalignment values during operation (Page 72).

# Commissioning 6

**⚠ 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 73).
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.

# Operation 7

## 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.

**⚠ 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

| Fault | Cause | Rectification |
|---|---|---|
| Sudden changes in the noise level and/or sudden occurrences of shocks | Wear of wearing parts | Follow the instructions given in section Replacing wearing parts (Page 42). |
| | Changed alignment | Follow the instructions given in section Correcting the changed alignment (Page 43). |
| | Coupling not suitable for the operating conditions.<br>Check the possible causes given in section Unsuitable coupling (Page 41). | Use a coupling that is suitable for the operating conditions. |
| | Incorrect assembly of the coupling.<br>Check the possible causes given in sections Assembly-related causes (Page 41) and Specific installation-related and maintenance-related causes (Page 42). | Reassemble the coupling in accordance with these instructions.<br>Please observe all the stipulations and requirements given in chapter Assembly (Page 25). |
| | Incorrect maintenance of the coupling.<br>Check the possible causes given in sections Maintenance-related causes (Page 42) and Specific installation-related and maintenance-related causes (Page 42). | Please observe all the stipulations and requirements given in chapter Servicing (Page 45). |

| Fault | Cause | Rectification |
|---|---|---|
| Presence of vibration | Coupling not suitable for the operating conditions.<br>Check the possible causes given in section Unsuitable coupling (Page 41). | Use a coupling that is suitable for the operating conditions. |
| | Incorrect assembly of the coupling.<br>Check the possible causes given in sections Assembly-related causes (Page 41) and Specific installation-related and maintenance-related causes (Page 42). | Reassemble the coupling in accordance with these instructions.<br>Please observe all the stipulations and requirements given in chapter Assembly (Page 25). |
| | Incorrect maintenance of the coupling.<br>Check the possible causes given in sections Maintenance-related causes (Page 42) and Specific installation-related and maintenance-related causes (Page 42). | Please observe all the stipulations and requirements given in chapter Servicing (Page 45). |

#### 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.

## 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 46)).
2. Replace the buffers (5) where appropriate (see section Replacing wearing parts (Page 46)).

#### 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.

# Servicing 8

## 8.1 Maintenance intervals

**⚠ DANGER**

**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**

**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 46).

Table 8-1 Maintenance intervals

| Type | Initial maintenance | Follow-up maintenance |
|---|---|---|
| RWB | 3 months after commissioning | Every 12 months |
| RBS | | |

**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.

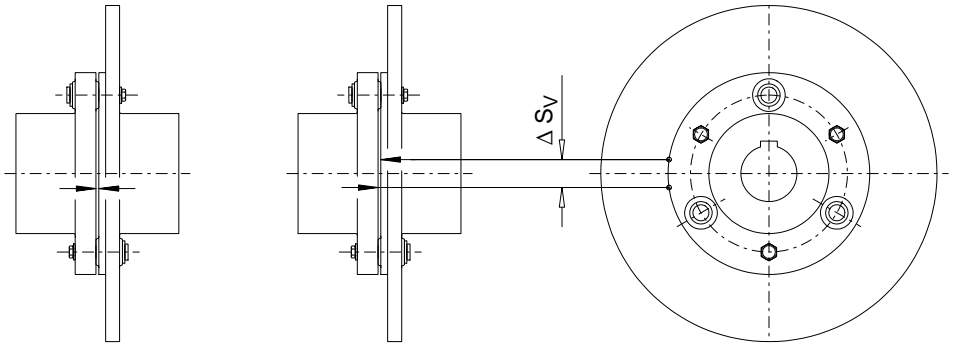



Figure 8-1 Markings for calculating the torsional backlash

Table 8-2 Maximum permissible torsional backlash for the types RWB and RBS

| Size | 144 | 162<br>198 | 228<br>252 | 285<br>320 | 360<br>400 | 450<br>500 | 560<br>630 | 710<br>800 | 900<br>1 000 |
|---|---|---|---|---|---|---|---|---|---|
| Maximum permissible torsional backlash $\Delta S_V$ [mm] | 3.5 | 4.0 | 4.5 | 6.0 | 7.0 | 8.5 | 10.0 | 12.0 | 13.5 |

## 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.

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) varies according to the coupling size.

- Up to coupling size 400
  Replacing buffers (5) up to coupling size 400 (Page 47)
- From coupling size 450 to 630
  Replacing buffers (5) as of coupling size 450 to 630 (Page 47)
- From coupling size 710
  Replacing buffers (5) as of coupling size 710 (Page 48)

## 8.3.1 Replacing buffers (5) up to coupling size 400

### Procedure

1. Remove the hexagon nuts (7).
2. Remove the bolts (4) with the washers (6) and the buffers (5) through the buffer fitting holes.
3. Pull the buffers (5) off the bolts (4).
4. Clean the bolts (4), the washers (6), the buffer fitting holes and the bolt fitting holes in the coupling parts 1 (1) and/or 3 (3).
5. Mount new buffers (5) on the bolts (4).
   Please observe the information in section Use and storage of the buffers (5) (Page 74) when replacing the buffers (5).
6. Insert the bolts (4) with the washers (6) and the buffers (5) through the buffer fitting holes into the bolt fitting holes. Observe any markings that might be provided.
7. Secure the bolts (4) with new hexagon nuts (7) of the same quality.
8. Tighten the hexagon nuts (7) to the specified tightening torque $T_A$ (see section Tightening torques and widths A/F (Page 73)).

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

| NOTICE |
| --- |
| **Blockage of cross bore of bolts (4)**<br>The liquid screw locking agent can seal the cross bore of the bolts (4). Pressing out the bolts (4) with grease then becomes difficult or completely impossible.<br>• Apply only a small quantity of the liquid screw locking agent to the screws (11). |

When removing the bolts (4), please observe the information in section Pressing out bolts (Page 49).

### Procedure

1. Remove the hexagon head screws (11) and the washers (8).
2. Remove the bolts (4) with the buffers (5) through the buffer fitting holes.
3. Pull the buffers (5) off the bolts (4).
4. Clean the bolts (4), the washers (6), the buffer fitting holes and the bolt fitting holes in the coupling parts 1 (1) and/or 3 (3).
5. Mount new buffers (5) on the bolts (4). Please observe the information in section Use and storage of the buffers (5) (Page 74) when replacing the buffers (5).
6. Insert the bolts (4) with the washers (6) and the buffers (5) through the buffer fitting holes into the bolt fitting holes. Observe any markings that might be provided.
7. Push the washers (8) onto the screws (11).
8. Apply a small quantity of liquid screw locking agent (e.g. Loctite 243 medium strength) to the screws (11).
9. Secure the bolts (4) with the screws (11) and washers (8).
10. Tighten the screws (11) to the specified tightening torque $T_A$ (see section Tightening torques and widths A/F (Page 73)).

## 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 48)
- Replacing buffers (5) with removal of the bolts (4) (Page 49)

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

### 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 parts 1 (1) and/or 3 (3).
4. Mount new buffers (5) on the bolts (4). Please observe the information in section Use and storage of the buffers (5) (Page 74) 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)

| NOTICE |
| --- |
| **Blockage of cross bore of bolts (4)**<br>The liquid screw locking agent can seal the cross bore of the bolts (4). Pressing out the bolts (4) with grease then becomes difficult or completely impossible.<br>• Apply only a small quantity of the liquid screw locking agent to the screws (11). |

### Procedure

1. Remove the bolts (4). Please observe the relevant information in section Pressing out bolts (Page 49).
2. Remove the locking rings (12) and the washers (6).
3. Pull the buffers (5) off the bolts (4).
4. Clean the bolts (4), the washers (6), the locking rings (12), the buffer fitting holes and the bolt fitting holes in the coupling parts 1 (1) and/or 3 (3).
   If old bolts (4) are to be reused, the tapped holes and cross bores must be completely free of any residues of grease or liquid screw locking agent.
5. Mount new buffers (5) on the bolts (4). Please observe the information in section Use and storage of the buffers (5) (Page 74) when replacing the buffers (5).
6. Secure the buffers (5) with the washers (6) and the locking rings (12).
7. Insert the bolts (4) with the buffers (5) into the bolt fitting holes. Observe any markings that might be provided.
8. Push the washers (8) onto the screws (11).
9. Apply a small quantity of liquid screw locking agent (e.g. Loctite 243 medium strength) to the screws (11).
10. Secure the bolts (4) with the screws (11) and washers (8).
11. Tighten the screws (11) to the specified tightening torque $T_A$ (see section Tightening torques and widths A/F (Page 73)).

## 8.3.4 Pressing out bolts

The bolts (4) for coupling sizes 450 to 1 000 have cross bores that make it easier to press out the bolts (4).

### 8.3.4.1 Pressing out bolts (4) 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), please observe the operating instructions BA 3600.1, "Demounting box for extraction of RUPEX bolts".

### 8.3.4.2 Pressing out bolts (4) with grease

**⚠ WARNING**

**Risk of injury from flying bolts (4)**

Loose bolts (4) 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.

**⚠ WARNING**

**Risk of crush injuries as a result of bolt (4) suddenly working loose**

If bolt (4) 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), screw (11) or washer (8).

**⚠ WARNING**

**Risk of injury**

When you are pressing out the bolts (4), grease can escape under high pressure. If bolt (4) suddenly works loose, fragments can become detached and fly through the air at high speed.

- Wear safety goggles.

## Procedure

1. Remove the hexagon head screws (11) and the washers (8).
2. Clean the tapped holes of the bolts (4) until they are free of all residues.
3. Fill the tapped hole of a bolt (4) to 90 % with commercially available machine grease (e.g. Fuchs Renolit H443-HD-88).
4. Wrap screw (11) in Teflon tape or Teflon sealing cord.
5. Place a washer (8) as an axial locking element over screw (11).

6. Insert the screw (11) with the washer (8) into the bolt (4) and tighten manually by two to three turns.
7. 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) and the bolt fitting hole of the coupling part 1 (1) and/or 3 (3).
   The bolt (4) is released suddenly and makes a loud noise.
8. Repeat the process in the order specified for all the installed bolts (4).

#### 8.3.4.3 Potential problems when pressing out bolts (4) with grease

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

## 8.4 Removing coupling part 1 (1) or 3 (3)

The procedure to be followed depends on the existing shaft-hub connection:

- Removing coupling part 1 (1) or 3 (3) with shaft and hub connected by a parallel key (Page 52)
- Removing coupling part 1 (1) or 3 (3) with shaft and hub connected by a pressurised oil interference fit (Page 52)

## 8.4.1 Removing coupling part 1 (1) or 3 (3) 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. Move the coupled machines apart.
2. Secure the coupling parts to prevent them from falling.
3. Remove the axial locking element (set screw, end plate).
4. Use a suitable pulling fixture.
5. Heat up the coupling part 1 (1) and/or 3 (3) 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 75)). Remove the buffers (5) if necessary.
6. Pull off the coupling part 1 (1) and/or 3 (3). Use suitable lifting gear when doing this.
7. Check the hub bore and the shaft for damage and protect them against corrosion.
8. Replace any damaged parts.

When reinstalling the coupling parts please observe the information in chapters Assembly (Page 25) and Commissioning (Page 37).

## 8.4.2 Removing coupling part 1 (1) or 3 (3) 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 and cause the coupling to 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 3 (3) 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. Move the coupled machines apart.
2. Remove the buffers (5). For further information, refer to section Replacing wearing parts (Page 46).
3. Use a suitable pulling fixture.
4. Secure the coupling part 1 (1) or 3 (3) and the pulling fixture in position to prevent them from falling.
5. Remove the screw plugs (101) or (301) from the oil channels.
6. Deaerate an oil pump and connect it to the oil channel in the centre.
7. 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.
8. Deaerate the next oil pump and connect it to the adjacent oil channel.
9. Repeat steps 7 and 8 on the remaining oil channels.
10. If so much oil escapes when pressure is applied that the pump cannot maintain the pressure, use a higher-viscosity oil.
11. 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 3 (3) 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.

12. Dismantle the oil pumps and the pulling fixture from the coupling part 1 (1) or 3 (3).
13. Check the hub bore and the shaft for damage and protect them against corrosion.
14. Replace any damaged parts.

When reinstalling the coupling parts please observe the information in chapters Assembly (Page 25) and Commissioning (Page 37).

# Service and support

# 9

## 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

# 10

## Disposal of the coupling

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

# Spare parts 11

## 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 60).

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

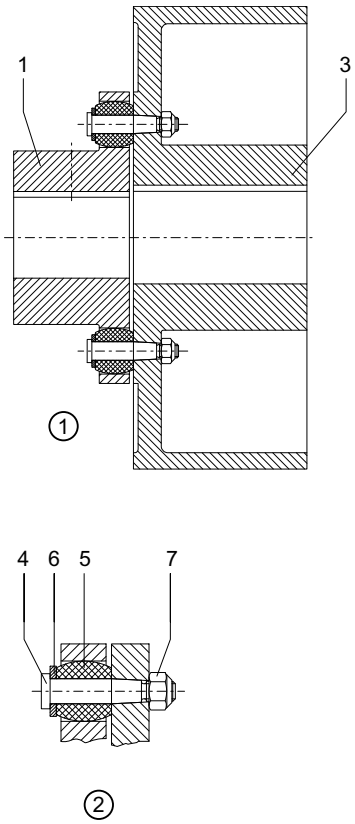
### Information required when ordering spare parts

- Flender order number with item
- Flender drawing number
- Coupling type and size
- Part number (refer to Spare parts drawing and spare parts list (Page 60))
- 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

- 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

### 11.2.1 Types RWB and RBS with brake drum in accordance with DIN 15431




① Types RWB and RBS with brake drum
② Bolt connection

Figure 11-1 Spare parts drawing for types RWB and RBS with brake drum

**Note**

**Arrangement of the buffers**

The buffers (5) are arranged on one side in the coupling part 1 (1).

Table 11-1 Spare parts list for types RWB and RBS with brake drum

| Part number | Designation |
|---|---|
| 1 | Coupling part 1 |
| 3 | Coupling part 3 |
| 4 | Bolt |
| 5 | Buffer |
| 6 | Washer |
| 7 | Hexagon nut, self-locking |
| 101 | Screw plug[1)] |
| 301 | Screw plug[1)] |

[1)] Screw plugs (101, 301) are only used in combination with a pressurised oil interference fit.

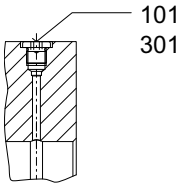
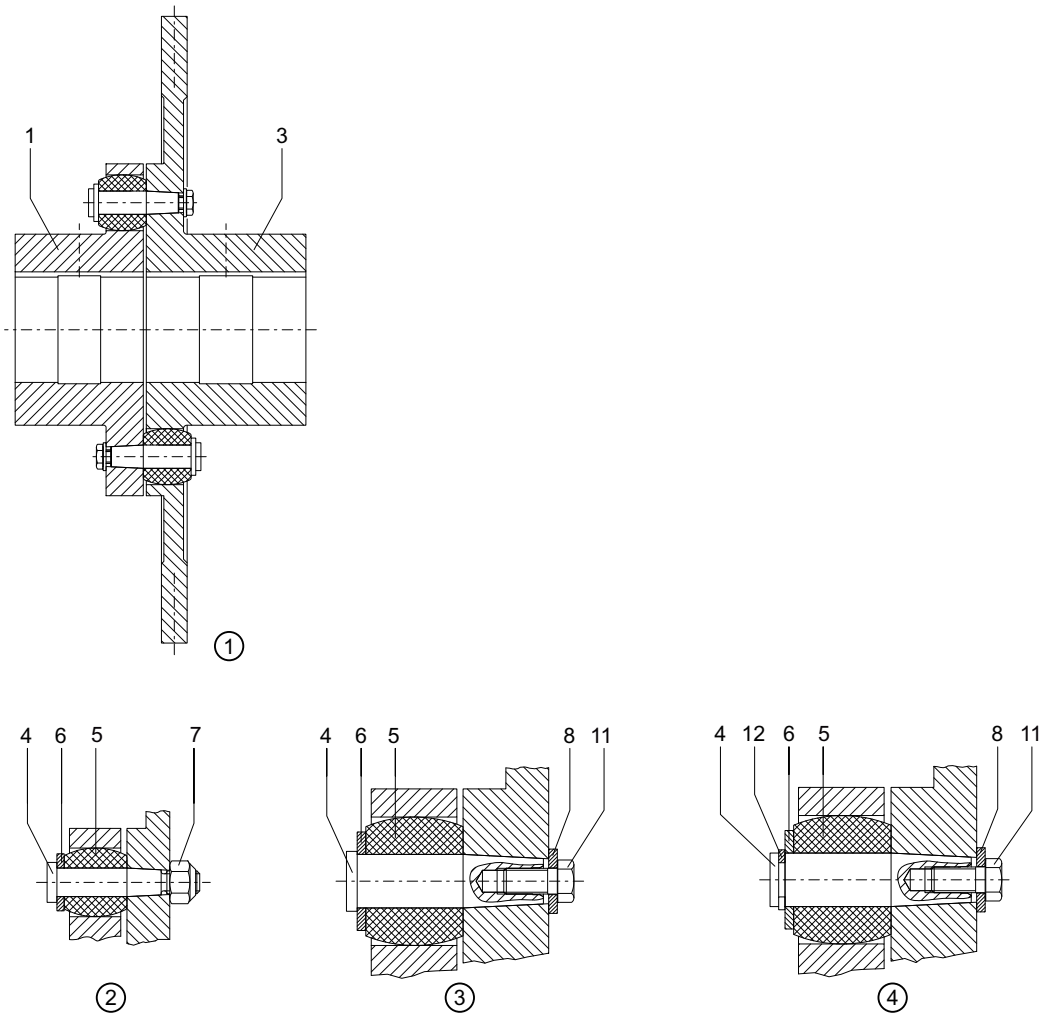



Figure 11-2 Screw plug

## 11.2.2 Types RWB and RBS with brake disk




① Types RWB and RBS with brake disk
② Bolt connection for coupling sizes 144 to 400
③ Bolt connection for coupling sizes 450 to 630
④ Bolt connection for coupling sizes 710 to 1000

Figure 11-3 Spare parts drawing for types RWB and RBS with brake disk

**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 3 (3).

Table 11-2 Spare parts list for types RWB and RBS with brake disk

| Part number | Designation |
|---|---|
| 1 | Coupling part 1 |
| 3 | Coupling part 3 |
| 4 | Bolt |
| 5 | Buffer |
| 6 | Washer |
| 7 | Hexagon nut, self-locking |
| 8 | Washer |
| 11 | Hexagon head screw |
| 12 | Locking ring |
| 101 | Screw plug[1)] |
| 301 | Screw plug[1)] |

[1)] Screw plugs (101, 301) are only used in combination with a pressurised oil interference fit.

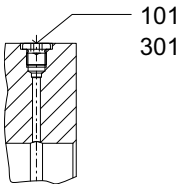



Figure 11-4 Screw plug

# Technical data

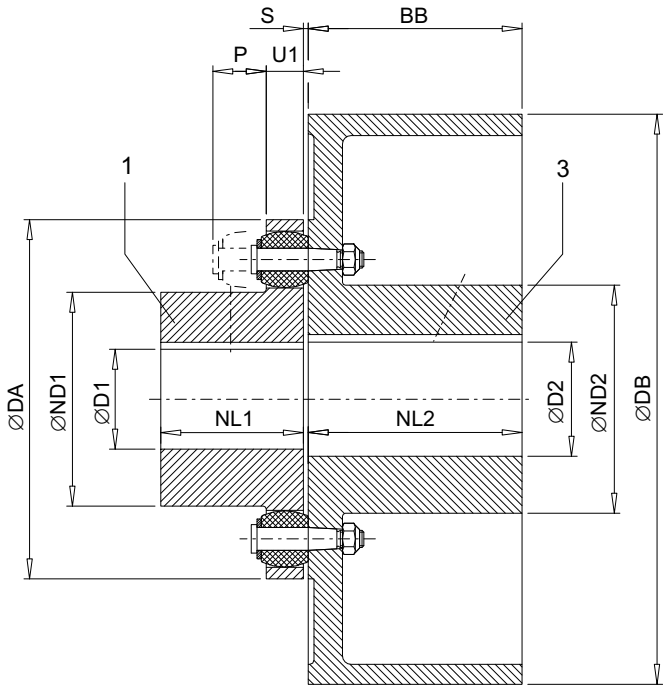
# A

## 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 RWB and RBS with brake drum in accordance with DIN 15431 (Page 65)
- Types RWB and RBS with brake disk 12.7 mm wide (Page 67)
- Types RWB and RBS with brake disk 30 mm wide, in accordance with DIN 15432 (Page 69)

### A.1.1 Types RWB and RBS with brake drum in accordance with DIN 15431




1 Coupling part 1

3 Coupling part 3

Figure A-1 Types RWB and RBS

Table A-1 Speeds, geometry data and weights of type RWB with brake drum in accordance with DIN 15431

| Size | Speed $n_{max.}$ | Maximum bore[1] | | | | | | | | | | | Weight[2] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | D1 | D2 | DA | ND1 | ND2 | NL1 | P | S | U1 | DB | BB NL2 | m |
| | rpm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | kg |
| **144** | 3 400 | 45 | 55 | 144 | 76 | 84 | 55 | 35 | 2 … 4 | 16 | 200 | 75 | 9.5 |
| **162** | 2 750 | 50 | 60 | 162 | 85 | 92 | 60 | 40 | 2 … 5 | 20 | 250 | 95 | 17 |
| **178** | 2 750 | 60 | 70 | 178 | 102 | 108 | 70 | 40 | 2 … 5 | 20 | 250 | 95 | 20 |
| | 2 150 | | | | | | | | | | 315 | 118 | 28 |
| **198** | 2 750 | 70 | 80 | 198 | 120 | 128 | 80 | 40 | 2 … 5 | 20 | 250 | 95 | 24 |
| | 2 150 | | | | | | | | | | 315 | 118 | 32 |
| **228** | 1 700 | 80 | 90 | 228 | 129 | 140 | 90 | 50 | 2 … 5 | 26 | 400 | 150 | 54 |
| **252** | 1 700 | 90 | 100 | 252 | 150 | 160 | 100 | 50 | 2 … 5 | 26 | 400 | 150 | 63 |
| | 1 400 | | | | | | | | | | 500 | 190 | 93 |
| **285** | 1 400 | 100 | 110 | 285 | 164 | 175 | 110 | 60 | 3 … 6 | 32 | 500 | 190 | 104 |
| | 1 100 | | | | | | | | | | 630 | 236 | 157 |
| **320** | 1 100 | 110 | 120 | 320 | 180 | 192 | 125 | 60 | 3 … 6 | 32 | 630 | 236 | 172 |
| | 950 | | | | | | | | | | 710 | 265 | 217 |
| **360** | 1 100 | 120 | 130 | 360 | 200 | 210 | 140 | 75 | 3 … 6 | 42 | 630 | 236 | 191 |
| | 950 | | | | | | | | | | 710 | 265 | 236 |

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

2) Weight applies to one coupling with maximum bore.

Table A-2 Speeds, geometry data and weights of type RBS with brake drum in accordance with DIN 15431

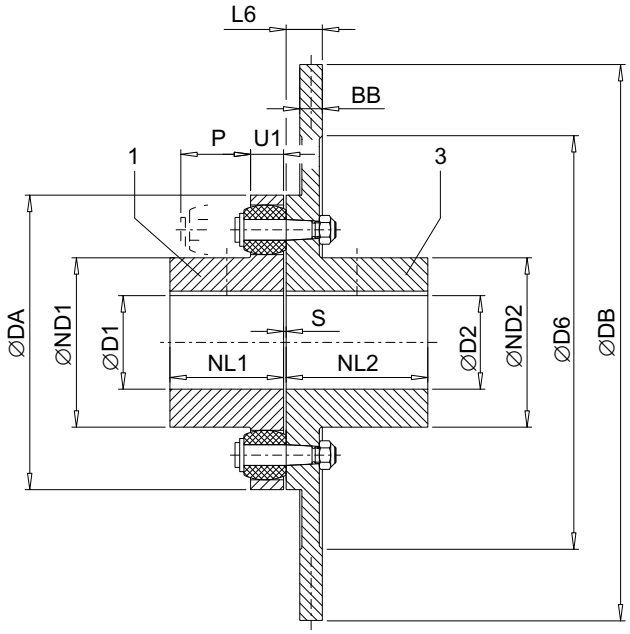
| Size | Speed $n_{max.}$ | Maximum bore[1] | | | | | | | | | | | Weight[2] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | D1 | D2 | DA | ND1 | ND2 | NL1 | P | S | U1 | DB | BB NL2 | m |
| | rpm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | kg |
| **144** | 5 000 | 50 | 60 | 144 | 76 | 84 | 55 | 35 | 2 … 4 | 16 | 200 | 75 | 10 |
| **162** | 5 000 | 55 | 65 | 162 | 85 | 92 | 60 | 40 | 2 … 5 | 20 | 250 | 95 | 18 |
| **178** | 4 900 | 70 | 75 | 178 | 102 | 108 | 70 | 40 | 2 … 5 | 20 | 250 | 95 | 22 |
| | 4 350 | | | | | | | | | | 315 | 118 | 30 |
| **198** | 4 600 | 80 | 85 | 198 | 120 | 128 | 80 | 40 | 2 … 5 | 20 | 250 | 95 | 26 |
| | 4 350 | | | | | | | | | | 315 | 118 | 35 |
| **228** | 3 400 | 85 | 95 | 228 | 129 | 140 | 90 | 50 | 2 … 5 | 26 | 400 | 150 | 60 |
| **252** | 3 400 | 100 | 110 | 252 | 150 | 160 | 100 | 50 | 2 … 5 | 26 | 400 | 150 | 68 |
| | 2 750 | | 100 | | | | | | | | 500 | 190 | 103 |
| **285** | 2 750 | 110 | 110 | 285 | 164 | 175 | 110 | 60 | 3 … 6 | 32 | 500 | 190 | 115 |
| | 2 150 | | | | | | | | | | 630 | 236 | 171 |

| Size | Speed $n_{max.}$ | Maximum bore[1] | | DA | ND1 | ND2 | NL1 | P | S | U1 | DB | BB | Weight[2] m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | D1 | D2 | | | | | | | | | NL2 | |
| | rpm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | kg |
| **320** | 2 150 | 125 | 125 | 320 | 180 | 192 | 125 | 60 | 3 … 6 | 32 | 630 | 236 | 185 |
| | 1 900 | | | | | | | | | | 710 | 265 | 230 |
| **360** | 2 150 | 135 | 135 | 360 | 200 | 210 | 140 | 75 | 3 … 6 | 42 | 630 | 236 | 210 |
| | 1 900 | | | | | | | | | | 710 | 265 | 255 |

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

[2] Weight applies to one coupling with maximum bore.

## A.1.2 Types RWB and RBS with brake disk 12.7 mm wide




1 Coupling part 1

3 Coupling part 3

Figure A-2 Types RWB and RBS with brake disk 12.7 mm wide

Table A-3 Speeds, geometry data and weights of type RWB with brake disk 12.7 mm wide

| Size | Speed[1] $n_{max.}$ | Maximum bore[2] | | | | | | | | | | | | | | | Weight[3] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | D1 | D2 | DA | ND1 | ND2 | NL1 | NL2 | P | S | U1 | DB | | D6 | BB | L6 | m |
| | | | | | | | | | | | | min. | max. | min. | | | |
| | rpm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | kg |
| **144** | 3 600 | 45 | 55 | 144 | 76 | 84 | 55 | 85 | 35 | 2 … 4 | 16 | 280 | 315 | 175 | 12.7 | 17.35 | 11 |
| **162** | 2 850 | 50 | 60 | 162 | 85 | 92 | 60 | 102 | 40 | 2 … 5 | 20 | 315 | 400 | 175 | 12.7 | 17.35 | 17.5 |
| **178** | 2 850 | 60 | 70 | 178 | 102 | 108 | 70 | 102 | 40 | 2 … 5 | 20 | 315 | 400 | 200 | 12.7 | 17.35 | 20.5 |
| **198** | 2 550 | 70 | 80 | 198 | 120 | 128 | 80 | 108 | 40 | 2 … 5 | 20 | 355 | 450 | 200 | 12.7 | 17.35 | 26.5 |
| **228** | 2 550 | 80 | 90 | 228 | 129 | 140 | 90 | 115 | 50 | 2 … 5 | 26 | 355 | 450 | 250 | 12.7 | 18.35 | 31.5 |
| **252** | 2 300 | 90 | 100 | 252 | 150 | 160 | 100 | 120 | 50 | 2 … 5 | 26 | 400 | 500 | 280 | 12.7 | 19.35 | 42 |
| **285** | 1 800 | 100 | 110 | 285 | 164 | 175 | 110 | 135 | 60 | 3 … 6 | 32 | 450 | 630 | 310 | 12.7 | 19.35 | 72 |
| **320** | 1 600 | 110 | 120 | 320 | 180 | 192 | 125 | 145 | 60 | 3 … 6 | 32 | 450 | 710 | 350 | 12.7 | 21.35 | 93 |
| **360** | 1 600 | 120 | 130 | 360 | 200 | 210 | 140 | 150 | 75 | 3 … 6 | 42 | 500 | 710 | 390 | 12.7 | 20.35 | 120 |

[1] Maximum speed for brake disk diameter $DB_{max.}$
The following applies to smaller brake diametersDB: $n_{max.}$ = 1146 / DB (DB in m).

[2] Maximum bore for parallel keyway in accordance with DIN 6885/1.

[3] Weight applies to one coupling with maximum bore and maximum brake disk diameter DB.

Table A-4 Speeds, geometry data and weights of type RBS with brake disk 12.7 mm wide

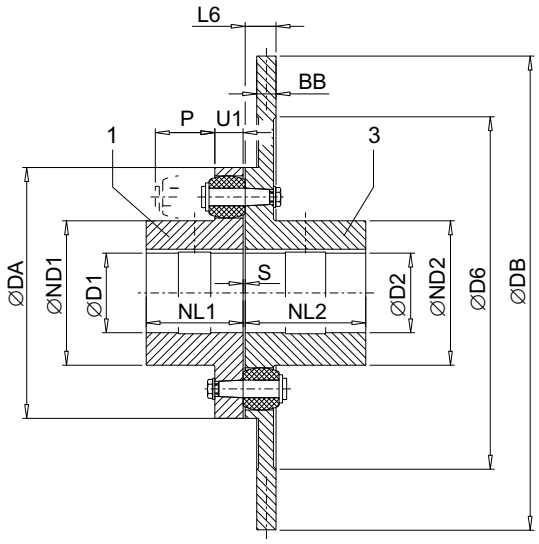
| Size | Speed[1] $n_{max.}$ | Maximum bore[2] | | | | | | | | | | | | | | | Weight[3] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | D1 | D2 | DA | ND1 | ND2 | NL1 | NL2 | P | S | U1 | DB | | D6 | BB | L6 | m |
| | | | | | | | | | | | | min. | max. | min. | | | |
| | rpm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | kg |
| **144** | 4 800 | 50 | 60 | 144 | 76 | 84 | 55 | 85 | 35 | 2 … 4 | 16 | 280 | 315 | 175 | 12.7 | 17.35 | 11.5 |
| **162** | 3 800 | 55 | 65 | 162 | 85 | 92 | 60 | 102 | 40 | 2 … 5 | 20 | 315 | 400 | 175 | 12.7 | 17.35 | 18.5 |
| **178** | 3 800 | 70 | 75 | 178 | 102 | 108 | 70 | 102 | 40 | 2 … 5 | 20 | 315 | 400 | 200 | 12.7 | 17.35 | 21 |
| **198** | 3 400 | 80 | 85 | 198 | 120 | 128 | 80 | 108 | 40 | 2 … 5 | 20 | 355 | 450 | 200 | 12.7 | 17.35 | 27.5 |
| **228** | 3 400 | 85 | 95 | 228 | 129 | 140 | 90 | 115 | 50 | 2 … 5 | 26 | 355 | 450 | 250 | 12.7 | 18.35 | 32 |
| **252** | 3 050 | 100 | 110 | 252 | 150 | 160 | 100 | 120 | 50 | 2 … 5 | 26 | 400 | 500 | 280 | 12.7 | 19.35 | 43 |
| **285** | 2 400 | 110 | 120 | 285 | 164 | 175 | 110 | 135 | 60 | 3 … 6 | 32 | 450 | 630 | 320 | 12.7 | 19.35 | 68 |
| **320** | 2 150 | 125 | 130 | 320 | 180 | 192 | 125 | 145 | 60 | 3 … 6 | 32 | 500 | 710 | 360 | 12.7 | 21.35 | 91 |
| **360** | 2 150 | 135 | 140 | 360 | 200 | 210 | 140 | 150 | 75 | 3 … 6 | 42 | 560 | 710 | 400 | 12.7 | 20.35 | 122 |

[1] Maximum speed for brake disk diameter $DB_{max.}$
The following applies to smaller brake diametersDB: $n_{max.}$ = 1528 / DB (DB in m).

[2] Maximum bore for parallel keyway in accordance with DIN 6885/1.

[3] Weight applies to one coupling with maximum bore and maximum brake disk diameter DB.

## A.1.3 Types RWB and RBS with brake disk 30 mm wide, in accordance with DIN 15432




1 Coupling part 1

3 Coupling part 3

Figure A-3 Types RWB and RBS with brake disk 30 mm wide

Table A-5 Speeds, geometry data and weights of type RWB with brake disk 30 mm wide

| Size | Speed[1] | Maximum bore[2] | | | | | | | | | | | | | | | Weight[3] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $n_{max.}$ | D1 | D2 | DA | ND1 | ND2 | NL1 | NL2 max. | P | S | U1 | DB min. | DB max. | D6 min. | BB | L6 | m |
| | rpm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | kg |
| **144** | 2 300 | 45 | 45 | 144 | 76 | 84 | 55 | 219 | 35 | 2 … 4 | 16 | 315 | 500 | 175 | 30 | 34 | 48 |
| **162** | 2 050 | 50 | 50 | 162 | 85 | 92 | 60 | 219 | 40 | 2 … 5 | 20 | 315 | 560 | 175 | 30 | 34 | 61 |
| **178** | 2 050 | 60 | 60 | 178 | 102 | 108 | 70 | 219 | 40 | 2 … 5 | 20 | 355 | 560 | 200 | 30 | 34 | 65 |
| **198** | 2 050 | 70 | 70 | 198 | 120 | 128 | 80 | 219 | 40 | 2 … 5 | 20 | 355 | 560 | 200 | 30 | 34 | 69 |
| **228** | 1 400 | 80 | 80 | 228 | 129 | 140 | 90 | 219 | 50 | 2 … 5 | 26 | 450 | 800 | 250 | 30 | 34 | 130 |
| **252** | 1 400 | 90 | 100 | 252 | 150 | 160 | 100 | 219 | 50 | 2 … 5 | 26 | 500 | 800 | 280 | 30 | 34 | 135 |
| **285** | 1 400 | 100 | 110 | 285 | 164 | 175 | 110 | 219 | 60 | 3 … 6 | 32 | 560 | 800 | 310 | 30 | 34 | 145 |
| **320** | 1 150 | 110 | 120 | 320 | 180 | 192 | 125 | 219 | 60 | 3 … 6 | 32 | 630 | 1 000 | 350 | 30 | 34 | 220 |
| **360** | 1 150 | 120 | 130 | 360 | 200 | 210 | 140 | 221 | 75 | 3 … 6 | 42 | 710 | 1 000 | 390 | 30 | 36 | 240 |
| **400** | 1 150 | 140 | 140 | 400 | 230 | 230 | 160 | 225 | 75 | 3 … 6 | 42 | 630 | 1 000 | 440 | 30 | 40 | 260 |
| **450** | 1 150 | 160 | 160 | 450 | 260 | 260 | 180 | 225 | 90 | 4 … 7 | 52 | 630 | 1 000 | 500 | 30 | 40 | 300 |
| **500** | 1 150 | 180 | 180 | 500 | 290 | 290 | 200 | 225 | 90 | 4 … 7 | 52 | 710 | 1 000 | 500 | 30 | 40 | 340 |
| **560** | 1 150 | 140 | 200 | 560 | 250 | 320 | 220 | 225 | 120 | 4 … 8 | 68 | 800 | 1 000 | 560 | 30 | 40 | 410 |
| | | 180 | | | 300 | | | | | | | | | | | | 410 |
| | | 200 | | | 320 | | | | | | | | | | | | 410 |

| Size | Speed[1] | Maximum bore[2] | | | | | | | | | | DB | | D6 | BB | L6 | Weight[3] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $n_{max.}$ | D1 | D2 | DA | ND1 | ND2 | NL1 | NL2 max. | P | S | U1 | min. | max. | min. | | | m |
| | rpm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | kg |
| **630** | 900 | 140 | 220 | 630 | 250 | 355 | 240 | 240 | 120 | 4 … 8 | 68 | 900 | 1 250 | 630 | 30 | 55 | 570 |
| | | 180 | | | 300 | | | | | | | | | | | | 580 |
| | | 220 | | | 355 | | | | | | | | | | | | 600 |
| **710** | 800 | 160 | 240 | 710 | 290 | 385 | 260 | 260 | 140 | 5 … 9 | 80 | 1 000 | 1 400 | 710 | 30 | 75 | 770 |
| | | 200 | | | 330 | | | | | | | | | | | | 780 |
| | | 240 | | | 385 | | | | | | | | | | | | 790 |
| **800** | 700 | 180 | 260 | 800 | 320 | 420 | 290 | 290 | 140 | 5 … 9 | 80 | 1 250 | 1 600 | 800 | 30 | 75 | 1 030 |
| | | 220 | | | 360 | | | | | | | | | | | | 1 040 |
| | | 260 | | | 420 | | | | | | | | | | | | 1 060 |
| **900** | 700 | 220 | 290 | 900 | 360 | 465 | 320 | 320 | 160 | 5 … 10 | 90 | 1 250 | 1 600 | 900 | 30 | 75 | 1 280 |
| | | 260 | | | 425 | | | | | | | | | | | | 1 300 |
| | | 290 | | | 465 | | | | | | | | | | | | 1 330 |
| **1 000** | 700 | 240 | 320 | 1 000 | 395 | 515 | 350 | 350 | 160 | 5 … 10 | 90 | 1 250 | 1 600 | 1 000 | 30 | 75 | 1 520 |
| | | 280 | | | 460 | | | | | | | | | | | | 1 550 |
| | | 320 | | | 515 | | | | | | | | | | | | 1 580 |

1) Maximum speed for brake disk diameter $DB_{max.}$
The following applies to smaller brake diametersDB: $n_{max.}$ = 1146 / DB (DB in m).

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

3) Weight applies to one coupling with maximum bore and maximum brake disk diameter DB.

Table A-6 Speeds, geometry data and weights of type RBS with brake disk 30 mm wide

| Size | Speed[1] | Maximum bore[2] | | | | | | | | | | DB | | D6 | BB | L6 | Weight[3] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $n_{max.}$ | D1 | D2 | DA | ND1 | ND2 | NL1 | NL2 max. | P | S | U1 | min. | max. | min. | | | m |
| | rpm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | kg |
| **144** | 3 050 | 50 | 45 | 144 | 76 | 84 | 55 | 219 | 35 | 2 … 4 | 16 | 315 | 500 | 175 | 30 | 34 | 52 |
| **162** | 2 750 | 55 | 50 | 162 | 85 | 92 | 60 | 219 | 40 | 2 … 5 | 20 | 315 | 560 | 175 | 30 | 34 | 66 |
| **178** | 2 750 | 70 | 60 | 178 | 102 | 108 | 70 | 219 | 40 | 2 … 5 | 20 | 355 | 560 | 200 | 30 | 34 | 69 |
| **198** | 2 750 | 80 | 70 | 198 | 120 | 128 | 80 | 219 | 40 | 2 … 5 | 20 | 355 | 560 | 200 | 30 | 34 | 74 |
| **228** | 1 900 | 85 | 80 | 228 | 129 | 140 | 90 | 219 | 50 | 2 … 5 | 26 | 450 | 800 | 250 | 30 | 34 | 140 |
| **252** | 1 900 | 100 | 100 | 252 | 150 | 160 | 100 | 219 | 50 | 2 … 5 | 26 | 500 | 800 | 280 | 30 | 34 | 145 |
| **285** | 1 900 | 110 | 120 | 285 | 164 | 175 | 110 | 219 | 60 | 3 … 6 | 32 | 560 | 800 | 310 | 30 | 34 | 155 |
| **320** | 1 550 | 125 | 130 | 320 | 180 | 192 | 125 | 219 | 60 | 3 … 6 | 32 | 630 | 1 000 | 350 | 30 | 34 | 230 |
| **360** | 1 550 | 135 | 140 | 360 | 200 | 210 | 140 | 221 | 75 | 3 … 6 | 42 | 710 | 1 000 | 390 | 30 | 36 | 250 |
| **400** | 1 550 | 150 | 150 | 400 | 230 | 230 | 160 | 225 | 75 | 3 … 6 | 42 | 560 | 1 000 | 440 | 30 | 40 | 280 |
| **450** | 1 550 | 170 | 170 | 450 | 260 | 260 | 180 | 225 | 90 | 4 … 7 | 52 | 630 | 1 000 | 500 | 30 | 40 | 320 |

| Size | Speed[1] | Maximum bore[2] | | | | | | | | | | DB | | D6 | BB | L6 | Weight[3] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $n_{max.}$ | D1 | D2 | DA | ND1 | ND2 | NL1 | NL2 max. | P | S | U1 | min. | max. | min. | | | m |
| | rpm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | kg |
| **500** | 1 550 | 190 | 190 | 500 | 290 | 290 | 200 | 225 | 90 | 4 … 7 | 52 | 710 | 1 000 | 500 | 30 | 40 | 360 |
| **560** | 1 550 | 165 | 210 | 560 | 250 | 320 | 220 | 225 | 120 | 4 … 8 | 68 | 800 | 1 000 | 600 | 30 | 40 | 420 |
| | | 200 | | | 300 | | | | | | | | | | | | 430 |
| | | 210 | | | 320 | | | | | | | | | | | | 430 |
| **630** | 1 200 | 165 | 235 | 630 | 250 | 355 | 240 | 240 | 120 | 4 … 8 | 68 | 900 | 1 250 | 670 | 30 | 55 | 590 |
| | | 200 | | | 300 | | | | | | | | | | | | 600 |
| | | 235 | | | 355 | | | | | | | | | | | | 620 |
| **710** | 1 100 | 190 | 250 | 710 | 290 | 385 | 260 | 260 | 140 | 5 … 9 | 80 | 1 000 | 1 400 | 760 | 30 | 75 | 800 |
| | | 220 | | | 330 | | | | | | | | | | | | 810 |
| | | 250 | | | 385 | | | | | | | | | | | | 830 |
| **800** | 950 | 210 | 280 | 800 | 320 | 420 | 290 | 290 | 140 | 5 … 9 | 80 | 1 250 | 1 600 | 840 | 30 | 75 | 1 080 |
| | | 240 | | | 360 | | | | | | | | | | | | 1 090 |
| | | 280 | | | 420 | | | | | | | | | | | | 1 120 |
| **900** | 950 | 210 | 310 | 900 | 320 | 465 | 320 | 320 | 160 | 5 … 10 | 90 | 1 250 | 1 600 | 950 | 30 | 75 | 1 280 |
| | | 240 | | | 360 | | | | | | | | | | | | 1 310 |
| | | 280 | | | 425 | | | | | | | | | | | | 1 290 |
| | | 310 | | | 465 | | | | | | | | | | | | 1 320 |
| **1 000** | 950 | 230 | 340 | 1000 | 355 | 515 | 350 | 350 | 160 | 5 … 10 | 90 | 1 250 | 1 600 | 1 050 | 30 | 75 | 1 450 |
| | | 260 | | | 395 | | | | | | | | | | | | 1 520 |
| | | 300 | | | 460 | | | | | | | | | | | | 1 540 |
| | | 340 | | | 515 | | | | | | | | | | | | 1 580 |

1) Maximum speed for brake disk diameter $DB_{max.}$
The following applies to smaller brake diametersDB: $n_{max.}$ = 1528 / DB (DB in m).

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

3) Weight applies to one coupling with maximum bore and maximum brake disk diameter DB.

# A.2 Shaft misalignment values during operation

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

Table A-7 Maximum permissible shaft misalignment values during operation

| Size | Coupling speed [rpm] | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 250 | 500 | 750 | 1 000 | 1 500 | 2 000 | 3 000 | 4 000 | 5 000 |
| 144 | 0.6 | 0.4 | 0.35 | 0.3 | 0.25 | 0.2 | 0.15 | 0.15 | 0.1 |
| 162 | 0.65 | 0.45 | 0.35 | 0.3 | 0.25 | 0.2 | 0.15 | 0.15 | 0.15 |
| 178 | 0.7 | 0.5 | 0.4 | 0.35 | 0.25 | 0.25 | 0.2 | 0.15 | |
| 198 | 0.75 | 0.5 | 0.4 | 0.35 | 0.3 | 0.25 | 0.2 | 0.15 | |
| 228 | 0.8 | 0.55 | 0.45 | 0.4 | 0.3 | 0.25 | 0.2 | 0.2 | |
| 252 | 0.85 | 0.6 | 0.5 | 0.45 | 0.35 | 0.3 | 0.25 | 0.2 | |
| 285 | 0.95 | 0.65 | 0.55 | 0.45 | 0.4 | 0.3 | 0.25 | | |
| 320 | 1.05 | 0.75 | 0.6 | 0.5 | 0.4 | 0.35 | 0.3 | | |
| 360 | 1.15 | 0.8 | 0.65 | 0.55 | 0.45 | 0.4 | 0.3 | | |
| 400 | 1.25 | 0.85 | 0.7 | 0.6 | 0.5 | 0.45 | | | |
| 450 | 1.35 | 0.95 | 0.8 | 0.7 | 0.55 | 0.45 | | | |
| 500 | 1.5 | 1.05 | 0.85 | 0.75 | 0.6 | 0.5 | | | |
| 560 | 1.65 | 1.15 | 0.95 | 0.8 | 0.65 | 0.55 | | | |
| 630 | 1.85 | 1.3 | 1.05 | 0.9 | 0.75 | | | | |
| 710 | 2.05 | 1.45 | 1.15 | 1 | 0.8 | | | | |
| 800 | 2.25 | 1.6 | 1.3 | 1.1 | | | | | |
| 900 | 2.5 | 1.75 | 1.45 | 1.25 | | | | | |
| 1 000 | 2.75 | 1.95 | 1.6 | 1.35 | | | | | |

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

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

Coupling speed n in rpm

DA in mm (see Speeds, geometry data and weights (Page 65))

Radial misalignment $\Delta Kr_{perm}$ 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-8 Tightening torques and widths A/F of bolt connection

| Size | Tightening torque<br>$T_A$<br>Nm | Width A/F external hexagon<br>SW<br>mm |
|---|---|---|
| 144 | 15 | 13 |
| 162 | 30 | 17 |
| 178 | 30 | 17 |
| 198 | 30 | 17 |
| 228 | 55 | 19 |
| 252 | 55 | 19 |
| 285 | 100 | 24 |
| 320 | 100 | 24 |
| 360 | 170 | 27 |
| 400 | 170 | 27 |
| 450 | 180 | 24 |
| 500 | 180 | 24 |
| 560 | 340 | 30 |
| 630 | 340 | 30 |
| 710 | 580 | 36 |
| 800 | 580 | 36 |
| 900 | 600 | 36 |
| 1 000 | 600 | 36 |

Apply the recommended tightening torques in accordance with the stipulations in section Tightening procedure (Page 74).

# A.4 Tightening procedure

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

Table A-9 Tightening procedure

| Scatter of the torque applied at the tool | Tightening procedure<br>(As a rule, the tightening procedures listed are within the specified tool torque scatter) |
|---|---|
| ±5 % | • Hydraulic tightening with mechanical screwdriver<br>• Torque-controlled tightening with a torque wrench or a torque wrench that gives a signal<br>• Tightening with a precision mechanical screwdriver with dynamic torque measurement |

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.

# A.5 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 A-10 RUPEX buffers

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

# Quality documents

B

## B.1 EU declaration of conformity

EU declaration of conformity

Product:
FLENDER RUPEX® Couplings
Types RWB and RBS

Name and address of the manufacturer:
Flender 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:
– Directive 2014/34/EU Official Journal L 96, 29.3.2014, Pages 309-356

Harmonised standards or other technical specifications on which the declaration of conformity is based:

| | |
|---|---|
| EN 1127-1 | : 2011 |
| EN ISO 80079-36 | : 2016 |
| EN ISO 80079-37 | : 2016 |
| 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:
Flender GmbH

Bocholt, 2019-01-01

Dr. Tim Sadek, Vice President, Applications Couplings

# FLENDER COUPLINGS

RUPEX
Operating Instructions 3602en
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Flender GmbH
Alfred-Flender-Straße 77
46395 Bocholt
GERMANY

flender.com

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