FLENDER COUPLINGS

ELPEX-B

Assembly and operating instructions M3320-01en
Edition 09/2022

EBWT, EBWN, EBWZ

FLENDER

Original assembly and operating instructions

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1.1 Legal information

Warning system

These instructions contain information you must observe for your own personal safety as well as to avoid damage to property and persons. The information regarding your personal safety is highlighted with a warning triangle. Information exclusively regarding property damage alone is not marked with a warning triangle. Depending on the hazard class, the warnings shall be depicted as follows, in descending order.

⚠ DANGER

means that death or severe physical injury **will** occur if the relevant precautionary measures are not taken.

⚠ WARNING

means that death or severe physical injury **may** occur if the relevant precautionary measures are not taken.

⚠ CAUTION

means that mild physical injury may occur if the relevant precautionary measures are not taken.

NOTICE

means that damage to property may occur if the relevant precautionary measures are not taken.

If multiple hazard classes come into play, the warning for the highest level in question shall always be used. If a warning containing the warning triangle warns of harm to individuals, the same warning may also include a warning regarding damage to property.

Information

Information

Information offers additional notes, assistance and tips for handling the product.

Qualified personnel

The product/system associated with this documentation may only be used by **qualified personnel** trained to perform the relevant tasks, taking into account the associated documentation for the relevant tasks, particularly the safety information and warnings included therein. Due to their qualification and experience, qualified personnel are capable of detecting risks and avoiding potential hazards when dealing with these products/systems.

Intended use of Flender products

Please note the following:

⚠ WARNING

Flender products are only suitable for the uses set out in the catalogue and associated technical documentation. If third-party products and components are used, these must be recommended and/or authorised by Flender. Safe and flawless operation of the products requires proper transport, proper storage, setup, assembly, installation, commissioning, operation and maintenance. The permissible environmental conditions must be adhered to. Instructions in the associated documentation must be followed.

Trademarks

All designations marked with the trademark symbol ® are registered trademarks of Flender GmbH. Other designations in this document may be trademarks whose use by third parties for their own purposes may violate the rights of the owner.

Liability disclaimer

We have assessed the contents of these instructions for compliance with the hardware and software described. However, deviations cannot be ruled out, so we are unable to accept liability for full compliance. The details in these instructions are regularly reviewed and necessary corrections are contained in subsequent editions.

1.2 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.

1.3 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.

1.4 Copyright

The copyright of 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 53)).

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 assembly units and accessories that increase performance and safety while maintaining the essential features.

Symbols

ISO	ANSI	Warning
		Warning – hazardous electrical voltage
		Warning – explosive substances
	---	Warning – entanglement hazard
	---	Warning – hot surfaces
	---	Warning – corrosive substances
	---	Warning – suspended load

ISO	ANSI	Warning
	---	Warning – hand injuries

Table 2-1: General warnings

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.

Protective clothing

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

Using the coupling

The relevant occupational 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 hoisting gear or load lifting 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.

Take measures to prevent the accidental restarting of the drive aggregate. Attach an information notice to the start 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 operator of the machine or system 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.

- Use only original replacement parts from Flender. Flender only accepts liability for original replacement parts from Flender.
  Other replacement parts are not tested and approved by Flender. Non-approved replacement 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 replacement parts. The same applies to any accessories that were not supplied by Flender.

If you have any queries, please contact our customer service organisation (see Service and support (Page 53)).

2.3 General warning notices

⚠ WARNING

Danger if the coupling fractures

The coupling may burst if it is not used for its intended use. There is a risk of fatal injury from flying fragments.

- Use the coupling for the purpose for which it is intended.

⚠ WARNING

Danger from hot coupling parts

Risk of injury due to hot surfaces.

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

⚠ 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 ELPEX-B couplings described here are highly torsionally flexible couplings and are available in various types and sizes.

ELPEX-B couplings are without fail-safe device.

Types EBWN and EBWT are short shaft-to-shaft connections. Type EBWZ is a version with radially removable flanged shaft (6).

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

Application

ELPEX-B couplings are suitable for drives with very uneven torque load and/or with large misaligments.

Design

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

You can find a complete description of the versions in Spare parts drawing and spare parts list (Page 58).

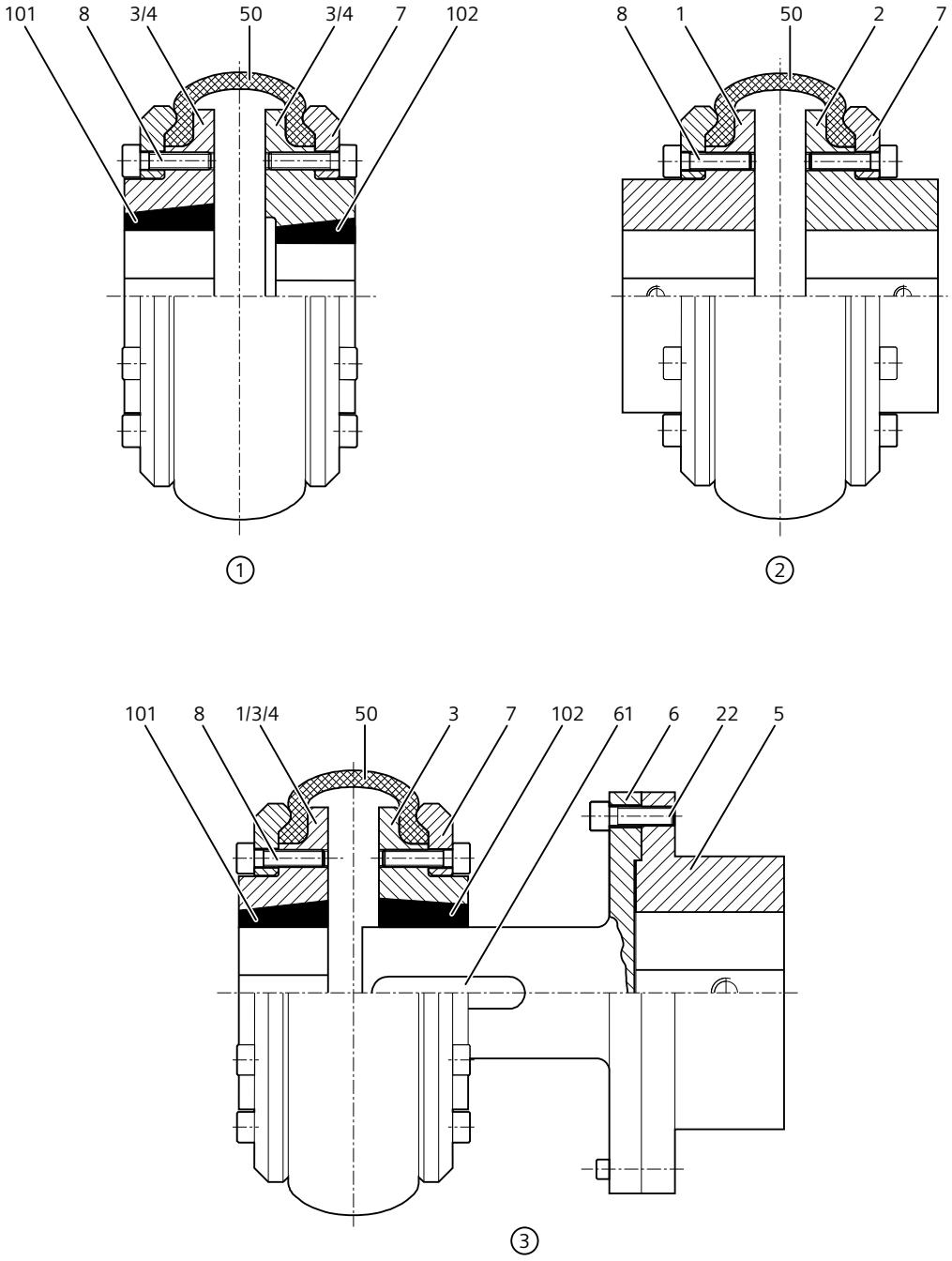

Figure 3-1: Types EBWT, EBWN and EBWZ

①	Type EBWT
②	Type EBWN
③	Type EBWZ
1	Coupling part 1
2	Coupling part 2
3	Coupling part 3
3/4	Coupling part 3 or 4
1/3/4	Coupling part 1 or 3 or 4
5	Coupling part 5
6	Flanged shaft
7	Clamping ring
8	Screws
22	Screws
50	Tyre
61	Parallel key
101	TAPER clamping bush
102	TAPER clamping bush

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.

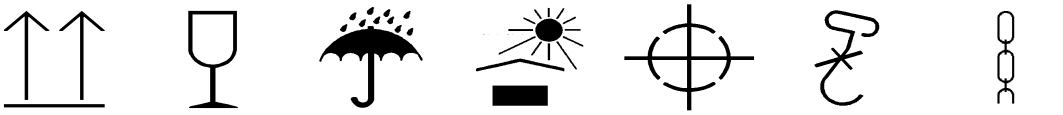

Figure 4-1: Transport symbols

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 specifications on storing the coupling.

The coupling, unless not specifically ordered otherwise, is supplied with preservation and can be stored for up to 3 months.

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.

- Please observe the specifications on 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.

Preservative agent	Features	Indoor storage	Outdoor storage
Oil spray	Corrosion protection	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

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

Assembling 5

Assembly of the coupling comprises the following steps:

- Preparatory work (Page 25)
- Assembling the coupling (Page 32)
- Aligning the coupling (Page 36)

⚠ WARNING

Danger of injury 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.

- Please observe all the stipulations concerning assembly.

Notes regarding assembly of the coupling

- Only use undamaged components when assembling 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

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 finished bore (Page 25)
- Mill the parallel keyway (Page 27)
- Machining an axial locking mechanism (Page 27)
- Balancing the coupling (Page 30)

Information

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 finished bore

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.

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

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

Bore hole diameter

⚠ WARNING

Danger if the coupling fractures

If you exceed the maximum diameter of the finished bore, then this can cause the coupling to fracture in operation. There is a risk of fatal injury from flying fragments.

- Adhere to the maximum diameters specified.

The maximum diameters are listed in Section Geometry data and weights (Page 63).

Procedure

1. Remove the clamping ring (7) and the bolts (8).
2. Remove the preservation and clean the coupling parts 1 (1), 2 (2) or 5 (5) 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.

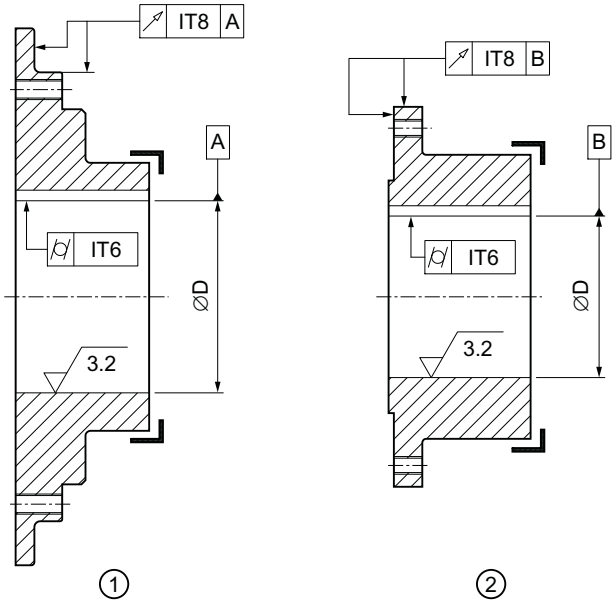

Figure 5-1: Tolerances for finished bore

① Coupling part 1 or 2
② Coupling part 5

5.1.2 Mill the parallel keyway

Position of the parallel keyway

Arrange the parallel keyway in the centre between the tapped holes or 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 following diagram shows the axial position of the tapped hole.

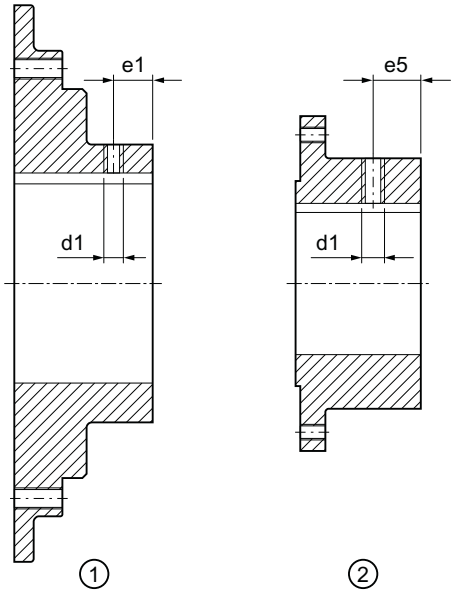

Figure 5-2: Diameter and axial position of the tapped hole in the hub

① Coupling part 1 or 2
② Coupling part 5

The following tables contain the values for the diameter and axial position of the tapped holes, tightening torques and widths across flats.

Finished bore		Tapped hole	Tightening torque	Width across flats
over mm	up to mm	d_1	T_A Nm	Hexagonal socket mm
-	22	M5	3	2.5
22	30	M6	4	3
30	38	M8	8	4
38	44	M10	15	5
44	58	M12	25	6
58	75	M16	70	8
75	110	M20	130	10
110	160	M24	230	12

Table 5-2: Tapped hole, tightening torque and width across flats for coupling parts 1 (1) and 2 (2)

Apply the specified tightening torques as listed in section Tightening procedure (Page 71).

Size	e1 mm
105	16
135	10
165	12
190	20
210	25
235	20
255	25
280	30
315	35
360	30
400	45
470	60
510	60
560	50
630	65

Table 5-3: Axial position of the tapped hole for the coupling parts 1 (1) and 2 (2)

Size	e5 mm	Tapped hole d1	Tightening torque T_A Nm	Width across flats Hexagonal socket mm
105	20	M6	4	3
135	25	M8	8	4
165				
190	40	M12	25	6
210				
235				
255	50	M12	25	6
280				
315	55	M16	70	8
360				
400	60	M16	70	8
470	65	M16	70	8

Table 5-4: Tapped hole, axial position of the tapped hole, tightening torque and width across flats for the coupling part 5 (5)

Apply the specified tightening torques as listed in section Tightening procedure (Page 71).

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), 2 (2), 3 (3), 4 (4) or 5 (5)

If you completely drill through the flange on coupling part 1 (1), 2 (2), 3 (3), 4 (4) or 5 (5), then coupling part 1 (1), 2 (2), 3 (3), 4 (4) or 5 (5) is no longer allowed to be used for operation.

- Please observe the stipulations about machining the balancing bore.

Please note the following when balancing the coupling:

- Select the balancing quality according to the application (but at least G16 in accordance with DIN ISO21940).
- Observe the balancing specification according to DIN ISO21940-32.
- Machine the balancing bore on a large radius with adequate clearance to the holes and the outer contour. The balancing bore must not be machined in the region of the tyre clamping.

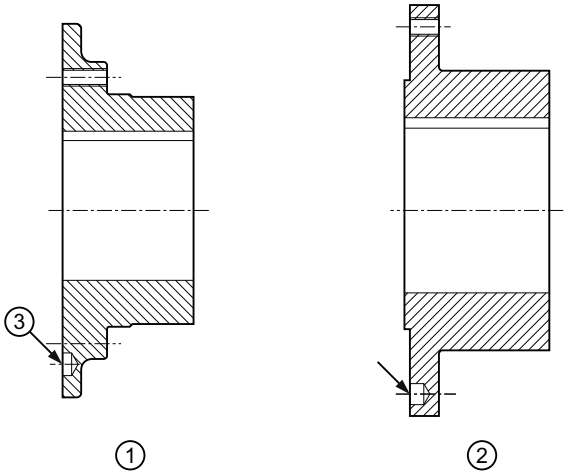

Figure 5-3: Position of the balancing bore for single-plane balancing

① Part 1, part 2, part 3, part 4
② Part 5
③ Balancing bore

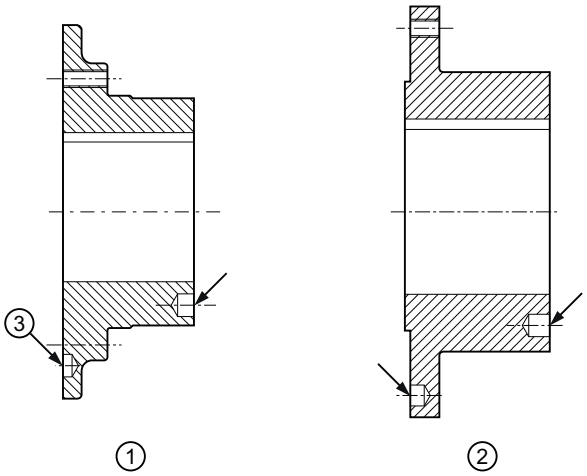

Figure 5-4: Position of the balancing bore for two-plane balancing

① Part 1, part 2, part 3, part 4
② Part 5
③ Balancing bore

Information

A better balancing result can be achieved by balancing the coupling parts when they are screwed together as an assembly. When balancing all parts together, mark the position of the components relative to one another.

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, the TAPER clamping bush and/or the parallel key.

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

The assembly procedure depends on which coupling part you wish to assemble.

- Mounting coupling parts 1 (1), 2 (2) or 5 (5) with shaft and hub connected by a parallel key (Page 32)
- Mounting coupling parts 1 (1), 2 (2) or 5 (5) with shaft and hub connected by a pressurised oil interference fit (Page 33)
- Mounting coupling parts 3 (3) or 4 (4) with shaft and hub connected with a TAPER clamping bush by a parallel key (Page 34)
- Mounting a flanged shaft (6) (Page 34)
- Mounting a tyre (50) (Page 35)

5.2.1 Mounting coupling parts 1 (1), 2 (2) or 5 (5) with shaft and hub connected by a parallel key

Procedure

1. Unscrew the set screw out of coupling parts 1 (1), 2 (2) or 5 (5) 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), 2 (2) or 5 (5) and the shafts with MoS_2 assembly paste (e.g. Microgleit LP 405).
4. For sizes 190 to 630, place the clamping ring (7) on the shaft before attaching the coupling part 1 (1) and/or 2 (2). Make sure that the clamping ring (7) cannot obstruct mounting of the coupling part 1 (1) and/or 2 (2).
5. Mount the coupling part 1 (1), 2 (2) or 5 (5) on the shaft.

⚠ WARNING

Danger if the coupling fractures

If you do not observe the information stipulated here when assembling coupling parts with conical bore, then this can cause the coupling to fracture in operation. There is a risk of fatal injury from flying fragments.

- Mount the coupling part 1 (1), 2 (2) or 5 (5) with conical bore and parallel keyway on the shaft in cold condition. Secure the coupling part with a suitable end plate without pulling the coupling part further onto the cone (fitting dimension = 0).

Information

Coupling parts with cylindrical bore

To make assembly easier, you can heat coupling part 1 (1), 2 (2) or 5 (5) with cylindrical bore up to a maximum of 120 °C if required. Protect adjacent components against damage and heating to temperatures above 80 °C.

6. If you have heated coupling parts 1 (1), 2 (2) and/or 5 (5), wait until the coupling parts have cooled to a temperature ≤ 30 °C before continuing with assembly.
7. Secure the coupling part 1 (1), 2 (2) or 5 (5) 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.
8. 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 refer to Machining an axial locking mechanism (Page 27)).

5.2.2 Mounting coupling parts 1 (1), 2 (2) or 5 (5) with shaft and hub connected by a pressurised oil interference fit

Procedure

1. Remove the screw plugs (101) and/or (201) from the coupling parts 1 (1), 2 (2) and/or 5 (5).
2. Clean, degrease, de-oil and dry the bores and shaft ends.
3. Clean and dry the oil channels and the oil circulation grooves.
4. Protect adjacent components against damage and heating to temperatures above 80 °C.
5. For sizes 190 to 630, place the clamping ring (7) on the shaft before mounting the coupling part 1 (1) and/or 2 (2). Make sure that the clamping ring (7) cannot obstruct mounting of the coupling part 1 (1) and/or 2 (2).
6. Heat up the coupling parts 1 (1), 2 (2) and/or 5 (5) 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), 2 (2) and/or 5 (5) 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), 2 (2) and/or 5 (5) against corrosion, fill them with a suitable pressurised oil and seal the oil channels with the screw plugs (101) and/or (201).

5.2.3 Mounting coupling parts 3 (3) or 4 (4) with shaft and hub connected with a TAPER clamping bush by a parallel key

Procedure

1. Clean the bores, the shaft ends and the TAPER clamping bushes (101), (102).
   The large front face of the TAPER clamping bush (101), (102) has two axis-parallel half blind holes up to size 3030 and three in the case of size 3535 and larger. The coupling part 3 (3) or 4 (4) has half threaded holes in the same angular position.
2. Insert the TAPER clamping bush (101) or (102) in the coupling part 3 (3) or 4 (4).
3. Line up the half blind holes of the TAPER clamping bush (101) or (102) with the half threaded holes of the coupling part 3 (3) or 4 (4).
4. Apply a small quantity of liquid screw locking agent (e.g. Loctite 243 medium strength) to the screws of the TAPER clamping bush.
5. Insert the screws for the TAPER clamping bush (101), (102) into the blind hole/threaded hole combination and tighten them slightly.
   Install the TAPER clamping bush (101), (102) from the shaft end face end in the case of coupling part 3 (3), and from the shaft shoulder end in the case of coupling part 4 (4).
6. For sizes 190 to 560, place the clamping ring (7) on the shaft before attaching the coupling part 3 (3) and/or 4 (4). Make sure that the clamping ring (7) cannot obstruct mounting of the coupling part 3 (3) and/or 4 (4).
7. Position the coupling part 3 (3) or 4 (4) together with the TAPER clamping bush (101) or (102) on the shaft. The shaft must not be set back from the inner side of the hub.
8. Gradually tighten the screws for the TAPER clamping bush (101), (102) in sequence up to the specified tightening torque T_A (see Table A-29 Tightening torques and widths A/F for screws for the TAPER clamping buses (101) or (102) (Page 71)).
   As the screws are tightened, the hub is drawn against the TAPER clamping bush (101), (102) and the bush thus pressed onto the shaft.
9. Fill any unused bores of the TAPER clamping bush (101) or (102) with a suitable grease to prevent the ingress of dirt.

5.2.4 Mounting a flanged shaft (6)

Procedure

1. Clean the contact surfaces of the flange shaft (6), parallel key (61) and coupling part 5 (5).
2. Insert the parallel key (61) into the groove of the flange shaft (6).

3. Fasten the flange shaft (6) with the bolts (22) on coupling part 5 (5) and tighten the bolts (22) with the specified tightening torque T_A (see Table A-28 Tightening torques and widths A/F for part 8 and part 22 (Page 70)).
4. For sizes 190 to 470, place the clamping ring (7) on the shaft before attaching the coupling part 3 (3). Make sure that the clamping ring (7) cannot obstruct mounting of the coupling part 3 (3).
5. Mount coupling part 3 (3) according to the instructions in chapter Mounting coupling parts 3 (3) or 4 (4) with shaft and hub connected with a TAPER clamping bush by a parallel key (Page 34).

5.2.5 Mounting a tyre (50)

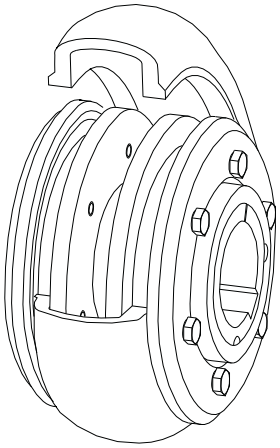

Figure 5-5: Mount elastic tyre (50)

Procedure

1. Align the coupling in accordance with Section Aligning the coupling (Page 36).
2. Clean the fixing points for the elastic tyre (50).
3. Fasten clamping ring (7) with the bolts (8) on coupling part 1 (1), 2 (2), 3 (3) or 4 (4). Tighten the bolts just so far that the clamping ring (7) cannot come loose.
4. The elastic tyre (50) has one slit on its circumference for installation purposes. Open the elastic tyre (50) at the slitted side and fit it using the fixing points according to the image above until the interfaces touch or are a short distance away from each other.
   The slitted part of the elastic tyre (50) is still visible after it is put on.
5. Tighten the screws (8) one by one as far as possible by hand.
6. Gradually tighten the bolts (8) in sequence one revolution at a time up to the specified tightening torque T_A (see Table A-28 Tightening torques and widths A/F for Part 8 and Part 22 (Page 70)).

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 69).

5.3.2 Possible misalignment

The following types of misalignment can occur:

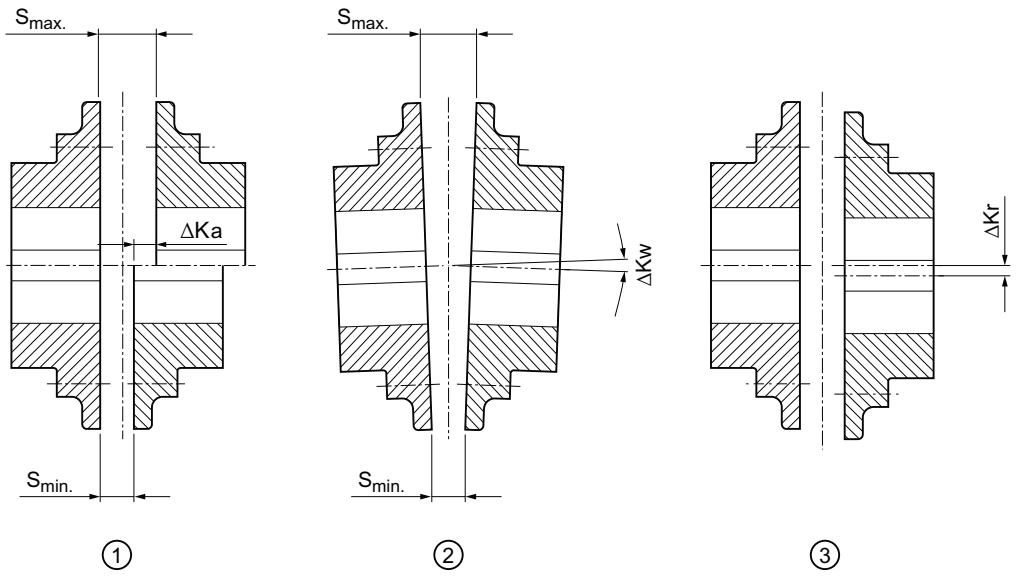

Figure 5-6: Possible misalignment

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

NOTICE

Property damage

The specified permissible values for axial, angular and/or radial misalignment may not appear simultaneously.

- If axial, angular and/or radial misalignment appear simultaneously, halve the values given in the table in section Shaft misalignment values during operation (Page 69).

5.3.2.1 Axial misalignment

For axial alignment, comply with the clearance S within the following limits:

$S_{min.} = S - \Delta Ka$

$S_{max.} = S + \Delta Ka$

The values for the dimension S are provided in Technical data of type EBWN (Page 66).

You will find the values for ΔKa_{perm} in section Shaft misalignment values during operation (Page 69).

5.3.2.2 Angular misalignment

Determine the value ΔS ($\Delta S = S_{max.} - S_{min.}$). The determined value ΔS must not exceed the value ΔS_{perm}.

You will find the values for ΔS_{perm} in section Shaft misalignment values during operation (Page 69).

5.3.2.3 Radial misalignment

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

You will find the permissible radial misalignment ΔKr_{perm} in section Shaft misalignment values during operation (Page 69).

Commissioning 6

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

Testing before commissioning

⚠ WARNING

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.

- 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 70).
2. Check the tightening torques of the foundation bolts of the coupled machines.
3. Check whether suitable enclosures (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 Fault - causes and correction

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

⚠ WARNING

Danger due to bursting of the coupling

There is a risk of fatal injury from flying fragments.

- 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 16).

7.2.2.1 Possible 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 44).
	Changed alignment	Follow the instructions given in section Correcting the changed alignment (Page 44).
	Coupling not suitable for the operating conditions. Check the possible causes given in section Unsuitable coupling (Page 43).	Use a coupling that is suitable for the operating conditions.
	Incorrect assembly of the coupling. Check the possible causes given in sections Assembly-related causes (Page 43) and Specific assembly-related and maintenance-related causes (Page 44).	Reassemble the coupling in accordance with these instructions. Please observe all the stipulations and requirements given in chapter Assembling (Page 25).
	Incorrect maintenance of the coupling. Check the possible causes given in sections Maintenance-related causes (Page 44) and Specific assembly-related and maintenance-related causes (Page 44).	Please observe all the stipulations and requirements given in chapter Maintenance (Page 47).
Presence of vibration	The dynamic properties of the tyre (50) have changed.	Replace the tyre (50).
	Coupling not suitable for the operating conditions. Check the possible causes given in section Unsuitable coupling (Page 43).	Use a coupling that is suitable for the operating conditions.

Fault	Cause	Rectification
Presence of vibration	Incorrect assembly of the coupling. Check the possible causes given in sections Assembly-related causes (Page 43) and Specific assembly-related and maintenance-related causes (Page 44).	Reassemble the coupling in accordance with these instructions. Please observe all the stipulations and requirements given in chapter Assembling (Page 25).
	Incorrect maintenance of the coupling. Check the possible causes given in sections Maintenance-related causes (Page 44) and Specific assembly-related and maintenance-related causes (Page 44).	Please observe all the stipulations and requirements given in chapter Maintenance (Page 47).

Table 7-1: Table of faults

7.2.2.2 Possible causes

7.2.2.2.1 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.

7.2.2.2.2 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.
- Screws inserted dry or greased.

- Flange surfaces of screw 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.

7.2.2.2.3 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.

7.2.2.2.4 Specific assembly-related and maintenance-related causes

- ELPEX-B tyre (50) not correctly mounted.
- After the coupling parts were heated, the tyre (50) was mounted although the temperature was impermissibly high.

7.2.3 Resolving faults

7.2.3.1 Replacing wearing parts

Tyres (50) are subject to wear. Signs of wear are visible changes to the tyre (50).

Procedure

1. Subject the tyre (50) to a visual inspection.
   Look out for signs of wear, such as changes at the clamping point, buckling of the surface or incipient cracks. Failure of the tyre (50) can occur very soon after signs of wear.
2. Replace the tyre (50) where appropriate (see Replacing wearing parts (Page 48)).

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.

Maintenance 8

8.1 Maintenance intervals

⚠ WARNING

Danger of injury 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.

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

⚠ WARNING

Danger of injury 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.

- 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.

Maintenance includes checking the tightening torque T_A of the clamping ring bolt connection (8) (see Table A-28 Tightening torques and widths A/F for Part 8 and Part 22 (Page 70)) and visual inspection of the elastic tyre (50).

Check the elastic tyre (50) for wear at the indicated maintenance intervals. Wear leads to changes at the fixing point, surface warping or cracks. Signs of wear may soon be followed by the failure of the elastic tyre (50) and drive downtime. We recommend immediately replacing the elastic tyre (50) on signs on wear.

Model	Initial maintenance	Follow-up maintenance
EBWT	3 months after commissioning	Every 12 months
EBWN		
EBWZ		

Table 8-1: Maintenance intervals

Shorter maintenance intervals

If necessary, set shorter maintenance intervals depending on actual wear.

8.2 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.

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

If tyres are worn, replace the tyres of the coupling.

The tyre has one slit on its circumference so that it is possible to mount and remove it without moving the coupled machines apart.

Procedure

1. Carefully secure the parts and components so that they cannot fall.
2. Unscrew the screws (8) on the tyre (50) one after the other.
3. For sizes 190 to 630, place the clamping ring (7) on the hub. For sizes 105 to 165, pay attention to the clamping rings (7) that are now loose in the cavity of the tyre (50).
4. Remove the tyre (50).

When reinstalling the coupling parts please observe the information in chapters Assembling (Page 25) and Commissioning (Page 39).

8.3 Removing the coupling

Procedure

1. Secure the coupling parts to prevent them from falling.
2. Remove the screws (8) of the clamping ring screw connection one after the other.
3. For sizes 190 to 630, place the clamping ring (7) on the hub. Make sure that the clamping ring (7) cannot obstruct removal of the coupling part. Secure the clamping ring (7) so that it cannot fall.
4. Remove the tyre (50), for sizes 105 to 165 together with the clamping rings (7).
5. For types EBWT and EBWN, move the coupled machines apart.
6. On the type EBWZ, remove the screws (22) and the flanged shaft (6). You remove the coupling part 5 (5) as described in Remove coupling part 1 (1), 2 (2), 3 (3), 4 (4) or 5 (5) (Page 49).
7. Remove the coupling parts as described in Remove coupling part 1 (1), 2 (2), 3 (3), 4 (4) or 5 (5) (Page 49).

When reinstalling the coupling parts please observe the information in chapters Assembling (Page 25) and Commissioning (Page 39).

8.4 Remove coupling part 1 (1), 2 (2), 3 (3), 4 (4) or 5 (5)

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

- Removing coupling part 1 (1), 2 (2) or 5 (5) with shaft and hub connected by a parallel key (Page 49)
- Removing coupling part 1 (1), 2 (2) or 5 (5) with shaft and hub connected by a pressurised oil interference fit (Page 50)
- Removing coupling parts 3 (3) or 4 (4) with shaft and hub connected with a TAPER clamping bush by a parallel key (Page 51)

8.4.1 Removing coupling part 1 (1), 2 (2) or 5 (5) 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.

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

Procedure

1. Secure the coupling parts to prevent them from falling.
2. Remove the axial locking elements (set screw, end plate).
3. Use a suitable pulling fixture.
4. Heat up the coupling part 1 (1), 2 (2) or 5 (5) using a burner above the parallel keyway along its length to maximum 80 °C.
5. Pull off the coupling part 1 (1), 2 (2) or 5 (5). Use suitable lifting gear when doing this.
6. Check the hub bore and the shaft for damage and protect them against corrosion.
7. Replace any damaged parts.

When reinstalling the coupling parts please observe the information in chapters Assembling (Page 25) and Commissioning (Page 39).

8.4.2 Removing coupling part 1 (1), 2 (2) or 5 (5) with shaft and hub connected by a pressurised oil interference fit

⚠ WARNING

Oil pressure in excess of maximum permissible value

The coupling can burst. There is a risk of fatal injury from flying fragments.

- 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.

⚠ WARNING

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.

- 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), 2 (2) or 5 (5) and the pulling fixture in position.
- Attach an axial locking element if the pressurised oil interference fit is tapered.

NOTICE

Risk of injury and danger to the environment due to leaking oil.

- Catch any oil which escapes.
- 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 oil 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 strength 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. Use a suitable pulling fixture.
2. Secure the coupling part 1 (1), 2 (2) or 5 (5) and the pulling fixture in position to prevent them from falling.
3. Remove the screw plugs (101) or (201) from the oil channels.
4. Deaerate an oil pump and connect it to the oil channel in the centre.
5. 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.
6. Deaerate the next oil pump and connect it to the adjacent oil channel.
7. Repeat steps 5 and 6 on the remaining oil channels.
8. If so much oil escapes when pressure is applied that the pump cannot maintain the pressure, use a higher-viscosity oil.
9. Pressurise the hydraulic cylinder if oil escapes from both front faces as a closed oil ring. Make sure that the coupling part 1 (1), 2 (2) or 5 (5) is pulled immediately off the shaft in a swift, smooth movement.

NOTICE

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 at the end of the stroke.

10. Dismantle the oil pumps and the pulling fixture from the coupling part 1 (1), 2 (2) or 5 (5) .
11. Check the hub bore and the shaft for damage and protect them against corrosion.
12. Replace damaged parts.

When reinstalling the coupling parts please observe the information in chapters Assembling (Page 25) and Commissioning (Page 39).

8.4.3 Removing coupling parts 3 (3) or 4 (4) with shaft and hub connected with a TAPER clamping bush by a parallel key

Procedure

1. Secure the coupling parts to prevent them from falling.
2. Remove the screws from the TAPER clamping bush (101) or (102).

3. Insert one of the screws as a withdrawal screw into the thread of the TAPER clamping bush (101) or (102) and tighten the screw.
   Use two withdrawal screws for no. 3535 TAPER clamping bushes (101) or (102) or larger.
4. Pull off the coupling part 3 (3) or 4 (4). Use suitable lifting gear when doing this.
5. Check coupling part 3 (3) or 4 (4), the TAPER clamping bush (101) or (102) and the shaft for any damage and protect them against corrosion.
6. Replace any damaged parts.

When reinstalling the coupling parts please observe the information in chapters Assembling (Page 25) and Commissioning (Page 39).

Service and support

9

9.1 Contact

When ordering replacement parts, requesting a customer service technician or if you have any technical queries, 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/)

More information

Further information about service and support can be found on the Internet:

Service & Support (https://www.flender.com/service)

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 replacement parts at the installation site you can ensure that the coupling is ready for use at any time.

Please only ever use original replacement parts from Flender. Flender only accepts liability for original replacement parts from Flender.

You can find the available replacement parts for the coupling described here at Spare parts drawing and spare parts list (Page 58).

You can find our contact data for ordering replacement parts here Service and support (Page 53).

Information required when ordering replacement 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 58))
- Dimensions of the replacement 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 replacement 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 Type EBWT

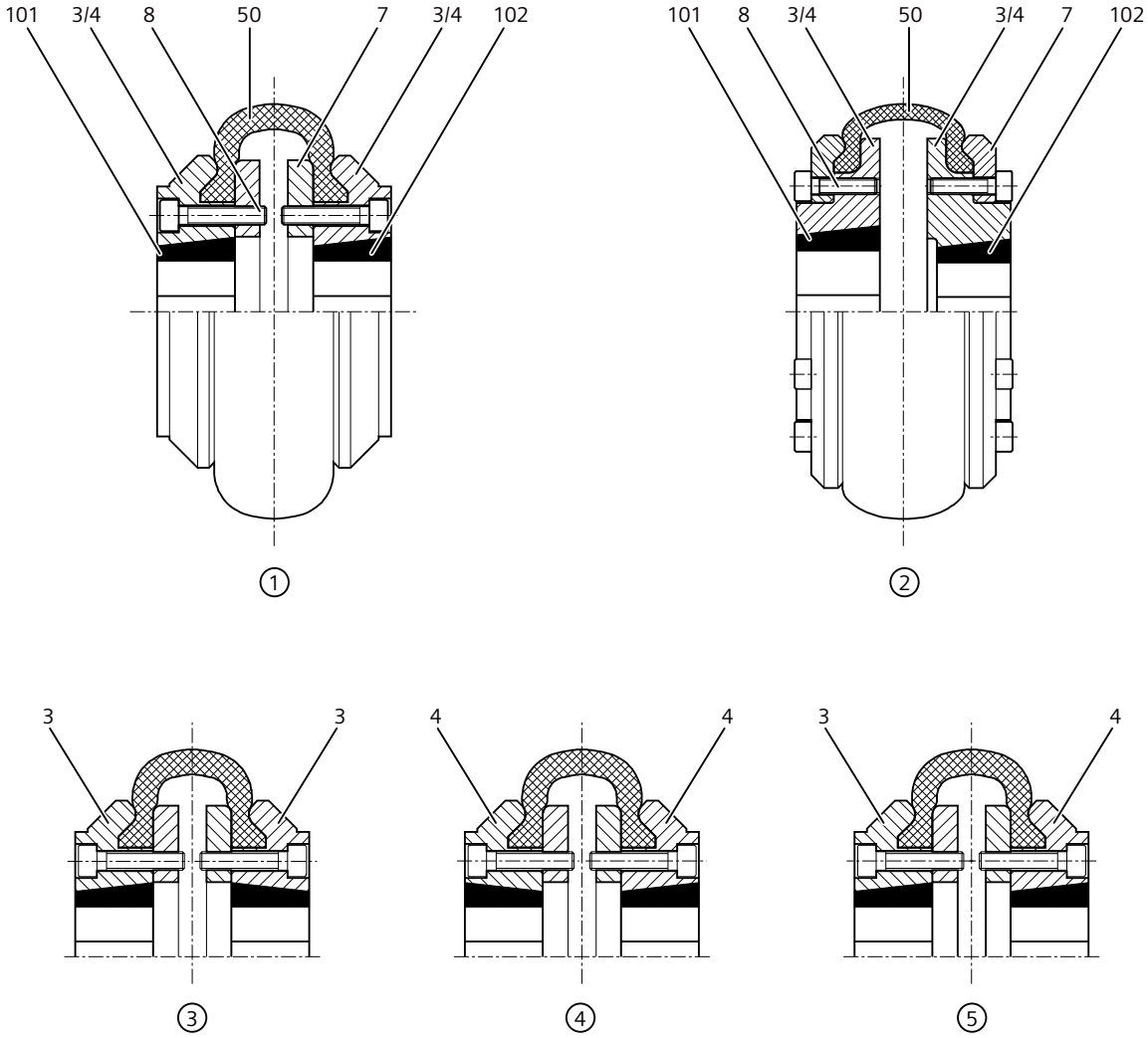

Figure 11-1: Spare parts drawing for type EBWT

① Sizes 105 to 165
② Sizes 190 to 560
③ Design A
④ Design B
⑤ Design AB

Design A		Design B		Design AB	
Part number	**Designation**	**Part number**	**Designation**	**Part number**	**Designation**
3	Coupling part 3	4	Coupling part 4	3	Coupling part 3
3	Coupling part 3	4	Coupling part 4	4	Coupling part 4

Design A		Design B		Design AB	
Part number	Designation	Part number	Designation	Part number	Designation
7	Clamping ring	7	Clamping ring	7	Clamping ring
8	Screws	8	Screws	8	Screws
50	Tyre	50	Tyre	50	Tyre
101	TAPER clamping bush	101	TAPER clamping bush	101	TAPER clamping bush
102	TAPER clamping bush	102	TAPER clamping bush	102	TAPER clamping bush

Table 11-1: Spare parts list for type EBWT

11.2.2 Type EBWN

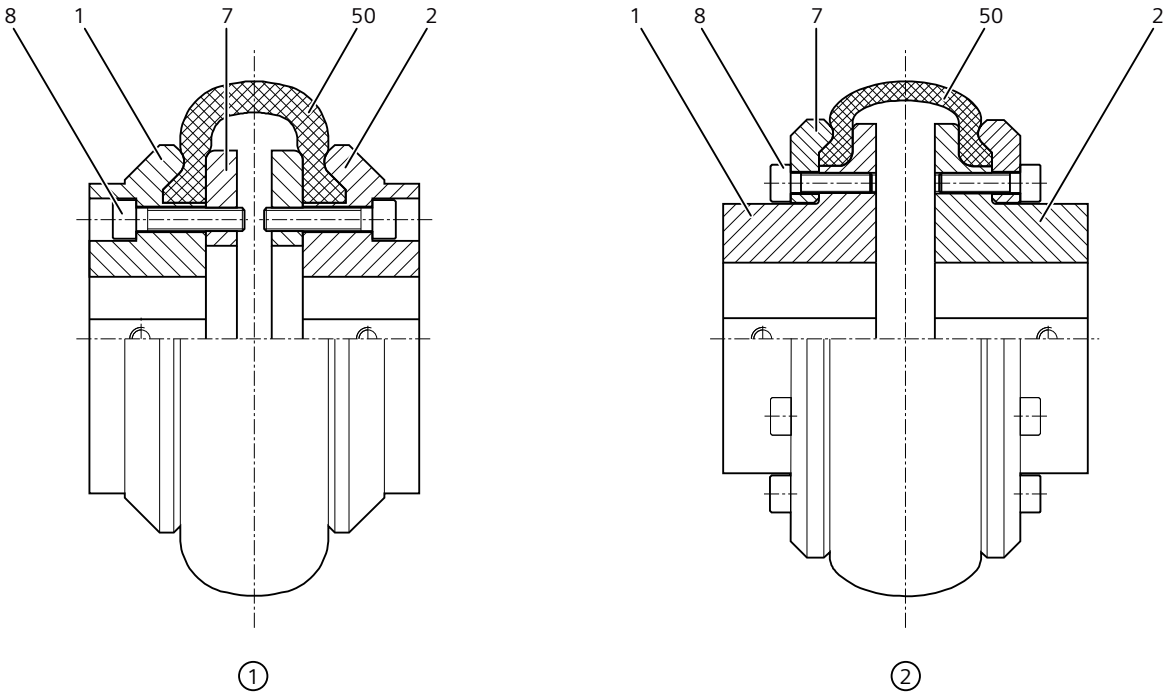

Figure 11-2: Spare parts drawing for type EBWN

① Sizes 105 to 165
② Sizes 190 to 630

Part number	Designation
1	Coupling part 1
2	Coupling part 2
7	Clamping ring
8	Screws
50	Tyre

Table 11-2: Spare parts list for type EBWN

11.2.3 Type EBWZ

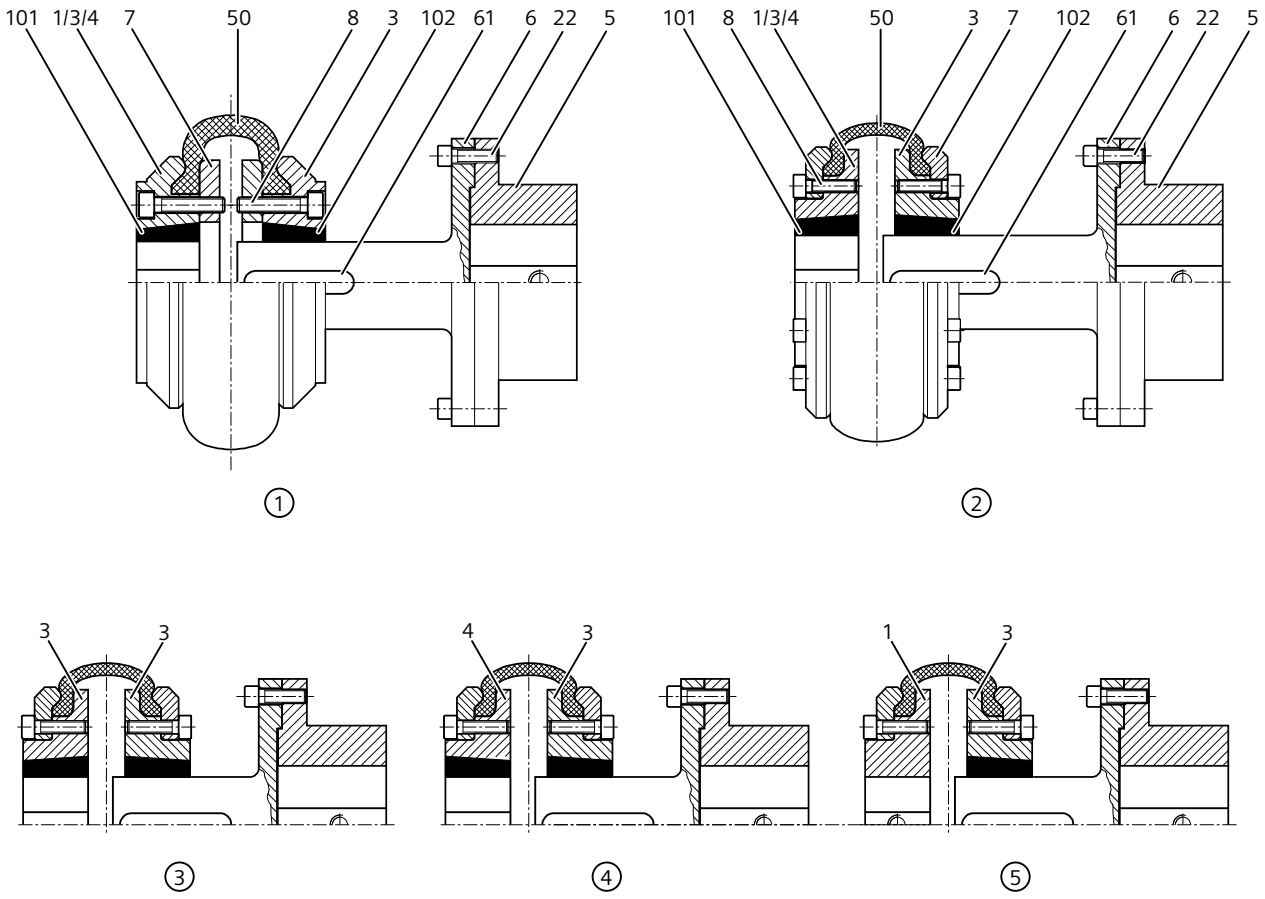

Figure 11-3: Spare parts drawing for type EBWZ

① Sizes 105 to 165
② Sizes 190 to 470
③ Design A
④ Design B
⑤ Design C

Design A		Design B		Design C	
Part number	**Designation**	**Part number**	**Designation**	**Part number**	**Designation**
3	Coupling part 3	3	Coupling part 3	1	Coupling part 1
3	Coupling part 3	4	Coupling part 4	3	Coupling part 3
5	Coupling part 5	5	Coupling part 5	5	Coupling part 5
6	Flanged shaft	6	Flanged shaft	6	Flanged shaft
7	Clamping ring	7	Clamping ring	7	Clamping ring
8	Screws	8	Screws	8	Screws
22	Screws	22	Screws	22	Screws

Design A		Design B		Design C	
Part number	**Designation**	**Part number**	**Designation**	**Part number**	**Designation**
50	Tyre	50	Tyre	50	Tyre
61	Parallel key	61	Parallel key	61	Parallel key
101	TAPER clamping bush	101	TAPER clamping bush	-	-
102	TAPER clamping bush	102	TAPER clamping bush	102	TAPER clamping bush

Table 11-3: Spare parts list for type EBWZ

Technical data

A

A.1 Geometry data and weights

In this section, you can find dimension drawings and technical data for ELPEX-B couplings of the following types:

- Type EBWT, dimension drawing (Page 63) and technical data (Page 64)
- Type EBWN, dimension drawing (Page 65) and technical data (Page 66)
- Type EBWZ, dimension drawing (Page 67) and technical data (Page 67)
- Flat groove in TAPER clamping bushes (101) or (102) (Page 68)

A.1.1 Dimension drawing of type EBWT

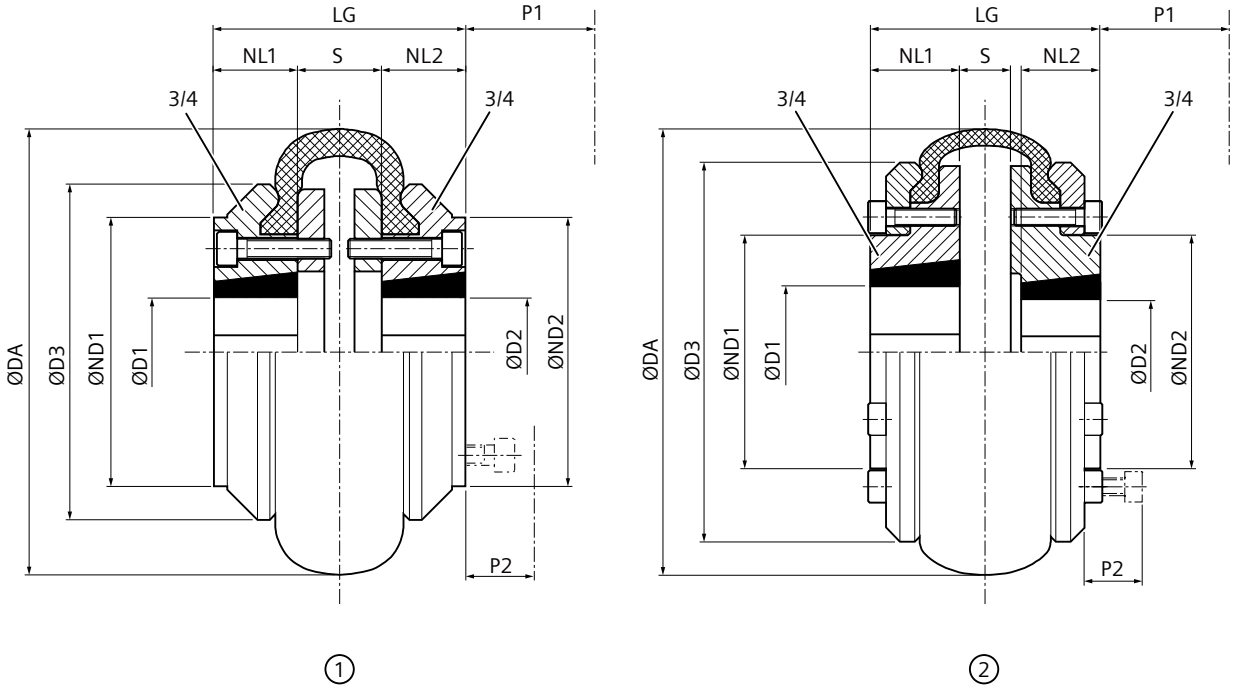

Figure A-1: Dimension drawing of type EBWT

① Sizes 105 to 165
② Sizes 190 to 560
3/4 Coupling part 3 or 4

A.1.2 Technical data of type EBWT

Size	Rated torque[1] T_{KN} Nm	Speed $n_{max.}$ rpm	Part No.	TAPER clamping bush	D1 / D2 min. mm	D1 / D2 max.[2] mm	DA mm	ND1 ND2 mm	NL1 NL2 mm	D3 mm	S mm	LG mm	P1[4] mm	P2[5] mm	Weight m[6] kg
105	24	4 500	3	1008	10	25[3]	104	–	22	82	22	66	29	35	1.8
			4												
135	66	4 500	3	1210	11	32	134	80	25	100	25	75	38	35	2.4
			4												
165	125	4 000	3	1610	14	42[3]	165	103	25	125	33	83	38	35	4
			4												
190	250	3 600	3	2012	14	50	187	80	32	145	23	87	42	35	5.4
			4	1610	14	42[3]			25				38		
210	380	3 100	3	2517	16	60	211	98	45	168	25	115	48	35	8
			4	2012	14	50			32			89	42		
235	500	3 000	3	2517	16	60	235	108	46	188	27	119	48	35	12
			4												
255	680	2 600	3	3020	25	75	254	120	51	216	27	129	55	35	14
			4	2517	16	60		113	45			117	48		
280	880	2 300	3	3020	25	75	280	134	52	233	25	129	55	35	22
			4												
315	1 350	2 050	3	3525	35	100[3]	314	140	66	264	29	161	67	35	23
			4	3020	25	75			51			131	55		
360	2 350	1 800	3	3525	35	100[3]	359	178	65	311	32	162	67	35	38
			4												
400	3 800	1 600	3	4030	40	115[3]	402	200	77	345	30	184	80	35	54
			4												
470	6 300	1 500	3	4535	55	125	470	210	89	398	46	224	89	35	98
			4												
510	9 300	1 300	3	4535	55	125	508	208	89	429	48	226	89	35	120
			4												

Size	Rated torque[1] T_{KN} Nm	Speed $n_{max.}$ rpm	Part No.	TAPER clamping bush	D1 / D2 min. mm	D1 / D2 max.[2] mm	DA mm	ND1 ND2 mm	NL1 NL2 mm	D3 mm	S mm	LG mm	P1[4] mm	P2[5] mm	Weight m[6] kg
560	11 500	1 100	3 4	5040	70	125	562	224	102	474	55	259	92	35	120

Table A-1: Torques, speeds, geometry data and weights of type EBWT

[1] Rated torques apply to TAPER clamping bushes with parallel key connection.

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

[3] Some bores have a flat groove.

[4] Space requirement for angled screwdriver and withdrawal screw for mounting and removing the TAPER clamping bush

[5] Space requirement for mounting and removing the tyre

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

For flat groove see Flat groove in TAPER clamping bushes (101) or (102) (Page 68).

A.1.3 Dimension drawing of type EBWN

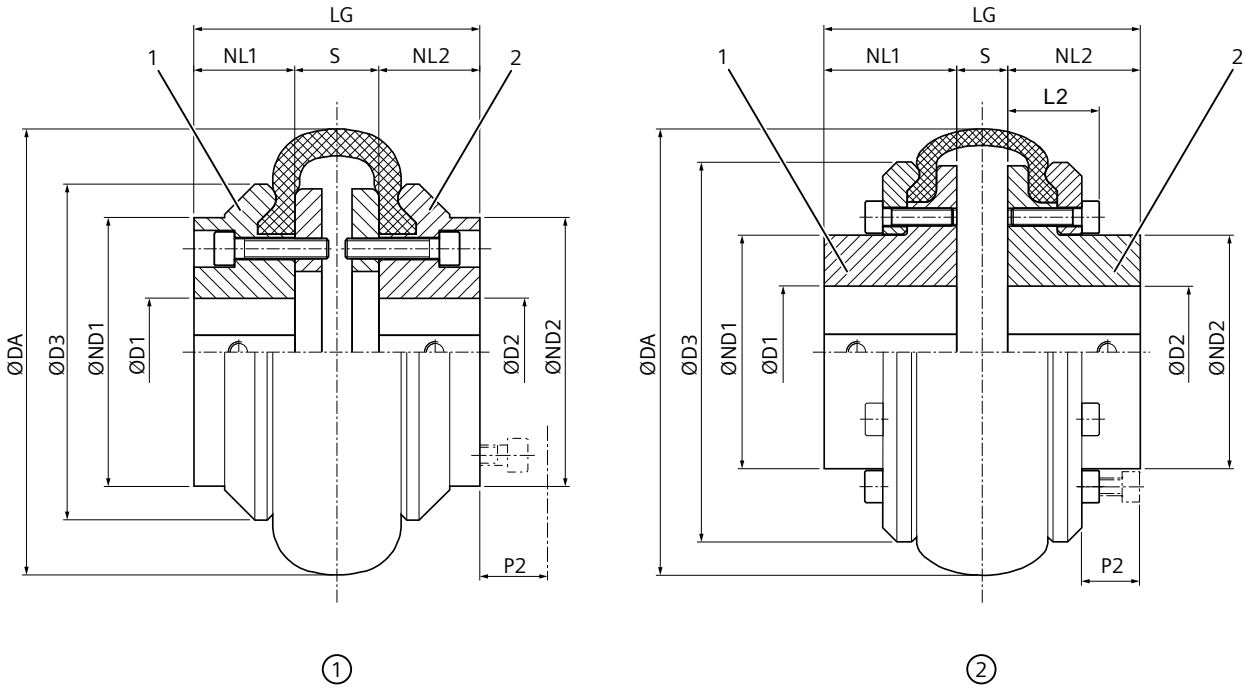

Figure A-2: Dimension drawing of type EBWN

① Sizes 105 to 165
② Sizes 190 to 560
1 Coupling part 1
2 Coupling part 2

A.1.4 Technical data of type EBWN

Size	Rated torque T_{KN}	Speed $n_{max.}$	D1 / D2		DA	ND1 / ND2	NL1 / NL2	D3	L2	S	LG	P2 [2]	Weight [3] m
			min.	max. [1]									
	Nm	rpm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg
105	24	4 500	-	30	104	70	30	82	-	22	82	35	2.2
135	66	4 500	-	38	134	80	40	100	-	25	105	35	3.6
165	125	4 000	-	45	165	70	50	125	-	33	133	35	5.4
190	250	3 600	-	50	187	80	55	145	36	23	133	35	6.9
210	380	3 100	-	60	211	98	65	168	40	25	155	35	11
235	500	3 000	-	70	235	111	70	188	45	27	167	35	14.8
255	680	2 600	-	80	254	130	75	216	44	27	177	35	20
280	880	2 300	-	90	280	145	80	233	45	25	185	35	24.5
315	1 350	2 050	-	95	314	155	90	264	50	29	209	35	35
360	2 350	1 800	-	125	359	200	100	311	50	32	232	35	54
400	3 800	1 600	-	135	402	216	125	345	59	30	280	35	78
470	6 300	1 500	-	160	470	260	140	398	67	46	326	35	120
510	9 300	1 300	-	140	508	250	150	429	73	48	348	35	146
			140	180		290							154
560	11 500	1 100	-	140	562	250	165	474	82	55	385	35	200
			140	180		300							206
630	14 500	1 000	80	140	629	250	195	532	82	59	449	35	258
			140	180		300							265

Table A-2: Torques, speeds, geometry data and weights of type EBWN

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

[2] Space requirement for mounting and removing the tyre

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

A.1.5 Dimension drawing of type EBWZ

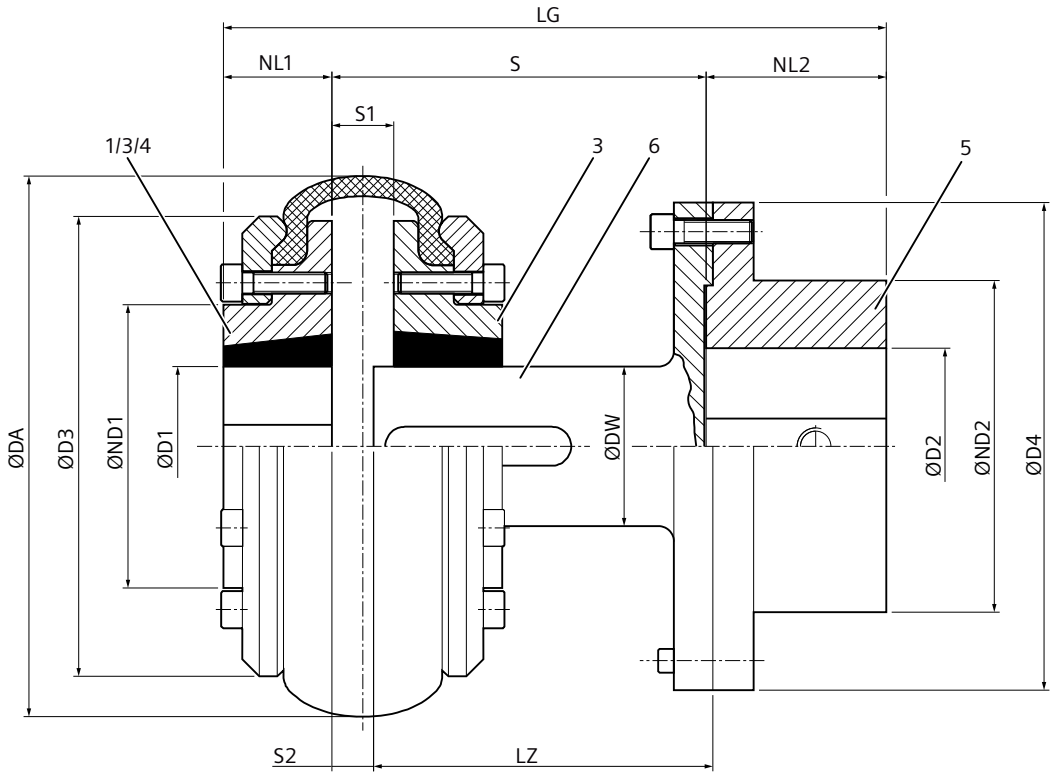

Figure A-3: Dimension drawing of type EBWZ

1/3/4 Coupling part 1 or 3 or 4
3 Coupling part 3
5 Coupling part 5
6 Flanged shaft

A.1.6 Technical data of type EBWZ

Size	Rated torque T_{KN} [1]	Speed $n_{max.}$	D2		DA	ND2	D4	DW	NL2	LZ	S		S1	S2		Weight	
			min.	max. [2]							min.	max.		min.	max.	m [4]	m [5]
	Nm	rpm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg	kg
105	24	4 500	-	42	104	70	95	25	45	96	100	116	22	6	22	4.3	4.5
										133	140	156					
135	66	4 500	-	55	134	90	125	32	50	93 [3]	100	116	25	9	25	6.7	7.3
										133	140	156					
165	125	4 000	-	55	165	90	125	32	50	93 [3]	100	124	33	9	33	8.4	9.1
										133	140	164					
190	250	3 600	-	75	187	125	180	48	80	93.5	100	114	23	9	23	19	19.5
										133.5	140	154					
										173.5	180	194					

Size	Rated torque T_{KN} [1]	Speed $n_{max.}$	D2		DA	ND2	D4	DW	NL2	LZ	S		S1	S2		Weight	
			min.	max. [2]							min.	max.		min.	max.	m [4]	m [5]
	Nm	rpm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg	kg
210	380	3 100	-	75	211	125	180	48	80	133.5	140	156	25	9	25	21.5	23
										173.5	180	196					
235	500	3 000	-	75	235	125	180	48	80	133.5	140	158	27	9	27	32	33
										173.5	180	198					
255	680	2 600	-	90	254	150	225	60	100	133.5	140	158	27	9	27	37	40
										173.5	180	198					
280	880	2 300	-	90	280	150	225	60	100	133.5	140	156	25	9	25	45	46
										173.5	180	196					
315	1 350	2 050	46	100	314	165	250	80	110	134.5	140	160	29	9	29	53	59
										174.5	180	200					
360	2 350	1 800	46	100	359	165	250	80	110	134.5	140	163	32	9	32	68	76
										174.5	180	203					
400	3 800	1 600	51	110	402	180	280	90	120	223.5	230	250	30	10	30	126	128
470	6 300	1 500	51	120	470	200	315	100	140	207.5	214	250	46	10	46	145	165

Table A-3: Torques, speeds, geometry data and weights of type EBWZ

[1] Rated torques apply to TAPER clamping bushes with parallel key connection.

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

[3] Special tool required for mounting

[4] Weight applies to one coupling in A or B version with maximum bore, including TAPER clamping bush

[5] Weight applies to one coupling in C version with maximum bore

For dimensions D1, ND1, NL1, D3 and the space requirement for mounting and removing the TAPER clamping bush and the tyre, see type EBWT, dimension drawing (Page 63) and technical data (Page 64), and type EBWN, dimension drawing (Page 65) and technical data (Page 66).

A.1.7 Flat groove in TAPER clamping bushes (101) or (102)

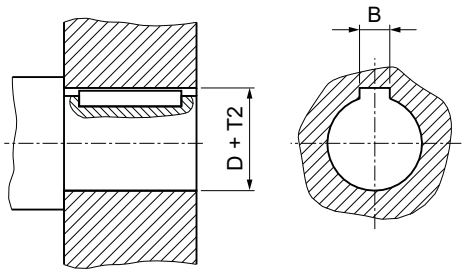

Figure A-4: Flat groove in TAPER clamping bushes

TAPER- Clamping bush No.	Bore D mm	Width B JS9 mm	Hub groove depth D + T2 mm
1008	24	8	D + 2
1008	25	8	D + 1.3
1610	42	12	D + 2.2
3525	100	28	D + 4.4
4030	115	32	D + 5.4

Table A-4: Flat groove in TAPER clamping bushes

A.2 Shaft misalignment values during operation

Size	Permissible shaft misalignment ΔK_{1500} at n = 1500 min^{-1}		
	ΔKa_{1500} mm	ΔKr_{1500} mm	ΔS_{1500} [1)] mm
105	1.3	1.1	5.7
135	1.7	1.3	7.0
165	2.0	1.6	8.7
190	2.3	1.9	10
210	2.6	2.1	12
235	3.0	2.4	13
255	3.3	2.6	15
280	3.7	2.9	16
315	4.0	3.2	18
360	4.6	3.7	22
400	5.3	4.2	24
470	6.0	4.8	28
510	6.6	5.3	30
560	7.3	5.8	33
630	8.2	6.6	37

Table A-5: Maximum permissible shaft misalignment values during operation

[1)] ΔS_{1500} corresponds to a permissible angular deviation of ΔKw_{1500} = 4°

The maximum permissible axial, radial and angular misalignment depends on the operating speed.

Use the following formulae to calculate the maximum permissible misalignment in your system:

$\Delta Ka_{perm} = \Delta Ka_{1500} \cdot FKV$

$\Delta Kr_{perm} = \Delta Kr_{1500} \cdot FKV$

$\Delta S_{perm} = \Delta S_{1500} \cdot FKV$

Halve the values for axial, angular and/or radial misalignment ΔKa_{perm}, ΔKr_{perm} and ΔS_{perm} if they appear simultaneously.

	Speed in rpm			
	500	**1 000**	**1 500**	**3 000**
Correction factor FKV	1.2	1.1	1.0	0.7

Table A-6: Correction factor

Information

Note the maximum speed for the relevant coupling size.

A.3 Tightening torques and widths A/F

A.3.1 Tightening torques and widths A/F for part 8 and part 22

Size	Tightening torque T_A and width A/F SW			
	Part 8		Part 22	
	Hexagon socket wrench		Hexagon socket wrench	
	T_A	SW	T_A	SW
	Nm	mm	Nm	mm
105	15	5	10	5
135	15	5	25	6
165	15	5	25	6
190	24	6	49	8
210	24	6	49	8
235	40	8	49	8
255	40	8	86	10
280	40	8	86	10
315	50	10	210	14
360	55	10	210	14
400	80	14	210	14
470	105	14	210	14
510	120	14	-	-
560	165	17	-	-
630	165	17	-	-

Table A-7: Tightening torques and widths A/F for part 8 and part 22

Apply the specified tightening torques as listed in section Tightening procedure (Page 71).

A.3.2 Tightening torques and widths A/F of screws for the TAPER clamping bush (101) or (102)

Size	TAPER-Clamping bush Number	Tightening torque T_A and width A/F SW			
		BSW Inch	Length Inch	T_A Nm	SW mm
105	1008	1/4	1/2	5.6	3
135	1210	3/8	5/8	20	5
165	1610	3/8	5/8	20	5
190					
190	2012	7/16	7/8	31	5
210					
210	2517	1/2	1	48	6
235					
255					
255	3020	5/8	1 1/4	90	8
280					
315					
315	3525	1/2	1 1/2	113	10
360					
400	4030	5/8	1 3/4	170	12
470	4535	3/4	2	192	14
510					
560	5040	7/8	2 1/4	271	14

Table A-8: Tightening torques and widths A/F of screws for the TAPER clamping bushes (101) or (102)

Apply the specified tightening torques as listed in section Tightening procedure (Page 71).

A.4 Tightening procedure

Adhere to tightening torques taking into account the following table:

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

Table A-9: 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.

A.5 Tyre (50)

A.5.1 Use and storage of the tyre (50)

Note the following concerning the use and storage of the tyre (50):

- 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

A.5.2 ELPEX-B tyre (50)

Material	Hardness	Comment	Marking	Ambient temperature
NR	70 Shore A	Standard	048	-50 °C to +50 °C
CR	70 Shore A	-	068 FRAS	-15 °C to +70 °C

Table A-10: ELPEX-B tyre (50)

FLENDER COUPLINGS

ELPEX-B
Assembly and operating instructions M3320-01en
Edition 09/2022

Flender GmbH
Alfred-Flender-Straße 77
46395 Bocholt
Germany

FLENDER