

# FLENDER COUPLINGS

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## ELPEX-B

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Operating instructions 3320 en  
Edition 10/2017

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EBWT, EBWN, EBWZ

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## FLENDER COUPLINGS

### ELPEX-B 3320 en

#### Operating instructions

Translation of the original operating instructions

EBWT, EBWN, EBWZ

Edition 10/2017

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## Legal notes

### Warning note concept

This manual comprises notes which must be observed for your personal safety and for preventing material damage. Notes for your personal safety are marked with a warning triangle or an "Ex" symbol (when applying Directive 2014/34/EU), those only for preventing material damage with a "STOP" sign.



#### **WARNING! Imminent explosion!**

The notes indicated by this symbol are given to prevent **explosion damage**. Disregarding these notes may result in serious injury or death.



#### **WARNING! Imminent personal injury!**

The notes indicated by this symbol are given to prevent **personal injury**. Disregarding these notes may result in serious injury or death.



#### **WARNING! Imminent damage to the product!**

The notes indicated by this symbol are given to prevent **damage to the product**. Disregarding these notes may result in material damage.



#### **NOTE!**

The notes indicated by this symbol must be treated as general **operating information**. Disregarding these notes may result in undesirable results or conditions.



#### **WARNING! Hot surfaces!**

The notes indicated by this symbol are made to prevent **risk of burns due to hot surfaces** and must always be observed. Disregarding these notes may result in light or serious injury.

Where there is more than one hazard, the warning note for whichever hazard is the most serious is always used. If in a warning note a warning triangle is used to warn of possible personal injury, a warning of material damage may be added to the same warning note.

### Qualified personnel

The product/system to which this documentation relates may be handled only by **persons qualified** for the work concerned and in accordance with the documentation relating to the work concerned, particularly the safety and warning notes contained in those documents.

Qualified personnel must be specially trained and have the experience necessary to recognise risks associated with these products and to avoid possible hazards.

### Proper use of Flender products

Observe also the following:



Flender products must be used only for the applications provided for in the catalogue and the relevant technical documentation. If products and components of other makes are used, they must be recommended or approved by Flender. The faultfree, safe operation of the products calls for proper transport, proper storage, erection, assembly, installation, start-up, operation and maintenance. The permissible ambient conditions must be adhered to. Notes in the relevant documentations must be observed.

### Trade marks

All designations to which the registered industrial property mark ® is appended are registered trademarks of Flender GmbH. Other designations used in this document may be trademarks the use of which by third parties for their own purposes may infringe holders' rights.

### Exclusion of liability

We have checked the content of the document for compliance with the hard- and software described. Nevertheless, variances may occur, and so we can offer no warranty for complete agreement. The information given in this document is regularly checked, and any necessary corrections are included in subsequent editions.

### 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.

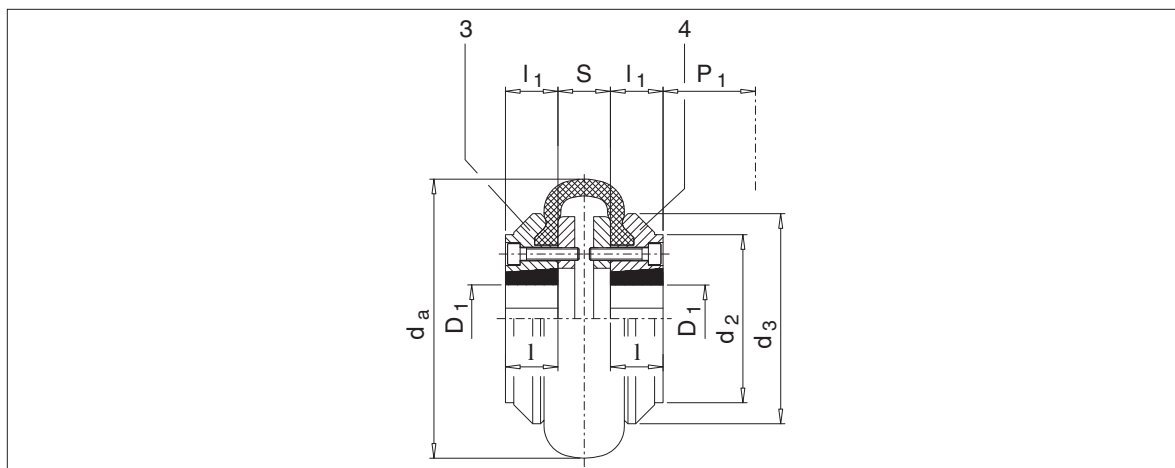
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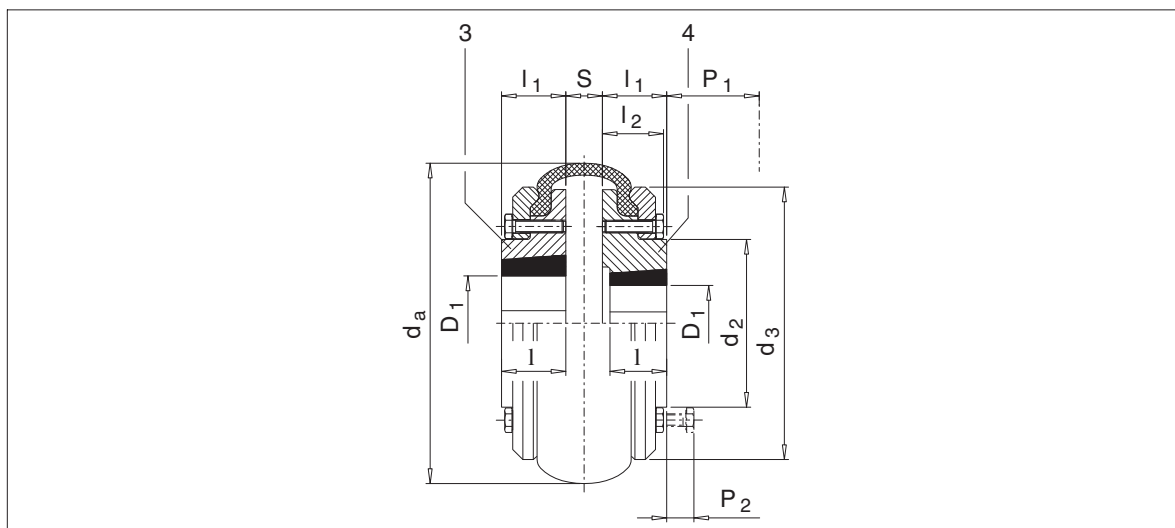
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# 1. Technical data

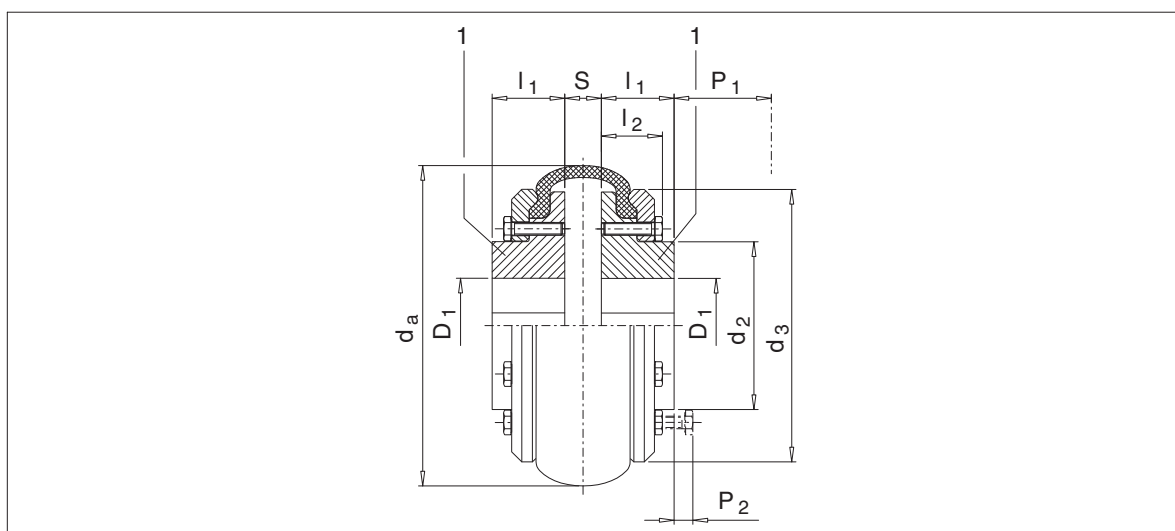
## 1.1 Geometric data of types EBWT and EBWN



**Fig. 1:** Dimensioned drawing, type EBWT, sizes 105 to 165



**Fig. 2:** Dimensioned drawing, type EBWT, sizes 190 to 560



**Fig. 3:** Dimensioned drawing, type EBWN, size 630

**Table 1:** Dimensions, weights and mass moments of inertia of Types EBWT and EBWN

| Size | Fig. | Part number<br>1) | Hole D <sub>1</sub><br>mm | Bush number  | d <sub>a</sub><br>mm | d <sub>2</sub><br>mm | d <sub>3</sub><br>mm | l<br>mm  | l <sub>1</sub><br>mm | l <sub>2</sub><br>mm | S<br>mm | P <sub>1</sub><br>2)<br>mm | P <sub>2</sub><br>3)<br>mm | Mass moment of inertia<br>4)<br>kgm <sup>2</sup> | Total weight<br>4)<br>kg |
|------|------|-------------------|---------------------------|--------------|----------------------|----------------------|----------------------|----------|----------------------|----------------------|---------|----------------------------|----------------------------|--|--------------------------|
| 105  | 1    | 3 / 4             | 10... 25                  | 1008         | 104                  | –                    | 82                   | 22       | 22                   | –                    | 22      | 29                         | –                          | 0.0009   | 1.8                      |
| 135  | 1    | 3 / 4             | 11... 32                  | 1210         | 134                  | 80                   | 100                  | 25       | 25                   | –                    | 25      | 38                         | –                          | 0.0019   | 2.4                      |
| 165  | 1    | 3 / 4             | 14... 42                  | 1610         | 165                  | 103                  | 125                  | 25       | 25                   | –                    | 33      | 38                         | –                          | 0.0049   | 4                        |
| 190  | 2    | 3<br>4            | 14... 50<br>14... 42      | 2012<br>1610 | 187                  | 80                   | 145                  | 32<br>25 | 32                   | 39                   | 23      | 42<br>38                   | 15<br>15                   | 0.0083<br>0.0085                                 | 5.4                      |
| 210  | 2    | 3<br>4            | 16... 60<br>14... 50      | 2517<br>2012 | 211                  | 98                   | 168                  | 45<br>32 | 45<br>32             | 42                   | 25      | 48<br>42                   | 6<br>19                    | 0.016<br>0.017                                   | 8                        |
| 235  | 2    | 3 / 4             | 16... 60                  | 2517         | 235                  | 108                  | 188                  | 45       | 46                   | 47                   | 27      | 48                         | 12                         | 0.019  | 8                        |
| 255  | 2    | 3<br>4            | 25... 75<br>16... 60      | 3020<br>2517 | 254                  | 120<br>113           | 216                  | 51<br>45 | 51<br>45             | 49                   | 27      | 55<br>48                   | 9<br>15                    | 0.049<br>0.050                                   | 14                       |
| 280  | 2    | 3 / 4             | 25... 75                  | 3020         | 280                  | 134                  | 233                  | 51       | 52                   | 50                   | 25      | 55                         | 8                          | 0.075  | 22                       |
| 315  | 2    | 3<br>4            | 35... 90<br>25... 75      | 3525<br>3020 | 314                  | 140                  | 264                  | 65<br>51 | 66<br>51             | 53                   | 29      | 67<br>55                   | –<br>14                    | 0.11<br>0.11                                     | 23                       |
| 360  | 2    | 3 / 4             | 35... 90                  | 3525         | 359                  | 178                  | 311                  | 65       | 65                   | 57                   | 32      | 67                         | 5                          | 0.26   | 38                       |
| 400  | 2    | 3 / 4             | 40...100                  | 4030         | 402                  | 197                  | 345                  | 77       | 77                   | 63                   | 30      | 80                         | 3                          | 0.44   | 54                       |
| 470  | 2    | 3 / 4             | 55...110                  | 4535         | 470                  | 205                  | 398                  | 89       | 89                   | 71                   | 46      | 89                         | –                          | 0.8  | 72                       |
| 510  | 2    | 3 / 4             | 55...110                  | 4535         | 508                  | 200                  | 429                  | 89       | 89                   | 79                   | 48      | 89                         | 5                          | 1.2  | 88                       |
| 560  | 2    | 3 / 4             | 70...125                  | 5040         | 562                  | 222                  | 474                  | 102      | 102                  | 91                   | 55      | 92                         | 4                          | 2.0  | 120                      |
| 630  | 3    | 1                 | 100...190                 | –            | 629                  | 265                  | 532                  | 132      | 132                  | 96                   | 59      | –                          | –                          | 3.5  | 200                      |

- 1) Part 3: Screw connection of the TAPER clamping bush from the **shaft-end face side**.  
Part 4: Screw connection of the TAPER clamping bush from the **machine-housing side**.
- 2) Space required for mounting and demounting TAPER clamping bushes or space required for replacing the elastic ring on sizes 105 to 165.
- 3) Space required for replacing the elastic rings.
- 4) Weights and mass moments of inertia apply to one coupling half.



1.2 Geometric data of type EBWZ

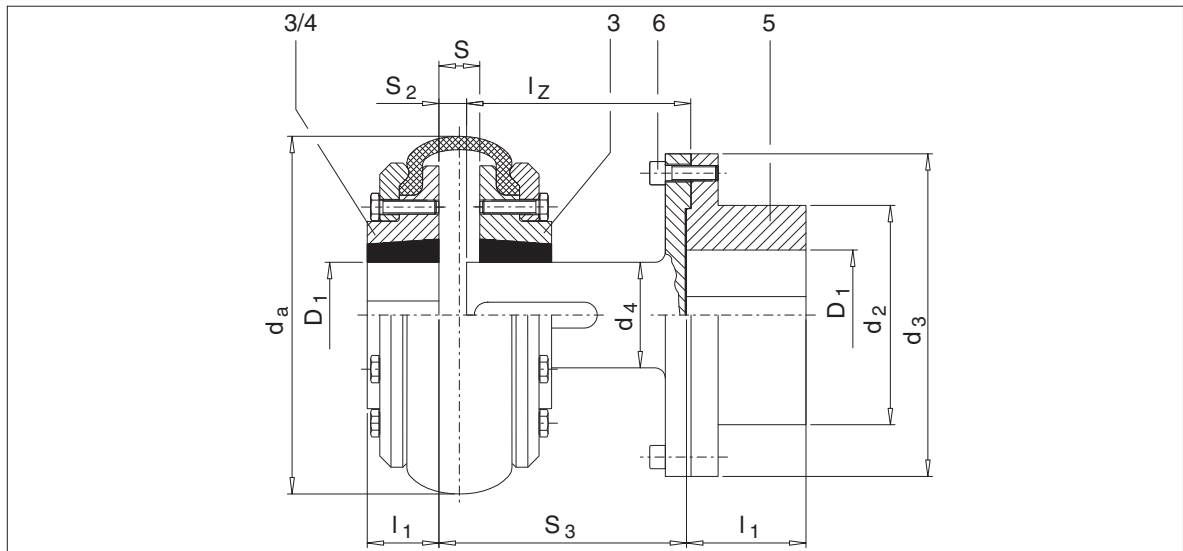


Fig. 4: Dimensioned drawing, type EBWZ, sizes 105 to 360

Table 2: Dimensions, weights and mass moments of inertia of Type EBWZ

| Size | Hole Part number  |         |          | Bush number Part number |      | Part number       |                   |                   |                   |                   |    |                   |                         |         |                   |                     | Mass moment of inertia |        | Total weight<br>1) kg |     |
|------|-------------------|---------|----------|-------------------------|------|-------------------|-------------------|-------------------|-------------------|-------------------|----|-------------------|-------------------------|---------|-------------------|---------------------|------------------------|--------|-----------------------|-----|
|      | 3                 | 4       | 5        | 3                       | 4    |                   |                   |                   | 3                 | 4                 | 5  | S                 | S <sub>2</sub>          | from    | to                | 3                   | 3+5+6                  |        |                       |     |
|      | D <sub>1</sub> mm |         |          |                         |      | d <sub>a</sub> mm | d <sub>2</sub> mm | d <sub>3</sub> mm | d <sub>4</sub> mm | I <sub>1</sub> mm |    | I <sub>z</sub> mm | mm                      | min. mm | S <sub>3</sub> mm | 1) kgm <sup>2</sup> |                        |        |                       |     |
| 105  | 10...25           | 10...25 | max..42  | 1008                    | 1008 | 104               | 70                | 95                | 25                | 22                | 22 | 45                | 96                      | 22      | 6                 | 100                 | 116                    | 0.0009 | 0.0027                | 4.2 |
| 135  | 11...32           | 11...32 | max..55  | 1210                    | 1210 | 134               | 90                | 125               | 32                | 25                | 25 | 50                | 93 <sup>2)</sup><br>133 | 25      | 9                 | 100<br>140          | 116<br>156             | 0.0019 | 0.0085                | 6.5 |
| 165  | 14...42           | 14...42 | max..55  | 1610                    | 1610 | 165               | 90                | 125               | 32                | 25                | 25 | 50                | 93 <sup>2)</sup><br>133 | 33      | 9                 | 100<br>140          | 124<br>164             | 0.0049 | 0.012                 | 8.2 |
| 190  | 14...50           | 14...42 | max..75  | 2012                    | 1610 | 187               | 125               | 180               | 48                | 32                | 32 | 80                | 133.5<br>173.5          | 23      | 9                 | 100<br>140<br>180   | 114<br>154<br>194      | 0.0083 | 0.046                 | 18  |
| 210  | 16...60           | 14...50 | max..75  | 2517                    | 2012 | 211               | 125               | 180               | 48                | 45                | 32 | 80                | 133.5<br>173.5          | 25      | 9                 | 140<br>180          | 156<br>196             | 0.016  | 0.053                 | 21  |
| 235  | 16...60           | 16...60 | max..75  | 2517                    | 2517 | 235               | 125               | 180               | 48                | 46                | 46 | 80                | 133.5<br>173.5          | 27      | 9                 | 140<br>180          | 158<br>198             | 0.019  | 0.056                 | 21  |
| 255  | 25...75           | 16...60 | max..90  | 3020                    | 2517 | 254               | 150               | 225               | 60                | 51                | 45 | 100               | 133.5<br>173.5          | 27      | 9                 | 140<br>180          | 158<br>198             | 0.049  | 0.15                  | 36  |
| 280  | 25...75           | 25...75 | max..90  | 3020                    | 3020 | 280               | 150               | 225               | 60                | 52                | 52 | 100               | 133.5<br>173.5          | 25      | 9                 | 140<br>180          | 156<br>196             | 0.075  | 0.17                  | 43  |
| 315  | 35...90           | 25...75 | 46...100 | 3525                    | 3020 | 314               | 165               | 250               | 80                | 66                | 51 | 110               | 134.5<br>174.5          | 29      | 9                 | 140<br>180          | 160<br>200             | 0.11   | 0.28                  | 52  |
| 360  | 35...90           | 35...90 | 46...100 | 3525                    | 3525 | 359               | 165               | 250               | 80                | 65                | 65 | 110               | 134.5<br>174.5          | 32      | 9                 | 140<br>180          | 163<br>203             | 0.26   | 0.43                  | 68  |

1) Weights and mass moments of inertia apply to mean bores including the TAPER clamping bush and ring portion.

2) Special tools required for assembly.

1.3 Performance data

**Table 3:** Torque values and permitted shaft misalignments

| Size       | Rated torque |                                  | Fatigue torque<br>$T_{KW}$<br>Nm | Speed<br>$n_{max}$<br>1/min. | Perm. shaft misalignment |             |  | Dynamic torsional stiffness<br>$C_{t\ dyn.}$<br>Nm / rad |
|------------|--------------|----------------------------------|----------------------------------|------------------------------|--------------------------|-------------|--|--|
|            | $T_{KN}$     | max.imum torque<br>$T_{K\ max.}$ |                                  |                              | $\Delta Ka$              | $\Delta Kr$ | $\Delta Kw = 4^\circ$<br>$S_{max.} - S_{min.}$ |  |
|            | Nm           | Nm                               |                                  |                              | mm                       | mm          | mm   |  |
| <b>105</b> | 24           | 64                               | 11                               | 4500                         | 1.3                      | 1.1         | 5.7  | 285  |
| <b>135</b> | 66           | 160                              | 26                               | 4500                         | 1.7                      | 1.3         | 7.0  | 745  |
| <b>165</b> | 125          | 320                              | 53                               | 4000                         | 2.0                      | 1.6         | 8.7  | 1500   |
| <b>190</b> | 250          | 490                              | 81                               | 3600                         | 2.3                      | 1.9         | 10   | 2350   |
| <b>210</b> | 380          | 760                              | 125                              | 3100                         | 2.6                      | 2.1         | 12   | 3600   |
| <b>235</b> | 500          | 1100                             | 185                              | 3000                         | 3.0                      | 2.4         | 13   | 5200   |
| <b>255</b> | 680          | 1500                             | 250                              | 2600                         | 3.3                      | 2.6         | 15   | 7200   |
| <b>280</b> | 880          | 2150                             | 355                              | 2300                         | 3.7                      | 2.9         | 16   | 10000  |
| <b>315</b> | 1350         | 3550                             | 590                              | 2050                         | 4.0                      | 3.2         | 18   | 17000  |
| <b>360</b> | 2350         | 5650                             | 940                              | 1800                         | 4.6                      | 3.7         | 22   | 28000  |
| <b>400</b> | 3800         | 9350                             | 1560                             | 1600                         | 5.3                      | 4.2         | 24   | 44500  |
| <b>470</b> | 6300         | 16500                            | 2750                             | 1500                         | 6.0                      | 4.8         | 28   | 78500  |
| <b>510</b> | 9300         | 23500                            | 3900                             | 1300                         | 6.6                      | 5.3         | 30   | 110000   |
| <b>560</b> | 11500        | 33000                            | 5550                             | 1100                         | 7.3                      | 5.8         | 33   | 160000   |
| <b>630</b> | 14500        | 42500                            | 7100                             | 1000                         | 8.2                      | 6.6         | 37   | 200000   |

Damping coefficient  $\psi = 0.9$

The indicated torques apply to:

- Daily operating cycle of up to 24 h
- During the starting operation or operation torque surges of up to the maximum torque are permitted up to 120 times an hour.
- Operation within the specified alignment.
- Operation in the temperature range of from - 50 °C to + 50 °C (ambient temperature or temperature in the immediate vicinity of the coupling).



**In the event of a change in operating conditions (e.g. output, speed, starting frequency, changes to the prime mover and driven machine and to the ambient temperature) the design must always be checked.**

## 2. General notes

### 2.1 Introduction

These instructions are an integral part of the delivery of the coupling and must be kept in its vicinity for reference at all times.



**All persons involved in the installation, operation, maintenance and repair of the coupling must have read and understood these operating instructions and must comply with them at all times. Flender accepts no responsibility for damage or disruption caused by disregard of these instructions.**

The "**FLENDER coupling**" described in these instructions has been developed for stationary use in general engineering applications. The coupling serves to transmit power and torque between two shafts or flanges connected by this coupling.

The coupling is designed only for the application described in section 1, "Technical data". Other operating conditions must be agreed by contract.

The coupling described in these instructions reflects the state of technical development at the time these instructions went to print.

In the interest of technical progress we reserve the right to make changes to the individual assemblies and accessories which we regard as necessary to preserve their essential characteristics and improve their efficiency and safety.

### 2.2 Copyright

The copyright to these operating instructions is held by Flender.

These instructions must not be wholly or partly reproduced for competitive purposes, used in any unauthorised way or made available to third parties without our agreement.

Technical enquiries should be addressed to the following factory or to one of our customer services:

Flender GmbH  
Schlavenhorst 100  
46395 Bocholt

Tel.: +49 (0)2871 / 92-0  
Fax: +49 (0)2871 / 92-2596

### 3. Safety instructions



**Any changes on the part of the user are not permitted. This applies equally to safety features designed to prevent accidental contact.**

#### 3.1 Obligations of the user

- The operator must ensure that all persons involved in installation, operation, maintenance and repair have read and understood these operating instructions and comply with them at all times in order to:
  - avoid injury or damage,
  - ensure the safety and reliability of the coupling,
  - avoid disruptions and environmental damage through incorrect use.
- During transport, assembly, installation, demounting, operation and maintenance of the unit, the relevant safety and environmental regulations must be complied with at all times.
- The coupling may only be operated, maintained and/or repaired by persons qualified for the work concerned (see "Qualified personnel" on page 3 of this manual).
- All work must be carried out with great care and with due regard to safety.
- All work on the coupling must be carried out only when it is at a standstill. The drive unit must be secured against being switched on accidentally (e.g. by locking the key switch or removing the fuses from the power supply). A notice should be attached to the ON switch stating clearly that work is in progress.
- The coupling must be fitted with suitable safeguards to prevent accidental contact. The operation of the coupling must not be impaired by the safeguard.
- The drive unit must be shut down as soon as changes to the coupling are detected during operation.
- When the coupling is installed in plant or equipment, the manufacturer of such plant or equipment must ensure that the contents of the present operating instructions are incorporated in his own prescription, instructions and descriptions in his operating instructions.
- All spare parts must be obtained from Flender.

## 4. Transport and storage

Observe the instructions in section 3, "Safety instructions"!

### 4.1 Scope of supply

The products supplied are listed in the dispatch papers. Check on receipt to ensure that all the products listed have actually been delivered. Parts damaged and/or missing parts must be reported to Flender in writing immediately.

### 4.2 Transport



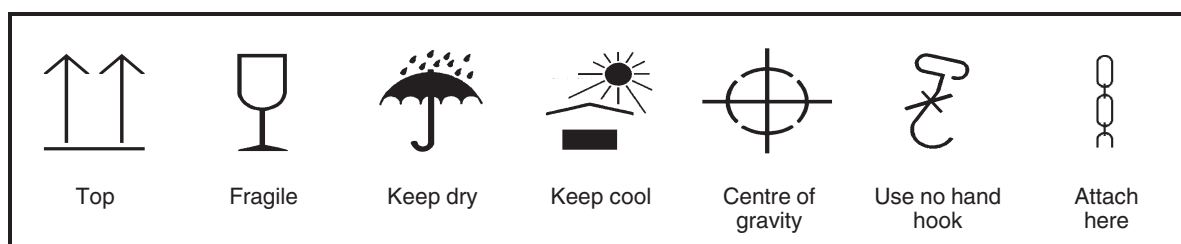
**When transporting the unit, use only lifting and handling equipment of sufficient load-bearing capacity.**



The coupling must be transported using suitable transport equipment only.

Different forms of packaging may be used depending on the size of the coupling and method of transport. Unless otherwise agreed, the packaging complies with the **HPE Packaging Guidelines**.

The symbols marked on the packing must be observed at all times. These have the following meanings:



**Fig. 5:** Transport symbols

### 4.3 Storage of the coupling

#### 4.3.1 Storage of the coupling parts

The coupling is delivered in a preserved condition and can be stored in a covered, dry place for up to 3 months. If the unit is to be stored for a longer period, it should be treated with a long-term preservative agent (Flender must be consulted).



**Before cleaning the coupling parts and applying the long-term preservative agent, the elastic ring must be covered or removed. The elastic ring must not come into contact with oil or cleaning agent.**

#### 4.3.2 Storage of the elastic rings

##### 4.3.2.1 General

Correctly stored elastic rings retain their properties unchanged for up to 5 years. Unfavourable storage conditions and improper treatment will negatively affect the physical properties of the elastic ring. Such negative effects may be caused by e.g. the action of ozone, extreme temperatures, light, moisture, or solvents.

##### 4.3.2.2 Storage area

The storage area must be dry and free from dust. The elastic rings must not be stored with chemicals, solvents, motor fuels, acids, etc. Furthermore, they should be protected against light, in particular direct sunlight and bright artificial light with a high ultraviolet content.



**The storage areas must not contain any ozone-generating equipment, such as fluorescent light sources, mercury vapour lamps, high-voltage electrical equipment. Damp storage areas are unsuitable. Ensure that no condensation occurs. The most favourable atmospheric humidity is below 65 %.**

## 5. Technical description

Observe the instructions in section 3, "Safety instructions"!

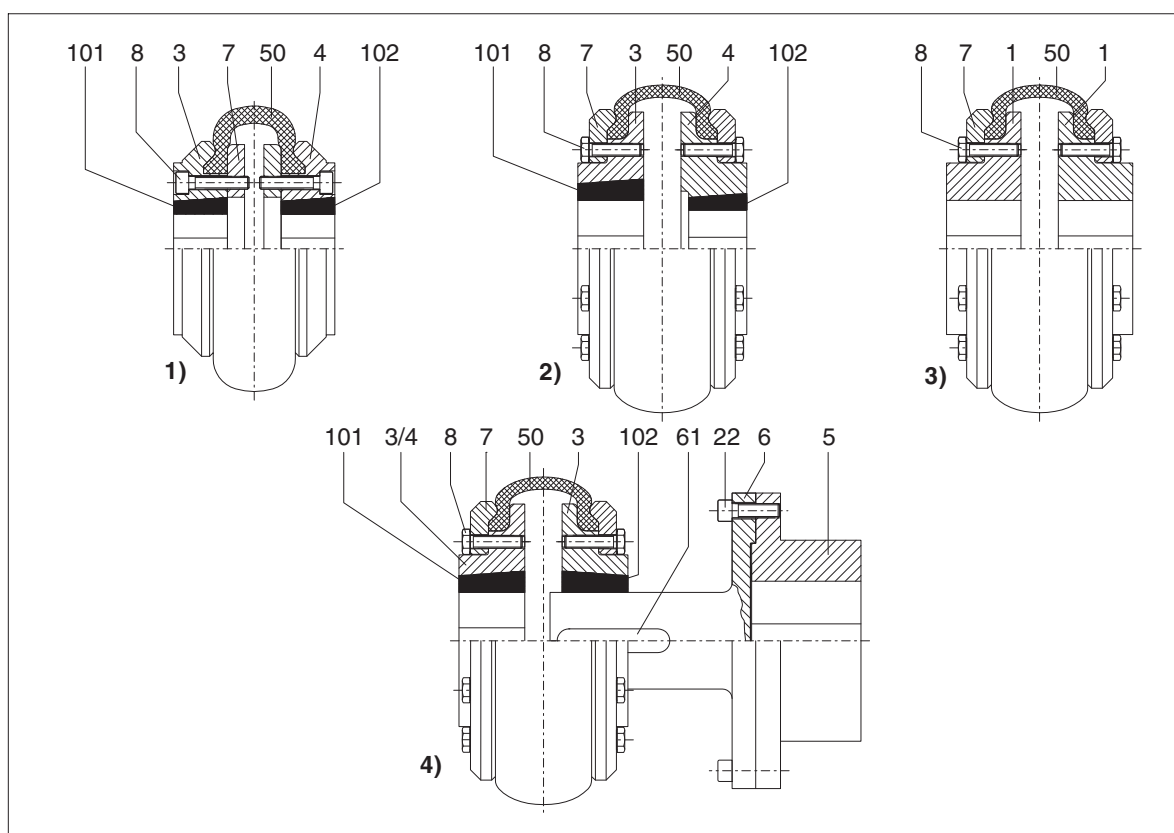
### 5.1 General description

ELPEX-B couplings are highly-flexible elastic-ring couplings. They are suitable for connecting machines and can compensate for relatively important shaft misalignment of the coupled machines. ELPEX-B couplings dampen torsional vibration, reduce impacts and insulate against structure-borne sound.

The elastic ring (50) is slit at one place on its circumference so that it can be replaced without having to shift the coupled machines. The elastic ring (50) is clamped non-positively by the clamping ring (7) and coupling part (1; 3 or 4) respectively. The coupling is free of circumferential backlash and therefore also especially suitable for reversing operation.

On type EBWT coupling part (3) and/or (4) is connected via TAPER clamping bushes (101; 102) to the shafts to be coupled. On coupling part (3) the TAPER clamping bush is bolted on from the shaft-end face side. On coupling part (4) the TAPER clamping bush is bolted on from the machine-housing face side.

Type EBWZ is designed with an adapter (6). Space can thus be created for demounting system components without shifting the coupled machines.



**Fig. 6:** Detailed view of the various types

- 1) Type EBWT, sizes 105 to 165
- 2) Type EBWT, sizes 190 to 560
- 3) Type EBWN, size 630
- 4) Type EBWZ

|   |                   |     |                     |
|---|-------------------|-----|---------------------|
| 1 | Coupling part (1) | 8   | Screws              |
| 3 | Coupling part (3) | 22  | Screws              |
| 4 | Coupling part (4) | 50  | Elastic ring        |
| 5 | Coupling part (5) | 61  | Parallel key        |
| 6 | Adapter           | 101 | TAPER clamping bush |
| 7 | Clamping ring     | 102 | TAPER clamping bush |

## 6. Fitting

Observe the instructions in section 3, "Safety instructions"!

At the customer's request Flender also delivers unbored or prebored coupling parts.

The necessary refinishing must be carried out in strict compliance with the following specifications and with particular care!



**Responsibility for carrying out the refinishing is borne by the customer. Flender will accept no guarantee claims arising from unsatisfactory refinishing.**


6.1 Instructions for machining the finished bore, parallel keyway, axial fastening, set screws and balancing

6.1.1 Finished bore

- Remove clamp ring (7) and screws.
- Depreserve and, if necessary, clean coupling parts.



**Observe manufacturer's instructions for handling solvent.**

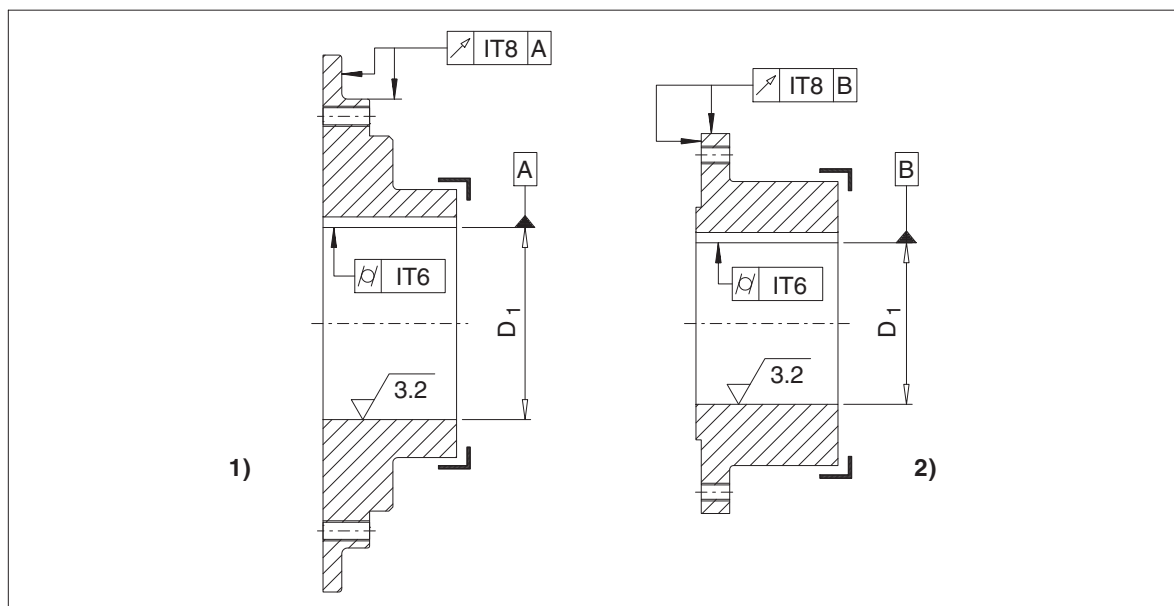
When machining the finished bore the parts must be carefully aligned. For the permissible radial and axial runout errors and the permissible cylindricity tolerances, see standard "DIN ISO 286". The parts must be fitted on the marked faces (  ).



**The maximum permissible bore diameters (see section 1) are designed for drive-type fastenings without taper action to standard "DIN 6885/1" and must not under any circumstances be exceeded. The finish-machined bores must be 100 % checked with suitable measuring equipment.**

If other shaft-hub connections (e.g. taper or stepped bore) are to be used instead of the drive-type fastenings provided for, Flender must be consulted.

Drive-type fastenings with taper action are not permissible.



**Fig. 7:** Machining the finished bore

1) Coupling part (1) of type EBWN

2) Coupling part (5) of type EBWZ

For drive by means of parallel keys the following fit pairs are prescribed for the bores:

**Table 4:** Fit pairs

| Selection of fit                    | Hole D <sub>1</sub> |       | Shaft tolerances | Bore tolerances |
|-------------------------------------|---------------------|-------|------------------|-----------------|
|                                     | over mm             | to mm |                  |                 |
| Shaft tolerance to Flender standard |                     | 25    | k6               | H7              |
|                                     | 25                  | 100   | m6               |                 |
|                                     | 100                 |       | n6               |                 |
| Shaft tolerance to DIN 748/1        |                     | 50    | k6               | H7              |
|                                     | 50                  |       | m6               |                 |
| System "standard shaft"             |                     | 50    | h6               | K7              |
|                                     | 50                  |       |                  | M7              |
|                                     |                     | all   | h8               | N7              |



**The assigned fits must be adhered to in order, on the one hand, to keep the play in the shaft-hub connection as low as possible, depending on utilisation of the tolerance zones, or, on the other, to keep the hub tension arising from the oversize within the permissible load limit. Failure to adhere to the assigned fits may impair the shaft-hub connection.**

**If the tolerance values of the shafts deviate from those in table 4, Flender must be consulted.**



**Failure to observe these instructions may result in breakage of the coupling. Danger to life from flying fragments.**

#### 6.1.2 Parallel keyway

The parallel keyways must be designed in accordance with standard "DIN 6885/1". If the keyway geometry deviates, Flender must be consulted. Taper keys or nose keys (gib headed keys) are not permissible.

The parallel keyways must be designed to suit the available parallel keys. For parallel keyways the tolerance zone of the hub keyway width **ISO JS9** must be adhered to.

**For heavier operating conditions** of the kind arising e.g. with reversing operation or operation with impulses the hub keyway tolerance zone **ISO P9** is specified.

#### 6.1.3 Axial securing

A set screw or end plate must be provided to secure the coupling parts axially. If end plates are used, Flender must be consulted with regard to machining the recesses in the coupling parts.

If the clutch part fitted on the shaft does not lie up against the shaft shoulder, we recommend using grooved spacer rings.



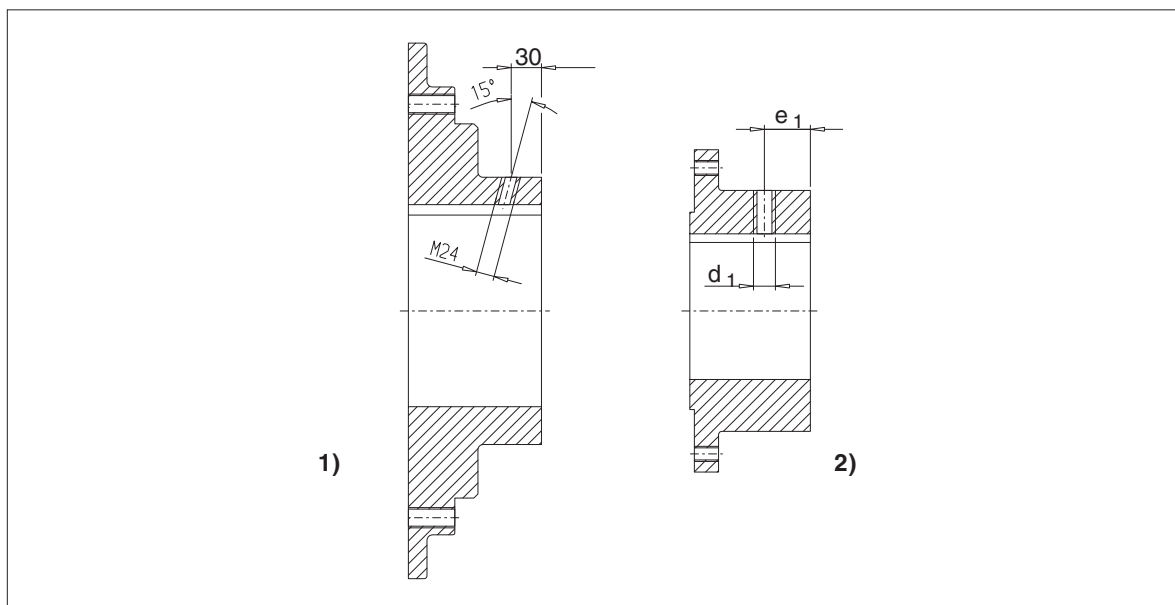
### 6.1.4 Set screws

Stud bolts with cup points to DIN 916 must be used for set screws.

The following guidelines must be observed!



**The length of the set screw must be selected so that it fills the threaded hole, but does not project from the hub ( $L_{min.} = d_1 \times 1.2$ ).**



**Fig. 8:** Arrangement of set screw

1) Coupling part (1) of type EBWN

2) Coupling part (5) of type EBWZ

**Table 5:** Set-screw assignment and tightening torques of the set screws

| Size                                    | 105 | 135 | 165 | 190 | 210 | 235 | 255 | 280 | 315 | 360 | 630 |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| $d_1$                                   | M6  | M8  | M8  | M12 | M12 | M12 | M12 | M12 | M16 | M16 | M24 |
| $e_1$                                   | 20  | 25  | 25  | 40  | 40  | 40  | 50  | 50  | 55  | 55  | 30  |
| Tightening torque of the set screw [Nm] | 4   | 8   | 8   | 25  | 25  | 25  | 25  | 25  | 70  | 70  | 230 |



**The set screws must always be positioned on the keyway.**

### 6.1.5 Balancing

Prebored couplings or prebored coupling parts are delivered unbalanced. It is recommended that these parts are balanced to suit the application after finish-boring (see standards "DIN ISO 1940" and "DIN 740/2"), but to minimum balancing quality G16.

Balancing is normally done by drilling material away.



**The balancing bores must not be made in the elastic ring clamping area.**

Finish-bored couplings or coupling parts are half-wedge-balanced according to standard "DIN ISO 8821". The balancing quality conforms to G16 at speed  $n = 1500$  1/min or maximum speed in accordance with standard "DIN ISO 1940". Different balancing settings must be expressly requested by the customer.

## 6.2 General information on fitting

During fitting, the Safety Instructions in section 3 must be observed.

Fitting work must be done with great care by trained and qualified personnel.

As early as during the planning phase it must be ensured that sufficient space is available for installation and subsequent care and maintenance work.

Adequate lifting equipment must be available before beginning the fitting work.

## 6.3 Mounting and demounting the TAPER clamping bush

### 6.3.1 Mounting the TAPER clamping bush

Before mounting begins, the shaft ends and the outer and inner taper of the TAPER clamping bush must be carefully cleaned and degreased. When cleaning the metal parts the elastic ring must not come into contact with the cleaning agent.



#### **Observe manufacturer's instructions for handling solvent.**

TAPER clamping bushes have, up to size 3030 two, and from size 3535 onwards, three axially parallel, cylindrical and smooth blind holes in the large end face, only half of which are however in the material of the bush. The other half, which is in the hub, have threads.

Insert coupling parts (3; 4) and TAPER clamping bush one inside the other, align holes and slightly tighten the bolts of the clamping bush.

Place the coupling part (3; 4) with the TAPER clamping bush on the shaft and align observing dimension "S<sub>1</sub>".

Tighten the clamping-bush screws one after the other (for tightening torques, see table 7).

During the screwing-on operation the hub is drawn onto the TAPER clamping bush and the bush thus pressed onto the shaft.

If the TAPER clamping bushes are to be used without parallel keys, the sliding torques and tightening torques (see table 6) must be observed. All TAPER clamping bushes are designed with a keyway for parallel keys with parallel sides (no wedges).

Fill the unused holes in the TAPER clamping bushes with grease to prevent the penetration of dirt.

### 6.3.2 Demounting the TAPER clamping bush

The TAPER clamping bush is released by removing the bolts. One of the bolts is then screwed into the bush thread as a forcing-off screw and tightened.

From TAPER clamping bush no. 3535 up, two forcing-off screws are provided.

The coupling part thus released can be pulled off by hand with the TAPER clamping bush without tools.

## 6.4 Alignment

### 6.4.1 General alignment

Misalignments of the coupling parts in relation to each other can be caused by inaccurate alignment during assembly, but also by actual operation of the equipment (expansion due to heat, shaft deflection, insufficiently rigid machine frames, etc.).

The couplings pick up positional errors in the shaft ends to be connected up to the data shown in table 1. During alignment radial and angular misalignment should be kept as small as possible to prolong the service life of the elastic ring.

After pulling on the coupling parts (1, 3, 4 or 5) and before fitting the elastic ring the coupled machines must be aligned.

Alignment has to be done in two axial planes arranged perpendicularly to each other. This can be done by means of a ruler (radial misalignment) and calliper gauge (angular misalignment).

### 6.4.2 Permissible shaft misalignment values



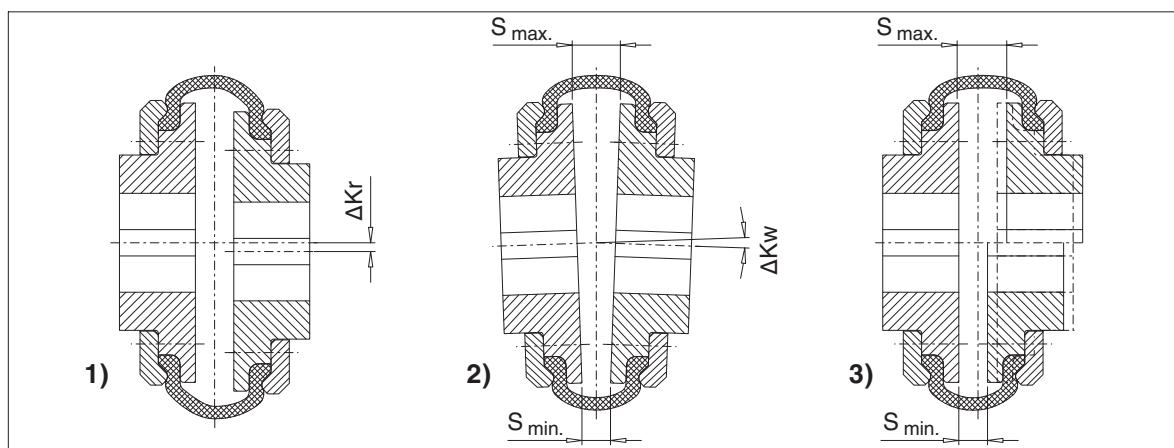
**The maximum permissible misalignment values specified in table 3 must under no circumstances be exceeded during operation.**



**The specified permissible axial, radial and angular misalignments must not occur at the same time.**

If axial, radial and angular misalignments occur at the same time, reduced permissible misalignment values must be adhered to.

With an axial misalignment of  $\Delta K_a / 2$  and radial misalignment of  $\Delta K_r / 2$  an angular misalignment of  $\Delta K_w \leq 2^\circ$  may be permitted.



**Fig. 9:** Possible misalignments

1) Radial misalignment

2) Angular misalignment

3) Axial misalignment

### 6.4.3 Radial misalignment

The maximum values can be found in table 3.

### 6.4.4 Angular misalignment

To simplify matters, the angular misalignment  $\Delta K_w$  is obtained as the difference between the dimensions " $S_{max.}$ " and " $S_{min.}$ ". The maximum values can be found in table 3.

### 6.4.5 Axial misalignment

The permitted axial misalignment  $\Delta K_a$  is shown in table 3. For the nominal gap dimension " $S$ " refer to table 1 or table 2.

The measured gap dimension must be between the values  $S_{max.}$  and  $S_{min.}$ , taking into consideration the restrictions above mentioned. Here applies the formula:

$$\begin{aligned} S_{max.} &= S + \Delta K_a \\ S_{min.} &= S - \Delta K_a \end{aligned}$$

## 6.5 Mounting and demounting the elastic ring

### 6.5.1 General

The elastic ring is slit at the circumference to enable fitting and demounting without shifting the coupled machines.

Before the elastic ring is fitted, it must be ensured that the clamping points on parts (1, 3, 4, 5 or 7) are free of any impurities.



**The elastic ring must not come into contact with cleaning agent.**

### 6.5.2 Mounting the elastic ring

The elastic ring must be pulled apart at the slit and slipped over the coupling parts (1; 3 or 4). Place the elastic ring in the clamping place between clamping ring (7) and coupling part (1; 3 or 4). After the elastic ring has been inserted, there should be a gap at the parting point on the ring.

Screw the bolts (8) in by hand as far as possible, then tighten them one after the other (not crosswise) with the wrench.



**Note tightening torques.**

**Do not further tighten the individual bolts by more than one turn.**

### 6.5.3 Demounting the elastic ring

Undo bolts (8) one after the other (not crosswise).

## 6.5.4 Bolt-tightening torques

### 6.5.4.1 TAPER clamping bush

**Table 6:** Tightening torques and sliding torques of the TAPER clamping bushes

| TAPER clamping bush No. | Bush bore         | Sliding torque <sup>1)</sup> | Tightening torque | Wrench width SW DIN 911 SW mm |
|-------------------------|-------------------|------------------------------|-------------------|-------------------------------|
|                         | D <sub>1</sub> mm | T <sub>R</sub> Nm            | T <sub>A</sub> Nm |                               |
| 1008                    | 12                | 29                           | 5.6               | 3                             |
|                         | 19                | 51                           |                   |                               |
|                         | 24                | 66                           |                   |                               |
| 1210                    | 16                | 82                           | 20                | 5                             |
|                         | 24                | 142                          |                   |                               |
|                         | 32                | 210                          |                   |                               |
| 1610                    | 19                | 98                           | 20                | 5                             |
|                         | 24                | 135                          |                   |                               |
|                         | 42                | 265                          |                   |                               |
| 2012                    | 24                | 165                          | 31                | 6                             |
|                         | 42                | 340                          |                   |                               |
|                         | 50                | 420                          |                   |                               |
| 2517                    | 24                | 220                          | 48                | 6                             |
|                         | 48                | 510                          |                   |                               |
|                         | 60                | 670                          |                   |                               |
| 3020                    | 38                | 520                          | 90                | 8                             |
|                         | 55                | 890                          |                   |                               |
|                         | 75                | 1300                         |                   |                               |
| 3525                    | 42                | 1000                         | 113               | 10                            |
|                         | 75                | 2150                         |                   |                               |
|                         | 90                | 2600                         |                   |                               |
| 4030                    | 48                | 1700                         | 170               | 12                            |
|                         | 75                | 3150                         |                   |                               |
|                         | 100               | 4400                         |                   |                               |
| 4535                    | 55                | 2500                         | 192               | 14                            |
|                         | 75                | 3900                         |                   |                               |
|                         | 110               | 6300                         |                   |                               |
| 5040                    | 75                | 3950                         | 271               | 14                            |
|                         | 100               | 5650                         |                   |                               |
|                         | 125               | 7370                         |                   |                               |

1) The specified sliding torques "T<sub>R</sub>" apply to the use of TAPER clamping bushes without parallel key, taking into consideration the specified tightening torques "T<sub>A</sub>". These sliding torques apply to the service factor  $f_1 = 1$ . Sliding torques for holes which are not specified in table 6, can be calculated by interpolation.

The precondition for achieving the specified sliding torques is always a clean, greasefree surface of the parts to be fitted one inside the other and thorough greasing of the tightening bolts.

A parallel key is necessary, if the operating torque of the coupling is greater than the sliding torque of the bush.

6.5.4.2 Screw connection (8) and screw connection (22)

**Table 7:** Tightening torques of screw connection (8) and screw connection (22)

| Size | Tightening torques $T_A$<br>and wrench width SW for |                     |                           | Tightening torques $T_A$<br>and wrench width SW for |                     |
|------|---|---------------------|---------------------------|---|---------------------|
|      | Part no. 8  |                     |                           | Part no. 22   |                     |
|      | $T_A$<br>Nm   | DIN 912<br>SW<br>mm | DIN 931 / 933<br>SW<br>mm | $T_A$<br>Nm   | DIN 912<br>SW<br>mm |
| 105  | 15  | 5                   |                           | 13  | 5                   |
| 135  | 15  | 5                   |                           | 17.5  | 6                   |
| 165  | 15  | 5                   |                           | 17.5  | 6                   |
| 190  | 24  |                     | 13                        | 44  | 8                   |
| 210  | 24  |                     | 13                        | 44  | 8                   |
| 235  | 40  |                     | 17                        | 44  | 8                   |
| 255  | 40  |                     | 17                        | 89  | 10                  |
| 280  | 40  |                     | 17                        | 89  | 10                  |
| 315  | 50  |                     | 19                        | 145   | 14                  |
| 360  | 55  |                     | 19                        | 145   | 14                  |
| 400  | 80  |                     | 24                        |   |                     |
| 470  | 105   |                     | 24                        |   |                     |
| 510  | 120   |                     | 24                        |   |                     |
| 560  | 165   |                     | 30                        |   |                     |
| 630  | 165   |                     | 30                        |   |                     |

## 7. Start-up

Observe the instructions in section 3, "Safety instructions"!

### 7.1 Procedure before start-up

Before start-up, check all the screw connections for the prescribed tightening torques and ensure that the coupling is correctly aligned (see section 6). The elastic ring must be checked to ensure correct clamping.



**Then finally fit the coupling guard to prevent unintentional contact.**

## 8. Operation

Observe the instructions in section 3, "Safety instructions"!

### 8.1 General operating data

During operation of the coupling watch for:

- Changes in running noises
- Sudden vibrations



**If any irregularities are noticed during operation, switch the drive assembly off at once. The cause of the fault must be ascertained.**

**If the cause cannot be identified and/or the unit repaired with the facilities available, you are advised to contact one of the Flender customer-service offices for specialist assistance (see section 2, "General notes").**

## 9. Faults, causes and remedy

Observe the instructions in section 3, "Safety instructions"!

### 9.1 General

The coupling must run with little noise and without vibration in all operating phases. Irregular behaviour must be treated as a fault requiring immediate remedy.



Faults and malfunctions occurring during the guarantee period and requiring repair work on the coupling must be carried out only by the Flender Customer Service.  
In case of faults and malfunctions occurring after the guarantee period and whose cause cannot be precisely identified, we advise our customers to contact our customer service.



**Flender will not be bound by the terms of the guarantee or warranty or otherwise be responsible in cases of improper use of the coupling, modifications on the coupling carried out without the agreement of Flender, or use of spare parts not supplied by Flender.**



**When remedying faults and malfunctions, the coupling must always be taken out of service.  
Secure the drive unit to prevent it from being started up unintentionally.  
A notice should be attached to the ON switch stating clearly that work is in progress.**

## 10. Maintenance and repair

Observe the instructions in section 3, "Safety instructions"!

### 10.1 General

Inspections are limited to a visual assessment of the condition of the coupling. As far as can be determined, screws should be checked for tightness and damage caused by force. In all cases inspection of the coupling should be carried out simultaneously with inspection of the whole system.

### 10.2 Replacement of wearing parts

Only original **ELPEX-B** elastic rings must be used for replacement in order to guarantee troublefree torque transmission and faultfree operation.

Small cracks or spalling may occur on the elastic ring after long periods of operation. These signs of ageing must be watched, although they do not mean that the elastic ring needs to be replaced immediately.

## 11. Spare parts, customer service

### 11.1 Spare-parts stockage

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

When ordering spare parts, always state the following:

- Part number (see section 5)
- Designation, size
- Quantity

We guarantee only the genuine spare parts supplied by us.

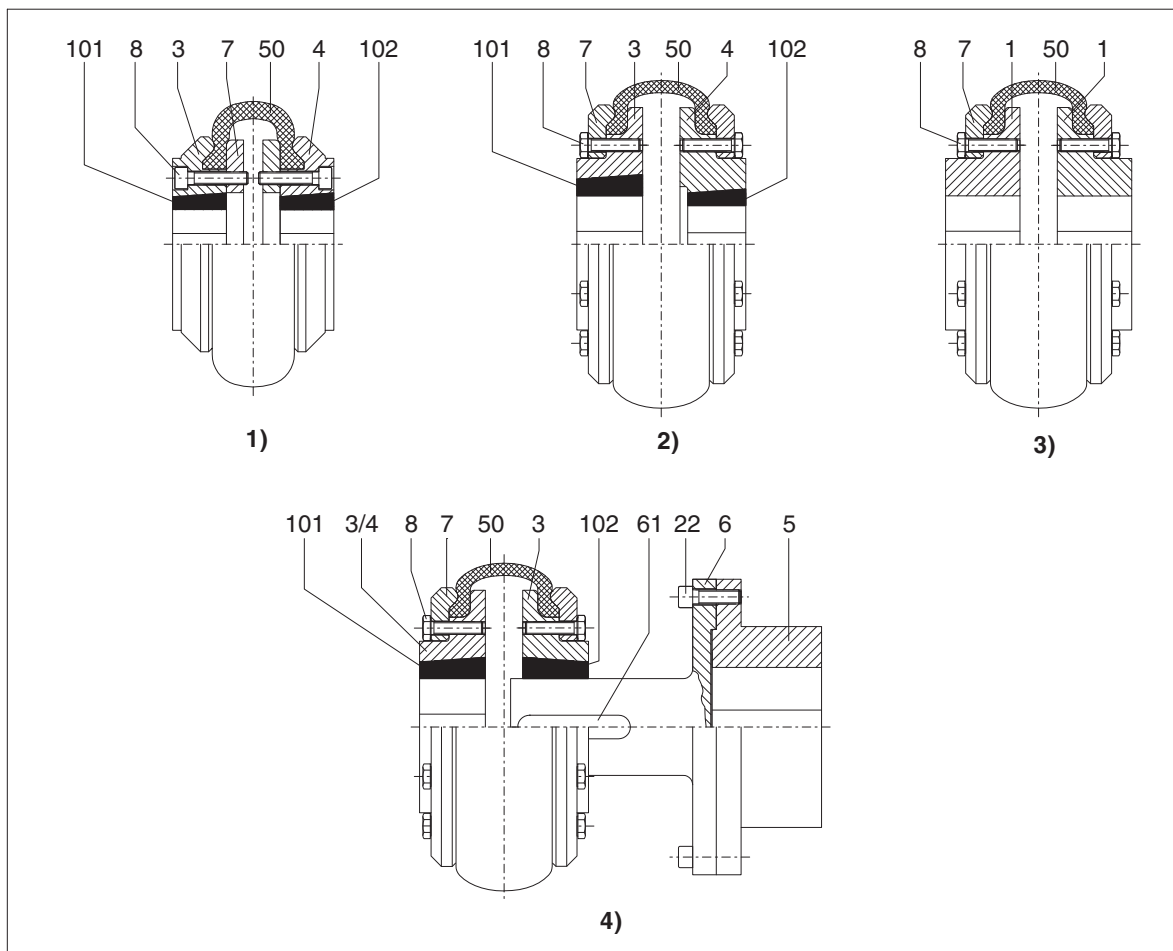


**Flender guarantee only the genuine spare parts supplied by Flender. Non-genuine spare parts have not been tested or approved by Flender. They may alter technical characteristics of the coupling, thereby posing an active and/or passive risk to safety. Flender will assume no liability or guarantee for damage caused by spare parts not supplied by Flender. The same applies to any accessories not supplied by Flender.**

Note that certain components often have special production and supply specifications and that Flender supplies you with spare parts which comply fully with the current state of technical development as well as current legislation.



## 11.2 Spare-parts drawing, spare-parts list



**Fig. 10:** Spare-parts drawing of the various types

- 1) Type EBWT, sizes 105 to 165
- 2) Type EBWT, sizes 190 to 560
- 3) Type EBWN, size 630
- 4) Type EBWZ

**Table 8:** Spare-parts list, Types EBWT, EBWN and EBWZ

| Spare parts |                 |             |                     |
|-------------|-----------------|-------------|---------------------|
| Part number | Designation     | Part number | Designation         |
| 1           | Coupling part 1 | 8           | Screws              |
| 3           | Coupling part 3 | 22          | Screws              |
| 4           | Coupling part 4 | 50          | Elastic ring        |
| 5           | Coupling part 5 | 61          | Parallel key        |
| 6           | Adapter         | 101         | TAPER clamping bush |
| 7           | Clamping ring   | 102         | TAPER clamping bush |

## 11.3 Addresses for ordering spare parts and customer service

When ordering spare parts or requesting a service specialist, please contact Flender first (see section 2, "General notes").

# FLENDER COUPLINGS

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ELPEX-B

Operating instructions 3320 en

Edition 10/2017

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