

FLENDER COUPLINGS

N-BIPEX

Assembly and operating instructions M3401-01en
Edition 09/2022

BWN, BWT, BNT



Original assembly and operating instructions

M3401-01
Edition 09/2022

Copyright (©2022 Flender GmbH)

V5
20/10/2022
09:22:51

Table of contents

1	Introduction.....	11
1.1	Legal information	11
1.2	About these instructions.....	12
1.3	Text attributes	12
1.4	Copyright.....	13
2	Safety instructions	15
2.1	General information	15
2.2	Intended use	17
2.3	Safety instructions for a coupling for use in potentially explosive atmospheres	17
2.3.1	Marking	17
2.3.2	Conditions of use	18
2.4	General warning notices	19
3	Description	21
4	Application planning	23
4.1	Transport of the coupling	23
4.2	Storage of the coupling	23
5	Assembly.....	25
5.1	Preparatory work.....	25
5.1.1	Milling the finished bore	26
5.1.2	Milling the parallel keyway	27
5.1.3	Machining an axial locking mechanism.....	27
5.1.4	Balancing the coupling.....	29
5.2	Assembling the coupling	30
5.2.1	Installing coupling part 1/2 (1 or 2).....	30
5.2.2	Assembling coupling part 3 (3) or 4 (4).....	31
5.3	Aligning the coupling	32
5.3.1	Purpose of alignment	32
5.3.2	Possible misalignment	33
5.3.2.1	Axial misalignment	33
5.3.2.2	Angular misalignment	33
5.3.2.3	Radial misalignment.....	33
6	Commissioning.....	35

7	Operation	37
7.1	Normal operation of the coupling	37
7.2	Faults - causes and rectification	37
7.2.1	Procedure in the event of malfunctions	37
7.2.2	Identifying the fault cause	37
7.2.2.1	Possible faults	38
7.2.2.2	Possible causes	39
7.2.2.2.1	Unsuitable coupling	39
7.2.2.2.2	Assembly-related causes	39
7.2.2.2.3	Maintenance-related causes	40
7.2.2.2.4	Specific installation-related and maintenance-related causes	40
7.2.3	Correcting faults	40
7.2.3.1	Replacing wearing parts	40
7.2.3.2	Correcting the changed alignment	40
8	Servicing	43
8.1	Maintenance intervals	43
8.2	Maximum permissible torsional backlash	44
8.3	Replacing wearing parts	44
8.4	Removing coupling part 1/2 (1 or 2)	45
8.5	Removing coupling part 3 (3) or 4 (4)	45
9	Service and support	47
9.1	Contact	47
10	Disposal	49
11	Spare parts	51
11.1	Ordering spare parts	51
11.2	Spare parts drawing and spare parts list	52
11.2.1	Type BWN	52
11.2.2	Type BWT	52
11.2.3	Type BNT	53
A	Technical data	55
A.1	Speeds, geometry data and weights	55
A.1.1	BWN type	55
A.1.2	BWT type	56
A.1.3	BNT type	58
A.1.4	Flat groove in TAPER clamping bushes (101), (102)	59
A.2	Shaft misalignment values during operation	59

A.3	Tightening torques and widths A/F	62
A.4	Tightening procedure	62
A.5	Cam rings.....	63
A.5.1	Use and storage of the cam rings	63
A.5.2	N-BIPEX cam ring (50)	63
B	Declaration of Conformity.....	65
B.1	EU Declaration of Conformity	65

List of tables

Table 2-1	General warnings	15
Table 2-2	Temperature classes (TX) for explosive atmospheres as a result of gases, vapours or mists	18
Table 2-3	Maximum surface temperature (TX) for an explosive atmosphere as a result of dust/air mixtures	18
Table 4-1	Types of preservative agents for long-term storage	24
Table 5-1	Recommended assigned fits for bores with parallel key connection	26
Table 5-2	Tapped hole, tightening torque and width A/F	28
Table 7-1	Table of faults	38
Table 8-1	Maintenance intervals	43
Table 8-2	Maximum permissible torsional backlash	44
Table 11-1	Spare parts list for type BWN	52
Table 11-2	Replacement parts list for BWT type	52
Table 11-3	Spare parts list for type BNT	53
Table A-1	Speed, geometry data and weights for BWN type	55
Table A-2	Speed, geometry data and weights for BWT type	57
Table A-3	Speed, geometry data and weights for BNT type	58
Table A-4	Flat groove in TAPER clamping bushes	59
Table A-5	Correction factor	60
Table A-6	Maximum permissible shaft misalignment values during operation for cam rings (50) with hardness 92 Shore A	60
Table A-7	Maximum permissible shaft misalignment values during operation for cam rings (50) with hardness 95 Shore A	61
Table A-8	Maximum permissible shaft misalignment values during operation for cam rings (50) with hardness 64 Shore A	61
Table A-9	Tightening torques and widths A/F of bolts for the TAPER clamping bushes (101 or 102)	62
Table A-10	Tightening procedure	62
Table A-11	N-BIPEX cam ring	63

List of figures

Figure 3-1	BWN type	21
Figure 3-2	BWT type	22
Figure 3-3	BNT type	22
Figure 4-1	Transport symbols.....	23
Figure 5-1	Tolerances for the finished bore in coupling part 1/2 (1 or 2).....	27
Figure 5-2	Diameter and axial position of the threaded hole in the hub	28
Figure 5-3	Position of the balancing bore for single-plane balancing	29
Figure 5-4	Position of the balancing bore for two-plane balancing.....	30
Figure 5-5	Possible misalignment.....	33
Figure 8-1	Markings for calculating the torsional backlash.....	44
Figure 11-1	Replacement parts drawing for BWN type	52
Figure 11-2	Replacement parts drawing for BWT type	52
Figure 11-3	Spare parts drawing for type BNT	53
Figure A-1	BWN type	55
Figure A-2	BWT type	56
Figure A-3	BNT type	58
Figure A-4	Flat groove in TAPER clamping bushes.....	59

Introduction

1

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 for these instructions is held by Flender.

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

If you have any technical queries, please contact our factory or one of our service outlets (refer to Service and support (Page 47)).

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

2.1 General information



ISO	ANSI	Warning
	---	Warning – hand injuries
		Explosion protection approval

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.

Explosion Protection Directive

The term “Explosion Protection Directive” used in these instructions refers to the harmonization legislation of the European Union relating to equipment and protective systems intended for use in potentially explosive atmospheres complied with in accordance with the co-applicable EU Declaration of Conformity.

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 47)).

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



Information

Declaration of conformity

A declaration of conformity required according to the respective Explosion Protection Directive can be found in chapter Declaration of Conformity (Page 65)

2.3.1 Marking

You can find a description of the coupling parts in chapter Description (Page 21).

A coupling designed in accordance with the Explosion Protection Directive has a marking on the coupling.

Damage to coupling part 1/2, coupling part 3 or coupling part 4

The following marking is visible on the outer diameter of coupling parts 1/2, coupling part 3 or coupling part 4:

Flender GmbH



D 46393 Bocholt

N-BIPEX

<Year of manufacture>



II 2G Ex h IIB T6 ... T4 Gb X



II 2D Ex h IIIC T85 °C ... 120 °C Db X



I M2 Ex h Mb X

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

2.3.2 Conditions of use

Note also the material-dependent permissible ambient temperature of the cam rings (50) in accordance with section N-BIPEX cam ring (50) (Page 63).

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

- Equipment group I
 - Category M2
- Equipment group II
 - Category 2 and 3
 - Group of substances G, zone 1 and 2
 - Group of substances D, zone 21 and 22
 - Explosion group IIA and IIB

Conditions of use for products with TX marking

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

1. Gases, vapours or mists

Check the ambient temperature for use of the coupling in the relevant temperature class.

Max. ambient temperature	Temperature class
100 °C	T4
70 °C	T5
55 °C	T6

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

2. Dust/air mixtures

Check the ambient temperature.

Max. ambient temperature	Max. surface temperature
90 °C	120 °C

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

Notes concerning operation of the coupling in potentially explosive atmospheres

- Only use the coupling underground in mines in potentially explosive atmospheres together with drive motors that can be switched off in the event of the formation of an explosive atmosphere.
- Earth machines that are connected via the coupling with a leakage resistance of less than $10^6 \Omega$.

- If you want to use a coated coupling in potentially explosive atmospheres, please note the requirements concerning the conductivity of the paint and the limitation on the paint layer thickness applied in accordance with EN 80079-36. No build-up of electrostatic charges is to be expected with a paint layer thickness of less than 200 µm.
- Only use TAPER clamping bushes with parallel key in potentially explosive atmospheres. Insert the screws for fastening the TAPER clamping bushes with liquid screw locking agent. If you are not using an original FlenderTAPER clamping bush, make sure that the TAPER clamping bush you are using fully meets the technical requirements.

2.4 General warning notices



DANGER

Danger due to bursting of the coupling

The coupling may burst if it is not used properly. There is a risk of fatal injury from flying fragments. If a coupling bursts in an area at risk of explosion, then this can result in an explosion.

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



DANGER

Risk of explosion when using coupling parts without Ex marking

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

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



DANGER

Danger

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

- Observe the information regarding conditions of use.



DANGER

Danger of explosion

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

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

2.4 General warning notices

**⚠ DANGER****Danger from hot coupling parts**

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

- Wear suitable protective equipment (gloves, safety goggles).
- Ensure that the area is not at risk of explosion.

**⚠ WARNING****Risk of chemical burns due to chemical substances**

There is a risk of chemical burns when handling aggressive cleaning agents.

- Please observe the manufacturer's information on how to handle cleaning agents and solvents.
- Wear suitable protective equipment (gloves, safety goggles).

⚠ CAUTION**Physical injury**

Risk of injury due to falling coupling parts.

- Secure the coupling parts to prevent them from falling.

Description

3

The N-BIPEX couplings described here are universally applicable, torsionally flexible claw couplings that are available in various types and sizes. They are characterised by a very compact design. The couplings can be used in accordance with the Explosion Protection Directive in potentially explosive atmospheres if they have a corresponding marking.

N-BIPEX couplings are fail-safe.

These instructions describe the assembly and operation of a N-BIPEX coupling arranged horizontally with a shaft-hub connection made by a cylindrical or conical bore with parallel key, or with TAPER clamping bush with parallel key. Please consult Flender if you want to use a different type of installation.

Application

N-BIPEX couplings are suitable for drives with a uniform torque load and low misalignment.

Structure

A N-BIPEX coupling consists of two hub parts that are connected to one another by a cam ring made of an elastomer material. The hub parts are joined to the shaft by finished bores with a parallel key or by TAPER clamping bushes with a parallel key. The three different types are differentiated by combination of these two options.

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

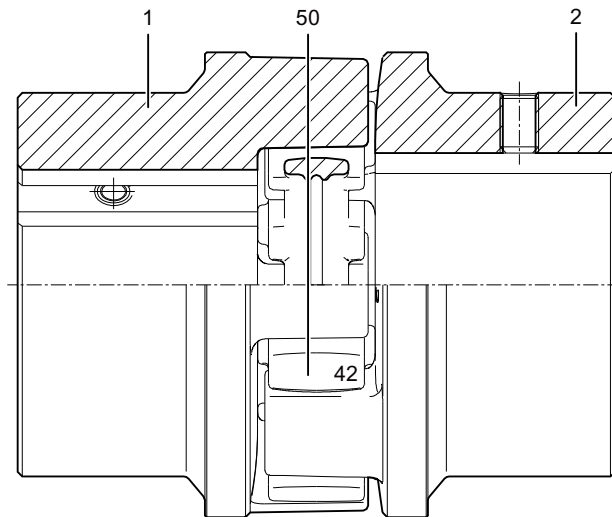


Figure 3-1: BWN type

- 1 Coupling part 1/2
- 2 Coupling part 1/2
- 50 Cam ring

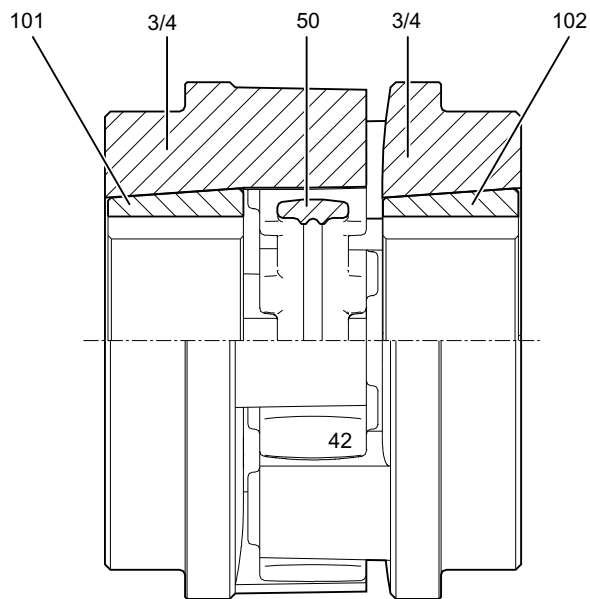


Figure 3-2: BWT type

- 3/4 Coupling part 3 or 4
- 50 Cam ring
- 101 TAPER clamping bush
- 102 TAPER clamping bush

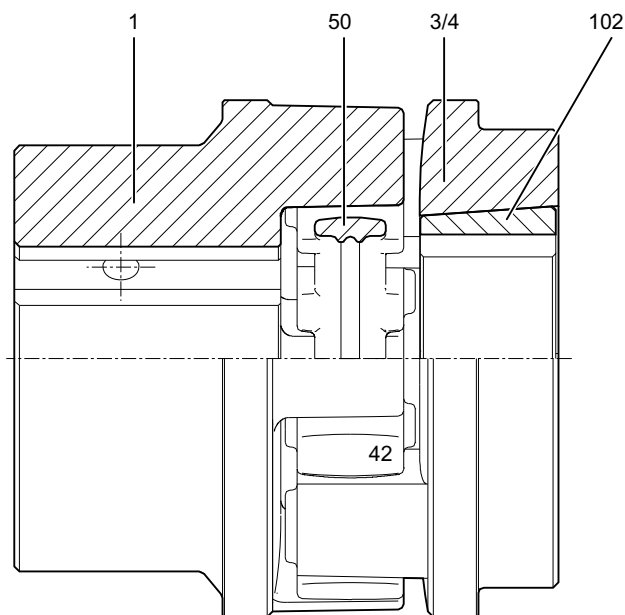


Figure 3-3: BNT type

- 1 Coupling part 1/2
- 3/4 Coupling part 3 or 4
- 50 Cam ring
- 102 TAPER clamping bush

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



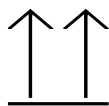
WARNING

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.



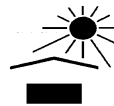
This way up



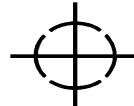
Fragile



Keep dry



Keep dry



Centre of gravity



Do not use hand hook



Attach here

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 procedure for storing the coupling.

The coupling, unless 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.

4.2 Storage of the coupling

- 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.

- Carefully observe the specifications for long-term storage.

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

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

Assembly of the coupling comprises the following steps:

- Preparatory work (Page 25)
- Mounting the coupling (Page 30)
- Aligning the coupling (Page 32)



DANGER

Danger due to bursting of the coupling

If you do not observe the information stipulated here regarding assembly, this can lead to bursting of the coupling during operation. There is a risk of fatal injury from flying fragments. If a coupling bursts in an area at risk of explosion, then this can result in an explosion.

- Carefully observe all of the specifications relating to 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 26)
- Milling the parallel keyway (Page 27)
- Machining an axial locking mechanism (Page 27)
- Balancing the coupling (Page 29)



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 diameter



WARNING


Danger due to bursting of the coupling

If you exceed the maximum diameter of the finished bore, then this can cause the coupling to burst in operation. There is a risk of fatal injury from flying fragments. If a coupling bursts in an area at risk of explosion, then this can result in an explosion.

- Adhere to the maximum diameters specified.

The maximum diameters are listed in Section Speeds, geometry data and weights (Page 55)

Procedure

1. Remove the cam ring (50).
2. Remove the preservation and clean the coupling part 1/2 (1 or 2) 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.

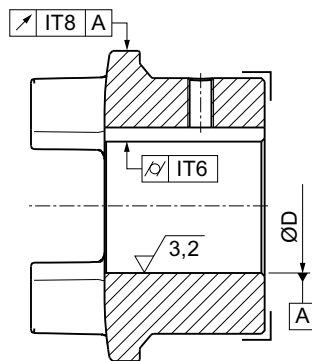


Figure 5-1: Tolerances for the finished bore in coupling part 1/2 (1 or 2)

5.1.2 Milling the parallel keyway

Position of the parallel keyway

Arrange the parallel keyway in the centre between the cams.

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 1/2 (1 or 2) 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 threaded hole in the hub

The following diagram shows the axial position of the threaded hole.

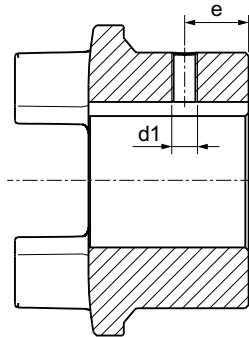


Figure 5-2: Diameter and axial position of the threaded hole in the hub

The following table contains the values for the diameter and axial position of the threaded hole depending on the coupling size.

Coupling part 1/2 (1 or 2) of types BWN and BNT				
Coupling size	Tapped hole d1	Clearance e mm	Tightening torque T_A Nm	Width across flats Hexagon socket wrench mm
19	M5	10	3	2.5
24	M5	10	3	2.5
28	M8	15	8	4
38	M8	15	8	4
42	M8	20	8	4
48	M8	20	8	4
55	M10	20	15	5
65	M10	20	15	5
75	M10	25	15	5
90	M12	30	25	6

Table 5-2: Tapped hole, tightening torque and width A/F

Apply the specified tightening torques as listed in Section Tightening procedure (Page 62).

Position of the threaded hole with respect to the parallel keyway

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

Selection of the set screw

⚠ CAUTION

Physical injury

Danger of injury from protruding set screw.

- Please observe the information about selecting the set screw.

Use set screws 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 threaded hole as much as possible and must not protrude beyond the hub.

5.1.4 Balancing the coupling

Notes on balancing the coupling

NOTICE

Property damage to coupling part 1/2 (1 or 2)

If you completely drill through the base on coupling part 1/2 (1 or 2), then coupling part 1/2 (1 or 2) 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 ISO 21940).
- Observe the balancing specification according to DIN ISO 21940-32.
- Machine the balancing bore on a large radius with adequate clearance to the cams and the outer circumference.
- Carefully deburr the balancing bore.

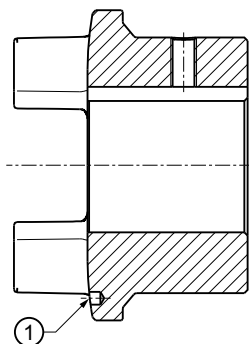


Figure 5-3: Position of the balancing bore for single-plane balancing

- ① Balancing bore

5.2 Assembling the coupling

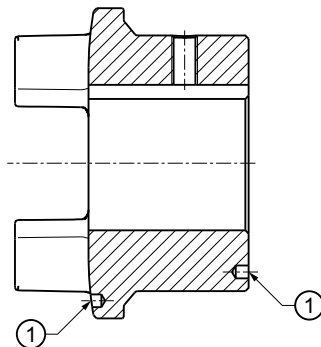


Figure 5-4: Position of the balancing bore for two-plane balancing

① Balancing bore

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.

- The coupling parts 1/2 (1 and 2) with coupling types BWN and BNT are mounted on the shaft by means of a parallel key.
- The coupling parts 3 (3) and 4 (4) with coupling types BWT and BNT are mounted on the shaft with TAPER clamping bushes with parallel key.

5.2.1 Installing coupling part 1/2 (1 or 2)

Procedure

1. Unscrew the set screw out of coupling parts 1/2 (1 and/or 2) 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 the coupling parts 1/2 (1 and/or 2) and the shafts with MoS₂ assembly paste (e.g. Microgleit LP 405).

4. Mount the coupling part 1/2 (1 and/or 2) on the shaft.



! WARNING

Danger due to bursting of the coupling

If you do not observe the information stipulated here when assembling coupling parts with a tapered bore, then this can cause the coupling to burst in operation. There is a risk of fatal injury from flying fragments. If a coupling bursts in an area at risk of explosion, then this can result in an explosion.

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



Information

Coupling parts with cylindrical bore

To make assembly easier, you can heat coupling part 1/2 (1 or 2) with cylindrical bore up to a maximum of 120 °C if required. Note when doing this the temperature range of the cam ring (50) (see section N-BIPEX cam ring (50) (Page 63)). Remove the cam ring (50) where appropriate. Protect adjacent components against damage and heating to temperatures above 80 °C.

5. Secure the coupling parts 1/2 (1 and 2) with a set screw or an end plate. When securing with a set screw the shaft must not protrude or be set back from the inner side of the hub.
6. Tighten up the set screw or the screw to attach the end plate to the specified tightening torque T_A (for the set screw please see section Machining an axial locking mechanism (Page 27)).
7. If you have removed the cam ring (50), re-fit the cam ring (50).

5.2.2 Assembling coupling part 3 (3) or 4 (4)



! DANGER

Danger of explosion

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

- Make sure that a parallel key has been inserted in the shaft.
- Apply a small quantity of liquid screw locking agent (e.g. Loctite 243, medium strength) to the threads of the screws for the TAPER clamping bush (101), (102).

Procedure

1. Clean the bores, the shaft ends and the TAPER clamping bush (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 tapped holes in the same angular position.
2. Insert the TAPER clamping bush (101) or (102) in the coupling part 3 (3) or 4 (4).

5.3 Aligning the coupling

3. Line up the half blind holes of the TAPER clamping bush (101) or (102) with the half tapped 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/tapped 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. Position the coupling part 3 (3) or 4 (4) together with the TAPER clamping bush (101) or (102) on the shaft. When doing this the shaft must not protrude or be set back from the inner side of the hub.
7. Gradually tighten the screws for the TAPER clamping bush (101), (102) in sequence up to the specified tightening torque T_A (see section Tightening torques and widths A/F (Page 62)).
As the screws are tightened, the hub is drawn against the TAPER clamping bush (101), (102) and the bush thus pressed onto the shaft.
8. Fill any unused bores of the TAPER clamping bush (101), (102) with a suitable grease to prevent the ingress of dirt.
9. After a brief period of operation under load, check the tightening torques T_A again (see section Tightening torques and widths A/F (Page 62)). When liquid screw locking agent is used (for use in potentially explosive atmospheres) the tightening torques do not have to be checked.

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 59).

5.3.2 Possible misalignment

The following types of misalignment can occur:

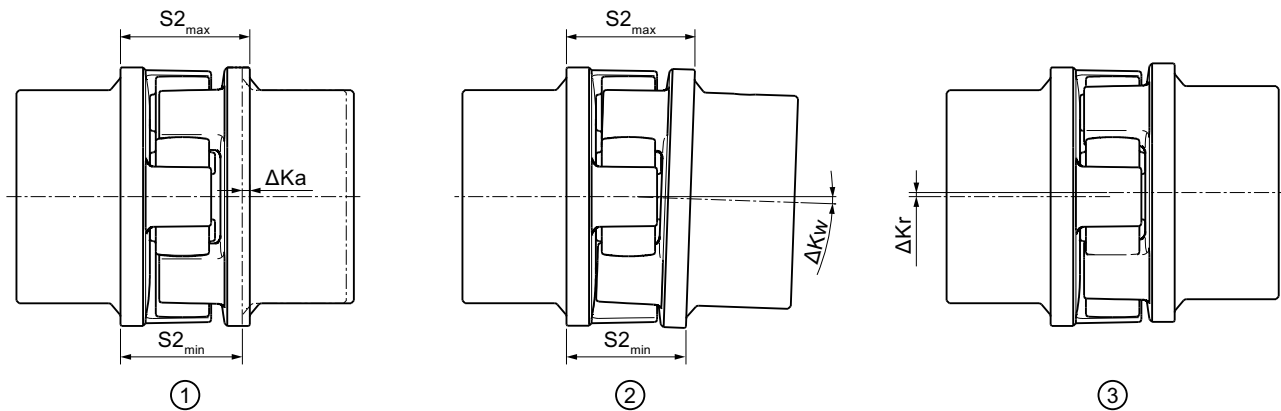


Figure 5-5: Possible misalignment

- ① Axial misalignment (ΔK_a)
- ② Angular misalignment (ΔK_w)
- ③ Radial misalignment (ΔK_r)

5.3.2.1 Axial misalignment

Set the axial misalignment ΔK_a to a value within the permissible tolerance range of dimension S_2 .

You can find the values for dimension S_2 in section Speeds, geometry data and weights (Page 55).

5.3.2.2 Angular misalignment

Determine the value ΔS_2 ($\Delta S_2 = S_{2_{\max}} - S_{2_{\min}}$). The determined value ΔS_2 may not exceed the value $\Delta S_{2_{\text{perm}}}$.

You can find the values for $\Delta S_{2_{\text{perm}}}$ in section Shaft misalignment values during operation (Page 59).

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

$$\Delta K_w [\text{rad}] = \Delta S_2 / DA$$

$$\Delta K_w [\text{deg}] = (\Delta S_2 / DA) \cdot (180 / \pi)$$

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

$$\Delta K_{w_{\text{perm}}} [\text{rad}] = \Delta S_{2_{\text{perm}}} / DA$$

$$\Delta K_{w_{\text{perm}}} [\text{deg}] = (\Delta S_{2_{\text{perm}}} / DA) \cdot (180 / \pi)$$

DA in mm see section Speeds, geometry data and weights (Page 55)

$\Delta S_{2_{\text{perm}}}$ see section Shaft misalignment values during operation (Page 59)

5.3.2.3 Radial misalignment

Determine the value ΔK_r . The determined value ΔK_r may not exceed the value $\Delta K_{r_{\text{perm}}}$.

5.3 Aligning the coupling

You can find the permissible radial misalignment $\Delta K_{r_{perm}}$ in section Shaft misalignment values during operation (Page 59).



DANGER

Danger due to igniting deposits

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

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

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

Testing before commissioning



DANGER

Danger

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

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

1. Check the tightening torques of the screws of the coupling in accordance with section Tightening torques and widths A/F (Page 62).
2. Check the tightening torques of the foundation bolts of the coupled machines.
3. Check whether suitable enclosures (ignition protection, coupling guard, touch protection) have been installed and that the function of the coupling has not been adversely affected by the enclosure. This also applies to test runs and rotational direction checks.

7.1 Normal operation of the coupling

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

7.2 Faults - causes and rectification

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

Look out specifically for the following faults during coupling operation:

- Unusual coupling noise
- Sudden occurrence of shocks

7.2.1 Procedure in the event of malfunctions



DANGER

Danger due to bursting of the coupling

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

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

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

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

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

7.2.2 Identifying the fault cause

Faults occur frequently due to application errors or they occur due to operational circumstances such as wear of wearing parts or changes to the system.

The faults and fault causes listed below only serve as an indication for troubleshooting. In the case of a complex system be sure to include all the system components in the search for the fault.



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 17).

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 40).
	Changed alignment	Follow the instructions given in section Correcting the changed alignment (Page 40).
	Coupling not suitable for the operating conditions. Check the possible causes given in section Unsuitable coupling (Page 39).	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 39) and Specific installation-related and maintenance-related causes (Page 40).	Reassemble the coupling in accordance with these instructions. Please observe all the stipulations and requirements given in chapter Assembly (Page 25).
	Incorrect maintenance of the coupling. Check the possible causes given in sections Maintenance-related causes (Page 40) and Specific installation-related and maintenance-related causes (Page 40).	Please observe all the stipulations and requirements given in chapter Servicing (Page 43).
Presence of vibration	Coupling not suitable for the operating conditions. Check the possible causes given in section Unsuitable coupling (Page 39).	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 39) and Specific installation-related and maintenance-related causes (Page 40).	Reassemble the coupling in accordance with these instructions. Please observe all the stipulations and requirements given in chapter Assembly (Page 25).
	Incorrect maintenance of the coupling. Check the possible causes given in sections Maintenance-related causes (Page 40) and Specific installation-related and maintenance-related causes (Page 40).	Please observe all the stipulations and requirements given in chapter Servicing (Page 43).

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.
- Bolts inserted dry or greased.

- Flange surfaces of screwed connections not cleaned.
- Alignment and/or shaft misalignment values not set in accordance with the instructions.
- Coupled machines were not correctly connected to the foundation so that a shifting of the machines leads to an impermissible displacement of the coupling parts.
- Coupled machines not earthed adequately.
- Coupling guard used is not suitable.

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 installation-related and maintenance-related causes

- Cam ring (50) not fitted.
- Fitted cam ring (50) excessively heated up when applying heat to the coupling parts.

7.2.3 Correcting faults

7.2.3.1 Replacing wearing parts

Cam rings (50) are subject to wear and this wear can result in torsional backlash.

Procedure

1. Check the wear on the cam ring (50) (see section Maximum permissible torsional backlash (Page 44)).
2. Replace the cam ring (50) where appropriate (see section Replacing wearing parts (Page 44)).

7.2.3.2 Correcting the changed alignment

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

Procedure

1. Correct the cause for the change in alignment.
2. Check the wearing parts for wear and replace them as required.

3. Check the locking elements that prevent axial movements and correct these as required.
4. Realign the coupling.

8.1 Maintenance intervals



DANGER

Danger due to bursting of the coupling

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

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



DANGER

Danger due to bursting of the coupling

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

- Note also the actual wear of the elastomer components.



WARNING

Physical injury

Injury from rotating parts.

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

Check the torsional backlash between the coupling parts at the specified maintenance intervals. The maximum permissible torsional backlash for the various coupling sizes can be found in section Maximum permissible torsional backlash.

Model	Initial maintenance	Follow-up maintenance
BWN	3 months after commissioning	Every 12 months
BWT		
BNT		

Table 8-1: Maintenance intervals

Shorter maintenance intervals

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

8.2 Maximum permissible torsional backlash

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

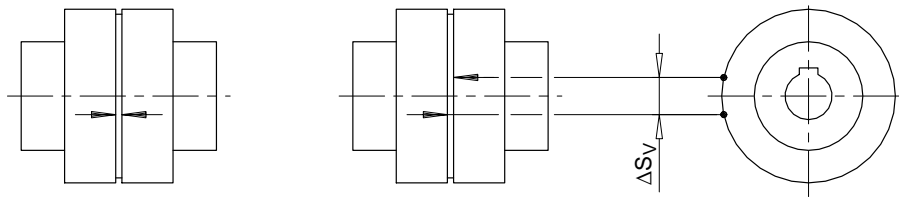


Figure 8-1: Markings for calculating the torsional backlash

Size	19	24	28	38	42	48	55	65	75	90
Maximum permissible torsional backlash ΔS_v [mm]	2.5	3.5	4.5	5.5	6.5	7	8	9	11	13.5

Table 8-2: Maximum permissible torsional backlash

8.3 Replacing wearing parts



! DANGER

Danger due to bursting of the coupling

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

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

Replace the cam ring (50) if the maximum permissible torsional backlash has been reached.

Procedure

1. Move the coupled machines apart.
2. Remove the cam ring (50).
3. Insert the new cam ring (50).
Please observe the information in section Use and storage of the cam rings (Page 63).

When reinstalling the coupling parts please observe the information in chapters Assembly (Page 25) and Commissioning (Page 35).

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



! WARNING

Danger from burners and hot coupling parts

Risk of injury due to burners and hot surfaces. Burners or hot coupling parts can lead to an explosion in potentially explosive atmospheres.

- Wear suitable protective equipment (gloves, safety goggles).
- Ensure that the area is not at risk of explosion.

Procedure

1. Move the coupled machines apart.
2. Secure the coupling parts to prevent them from falling.
3. Remove the axial locking elements (set screw, end plate).
4. Use a suitable pulling fixture.
5. Heat up the coupling part 1/2 (1 or 2) using a burner above the parallel keyway along its length to maximum 80 °C.
Note when doing this the temperature range of the cam ring (50) (refer to section N-BIPEX cam ring (50) (Page 63)). Remove the cam ring (50) where appropriate.
6. Pull off the coupling part 1/2 (1 or 2). Use suitable lifting gear when doing this.
7. Check the hub bore and the shaft for damage and protect them against corrosion.
8. Replace any damaged parts.

When reinstalling the coupling parts please observe the information in chapters Assembly (Page 25) and Commissioning (Page 35).

8.5 Removing coupling part 3 (3) or 4 (4)

Procedure

1. Move the coupled machines apart.
2. Secure the coupling parts to prevent them from falling.
3. Remove the bolts from the TAPER clamping bush (101) or (102).
4. Insert one of the bolts as a clamping screw into the thread of the TAPER clamping bush (101) or (102) and tighten the bolt.
Use two jacking screws for no. 3535 TAPER clamping bushes or larger.
5. Pull off the coupling part 3 (3) or 4 (4). Use suitable lifting gear when doing this.
6. 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.
7. Replace any damaged parts.

When reinstalling the coupling parts please observe the information in chapters Assembly (Page 25) and Commissioning (Page 35).

8.5 Removing coupling part 3 (3) or 4 (4)

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.

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.

Use only 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 52).

You can find our contact data for ordering replacement parts at Service and support (Page 47).

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 52))
- 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 BWN

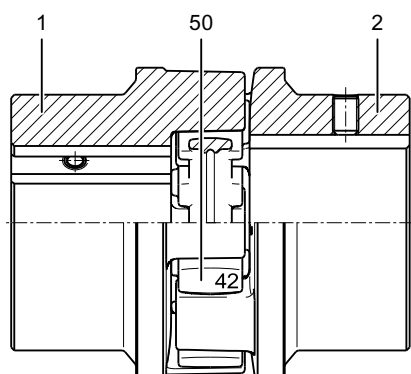


Figure 11-1: Replacement parts drawing for BWN type

Part number	Designation
1	Coupling part 1/2
2	Coupling part 1/2
50	Cam ring

Table 11-1: Spare parts list for type BWN

11.2.2 Type BWT

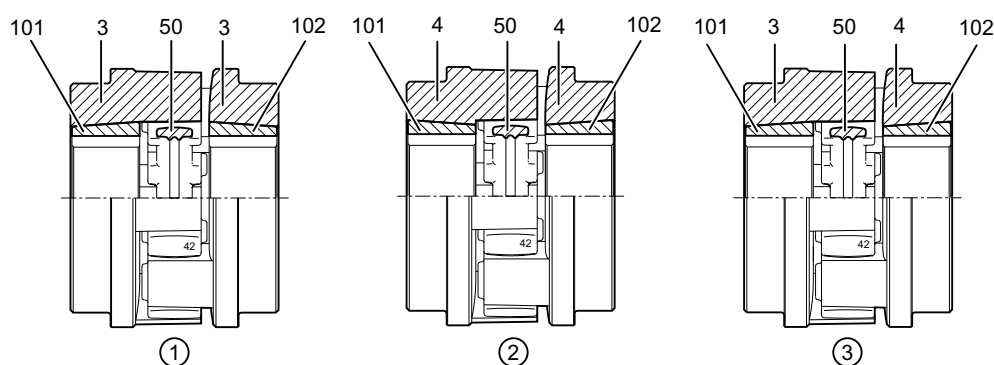


Figure 11-2: Replacement parts drawing for BWT type

- ① Design A
- ② Design B
- ③ 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

Design A		Design B		Design AB	
Part number	Designation	Part number	Designation	Part number	Designation
3	Coupling part 3	4	Coupling part 4	4	Coupling part 4
50	Cam ring	50	Cam ring	50	Cam ring
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 11-2: Replacement parts list for BWT type

11.2.3 Type BNT

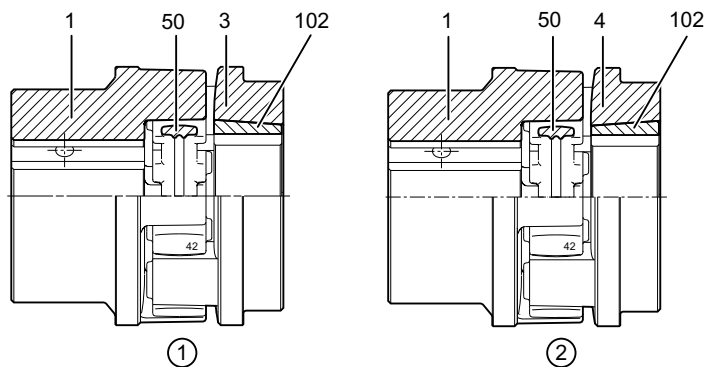


Figure 11-3: Spare parts drawing for type BNT

- ① Design A
- ② Design B

Design A		Design B	
Part number	Designation	Part number	Designation
1	Coupling part 1/2	1	Coupling part 1/2
3	Coupling part 3	4	Coupling part 4
50	Cam ring	50	Cam ring
102	TAPER clamping bush	102	TAPER clamping bush

Table 11-3: Spare parts list for type BNT

Technical data

A

A.1 Speeds, geometry data and weights

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

- BWN type (Page 55)
- BWT type (Page 56)
- BNT type (Page 58)

A.1.1 BWN type

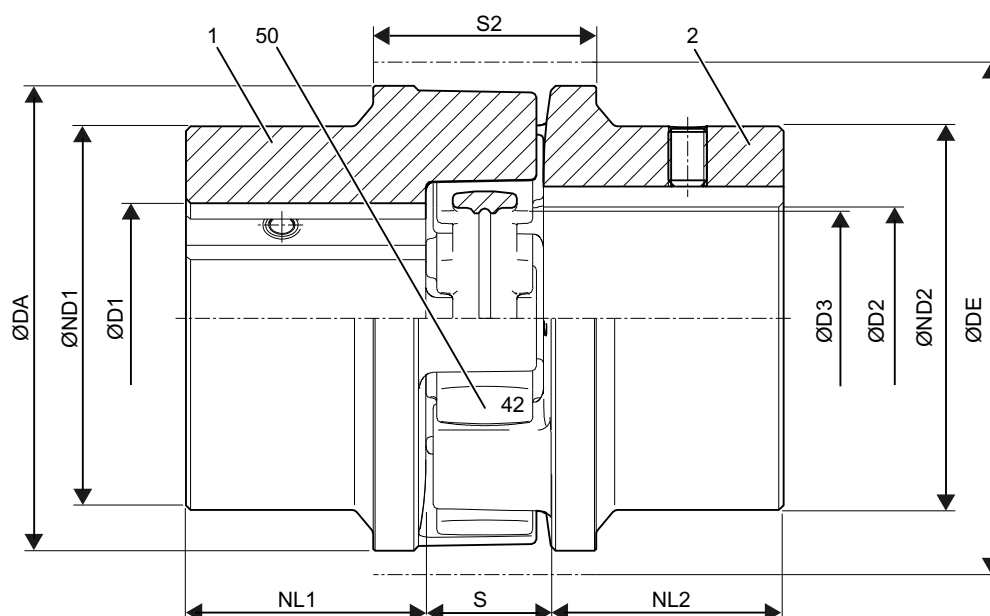


Figure A-1: BWN type

- 1 Coupling part 1/2
2 Coupling part 1/2

Size	Speed										Weight ³⁾
	n_{max}	$D1 / D2$	DA	$ND1 / ND2$	$NL1 / NL2$	$D3$	$DE^{2)}$	S	$S2$		m
	rpm	max. ¹⁾ mm	mm	mm	mm	mm	mm	mm	perm dev.	mm	kg
19	19,500	25	42	38	25	17	46	16	31	± 1	0.3
24	14,500	35	57	50	30	25	62	18	37	± 1.5	0.6
28	12,500	40	67	58	35	28	73	20	41	± 1	1
38	10,000	48	82	68	45	36	89	24	45	± 1.5	1.7
42	8,500	55	97	80	50	43	105	26	48	± 1.5	2.6
48	7,500	62	107	90	56	48	116	28	50	± 2	3.6

Size	Speed										Weight ³⁾
	n _{max}	D1 / D2 max. ¹⁾	DA	ND1 / ND2	NL1 / NL2	D3	DE ²⁾	S	S2		
									perm dev.		
									rpm	mm	mm
55	6,500	75	123	105	65	57	133	30	60	± 2	5.2
65	6,000	82	138	115	75	64	150	35	65	± 2.5	7.5
75	5,000	96	160	135	85	76	177	40	104	± 2.5	13.8
90	4,000	120	205	170	100	95	220	45	85	± 3	21.4

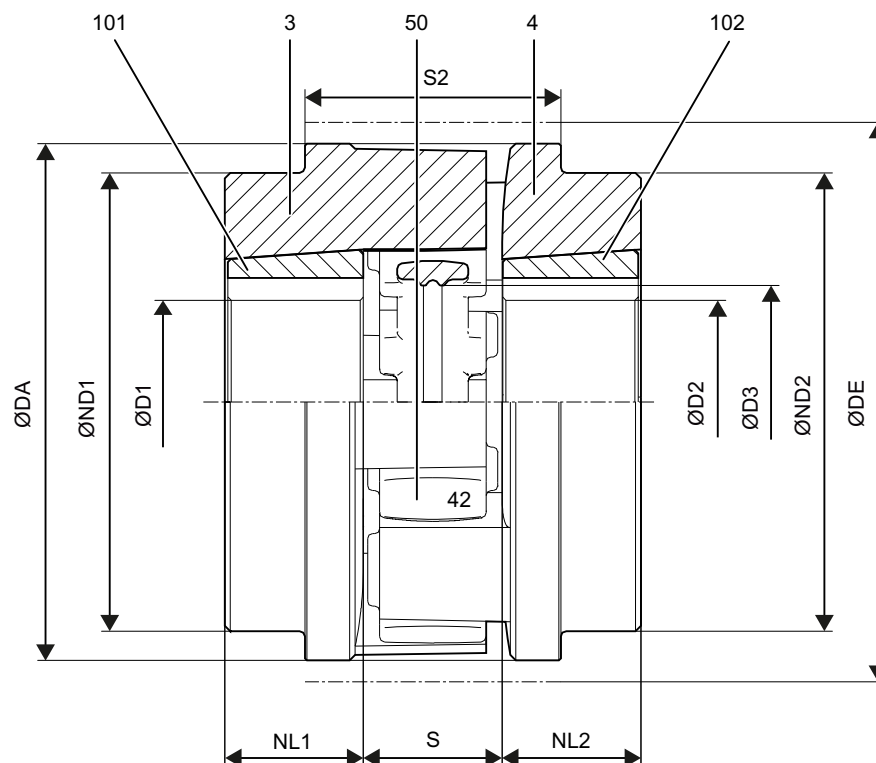
Table A-1: Speed, geometry data and weights for BWN type

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

²⁾ Required installation space

³⁾ Weight applies to one coupling with maximum bore

A.1.2 BWT type


Figure A-2: BWT type

3 Coupling part 3

4 Coupling part 4

Size	Speed											TAPER- clamping bush No.	Weight ⁵⁾ m kg
	n _{max} rpm	D1 / D2		DA	ND1	NL1	D3	DE ⁴⁾	S	S2			
		min.	max. ¹⁾		ND2	NL2		perm dev.					
									mm	mm	mm		
24	14,500	10	25 ²⁾	57	54	23	25	62	18	37	± 1.5	1008	0.6
28	12,500	10	28 ²⁾	67	58	23	28	73	20	41	± 1.0	1108	0.8
38	10,000	10	28 ²⁾	82	58	23	36	89	24	45	± 1.5	1108	1.2
42	8,500	14	42 ²⁾	97	86	26	43	105	26	48	± 1.5	1610	1.8
48	7,500	14	42 ²⁾	107	80	39	48	116	28	50	± 2.0	1615	2.6
55	6,500	14	50	123	100	33	57	133	30	60	± 2.0	2012	3.5
65	6,000	14	50	138	100	33	64	150	35	65	± 2.5	2012	4.5
65		55	60		118	46					2517 ³⁾	5.5	
75	5,000	16	60	160	118	46	76	177	40	75	± 2.5	2517	8.4
75		65	75		135	52					3020 ³⁾	8.2	
90	4,000	25	75	205	142	52	95	220	45	85	± 3.0	3020	12.9
90		80	90		170	90					3535 ³⁾	19.8	

Table A-2: Speed, geometry data and weights for BWT type

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

²⁾ Some bores have a flat groove.

³⁾ TAPER- clamping bush only possible in coupling part 4 (4).

⁴⁾ Required installation space.

⁵⁾ Weight applies to one coupling without TAPER clamping bush.

A.1.3 BNT type

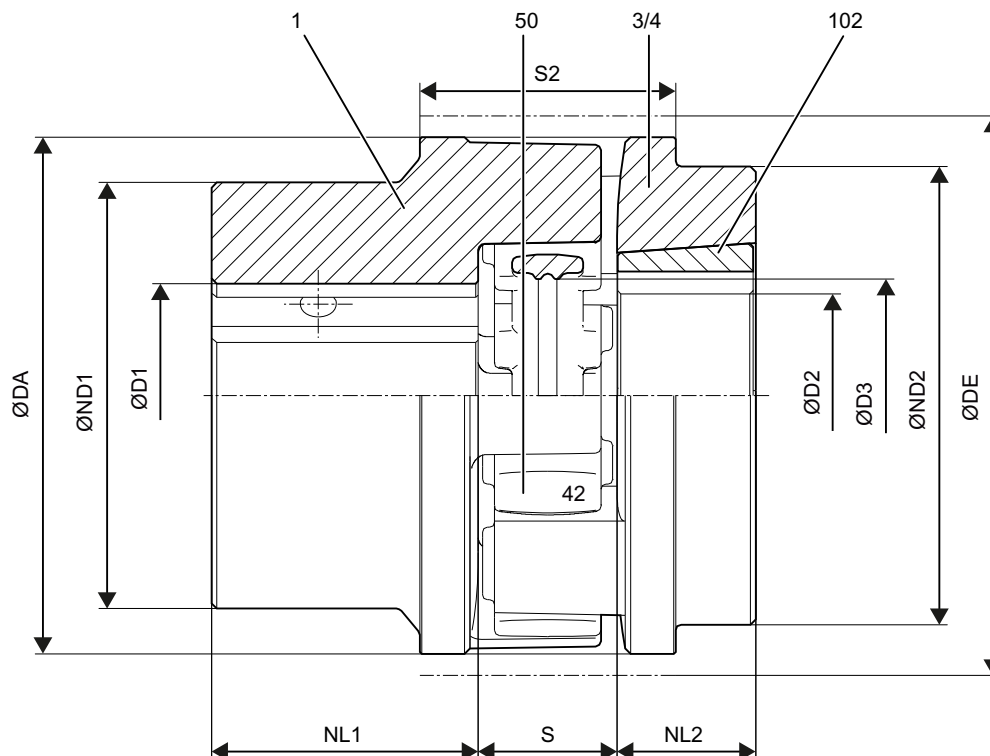


Figure A-3: BNT type

- 1 Coupling part 1/2
3/4 Coupling part 3 or 4

Size	Speed													TAPER- clamp- ing bush	Weigh t ⁵⁾ m				
	n _{max} rpm	D1		D2		DA	ND1	ND2	NL1	NL2	D3	DE ⁴⁾	S			S2			
		max ²⁾	min.	max. ¹⁾	perm dev.														
																mm	mm	mm	mm
mm																			
24	14,500	35	10	25 ²⁾	57	50	54	30	23	25	62	18	37	± 1.5	1008	0.6			
28	12,500	40	10	28 ²⁾	67	58	58	35	23	28	73	20	41	± 1.0	1108	0.8			
38	10,000	48	10	28 ²⁾	82	68	58	45	23	36	89	24	45	± 1.5	1108	1.4			
42	8,500	55	14	42 ²⁾	97	80	86	50	26	43	105	26	48	± 1.5	1610	2.3			
48	7,500	62	14	42 ²⁾	107	90	80	56	39	48	116	28	50	± 2.0	1615	3.2			
55	6,500	75	14	50	123	105	100	65	33	57	133	30	60	± 2.0	2012	4.4			
65	6,000	82	14	50	138	115	100	75	33	64	150	35	65	± 2.5	2012	6.0			
65			55	60			118	46	2517 ³⁾						6.5				
75	5,000	96	16	60	160	135	118	85	46	76	177	40	89.5	± 2.5	2517	11.1			
75			65	75			135	52	3020 ³⁾						11.0				
90	4,000	120	25	75	205	170	142	100	52	95	220	45	85	± 3.0	3020	17.2			

Size	Speed													TAPER- clamp- ing bush	Weigh t ⁵⁾ m										
	n _{max}	D1		D2		DA	ND1	ND2	NL1	NL2	D3	DE ⁴⁾	S			S2									
		max ²⁾	min.	max. ¹⁾												perm dev.									
																mm		mm		mm		mm		mm	
	rpm	mm		mm		mm		mm		mm		mm			mm		No.	kg							
	mm																								
90	4,000	120	80	90	205	170	170	100	90	95	220	45	85	± 3.0	3535 ³⁾	20.7									

Table A-3: Speed, geometry data and weights for BNT type

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

²⁾ Some bores have a flat groove.

³⁾ TAPER- clamping bush only possible in coupling part 4 (4).

⁴⁾ Required installation space.

⁵⁾ Weight applies to one coupling with maximum bore in coupling part 1/2 (1), without TAPER clamping bush.

A.1.4 Flat groove in TAPER clamping bushes (101), (102)

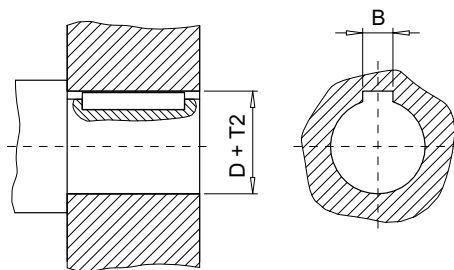


Figure A-4: Flat groove in TAPER clamping bushes

TAPER- Clamping bush	Bore D	Width B	Hub groove depth D + T2
No.	mm	mm	mm
1008	24	8	D + 2
1008	25	8	D + 1.3
1108	28	8	D + 2
1610 1615	42	12	D + 2.2

Table A-4: Flat groove in TAPER clamping bushes

A.2 Shaft misalignment values during operation

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

Shaft misalignment values during operation

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

$$\Delta K_{\text{perm}} = \Delta K_{1,500} \cdot \text{FKV}$$

You can find the correction factor FKV and the values for ΔK in the following tables.

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

Table A-5: Correction factor



Information

Note the maximum speed for the relevant coupling size and coupling type.

Cam rings (50) with hardness 92 Shore A

Size	$\Delta K_{1,500}$ at n = 1,500 rpm		
	ΔK_{perm} 1)	$\Delta K_{\text{a perm}}$	$\Delta S2_{\text{perm}}$ 1)
	mm	mm	mm
19	0.17	0.3	0.37
24	0.23	0.4	0.50
28	0.25	0.5	0.58
38	0.29	0.6	0.72
42	0.34	0.7	0.85
48	0.38	0.8	0.93
55	0.40	0.9	1.10
65	0.45	1.0	1.20
75	0.52	1.2	1.42
90	0.60	1.4	1.77

Table A-6: Maximum permissible shaft misalignment values during operation for cam rings (50) with hardness 92 Shore A

1) At a speed of 1,500 rpm $\Delta S2_{\text{perm}}$ corresponds to a permissible angular deviation of $\Delta K_{\text{w perm}} = 0.5^\circ$

Cam rings (50) with hardness 95 Shore A

Size	ΔK_{1500} at n = 1,500 rpm		
	ΔK_{perm} 1)	$\Delta K_{a,perm}$	$\Delta S2_{perm}$ 1)
	mm	mm	mm
19	0.15	0.27	0.29
24	0.21	0.36	0.40
28	0.23	0.45	0.47
38	0.26	0.54	0.57
42	0.31	0.63	0.68
48	0.34	0.72	0.75
55	0.36	0.81	0.86
65	0.41	0.9	0.96
75	0.47	1.08	1.14
90	0.54	1.26	1.42

Table A-7: Maximum permissible shaft misalignment values during operation for cam rings (50) with hardness 95 Shore A

1) At a speed of 1,500 rpm $\Delta S2_{perm}$ corresponds to a permissible angular deviation of $\Delta K w_{perm} = 0.4^\circ$

Cam rings (50) with hardness 64 Shore A

Size	ΔK_{1500} at n = 1,500 rpm		
	ΔK_{perm} 1)	$\Delta K_{a,perm}$	$\Delta S2_{perm}$ 1)
	mm	mm	mm
19	0.14	0.24	0.22
24	0.18	0.32	0.30
28	0.20	0.40	0.35
38	0.23	0.48	0.43
42	0.27	0.56	0.51
48	0.30	0.64	0.56
55	0.32	0.72	0.64
65	0.36	0.80	0.72
75	0.42	0.96	0.85
90	0.48	1.12	1.06

Table A-8: Maximum permissible shaft misalignment values during operation for cam rings (50) with hardness 64 Shore A

1) At a speed of 1,500 rpm $\Delta S2_{perm}$ corresponds to a permissible angular deviation of $\Delta K w_{perm} = 0.3^\circ$

A.3 Tightening torques and widths A/F

Size	TAPER- Clamping bush Number	Tightening torque T_A and width A/F SW			
		BSW ¹⁾	Length	T_A	SW
		Inch	Inch	Nm	mm
24	1008	1/4	1/2	5.6	3
28/38	1108	1/4	1/2	5.6	3
38	1210	3/8	5/8	20	5
42	1610	3/8	5/8	20	5
48	1615	3/8	5/8	20	5
55/65	2012	7/16	7/8	31	5
65/75	2517	1/2	1	48	6
75/90	3020	5/8	1 1/4	90	8
90	3535	1/2	1 1/2	113	10

Table A-9: Tightening torques and widths A/F of bolts for the TAPERclamping bushes (101 or 102)

¹⁾ BSW: British Standard Whitworth

Apply the recommended tightening torques in accordance with the stipulations in section Tightening procedure (Page 62).

A.4 Tightening procedure

Tightening torques must be observed 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 %	<ul style="list-style-type: none"> Hydraulic tightening with mechanical screwdriver Torque-controlled tightening with a torque wrench or a torque wrench that gives a signal Tightening with a precision mechanical screwdriver with dynamic torque measurement

Table A-10: 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 Cam rings

A.5.1 Use and storage of the cam rings

Note the following concerning the use and storage of the cam rings:

- 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 N-BIPEX cam ring (50)

Material	Hardness	Comment	Marking	Ambient temperature
TPU	92 Shore A	standard, soft	red	-50 °C to +100 °C
TPU	95 Shore A	medium, shifting of the resonant speed	green	-50 °C to +100 °C
TPU	64 Shore D	hard	blue	-50 °C to +100 °C

Table A-11: N-BIPEX cam ring

Declaration of Conformity

B

EU Declaration of Conformity

Product:

FLENDER N-BIPEX® couplings
Types BWN, BWT and BNT

Name and address of the manufacturer:

Flender GmbH
Schlavenhorst 100
46395 Bocholt
Germany

This Declaration of Conformity is issued under the sole responsibility of the manufacturer.

This declaration refers to the product mentioned above.

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

– Directive 2014/34/EU, Official Journal L 96, 29 March 2014, Pages 309-356

Harmonised standards or other technical specifications on which the Declaration of Conformity is based:

EN 1127-1 : 2019

EN 1127-2 : 2014

EN ISO 80079-36 : 2016

EN ISO 80079-37 : 2016

EN ISO/IEC 80079-38 : 2016

Notified Body, DEKRA Testing and Certification GmbH (0158) has received the technical documentation.

Signed for and on behalf of:

Flender GmbH

Bocholt, 2022-09-01



Dr Dennis Geers, President, Business Line Couplings

FLENDER COUPLINGS

N-BIPEX

Assembly and operating instructions M3401-01en

Edition 09/2022

[Flender GmbH](#)

Alfred-Flender-Straße 77

46395 Bocholt

Germany