FLENDER COUPLINGS

N-ARPEX

Operating Instructions 8714en
Edition 10/2017

ARN-6

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Legal information

Warning notice system

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

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

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

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

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

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

Qualified Personnel

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

Proper use of Flender products

Note the following:

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

Trademarks

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

Disclaimer of Liability

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

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Table of contents

Tables

Figures

Introduction 1

1.1 About these instructions

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

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

1.2 Text attributes

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

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

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

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

(1) Numbers in brackets are part numbers.

Note

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

1.3 Copyright

The copyright of these instructions is held by Flender.

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

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

Safety instructions

2

2.1 General information

Instructions

These instructions are part of the delivery. Always keep these instructions close to the coupling.

Please make sure that every person who is commissioned to work on the coupling has read and understood these instructions prior to handling the coupling and observes all of the points.

Only the knowledge of these instructions can avoid faults on the coupling and ensure fault-free and safe operation. Non-adherence to the instructions can cause product or property damage or personal injury. Flender does not accept any liability for damage or operating failures that are due to non-adherence to these instructions.

State of the art

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

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

Symbols

Table 2-1 General warnings

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

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

Explanation regarding Machinery Directive 2006/42/EC

The couplings described here are “components” in accordance with the Machinery Directive and do not require a declaration of incorporation.

ATEX Directive

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

Protective clothing

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

Using the coupling

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

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

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

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

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

Work on the coupling

Only carry out work on the coupling when it is not in operation and is not under load.

Secure the drive unit against being switched on accidentally. Attach a notice to the switch stating clearly that work is being carried out on the coupling. Ensure that the entire unit is not under load.

2.2 Intended use

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

When using the coupling please specifically observe the following:

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

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

2.2.1 Rated torques, maximum torques, overload torques and friction-locked connections

Rated torques

Rated torques T_{KN} are listed in the technical data for the particular type.

Maximum torques

Maximum torque T_{max} is the largest load that acts on the coupling in normal operation.

Maximum torque T_{max} is permissible up to 5 times per hour, and must be less than the coupling maximum torque T_{Kmax}.

The maximum coupling torque T_{Kmax} is 2 times the rated torque T_{KN}.

Overload torques

Overload torque T_{OL} is the highest load that acts on the coupling for special, infrequent operating states. It is only permissible that the overload state lasts for just fractions of a second.

Overload torque T_{OL} is permissible up to 1 time per month, and must be less than the coupling overload torque T_{KOL}.

Coupling overload torque T_{KOL} is 2.5 times the rated torque T_{KN}.

Note

Carry out a visual inspection if an overload torque has occurred.

Friction-locked connections in hazardous zones

Shaft-hub connections using a pressurized oil interference fit or clamping hub connections belong to friction-locked connections.

In hazardous zones, the maximum torque that can occur in operation must not exceed the maximum torque that can be transmitted using the friction-locked connection.

⚠ WARNING

Risk of explosion when the maximum torque that can be transmitted by the friction-locked connection is exceeded

Refer to the dimension drawing provided for the maximum torque of the pressurized oil interference fit that can be transmitted.

Refer to Section Technical data of the complete clamping hub (Page 77) for the maximum clamping hub connection torque that can be transmitted.

2.2.2 Coupling service life

N-ARPEX couplings are not subject to any wear. The couplings have an unlimited service life when professionally and correctly mounted and when used as intended.

2.3 Safety instructions for a coupling when used in a hazardous zone

2.3.1 Marking

You can find a description of the coupling parts in chapter Description (Page 19).

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

One of the coupling components (e.g. the hub) has one of the following markings on the outer diameter.

Version 1:

Flender GmbH	CE	Ⓔx II 2G c IIC TX X
46393 Bocholt - Germany		Ⓔx II 2D c TX X
FLENDER couplings N-ARPEX	<Year of manufacture>	I M2 c TX X

Version 2:

Flender GmbH	CE	Ⓔx II 2G c IIC TX -50 °C ≤ Ta ≤ +280 °C X
46393 Bocholt - Germany		Ⓔx II 2D c TX -50 °C ≤ Ta ≤ +280 °C X
FLENDER couplings N-ARPEX	<Year of manufacture>	Ⓔx I M2 c TX -50 °C ≤ Ta ≤ +150 °C X

All other components have the stamp Ⓔx. For small components, the packaging can also have markings.

Undrilled or predrilled couplings

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

Note

Undrilled or predrilled couplings with Ex marking

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

2.3.2 Conditions of use

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

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

Conditions of use for products with TX marking

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

1. Gases, vapours or mists

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

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

Max. ambient temperature	Temperature class
280 °C	T1
260 °C	T2
180 °C	T3
115 °C	T4
80 °C	T5
65 °C	T6

2. Dust/air mixtures

Check the ambient temperature.

The maximum surface temperature (TX) of the coupling for an explosive atmosphere as a result of dust/air mixtures is obtained from the maximum ambient temperature.

Notes concerning operation of the coupling in potentially explosive atmospheres

- Only use the coupling underground in mines in potentially explosive atmospheres together with drive motors that can be switched off in the event of the formation of an explosive atmosphere.
- Earth machines that are connected via the coupling with a leakage resistance of less than 10^6 Ω.
- If you want to use a coated coupling in potentially explosive atmospheres, please note the requirements concerning the conductivity of the paint and the limitation on the paint layer thickness applied in accordance with EN 13463-1. A build-up of electrostatic charges is not to be expected with a paint layer thickness of less than 200 µm.

2.4 General warning notices

⚠ DANGER

Danger due to bursting of the coupling

The coupling may burst if it is not used properly. There is a risk of fatal injury from flying fragments. Bursting of the coupling can lead to an explosion in potentially explosive atmospheres.

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

⚠ DANGER

Risk of explosion when using coupling parts without Ex marking

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

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

⚠ DANGER

Danger

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

- Observe the information regarding conditions of use.

⚠ DANGER

Danger of explosion

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

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

⚠ DANGER

Danger from hot coupling parts

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

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

⚠ WARNING

Risk of chemical burns due to chemical substances

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

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

⚠ CAUTION

Physical injury

Risk of injury due to falling coupling parts.

- Secure the coupling parts to prevent them from falling.

Description

3

The N-ARPEX couplings described here are torsionally-rigid multiple disk couplings that are free of torsional backlash and are available in various types and sizes. The couplings can be used in accordance with the ATEX Directive in potentially explosive atmospheres if they have a CE marking.

These instructions describe mounting and operating an N-ARPEX coupling in a horizontal arrangement. The shaft-hub connection is available in the following versions:

- Shaft-hub connection using a cylindrical or tapered bore with parallel key according to DIN 6885/1.
- Shaft-hub connection using a cylindrical or tapered bore with pressurized oil interference fit.
- Shaft-hub connection using a clamping hub.

Please consult Flender if you want to use a different type of installation.

Application

N-ARPEX couplings are designed for use in all kinds of machines and comply with the requirements laid down in API 610. Types NEN and MCECM can be optionally implemented according to API 671.

Design

N-ARPEX couplings are all-steel couplings. Plate packs are arranged between the flanges, which are bolted with one another on alternating sides.

The plate packs comprise hexagonal ring plates that are crimped together.

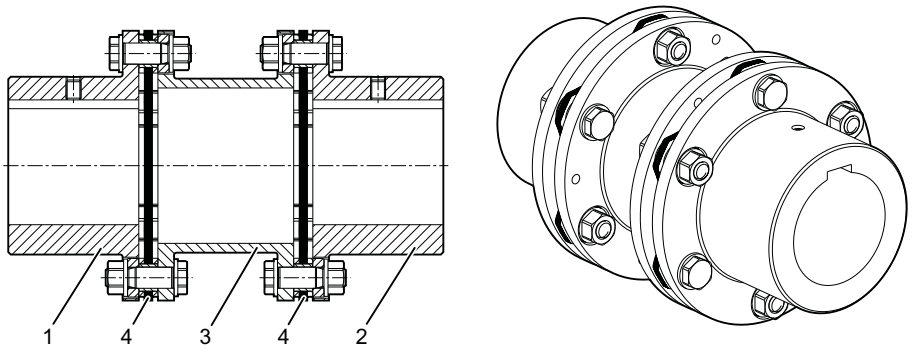
Collar bolts and nuts are used to connect the plate packs to the flanges. A capture assembly secures the spacer if the plates were to break.

The N-ARPEX coupling is torsionally stiff and transmits the torque without any backlash through the arrangement of the plate packs. The coupling can absorb axial, radial and angular offset of the connected loads.

The diagrams show the ARN-6 series, types NEN and MCECM with their various components, the associated part numbers and the plate design.

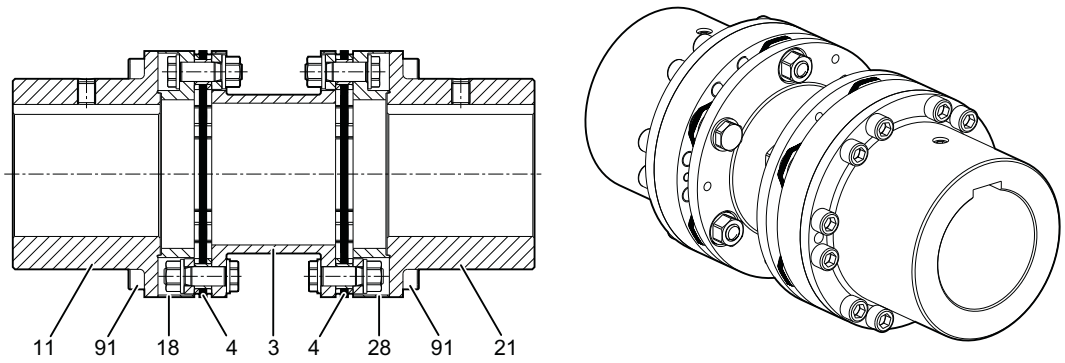
Additional types are shown in Section Spare parts drawing and spare parts list (Page 60).

For the components of the plate packs, refer to the associated mounting instructions provided in Section Assembling the plate pack (Page 38).



1 N hub
2 N hub
3 Spacer
4 Plate pack

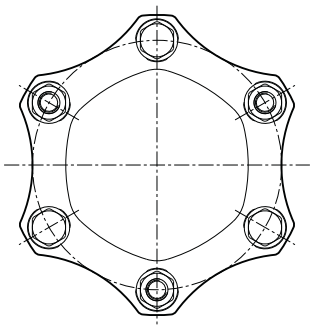
Figure 3-1 Type NEN



3 Spacer
4 Plate pack
11 M hub
18 C flange
21 M hub
28 C flange
91 Screws

Figure 3-2 Type MCECM

If not expressly ordered in any other way, intermediate unit CEC (18; 4; 3; 4; 28) is supplied already mounted.



① Ring plate

Figure 3-3 Plate design

Application planning

4

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

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

4.1 Transport of the coupling

⚠ WARNING

Severe personal injury due to improper transport

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

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

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

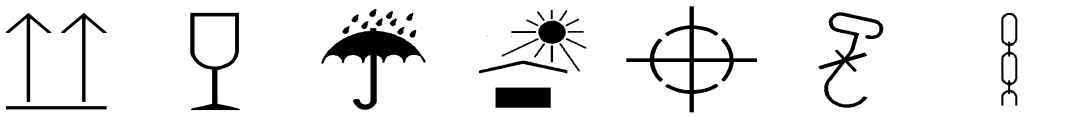


Figure 4-1 Transport symbols

4.2 Storage of the coupling

NOTICE

Property damage due to improper storage

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

- Please observe the information about storing the coupling.

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

Note

Information about storing the coupling

- Ensure that the storage room is dry (relative humidity < 65 %) and free of dust.
- Ensure that there is no condensation.
- Do not store the coupling together with corrosive chemicals, acids, caustic solutions, etc.
- Store the coupling on suitable supports or in suitable containers.

Long-term storage

NOTICE

Property damage due to improper long-term storage

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

- Note the handling instructions for long-term storage.

1. You can find the required type of preservative agent in the following table (types of preservative agents for long-term storage).
2. Clean the coupling parts.
3. Apply the stipulated preservative agent.
4. Store the coupling parts.

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

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

Assembly 5

Assembly of the coupling comprises the following steps:

- Preparatory work (Page 25)
- Assembling the coupling (Page 29)

⚠ DANGER

Danger due to bursting of the coupling

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

- Please observe all the stipulations concerning assembly.

Note

Information about the assembly of the coupling

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

5.1 Preparatory work

Note

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

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

- Machine the finished bore (Page 26)
- Milling the parallel keyway (Page 27)
- Machining an axial locking mechanism (Page 27)
- Balancing the coupling (Page 29)

Note

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

5.1.1 Machine 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.

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

Description	Interference fit									
	Suitable for reversing operation					not suitable for reversing operation				
Shaft tolerance	h6	k6	m6	n6	p6	h6	k6	m6	n6	p6
Bore tolerance	P7	M7	K7	J7	H7	N7	H7	H7	H7	F7

Procedure

1. Remove the preservation and clean the hubs to be machined.
2. Clamp the coupling to the areas marked with ⌜ in the diagram below.
3. Machine the finished bore in accordance with the diagram below.

Note

Diameter of the finished bore

The diameter of the finished bore may not exceed the specified maximum diameter.

- Please observe the maximum diameters specified in section Torques, speeds, geometry data and weights (Page 67).

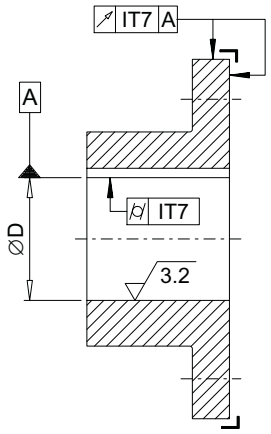


Figure 5-1 Tolerances for finished bore

5.1.2 Milling the parallel keyway

Position of the parallel keyway

Arrange the parallel keyway with sufficient clearance to the pulling-off holes.

Applicable standards

- For one parallel keyway, machine it according to DIN 6885/1 ISO P9.
- For two parallel keyways, machine them according to DIN 6885/1 ISO JS9.
- 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 hub is secured by a set screw or an end plate to prevent axial motion.

Please consult Flender if you want to use an end plate.

Note the following when using a set screw:

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

Diameter and axial position of the tapped hole in the hub

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

The set screw size may be a maximum of 2/3 of the parallel keyway width.

The following table lists the tightening torques and the widths A/F for the set screws.

Table 5-2 Tapped hole, tightening torque and width A/F for the N hub and the M hub

Tapped hole d_1	Tightening torque T_A Nm	Width across flats Hexagon socket wrench mm
M5	2	2.5
M6	4.8	3
M8	10	4
M10	17	5
M12	40	6
M16	80	8
M20	140	10
M24	240	12

Apply the recommended tightening torques in accordance with the stipulations in section Tightening procedure (Page 82).

Position of the tapped hole with respect to the parallel keyway

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

Selection of the set screw

⚠ CAUTION

Physical injury

Danger of injury from protruding set screw.

- Please observe the information about selecting the set screw.

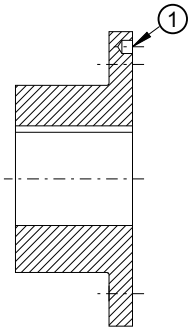
As set screws use threaded studs in accordance with ISO 4029 with a toothed cup point. The size of the set screw is determined by the bore made. The set screw should fill out the tapped hole as much as possible and must not protrude beyond the hub.

5.1.4 Balancing the coupling

Notes on balancing the coupling

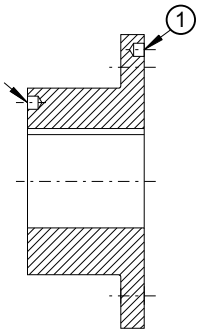
Please note the following when balancing the coupling:

- 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 flange bores and the outer contour.



① Balancing bore

Figure 5-2 Position of the balancing bore for single-plane balancing



① Balancing bore

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

5.2 Assembling the coupling

NOTICE
Property damage
Damage to the shaft end, the hubs and/or the parallel key.
• Note the handling instructions regarding assembling the coupling.

Assembly of the coupling comprises the following steps:

- Assembling the hubs (Page 30)
- Assembling couplings that are balanced as assembly (Page 34)
- Aligning the units (Page 34)
- Assembling the spacer (Page 35)
- Assembling the intermediate unit (Page 35)
- Assembling the plate pack (Page 38)

5.2.1 Assembling the hubs

NOTICE
Property damage
Damage to the shaft end, the hub and/or the parallel key. • Note the handling instructions regarding assembling the hub.

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

- Assembling hubs with shaft-hub connection through a parallel key (Page 30)
- Assembling hubs with shaft and hub connected through a pressurized oil interference fit (Page 31)
- Assembling the clamping hubs (Page 32)

5.2.1.1 Assembling hubs with shaft-hub connection through a parallel key

Procedure

1. Unscrew the set screw until it is no longer possible for there to be a collision with the parallel key or the shaft.
2. Clean the bores, shaft ends, fitting holes and contact surfaces.
3. Coat the bores of the hubs and the shafts with MoS_2 assembly paste (e.g. Microgleit LP 405).

4. Place the hubs on the shaft.

Note

Hubs with tapered bore

Mount the hubs with tapered bore and parallel keyway on the shaft in the cold condition. Secure the hubs with suitable end plates without pulling the coupling parts further onto the tape (fitting dimension = 0) - or according to the dimension drawing provided.

Note

Hubs with cylindrical bore

To make assembly easier, you can heat hubs with cylindrical bore up to a maximum of 150 °C if required. Protect adjacent components against damage and heating to temperatures above 80 °C.

5. Secure the hubs using 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)).

5.2.1.2 Assembling hubs with shaft and hub connected through a pressurized oil interference fit

Shaft-hub connections using a pressurized oil interference fit belong to friction-locked connections.

In hazardous zones, the maximum torque that can occur in operation must not exceed the maximum torque that can be transmitted using the friction-locked connection.

⚠ WARNING

Risk of explosion when the maximum torque that can be transmitted by the friction-locked connection is exceeded

Refer to the dimension drawing provided for the maximum torque of the pressurized oil interference fit that can be transmitted.

Procedure

1. Unscrew the screw plugs (10) and/or (20) from the hubs.
2. Clean the bores, shaft ends, fitting holes and contact surfaces.
3. Degrease and dry the bores and shaft ends.
4. Clean and dry the oil channels and the oil circulation grooves.
5. Protect adjacent components against damage and heating to temperatures above 80 °C.
6. Heat up the hub to the temperature specified in the dimension drawing.
   Make sure that no dirt or contaminants can soil the bores again during the heating process.
7. Mount the hubs quickly on the shaft according to the instructions in the dimension drawing.

8. Secure the hubs to stop them from moving until they have cooled down.
9. Allow the hubs to cool down to the ambient temperature.
10. Use an end plate to secure the hubs that have a tapered pressurized oil interference fit.
11. In order to protect the oil channels of the hubs against corrosion, fill them with a suitable pressurized oil. Close the oil ducts using the screw plugs (10) and/or (20).

5.2.1.3 Assembling the clamping hubs

Shaft-hub connections using clamping hub connections belong to friction-locked connections.

In hazardous zones, the maximum torque that can occur in operation must not exceed the maximum torque that can be transmitted using the friction-locked connection.

⚠ WARNING

Risk of explosion when the maximum torque that can be transmitted by the friction-locked connection is exceeded

Refer to Section Torques, speeds, geometry data and weights (Page 67) for the maximum clamping hub connection torque that can be transmitted.

Note

The complete clamping hub assembly (12) or (22) is supplied ready to be installed. Do not dismantle the clamping hub (7) and the clamping ring (5) before assembling for the first time.

NOTICE

Coupling damage by combining various different parts.

Only use the complete clamping hub assembly (12) or (22) supplied from the manufacturer. Do not combine parts from various complete clamping hub assemblies.

NOTICE

Incorrect cleaning can diminish the reliability of torque transmission

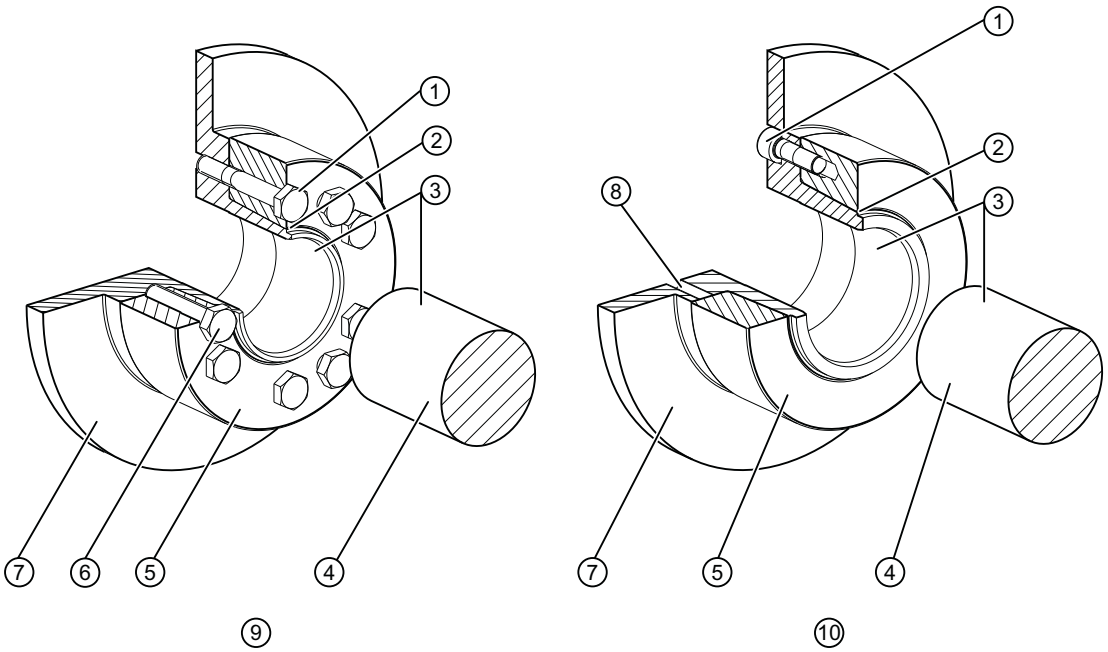
Ensure that the bore of the clamping hub (7) and shaft (4) in the area of the clamping ring seat are absolutely clean and free of any grease and oil.

- Only use clean cloths and solvent.
- Use solvents or chemical cleaning agents free of any oil.

Procedure

1. Clean the bores and shaft ends.
2. Check that all of the parts are in a perfect condition.
3. Slightly release the clamping bolts (1).
4. Slightly withdraw the clamping ring (5) from the clamping hub (7) so that the clamping ring (5) is loose.

5. Place the complete clamping hub assembly (12) or (22) on the shaft.
6. Tighten the clamping bolts (1) one after the other as follows:
   - When going around the circumference for the first time, use half the tightening torque from Section Bolting of the complete clamping hub (Page 81).
   - When going around the circumference for the second time and for all other iterations, apply the full tightening torque from Section Bolting of the complete clamping hub (Page 81).
   - Once you have reached the tightening torque, and the clamping ring (5) is located at the flange of the clamping hub (7), then the complete clamping hub assembly (12) or (22) has been correctly assembled.
7. Contact Flender if the clamping ring (5) is not in contact with the clamping hub (7).



① Clamping bolt
② Tapered surface lubricated
③ Grease-free
④ Shaft
⑤ Clamping ring
⑥ Forcing-off bolt (not included in the scope of delivery)
⑦ Clamping hub
⑧ Forcing off threaded hole
⑨ Clamping hub complete, type 124
⑩ Clamping hub complete, type 125

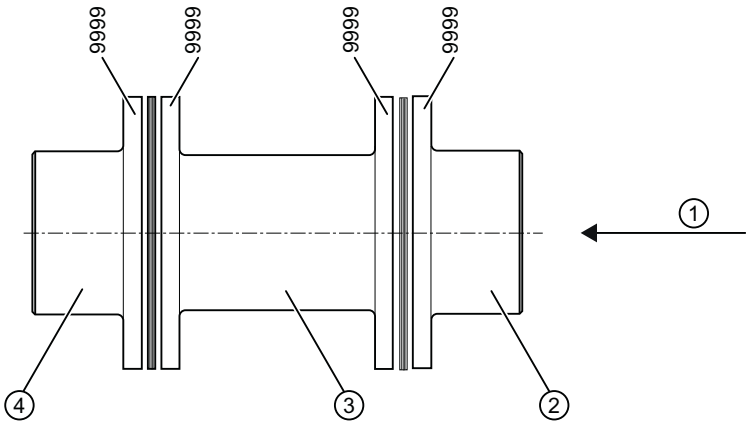
Figure 5-4 Complete clamping hub assembly (12) or (22)

5.2.2 Assembling couplings that are balanced as assembly

NOTICE
Material damage as a result of inadequate balance quality
Negative impact on the balance quality by not observing the marking. • Only bolt coupling parts together with the same numbers at the outer diameter. • Arrange the coupling parts so that the numbers are in one line and can be read from one direction (see the diagram).

For couplings, which are balanced as assembly, each individual coupling components has a multi-digit number at the outer flange diameter.

In the diagram, as example, the number 9999 is selected.



① Can be read from this direction
② Hub
③ Spacer/intermediate unit
④ Hub
9999 Any number to mark balancing as assembly

Figure 5-5 Marking for balancing as assembly

5.2.3 Aligning the units

Procedure for types NEN or MCECM

1. Move the machines to be coupled close to one another. Observe clearance S for types NEN or MCECM in Section Torques, speeds, geometry data and weights (Page 67).
2. Carefully align the machines.
3. For type MCECM, mount the intermediate unit. Observe the instructions provided in Section Assembling the intermediate unit (Page 35).

4. For type NEN, mount the spacer. Observe the instructions provided in Section Assembling the spacer (Page 35).
5. For type NEN, mount the plate pack. Observe the instructions provided in the associated assembly instructions from Section Assembling the plate pack (Page 38).

Procedure for types BEB or BEN

1. For type BEN, position the plate pack between the spacer and a B hub. For type BEB, position the plate packs between the spacer and two B hubs.
2. Mount the spacer. Observe the instructions provided in Section Assembling the spacer (Page 35).
3. Move the machines to be coupled close to one another. Observe clearance S1 for types BEB or BEN in Section Torques, speeds, geometry data and weights (Page 67).
4. Carefully align the machines.
5. For type BEN, position the plate pack between the spacer and a N hub.
6. Assembling the plate pack. Observe the instructions provided in the associated assembly instructions from Section Assembling the plate pack (Page 38).

5.2.4 Assembling the spacer

Procedure

1. Clean the spacer.
2. Check the fitting holes and the contact surface of the flange to ensure that they are in a perfect condition.
3. Position the spacer. Hold or support the spacer.
4. Align the bolting points. Observe any markings that might be provided corresponding to Section Assembling couplings that are balanced as assembly (Page 34).

5.2.5 Assembling the intermediate unit

The intermediate unit is supplied as individual parts

1. Clean the spacer.
2. Check the centering, the fitting holes and the contact surfaces of the flange to ensure that they are in a perfect condition.
3. Assemble the individual parts to create the intermediate unit. Observe the instructions provided in the associated assembly instructions from Section Assembling the plate pack (Page 38).

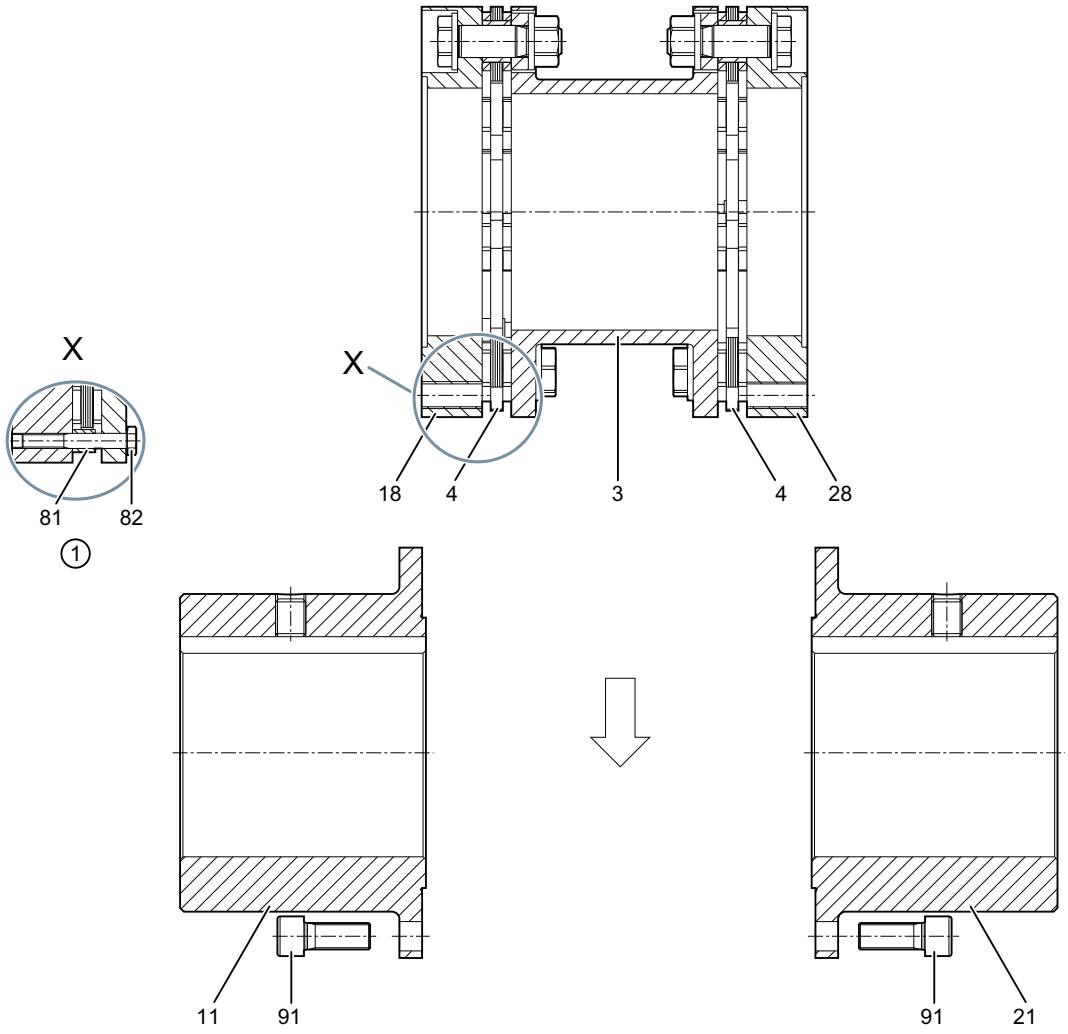
4. Attach the spacers (81) and the screws (82) of the transport lock.
5. Assemble the intermediate unit corresponding to the following instructions. Start with Point 4.

Preassembled intermediate unit

1. The intermediate unit with preassembled plate packs remains assembled. The plate packs are secured using transport locks (81; 82).
2. Clean the intermediate unit.
3. Check the centering and the contact surfaces of the flange to ensure that they are in a perfect condition.
4. Tighten screws (82) one after the other until the spacers (81) are in contact with the flange.
5. Position the intermediate unit between the flanges. Hold or support the intermediate unit.
6. Align the bolting points. Observe any markings that might be provided corresponding to Section Assembling couplings that are balanced as assembly (Page 34).
7. Tighten the bolts (91) finger-tight.
8. Remove the screws (82) and spacers (81).

⚠ WARNING
Danger when operated with transport locks Remove all of the transport locks (81 and 82), before you tighten screws (91) with the specified tightening torque.

9. Tighten the screws (91) diagonally and evenly with the specified tightening torque. The tightening torques are listed in Section Threaded joint C flange with the M hub (Page 80).



3	Spacer
4	Plate pack
11	Hub
18	C flange
21	Hub
28	C flange
81	Spacer (transport lock)
82	Screw (transport lock)
91	Screws
①	Individual unit X: Transport lock

Figure 5-6 Assembling the intermediate unit

5.2.6 Assembling the plate pack

Assemble the plate pack corresponding to the associated assembly instructions.

Plate packs are supplied in individual packages. The scope of delivery includes German assembly instructions for the plate packs. Instructions in other languages must be separately ordered.

The following data and instructions are included in the assembly instructions for plate packs.

- Instructions to assemble plate packs.
- Tightening torques for bolting the plate packs.
- Data on aligning the coupling.

Refer to the table for the associated assembly instructions.

Series	Type	Assembly instructions
ARN-6	3-part; with fitting screw connection NEN, BEB, BEN, KEK, KEN, BEK	AN 4280
	5-part; with fitting screw connection MCECM	

Commissioning 6

⚠ DANGER

Danger due to igniting deposits

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

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

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

Testing before commissioning

⚠ DANGER

Danger

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

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

1. Carefully check that all of the transport locks (81) and (82) have been removed.
2. Check the tightening torques of the screws of the coupling in accordance with section Tightening torques and widths A/F (Page 80) and in accordance to the associated assembly instructions from Section Assembling the plate pack (Page 38).
3. Check the tightening torques of the foundation bolts of the coupled machines.
4. Check whether suitable enclosures (ignition protection, coupling guard, touch protection) have been installed and that the function of the coupling has not been adversely affected by the enclosure. This also applies to test runs and rotational direction checks.

Operation 7

7.1 Normal operation of the coupling

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

7.2 Faults - causes and rectification

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

Look out specifically for the following faults during coupling operation:

- Unusual coupling noise
- Sudden occurrence of shocks

7.2.1 Procedure in the event of malfunctions

⚠ DANGER

Danger due to bursting of the coupling

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

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

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

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

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

7.2.2 Identifying the fault cause

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

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

⚠ WARNING

Physical injury

Injury from rotating parts.

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

Intended use

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

7.2.2.1 Possible faults

Table 7-1 Table of faults

Fault	Cause	Rectification
Sudden changes in the noise level and/ or sudden occurrences of shocks	Broken plate	Follow the instructions given in section Replacing the plate pack (Page 44).
	Changed alignment	Follow the instructions given in Section Correcting the changed alignment (Page 44).
	Coupling not suitable for the operating conditions. Check the possible causes given in section Unsuitable coupling (Page 43).	Use a coupling that is suitable for the operating conditions.
	Incorrect assembly of the coupling. Check the possible causes in Section Assembly-related causes (Page 43) und Specific assembly-related and maintenance-related causes (Page 44).	Reassemble the coupling in accordance with these instructions. Observe all of the specifications and regulations in Chapter Assembly (Page 25).
	Incorrect maintenance of the coupling. Check the possible causes in Section Maintenance-related causes (Page 44) und Specific assembly-related and maintenance-related causes (Page 44).	Observe all of the specifications and regulations in Chapter Maintenance (Page 45).
	Exceeding the coupling overload torque	Make a visual inspection.

7.2.2.2 Possible causes

Unsuitable coupling

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

Assembly-related causes

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

Maintenance-related causes

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

Specific assembly-related and maintenance-related causes

- Plate packs not assembled.
- Plate packs do not comply with the technical specification for the specific application
- Clamping ring is not in contact with the clamping hub.

7.2.3 Correcting faults

7.2.3.1 Replacing the plate pack

1. Checking the plate pack.
2. If a plate is broken, then replace the complete plate pack. Observe the instructions provided in Section Replacing the plate pack (Page 45).

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 couplings for damage.
3. Check the locking elements that prevent axial movements and correct these as required.
4. Realign the coupling. Observe the instructions provided in the associated assembly instructions from Section Assembling the plate pack (Page 38).

Maintenance 8

8.1 Maintenance intervals

⚠ DANGER

Danger due to bursting of the coupling

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

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

⚠ 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 coupling every 12 months for any abnormalities. Carry out a visual inspection.

Remove any faults. Troubleshooting notes are provided in Chapter Operation (Page 41).

8.2 Replacing the plate pack

⚠ DANGER

Danger if the coupling breaks up

If you do not observe the information stipulated here regarding replacement of plate packs, this can cause the coupling to break-up in operation. There is a risk of fatal injury from flying fragments. If a coupling breaks-up in a hazardous zone, then this can result in an explosion.

- Please observe all the stipulations concerning the replacement of wearing plate packs.

Note

Replacing the plate pack assembly

If individual parts of the plate pack are damaged, replace the complete plate pack assembly.

If you must replace the plate pack, then we recommend that you return the half coupling to Flender for repair and balancing.

If you replace the plate pack yourself, do not move the coupled machines.

Remove the spacer or the intermediate unit corresponding to the instructions in Section Disassembling the coupling (Page 46).

When removing and when re-assembling the plate packs, carefully follow the instructions in the associated assembly instructions from Section Assembling the plate pack (Page 38).

8.3 Disassembling the coupling

Disassembling the coupling involves the following steps:

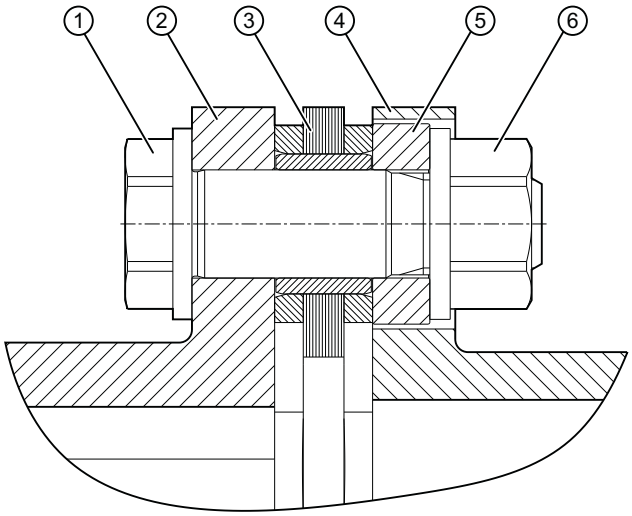
- Disassembling the spacer (Page 46)
- Disassembling the intermediate unit (Page 47)
- Disassembling the hubs (Page 48)

8.3.1 Disassembling the spacer

Procedure

1. Support the spacer.
2. Release all of the flanged nuts one after the other (6).
3. Remove the flanged nuts (6), the fitting bolts (1) and the (5) and the capture ring.
4. For types without B hub, remove the spacer and the plate packs without moving the coupled machines.
5. For types with B hub, remove the spacer and the plate packs by shifting the coupled machines.
6. Check the hubs, spacer and the plate packs for damage and protect them against corrosion.
7. Replace any damaged parts.

When reassembling the spacer, observe the information in chapters Assembly (Page 25) and Commissioning (Page 39).



① Fitting bolt
② Flange
③ Plate pack
④ Flange
⑤ Capture ring
⑥ Collar nut

Figure 8-1 Detailed view of the fitting bolt connection

8.3.2 Disassembling the intermediate unit

Procedure

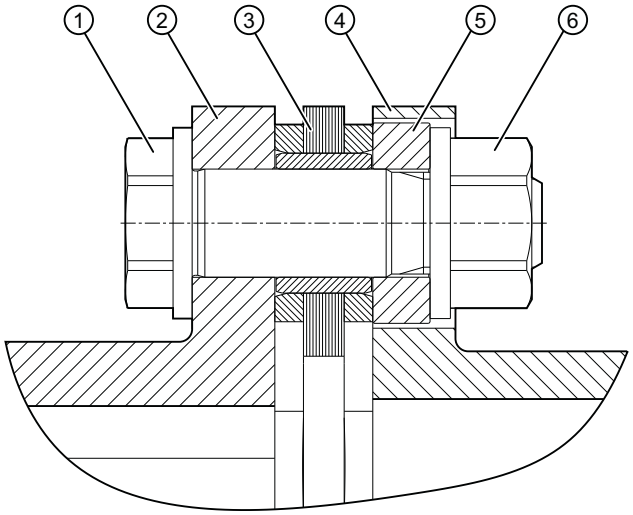
1. Attach the spacers (81) of the transport lock and insert the screws without tightening them (82)
2. Support the intermediate unit.
3. Remove the screws (91).
4. Tighten screws (82) one after the other until the spacers (81) are in contact with the flange.
5. Remove the intermediate unit from the centering by screwing the forcing-off screws into the forcing-off threaded holes.
6. Remove the intermediate unit.
7. Check the hubs, intermediate unit and the plate packs for damage and protect them against corrosion.
8. Replace any damaged parts.

When reassembling the intermediate unit, observe the information in chapters Assembly (Page 25) and Commissioning (Page 39).

Disassembling the intermediate unit

1. Secure the individual parts.
2. Release all of the flanged nuts one after the other (6).
3. Remove the flanged nuts (6), the fitting bolts (1) and the (5) and the capture ring.
4. Remove the plate pack.
5. Check the individual parts for damage and protect them against corrosion.
6. Replace any damaged parts.

When reassembling the intermediate unit, observe the information in chapters Assembly (Page 25) and Commissioning (Page 39).



① Fitting bolt
② Flange
③ Plate pack
④ Flange
⑤ Capture ring
⑥ Collar nut

Figure 8-2 Detailed view of the fitting bolt connection

8.3.3 Disassembling the hubs

NOTICE
Property damage
Damage to the shaft end, the hub and/or the parallel key. • Note the handling instructions when disassembling the hub.

The procedure for disassembling the hubs varies depending on the selected shaft-hub connection.

- Disassembling hubs with shaft-hub connection through a parallel key (Page 49)
- Disassembling the hub with shaft and hub connected through a pressurized oil interference fit (Page 50)
- Disassembling the clamping hubs (Page 52)

8.3.3.1 Disassembling hubs with shaft-hub connection through a parallel key

⚠ WARNING

Danger from burners and hot coupling parts

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

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

Procedure

1. Move the coupled machines apart.
2. Secure the hub to prevent it from falling.
3. Remove the axial locking element (set screw, end plate).
4. Use a suitable pulling fixture.
5. Heat up the hub using a burner above the parallel keyway along its length to maximum of 80 °C.
6. Withdraw the hub. 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 39).

8.3.3.2 Disassembling the hub with shaft and hub connected through a pressurized oil interference fit

⚠ DANGER

Oil pressure in excess of maximum permissible value

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

- Do not exceed the maximum oil pressure specified in the dimension drawing.
- Keep the oil pressure constant in all oil channels during the entire procedure.

⚠ DANGER

Danger as a result of improper handling of fixtures and pumps

Failure to handle fixtures and pumps properly can result in injuries. The coupling can burst. There is a risk of fatal injury from flying fragments. Bursting of the coupling can lead to an explosion in potentially explosive atmospheres.

- Please observe the manufacturer's information on handling the following tools:
  - Pulling fixtures
  - Pumps

⚠ WARNING

Risk of injury as a result of the hub or the forcing-off mechanism suddenly releasing.

When forcing off, the released hub or forcing-off mechanism can fall.

- Use suitable lifting gear to hold the hub and the forcing-off mechanism.
- Attach an axial locking element if the pressurised oil interference fit is tapered.

Note

Leaking oil

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

Tools required

- One oil pump with pressure gauge (at least 2500 bar) for each oil duct.
  Or:
  One motor-driven oil pump. One connection that can be closed independently is required for each oil channel.

  Refer to the dimension drawing for the number of oil channels.
- With a stepped bore:
  A motor-driven pump at the oil channel located at the point of transition from the smaller to the larger bore. A large quantity of oil per unit of time is needed here.
- Suitable connections and pipes.

- Suitable pulling fixture.
  Or:
  Retaining plate with retaining screws or threaded spindles with nuts. Screw and spindle material must have at least at least property class 10.9; material of the nuts depending on the material of the screws or spindles.
- Hydraulic cylinder with oil pump. Note displacement and pressure of the hydraulic cylinder. Refer to the dimension drawing for the required axial force.

Procedure

1. Move the coupled machines apart.
2. Use a suitable pulling fixture.
3. Secure the hub and the forcing-off mechanism so that they cannot fall.
4. Remove the screw plugs (10) or (20) from the oil ducts.
5. Deaerate an oil pump and connect it to the oil channel in the centre.
6. Pressurise the oil pump to the pressure specified in the dimension drawing until oil starts to escape from the adjacent connections or the front faces. Keep the pressure constant.
7. Deaerate the next oil pump and connect it to the adjacent oil channel.
8. Repeat steps 6 and 7 for the remaining oil ducts.
9. If so much oil escapes when pressure is applied that the pump cannot maintain the pressure, use a higher-viscosity oil.
10. Pressurise the hydraulic cylinder if oil escapes from both front faces as a closed oil ring. Make sure that the hub is immediately pulled off the shaft in a swift, smooth movement.

    Note

    Removal in several strokes

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

11. Remove the oil pump and the forcing-off mechanism from the hub.
12. Check the hub bore and the shaft for damage and protect them against corrosion.
13. Replace any damaged parts.

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

8.3.3.3 Disassembling the clamping hubs

⚠ WARNING

Risk of injury through incorrect disassembly

Risk of severe injury if the clamping ring (5) suddenly releases.

- Carefully comply with the described procedure.

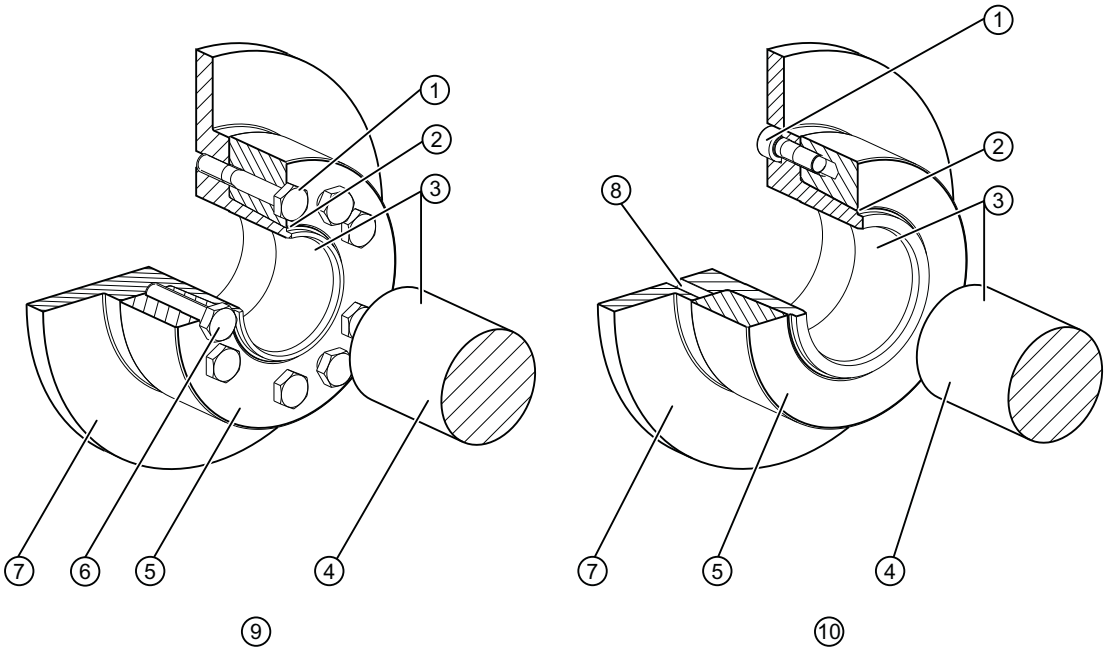
Procedure

1. Move the coupled machines apart.
2. Secure the clamping hub (7) and the clamping ring (5) so that they cannot fall.
3. Carefully release all of the clamping bolts (1) one after the other through just 1/4 revolution.
4. Repeat Step 3 until the clamping ring (5) releases.
5. If the clamping ring (5) is not released, you can use the forcing-off threaded holes arranged in an offset configuration to release it. Tighten the forcing-off screws (6) one after the other in several iterations:
6. Withdraw the clamping hub (7) together with the clamping ring (5). Use suitable lifting gear when doing this.
7. Clamping hub connections that have been released do not have to be disassembled and regreased.
8. Check all of the individual parts for damage and protect them against corrosion.
9. Replace any damaged parts.

When reassembling the hubs, observe the information in chapters Assembly (Page 25) and Commissioning (Page 39).

See also

Lubricant (Page 82)



① Clamping bolt
② Tapered surface lubricated
③ Grease-free
④ Shaft
⑤ Clamping ring
⑥ Forcing-off bolt (not included in the scope of delivery)
⑦ Clamping hub
⑧ Forcing off threaded hole
⑨ Clamping hub complete, type 124
⑩ Clamping hub complete, type 125

Figure 8-3 Complete clamping hub assembly (12) or (22)

Service and support

9

9.1 Contact

Contact

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

Flender GmbH

Schlavenhorst 100

46395 Bocholt

Germany

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

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

Disposal

10

Disposal of the coupling

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

Spare parts 11

11.1 Ordering spare parts

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

Note

Original spare parts

Use only original spare parts from Flender. Flender only accepts liability for original spare parts from Flender.

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

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

You can find the available spare parts for the coupling described here at Spare parts drawing and spare parts list (Page 60).

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

Information required when ordering spare parts

- Flender order number with item
- Flender drawing number
- Coupling type and size
- Part number (refer to Spare parts drawing and spare parts list (Page 60))
- Dimensions of the pare part, for example:
  - Bore
  - Bore tolerance
  - Parallel keyway and balancing
- Special dimensions, for example, flange connection dimensions, intermediate sleeve length or brake drum dimensions

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

11.2 Spare parts drawing and spare parts list

Note

Replacing the plate pack assembly

If individual parts of the plate pack are damaged, replace the complete plate pack assembly.

For information about the plate pack design and structure, refer to the associated assembly instructions provided in Section Assembling the plate pack (Page 38).

11.2.1 Type NEN

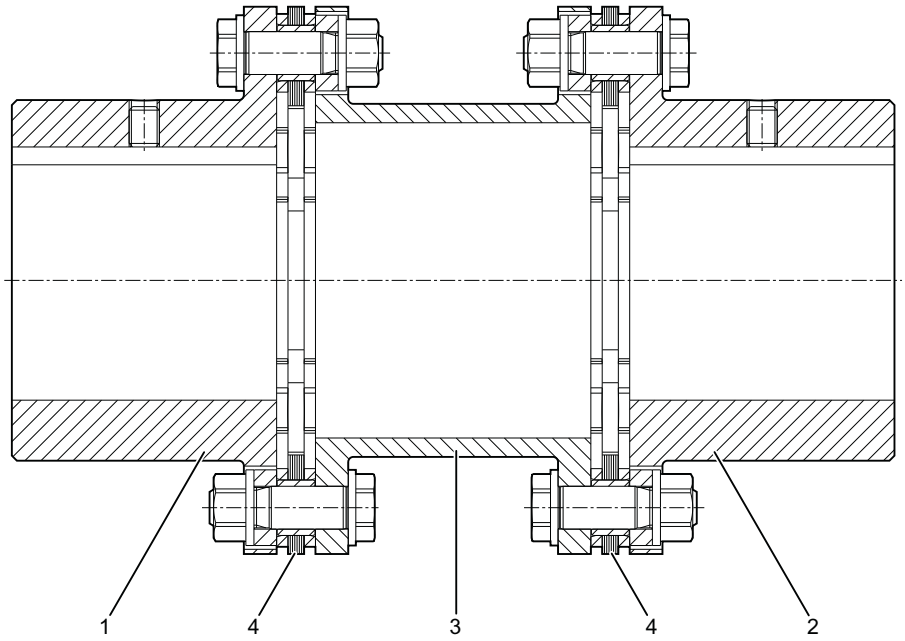


Figure 11-1 Spare parts drawing for type NEN

Table 11-1 Spare parts list for type NEN

Part number	Designation
1	N hub
2	N hub
3	E spacer
4	Plate pack
10	Screw plug[1)]
20	Screw plug[1)]

[1)] Screw plugs (10, 20) are only used in combination with a pressurized oil interference fit.

You can find a description of the screw plugs in Section Screw plug (Page 65).

11.2.2 Type BEB

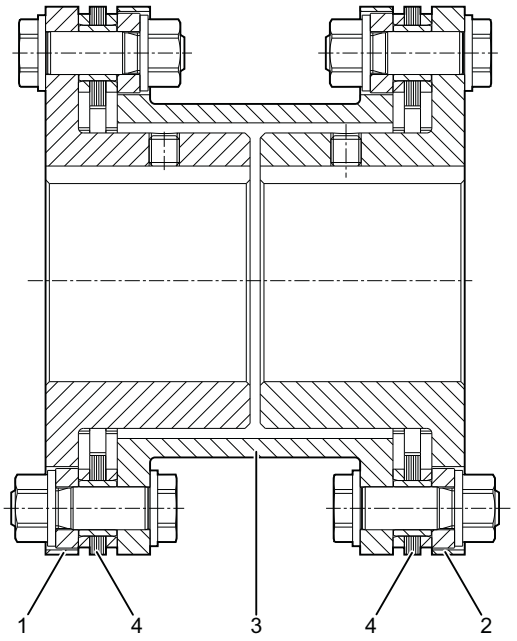


Figure 11-2 Spare parts drawing for type BEB

Table 11-2 Spare parts list for type BEB

Part number	Designation
1	B hub
2	B hub
3	E spacer
4	Plate pack
10	Screw plug[1)]
20	Screw plug[1)]

[1)] Screw plugs (10, 20) are only used in combination with a pressurized oil interference fit.

You can find a description of the screw plugs in Section Screw plug (Page 65).

11.2.3 Type BEN

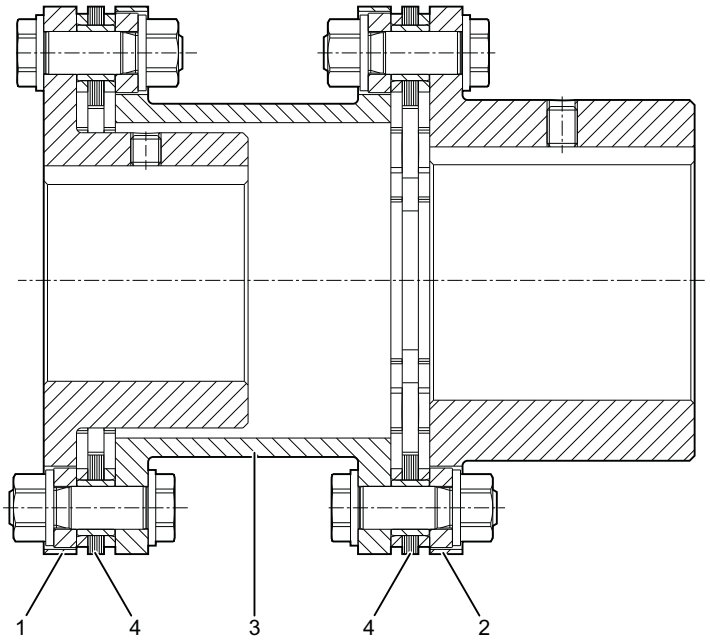


Figure 11-3 Spare parts drawing for type BEN

Table 11-3 Spare parts list for type BEN

Part number	Designation
1	B hub
2	N hub
3	E spacer
4	Plate pack
10	Screw plug[1)]
20	Screw plug[1)]

[1)] Screw plugs (10, 20) are only used in combination with a pressurized oil interference fit.

You can find a description of the screw plugs in Section Screw plug (Page 65).

11.2.4 Type MCECM

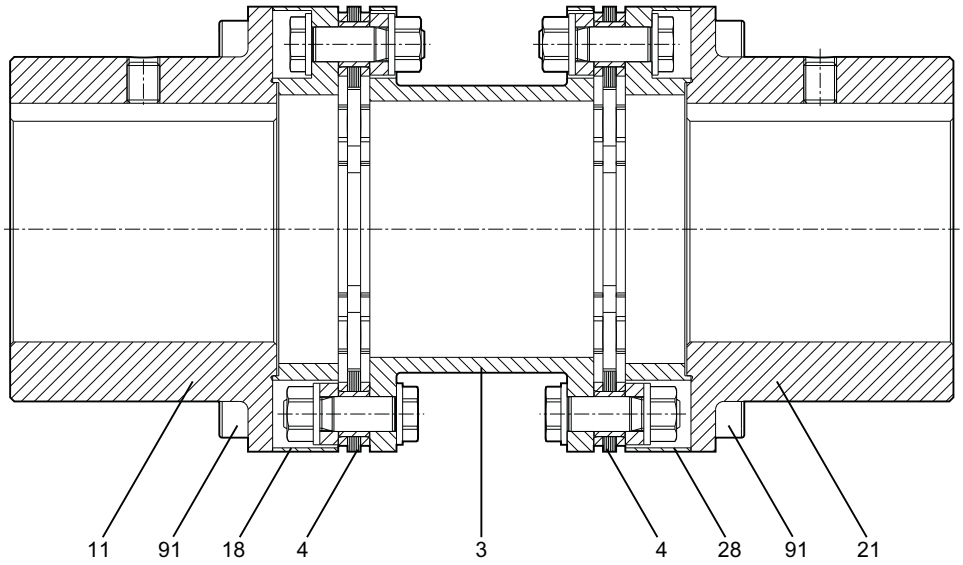


Figure 11-4 Spare parts drawing for type MCECM

Table 11-4 Spare parts list for type MCECM

Part number	Designation
3	E spacer[1)]
4	Plate pack[1)]
10	Screw plug[2)]
11	M hub
18	C flange[1)]
20	Screw plug[2)]
21	M hub
28	C flange[1)]
91	Screws

1) C flange (18), plate pack (4), E spacer (3), plate pack (4) and C flange (28), form the intermediate unit CEC.

2) Screw plugs (10, 20) are only used in combination with a pressurized oil interference fit.

You can find a description of the screw plugs in Section Screw plug (Page 65).

11.2.5 Screw plug

The following diagram shows the screw plugs (10) or (20):

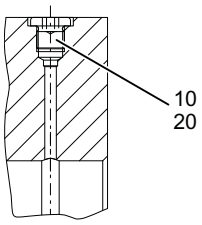


Figure 11-5 Screw plug

11.2.6 Additional hubs

11.2.6.1 Clamping hub complete

Instead of the N hub, typeNEN or BEN, you can also use the complete clamping hub (12) or (22). Types KEK, KEN or BEK are then obtained. You can find a description of the complete terminal hub in Section Dimension drawing of the complete clamping hub (Page 76).

Note

Replace complete clamping hub assembly (12) or (22)

If individual parts of the complete clamping hub assembly (12) or (22) are damaged, then replace the complete assembly.

Table 11-5 Spare parts list for types KEK, KEN or BEK

Part number	Designation	Type		
		KEK	KEN	BEK
1	B hub			x
2	N hub		x	
3	E spacer	x	x	x
4	Plate pack	x	x	x
10	Screw plug[1)]			
12	Clamping hub complete	x	x	
20	Screw plug[1)]			
22	Clamping hub complete	x		x

[1)] Screw plugs (10, 20) are only used in combination with a pressurized oil interference fit.

You can find a description of the screw plugs in Section Screw plug (Page 65).

Technical data

A

A.1 Torques, speeds, geometry data and weights

In this section you can find dimension drawings and technical data for N-ARPEX couplings, seriesARN-6 of the following types:

- Type NEN, dimension drawing (Page 68) and technical data (Page 69)
- Type BEB, dimension drawing (Page 70) and technical data (Page 71)
- Type BEN, dimension drawing (Page 72) and technical data (Page 73)
- Type MCECM, dimension drawing (Page 74) and technical data (Page 75)
- Clamping hub complete, dimension drawing (Page 76) and technical data (Page 77)

A.1.1 Dimension drawing of type NEN

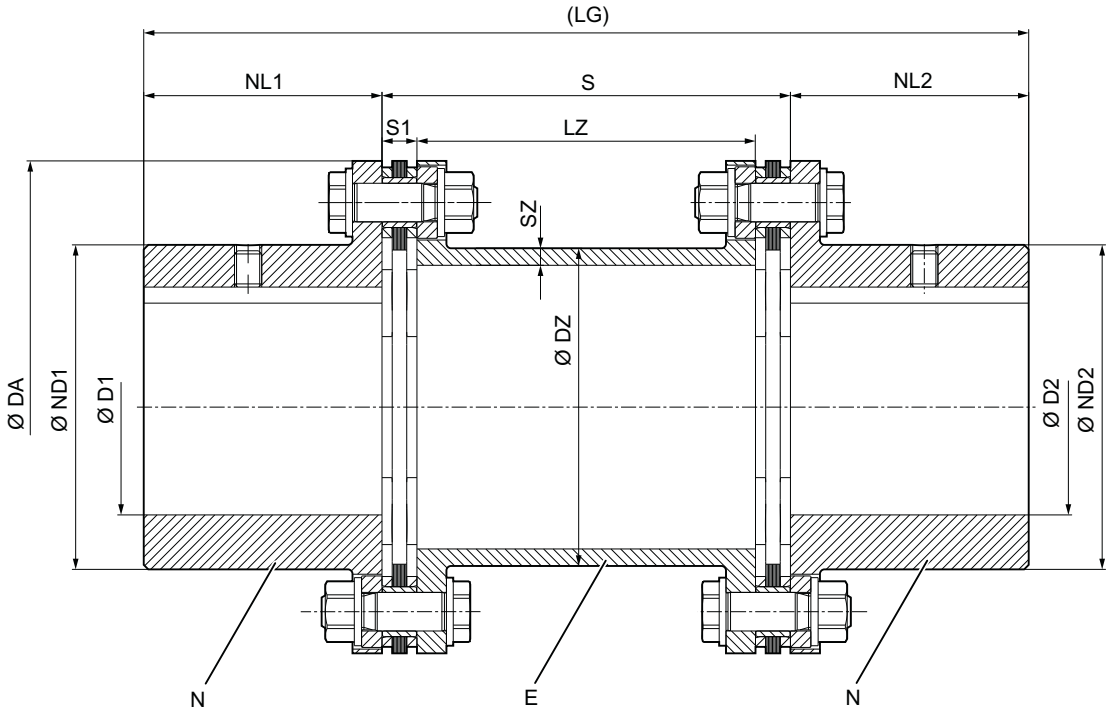


Figure A-1 Type NEN

A.1.2 Technical data of type NEN

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

Size	Rated torque	Speed	Maximum bore[1]										Weight[2]
	T_{KN}	n_{max}	D1 D2	DA	ND1 ND2	NL1 NL2	DZ	SZ	S1	S	LZ	LG	m kg
	Nm	rpm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
86-6	350	24 000	42	86	56	45	46	5.5	8.0	100	84	190	2.1
103-6	500	20 000	55	103	73	55	63	4.0	8.4	100	83.2	210	3.1
122-6	950	17 000	65	122	85	65	73	4.0	8.8	100	82.4	230	5.1
133-6	1 250	15 000	75	133	96	75	85	5.0	9.6	100	80.8	250	6.5
159-6	2 100	13 000	80	159	104	80	100	5.0	11.6	100	76.8	260	9.5
174-6	2 400	12 000	90	174	118	85	116	5.5	12.8	100	74.4	270	12.0
184-6	3 800	11 000	95	184	124	90	124	7.0	14.6	140	110.8	320	16.4
203-6	5 000	10 000	100	203	135	95	128	6.5	15.0	140	110	330	21.1
217-6	6 200	9 500	110	217	143	105	140	7.5	15.4	140	109.2	350	24.9
251-6	10 500	8 000	120	251	160	110	160	10.0	20.6	180	138.8	400	38.8
268-6	13 800	7 500	130	268	170	130	170	10.0	22.0	180	136	440	49.5
291-6	18 200	7 000	145	291	190	140	190	10.0	22.8	180	134.4	460	61.9
318-6	23 000	6 500	155	318	205	150	205	12.5	23.2	200	153.6	500	83.1
343-6	28 000	6 000	170	343	230	160	230	15.0	24.0	200	152	520	104.1

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

2) Weight applies to one coupling with maximum bore.

Note

For a deviating LZ dimension, you can calculate the new S dimension as follows:

$S_{new} = LZ_{available} + 2 \times S1$

A.1.3 Dimension drawing of type BEB

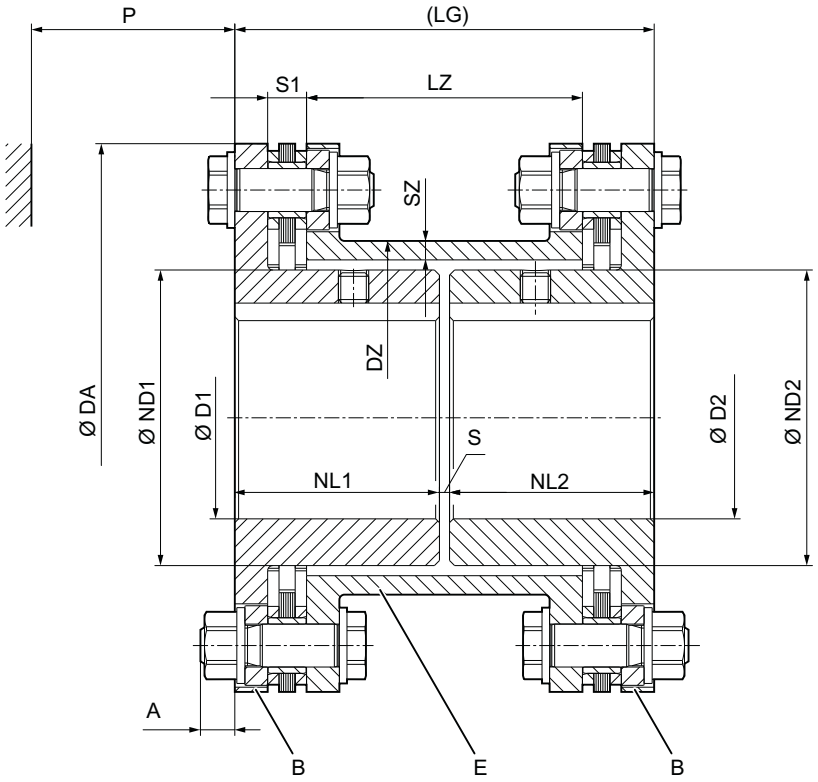


Figure A-2 Type BEB

A.1.4 Technical data of type BEB

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

Size	Rated torque T_{KN}	Speed n_{max}	Maximum bore[1] D1 / D2	DA	ND1 / ND2	NL1 / NL2	DZ	SZ	S1	S	LZ	A	P	LG	Weight[2] m
	Nm	rpm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg
86-6	350	24 000	22	86	33	30	46	5.5	8.0	12	44.0	8	32	72	1.5
103-6	500	20 000	38	103	53	34	63	4.0	8.4	4	43.2	8	32	72	2.0
122-6	950	17 000	48	122	63	56	73	4.0	8.8	4	82.4	8	38	116	4.3
133-6	1 250	15 000	55	133	72	56	85	5.0	9.6	4	80.8	7	38	116	5.2
159-6	2 100	13 000	65	159	85	57	100	5.0	11.6	4	76.8	11	48	118	7.8
174-6	2 400	12 000	75	174	98	77	116	5.5	12.8	4	114.4	10	48	158	11.0
184-6	3 800	11 000	80	184	104	80	124	7.0	14.6	4	110.8	17	64	164	14.7
203-6	5 000	10 000	85	203	111	80	128	6.5	15.0	4	110.0	16	64	164	17.7
217-6	6 200	9 500	90	217	117	81	140	7.5	15.4	4	109.2	14	66	166	21.2
251-6	10 500	8 000	100	251	130	102	160	10.0	20.6	6	138.8	15	77	210	34.4
268-6	13 800	7 500	108	268	141	105	170	10.0	22.0	6	136.0	17	89	216	43.5
291-6	18 200	7 000	120	291	156	106	190	10.0	22.8	6	134.4	15	89	218	52.4
318-6	23 000	6 500	130	318	169	118	205	12.5	23.2	6	153.6	20	100	242	71.4
343-6	28 000	6 000	150	343	195	143	230	15.0	24.0	6	202.0	19	100	292	93.1

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

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

A.1.5 Dimension drawing of type BEN

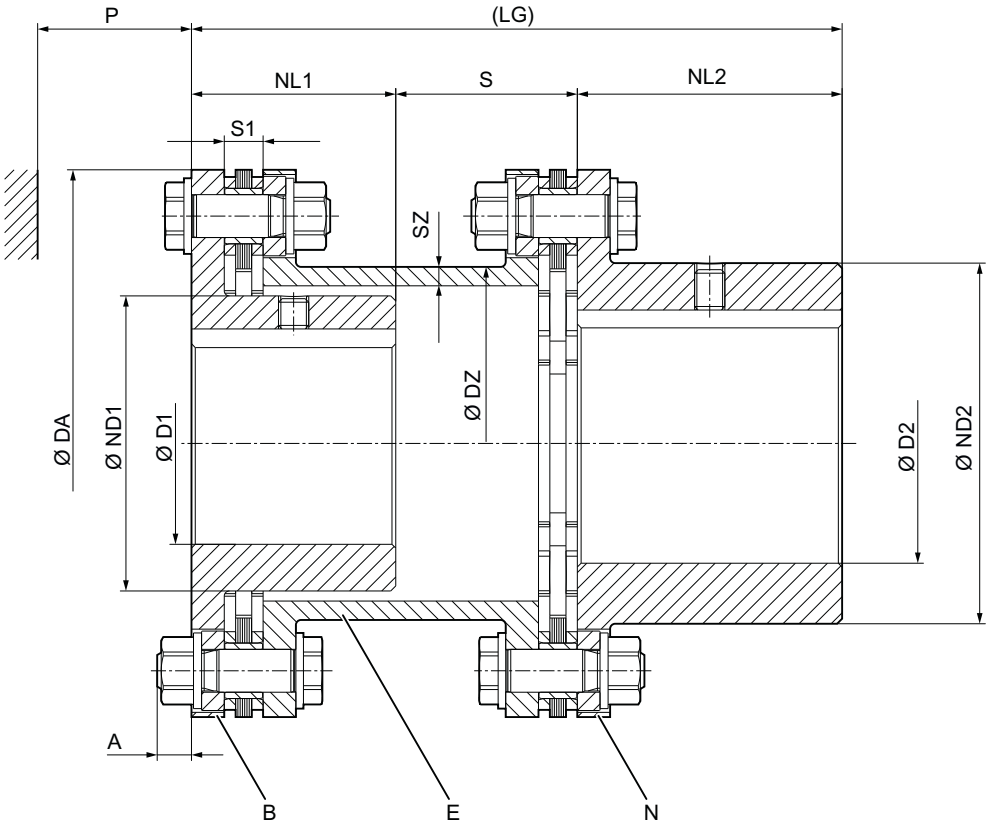


Figure A-3 Type BEN

A.1.6 Technical data of type BEN

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

Size	Rated torque T_{KN} Nm	Speed n_{max} rpm	Maximum bore[1] D1 mm	Maximum bore[1] D2 mm	DA mm	ND1 mm	ND2 mm	NL1 mm	NL2 mm	DZ mm	SZ mm	S1 mm	S mm	A mm	P mm	LG mm	Weight[2] m kg
86-6	350	24 000	22	42	86	33	56	30	45	46	5.5	8.0	58	8	32	118	1.6
103-6	500	20 000	38	55	103	53	73	34	55	63	4.0	8.4	59	8	32	127	2.4
122-6	950	17 000	48	65	122	63	85	56	65	73	4.0	8.8	82	8	38	194	4.7
133-6	1 250	15 000	55	75	133	72	96	56	75	85	5.0	9.6	84	7	38	196	5.8
159-6	2 100	13 000	65	80	159	85	104	57	80	100	5.0	11.6	86	11	48	200	8.6
174-6	2 400	12 000	75	90	174	98	118	77	85	116	5.5	12.8	108	10	48	262	11.8
184-6	3 800	11 000	80	95	184	104	124	80	90	124	7.0	14.6	108	17	64	268	15.6
203-6	5 000	10 000	85	100	203	111	135	80	95	128	6.5	15.0	113	16	64	273	19.4
217-6	6 200	9 500	90	110	217	117	143	81	105	140	7.5	15.4	114	14	66	276	23.1
251-6	10 500	8 000	100	120	251	130	160	102	110	160	10.0	20.6	143	15	77	347	36.6
268-6	13 800	7 500	108	130	268	141	170	105	130	170	10.0	22.0	145	17	89	355	46.5
291-6	18 200	7 000	120	145	291	156	190	106	140	190	10.0	22.8	149	15	89	361	57.1
318-6	23 000	6 500	130	155	318	169	205	118	150	205	12.5	23.2	162	20	100	398	77.3
343-6	28 000	6 000	150	170	343	195	230	143	160	230	15.0	24.0	128	19	100	414	100.6

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

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

A.1.7 Dimension drawing of type MCECM

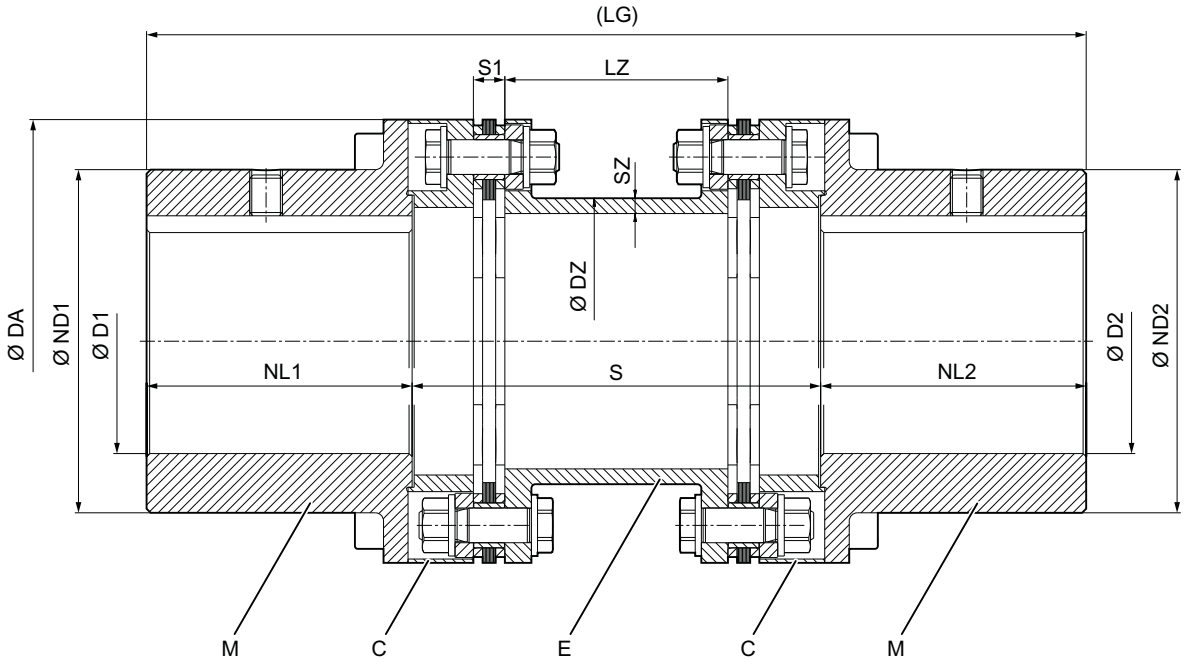


Figure A-4 Type MCECM

A.1.8 Technical data of type MCECM

Table A-4 Torques, speeds, geometry data and weights of type MCECM

Size	Rated torque	Speed	Maximum bore[1]										Weight[2]
	T_{KN}	n_{max}	D1 D2	DA	ND1 ND2	NL1 NL2	DZ	SZ	S1	S	LZ	LG	m
	Nm	rpm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg
86-6	350	24 000	42	86	62	42	46	5.5	8.0	140	84.0	224	3.1
103-6	500	20 000	55	103	72	55	63	4.0	8.4	140	83.2	250	4.4
122-6	950	17 000	70	122	91	70	73	4.0	8.8	140	82.4	280	7.6
133-6	1 250	15 000	80	133	103	80	85	5.0	9.6	140	80.8	300	9.4
159-6	2 100	13 000	95	159	123	95	100	5.0	11.6	140	76.8	330	15.0
174-6	2 400	12 000	105	174	136	105	116	5.5	12.8	140	74.4	350	19.4
184-6	3 800	11 000	110	184	142	110	124	7.0	14.6	200	110.8	420	25.6
203-6	5 000	10 000	115	203	150	115	128	6.5	15.0	200	110.0	430	31.8
217-6	6 200	9 500	130	217	168	130	140	7.5	15.4	200	109.2	460	39.7
251-6	10 500	8 000	150	251	193	150	160	10.0	20.6	250	138.8	550	62.7
268-6	13 800	7 500	160	268	206	160	170	10.0	22.0	250	136.0	570	76.0
291-6	18 200	7 000	170	291	221	170	190	10.0	22.8	250	134.4	590	92.4
318-6	23 000	6 500	190	318	245	190	205	12.5	23.2	300	153.6	680	131.7
343-6	28 000	6 000	205	343	267	205	230	15.0	24.0	300	152.0	710	161.6

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

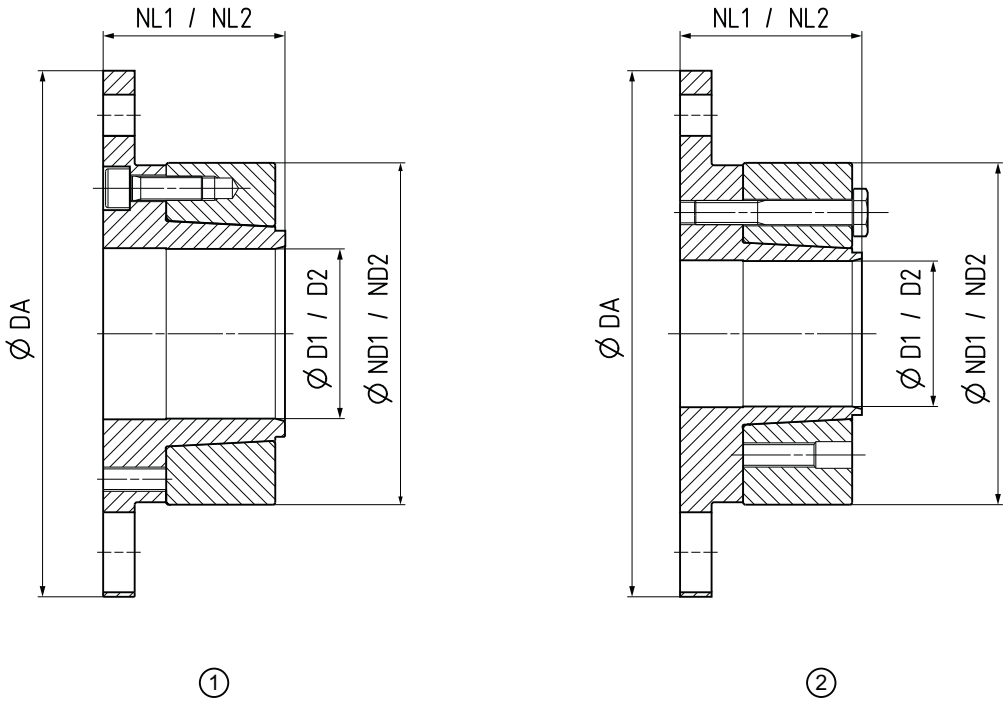
2) Weight applies to one coupling with maximum bore.

Note

For a deviating LZ dimension, you can calculate the new S dimension as follows:

$S_{new} = S_{Table} + LZ_{available} - LZ_{Table}$

A.1.9 Dimension drawing of the complete clamping hub



① Clamping hub, type 125
② Clamping hub, type 124

Figure A-5 Clamping hub

A.1.10 Technical data of the complete clamping hub

Table A-5 Speeds, geometry data and weights of the complete terminal hub

Size	Clamping hub Type	Bore D1 / D2 min. mm	Bore D1 / D2 max. mm	DA mm	ND1 ND2 mm	NL1 NL2 mm	Weight[1] m kg
86-6	124	19	25	86	50	35	0.5
	125						
103-6	124	25	38	103	67	40	0.9
	125						
122-6	124	30	42	122	77	45	1.5
	125						
133-6	124	32	50	133	88	50	2.0
	125						
159-6	124	35	60	159	105	55	3.2
	125						
174-6	124	40	70	174	120	65	4.6
	125						
184-6	124	45	70	184	126	70	5.9
	125						
203-6	124	50	80	203	139	75	7.4
	125						
217-6	124	60	90	217	147	90	9.2
	125						
251-6	124	70	95	251	168	95	14.0
	125						
268-6	124	75	100	268	175	115	18.5
	125						
291-6	124	80	120	291	195	125	22.9
	125						
318-6	124	85	120	318	209	140	31.5
	125						
343-6	124	95	140	343	234	150	39.6
	125						

[1] Weight applies to one coupling hub with maximum bore

Table A-6 Maximum torque that can be transmitted by the clamping hub depending on the finished bore

Bore 1)	Size													
	86-6	103-6	122-6	133-6	159-6	174-6	184-6	203-6	217-6	251-6	268-6	291-6	318-6	343-6
	Rated coupling torque T_{KN} Nm													
	350	500	950	1250	2100	2400	3800	5000	6200	10500	13800	18200	23000	28000
D1 / D2 mm	Maximum torque that can be transmitted by the clamping hub Nm													
19	400	-	-	-	-	-	-	-	-	-	-	-	-	-
20	460	-	-	-	-	-	-	-	-	-	-	-	-	
22	470	-	-	-	-	-	-	-	-	-	-	-	-	
24	350	-	-	-	-	-	-	-	-	-	-	-	-	
25	370	480	-	-	-	-	-	-	-	-	-	-	-	-
28	-	870	-	-	-	-	-	-	-	-	-	-	-	-
30	-	1150	1770	-	-	-	-	-	-	-	-	-	-	-
32	-	1140	1830	2300	-	-	-	-	-	-	-	-	-	-
35	-	570	1420	2360	3050	-	-	-	-	-	-	-	-	-
38	-	830	1720	3040	2710	-	-	-	-	-	-	-	-	-
40	-	-	1370	2610	3660	3680	-	-	-	-	-	-	-	-
42	-	-	1670	2930	2180	4020	-	-	-	-	-	-	-	-
45	-	-	-	2120	3750	4110	5780	-	-	-	-	-	-	-
48	-	-	-	2480	4160	4930	6200	-	-	-	-	-	-	-
50	-	-	-	2240	2300	4300	5840	7190	-	-	-	-	-	-
55	-	-	-	-	3310	5370	6410	7970	-	-	-	-	-	-
60	-	-	-	-	3260	3730	5370	8840	7570	-	-	-	-	-
65	-	-	-	-	-	4700	6240	8890	10390	-	-	-	-	-
70	-	-	-	-	-	4150	5920	8460	10640	14050	-	-	-	-
75	-	-	-	-	-	-	-	7960	9590	15350	20710	-	-	-
80	-	-	-	-	-	-	-	7340	8850	13510	20120	31840	-	-
85	-	-	-	-	-	-	-	-	7890	16370	21130	31230	36420	-
90	-	-	-	-	-	-	-	-	6290	14300	20810	33300	39050	-
95	-	-	-	-	-	-	-	-	-	13310	18570	33530	35940	54230
100	-	-	-	-	-	-	-	-	-	-	14440	31710	37500	56580
110	-	-	-	-	-	-	-	-	-	-	-	29020	35200	56900
120	-	-	-	-	-	-	-	-	-	-	-	22600	31490	53580
130	-	-	-	-	-	-	-	-	-	-	-	-	-	50910
140	-	-	-	-	-	-	-	-	-	-	-	-	-	43600

1) Finished bore / shaft with standard G6 / h6 fit.

Note

Risk of explosion when the maximum torque that can be transmitted by the friction-locked connection is exceeded

The maximum torque that can occur in operation must not exceed the maximum torque that can be transmitted using the friction-locked connection.

The maximum torques that can be transmitted for the clamping hub listed here are applicable for the standard G6/h6 fit.

Contact Flender for different finished bores and/or fit pairs.

A.2 Shaft misalignment values during operation

The following table shows the maximum permissible shaft misalignment values ΔKa_{perm} and ΔKw_{perm}. The values are rounded and specified in mm.

Table A-7 Maximum permissible shaft misalignment values during operation

Size	Permissible angular offset $\pm\Delta Kw_{perm}$										
	0.0°	0.1°	0.2°	0.3°	0.4°	0.5°	0.6°	0.7°	0.8°	0.9°	1.0
	Permissible axial offset $\pm\Delta Ka_{perm}$ in mm										
86-6	1.2	1.1	1.0	0.8	0.7	0.6	0.5	0.4	0.2	0.1	0.0
103-6	1.4	1.3	1.1	1.0	0.8	0.7	0.6	0.4	0.3	0.1	0.0
122-6	2.0	1.8	1.6	1.4	1.2	1.0	0.8	0.6	0.4	0.2	0.0
133-6	2.2	2.0	1.8	1.5	1.3	1.1	0.9	0.7	0.4	0.2	0.0
159-6	2.6	2.3	2.1	1.8	1.6	1.3	1.0	0.8	0.5	0.3	0.0
174-6	3.0	2.7	2.4	2.1	1.8	1.5	1.2	0.9	0.6	0.3	0.0
184-6	3.2	2.9	2.6	2.2	1.9	1.6	1.3	1.0	0.6	0.3	0.0
203-6	3.4	3.1	2.7	2.4	2.0	1.7	1.4	1.0	0.7	0.3	0.0
217-6	3.4	3.1	2.7	2.4	2.0	1.7	1.4	1.0	0.7	0.3	0.0
251-6	4.1	3.7	3.3	2.9	2.5	2.1	1.6	1.2	0.8	0.4	0.0
268-6	4.2	3.8	3.4	2.9	2.5	2.1	1.7	1.3	0.8	0.4	0.0
291-6	4.6	4.1	3.7	3.2	2.8	2.3	1.8	1.4	0.9	0.5	0.0
318-6	5.0	4.5	4.0	3.5	3.0	2.5	2.0	1.5	1.0	0.5	0.0
343-6	5.3	4.8	4.2	3.7	3.2	2.7	2.1	1.6	1.1	0.5	0.0

The maximum permissible radial misalignment ΔKr_{perm} depends on the distance between shafts S.

Calculate the permissible radial misalignment ΔKr_{perm} as follows:

Type NEN, KEN, KEK:
$\Delta Kr_{perm} = (S - S1) \times \tan(\Delta Kw)$

Type BEB, BEN, BEK und MCECM:
$\Delta Kr_{perm} = (LZ + S1) \times \tan(\Delta Kw)$

Note

The permissible shaft misalignments ΔKa, ΔKr and ΔKw are maximum values, and it is not permissible that they simultaneously occur.

A.3 Tightening torques and widths A/F

For tightening torques for bolting the plate packs, refer to the associated mounting instructions provided in Section Assembling the plate pack (Page 38).

A.3.1 Threaded joint C flange with the M hub

Table A-8 Tightening torques and widths across flats for the bolt connection C flange with the M hub

Size	Bolt (91)	Tightening torque	Width across flats Allen screw
		T_A Nm	SW mm
86-6	M6	10	5
103-6	M8	25	6
122-6	M8	25	6
133-6	M8	25	6
159-6	M10	49	8
174-6	M10	49	8
184-6	M12	86	10
203-6	M14	135	12
217-6	M14	135	12
251-6	M16	210	14
268-6	M18	290	14
291-6	M20	410	17
318-6	M22	560	17
343-6	M22	560	17

Apply the recommended tightening torques in accordance with the stipulations in section Tightening procedure (Page 82).

A.3.2 Bolting of the complete clamping hub

Table A-9 Tightening torques and widths across flats for the bolt connection of the complete clamping hub

Size	Clamping bolt	Tightening torque	Width across flats	
			Type 124 Hexagon head bolt	Type 125 Allen screw
		T_A Nm	SW mm	SW mm
86-6	M5	8	8	4
103-6	M6	14	10	5
122-6	M6	14	10	5
133-6	M8	35	13	6
159-6	M8	35	13	6
174-6	M10	69	17	8
184-6	M10	69	17	8
203-6	M12	120	19	10
217-6	M10	69	17	8
251-6	M12	120	19	10
268-6	M12	120	19	10
291-6	M16	290	24	14
318-6	M16	290	24	14
343-6	M16	290	24	14

Apply the recommended tightening torques in accordance with the stipulations in section Tightening procedure (Page 82).

A.4 Tightening procedure

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

Table A-10 Tightening procedure

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

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

A.5 Lubricant

Lubricant paste	Manufacturer
OPTIMOL OPTIMOLY PASTE PL	Castrol Industrie GmbH 41179 Mönchengladbach Germany
LP 430	Microgleit GmbH 74357 Bönnigheim Germany
AEMA-SOL M019 P/PS	Matthes GmbH 42653 Solingen Germany
Klüberpaste ALTEMP QNB 50	Klüber Lubrication KG 81379 Munich Germany
Klüberpaste 46 MR 401	Klüber Lubrication KG 81379 Munich Germany
MOLYCOTE G-RAPID PLUS PASTE	Dow Corning Europe S.A. 7180 Seneffe Belgium

Quality documents

B

B.1 Declaration of Conformity

EU declaration of conformity

Product:
FLENDER N-ARPEX® coupling
Type ARN-6

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

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

Object of the declaration is the product specified above.

The object of the declaration described above is in conformity with the relevant harmonisation legislation of the Union:
– Directive 2014/34/EU Official Journal L 96, 29.3.2014, pages 309-356

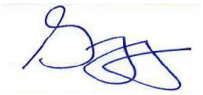
Harmonised standards or other technical specifications, on which the declaration of conformity is based:

EN 1127-1	: 2011
EN 1710	: 2008
EN 13463-1	: 2009
EN 13463-5	: 2011

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

Signed for and on behalf of:
Flender GmbH

Bocholt, 2017-10-01 i.V.
Felix Henseler, Head of PD MD AP



Bocholt, 2017-10-01 i.V.
Thomas Tebrügge, Head of PD MD AP COU BA

FLENDER COUPLINGS

N-ARPEX
Operating Instructions 8714en
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