FLENDER COUPLINGS

N-ARPEX

Operating Instructions 8714en
Edition 06/2019

ARN-6, ARN-8, ARN-10

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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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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

If you have any technical queries, please contact our factory or one of our service outlets (refer to Service and support (Page 61)).

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 61)).

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 in Section Torques, speeds, geometry data and weights (Page 73).

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}.

On the ARN-10 series, the maximum coupling torque T_{Kmax} is 1.75 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}.

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

On the ARN-10 series, the coupling overload torque T_{KOL} is 2.25 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 85) 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.

Flender GmbH	CE	II 2G Ex h IIC T6 ... T2 Gb X
D 46393 Bocholt		II 2D Ex h IIIC T85 °C ... 250 °C Db X
ARPEX	<Year of manufacture>	I M2 Ex h Mb X

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:

- Device group I (permissible ambient temperature range -50 °C to +150 °C)
  - Category M2
- Device group II (permissible ambient temperature range -50 °C to +230 °C)
  - 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

1. Gases, vapours or mists

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

The maximum surface temperature of the coupling for an explosive atmosphere as a result of gas/vapour/mist mixtures is obtained from the maximum ambient temperature and/or the maximum temperature of the adjacent components. The self-heating of the coupling is minor.

In normal atmospheric conditions for ATEX applications, a maximum surface temperature <85 °C can be expected.

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

Max. ambient temperature	Temperature class	Max. surface temperature
-50 °C to +230 °C	T2	<250 °C
-50 °C to +180 °C	T3	<200 °C
-50 °C to +115 °C	T4	<135 °C
-50 °C to +80 °C	T5	<100 °C
-50 °C to +65 °C	T6	<85 °C

2. Dust/air mixtures

Check the ambient temperature.

The maximum surface temperature of the coupling for an explosive atmosphere as a result of dust/air mixtures is obtained from the maximum ambient temperature and/or the maximum temperature of the adjacent components. The self-heating of the coupling is minor. In normal atmospheric conditions for ATEX applications, a maximum surface temperature <85 °C can be expected.

Notes concerning operation of the coupling in potentially explosive atmospheres

- Only use the coupling underground in mines in potentially explosive atmospheres together with drive motors that can be switched off in the event of the formation of an explosive atmosphere.
- Earth machines that are connected via the coupling with a leakage resistance of less than 10^6 Ω.
- If you want to use a coated coupling in potentially explosive atmospheres, please note the requirements concerning the conductivity of the paint and the limitation on the paint layer thickness applied in accordance with EN 80079-36. No build-up of electrostatic charges is to be expected with a paint layer thickness of less than 200 µm.

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.

The version with an E spacer as an intermediate spacer is available for each type of the N-ARPEX couplings. The E spacer is machined on all sides in accordance with the specifications of the API 671.

An H spacer is used for a large distance between shafts S and the correspondingly long intermediate spacer. The H spacer is left in the delivery condition on the inside and outside diameter of the tube and does not therefore meet the specifications of the API 671. If a coupling is implemented with an H spacer instead of an E spacer, the designation of the type changes. A NEN becomes a NHN, and a MFEFM becomes a MFHFM.

B hubs are only combined with an E spacer.

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 ring plates or segmented plates of the hexagonal, octagonal and decagonal types that are crimped together.

In the ARN-6 series, fitting bolts and nuts are used to connect the plate packs to the flanges. In the ARN-8 and ARN-10 series, tapered bolts and nuts/hexagon bolts are used to connect the plate packs to the flanges.

On all series, a capture assembly secures the spacer if the plates were to break.

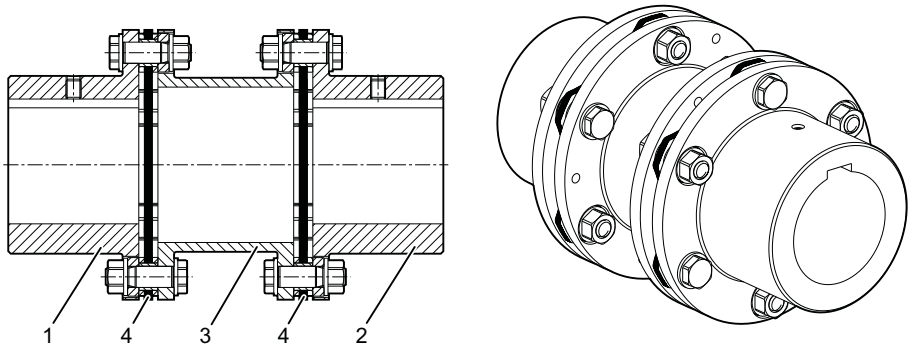
The N-ARPEX coupling is torsionally stiff and transmits the torque without any backlash through the arrangement of the plate packs. The coupling can absorb axial, radial and angular offset of the connected loads.

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

Additional types are shown in Section Spare parts drawing and spare parts list (Page 66).

For the components of the plate packs, refer to the associated mounting instructions provided in Section Assembling the plate pack (Page 41).

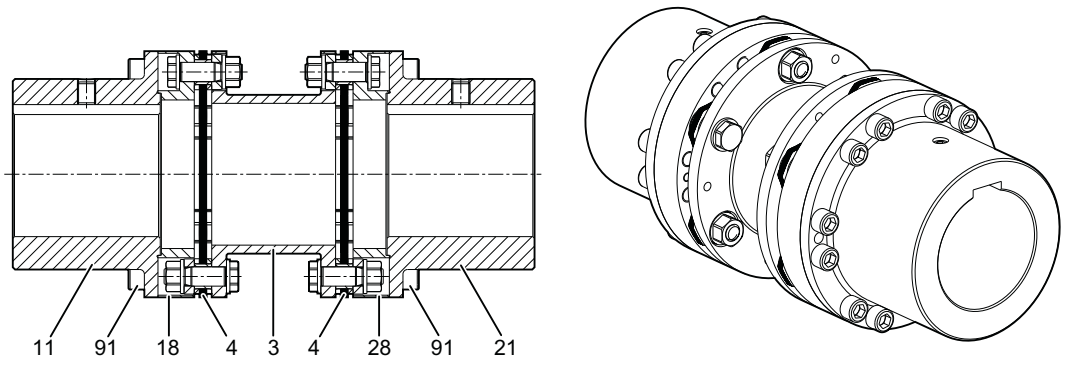
Type NEN



1 N hub
2 N hub
3 E spacer
4 Plate pack

Figure 3-1 Type NEN

Type MCECM

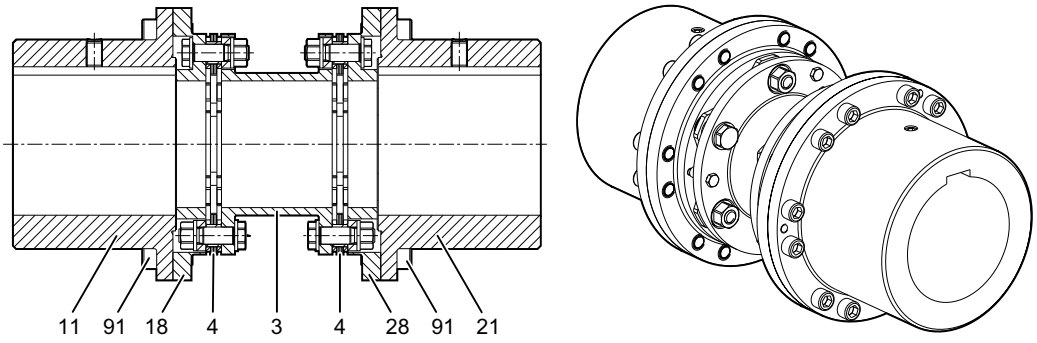


3 E spacer
4 Plate pack
11 M hub
18 C flange
21 M hub
28 C flange
91 Bolt

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.

Type MFEFM

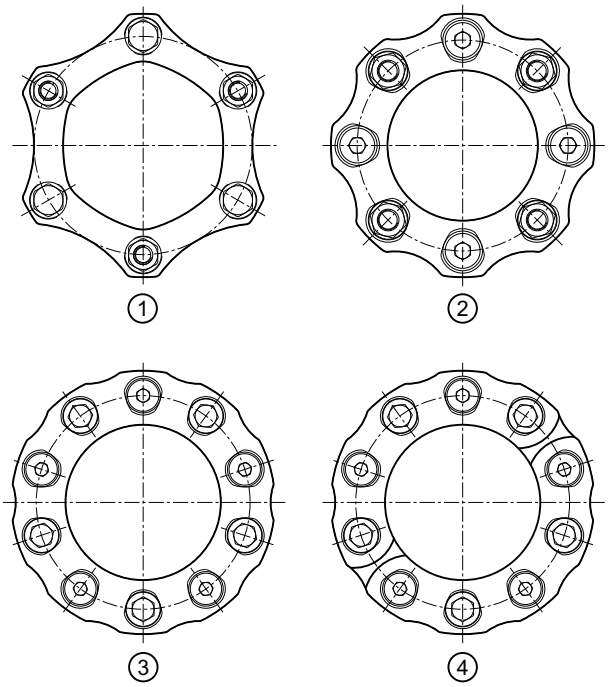


3 E spacer
4 Plate pack
11 M hub
18 F flange
21 M hub
28 F flange
91 Bolt: as of size 291-6: Fitting bolts (91) and nuts (92)

Figure 3-3 Type MFEFM

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

Plate design

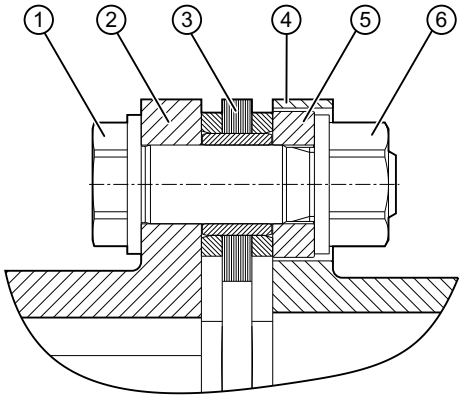


① Ring plate, hexagonal
② Ring plate, octagonal
③ Ring plate, decagonal
④ Segmented plate, decagonal, as of size 694-10

Figure 3-4 Plate design

Bolted joint of the plate pack

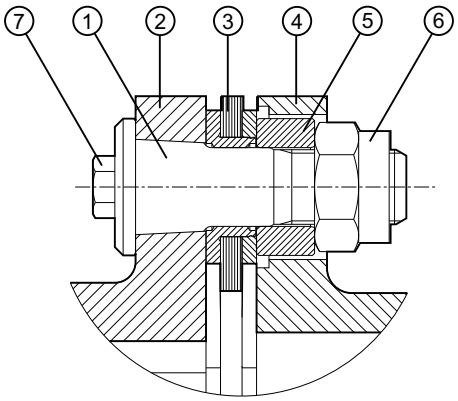
The bolted joint of the plate pack varies depending on the type and size.



Type ARN-6

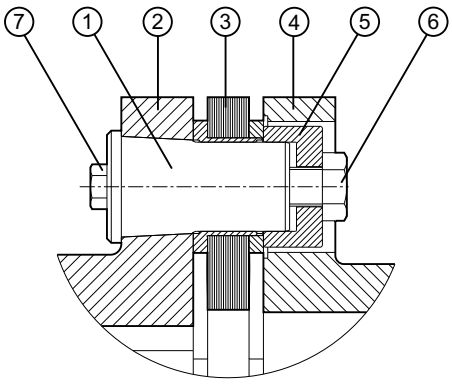
① Fitting bolt
② Flange
③ Plate pack
④ Flange
⑤ Guard ring
⑥ Nut

Figure 3-5 Detailed view of the fitting bolt connection



Type ARN-8, sizes 219-8 to 354-8

① Tapered bolt
② Flange
③ Plate pack
④ Flange
⑤ Guard ring
⑥ Nut
⑦ Hexagon bolt



Type ARN-8, sizes 387-8 to 631-8
Type ARN-10, sizes 495-10 to 988-10

① Tapered bolt
② Flange
③ Plate pack
④ Flange
⑤ Guard ring
⑥ Tensioning bolt
⑦ Hexagon bolt

Figure 3-6 Detailed view of the ball-pin connection

Application planning

4

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

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

4.1 Transport of the coupling

⚠ WARNING

Severe personal injury due to improper transport

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

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

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

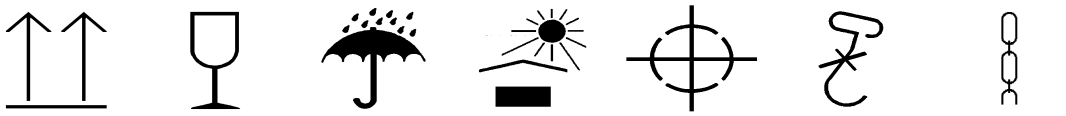


Figure 4-1 Transport symbols

4.2 Storage of the coupling

NOTICE

Property damage due to improper storage

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

- Please observe the information about storing the coupling.

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

Note

Information about storing the coupling

- Ensure that the storage room is dry (relative humidity < 65 %) and free of dust.
- Ensure that there is no condensation.
- Do not store the coupling together with corrosive chemicals, acids, caustic solutions, etc.
- 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 27)
- Assembling 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. 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 28)
- Milling the parallel keyway (Page 29)
- Machining an axial locking mechanism (Page 29)
- Balancing the coupling (Page 31)

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 73).

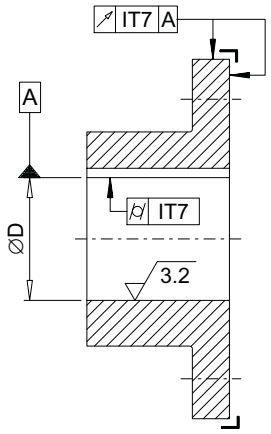


Figure 5-1 Tolerances for finished bore

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 92).

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.

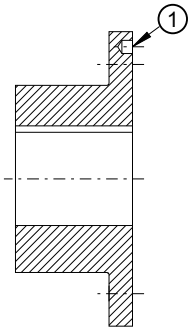
As set screws use threaded studs in accordance with ISO 4029 with a toothed cup point. The size of the set screw is determined by the bore made. The set screw should fill out the tapped hole as much as possible and must not protrude beyond the hub.

5.1.4 Balancing the coupling

Notes on balancing the coupling

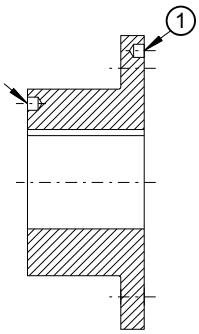
Please note the following when balancing the coupling:

- 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 32)
- Assembling couplings that are balanced as assembly (Page 36)
- Aligning the units (Page 36)
- Assembling the spacer (Page 37)
- Assembling the intermediate unit (Page 37)
- Assembling the plate pack (Page 41)

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 32)
- Assembling hubs with shaft and hub connected through a pressurized oil interference fit (Page 33)
- Assembling the clamping hubs (Page 34)

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 29)).

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. You will find a description of the screw plugs in Section Screw plug (Page 72).
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 73) 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

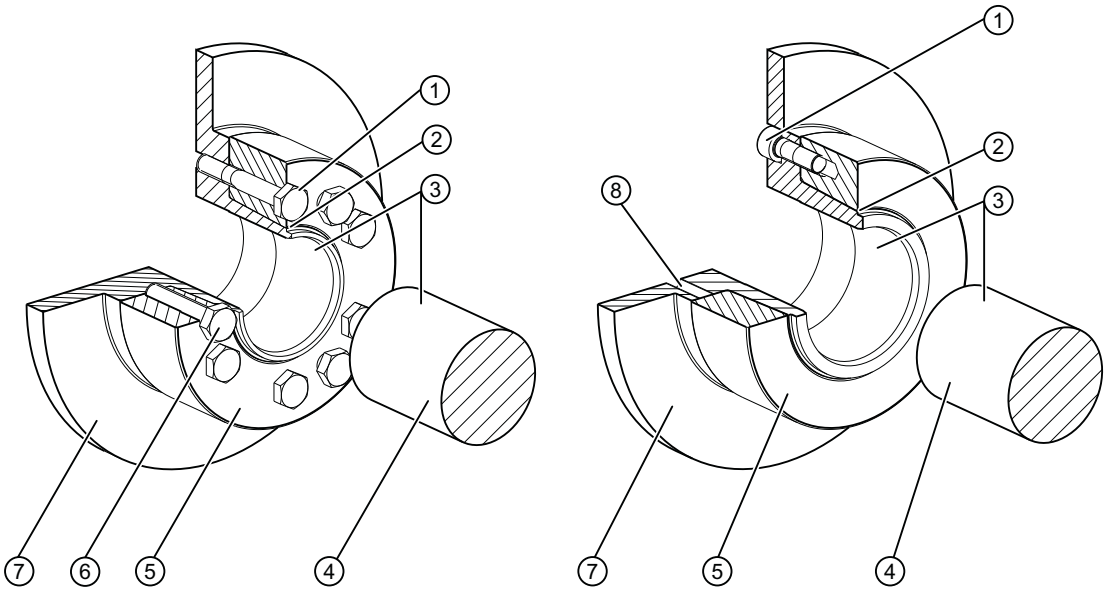
Ensure that the bore of the clamping hub (7) and shaft (4) in the area of the clamping ring seat are absolutely clean and free of any grease and oil.

- 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 91).
   - 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 91).
   - 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).



⑨ ⑩

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

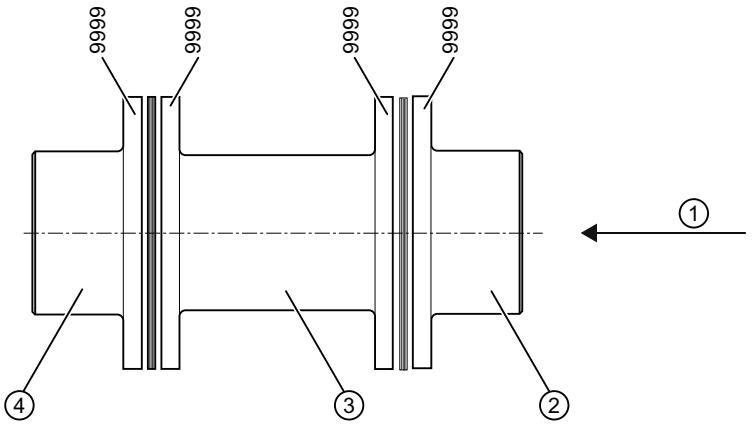
Figure 5-4 Complete clamping hub assembly (12) or (22)

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

Types NEN, MCECM, MFEFM, NHN, MCHCM, MFHFM

1. Move the machines to be coupled close to one another. Comply with the distance S stated in Section Torques, speeds, geometry data and weights (Page 73).
2. Carefully align the machines.

3. Assemble the intermediate unit on types MCECM / MCHCM or MFEFM / MFHFM. Follow the instructions given in Section Assembling the intermediate unit (Page 37).
4. For type NEN / NHN, mount the spacer. Follow the instructions given in Section Assembling the spacer (Page 37).
5. For type NEN / NHN, mount the plate pack. Follow the instructions provided in Section Assembling the plate pack (Page 41) of the relevant assembly instructions.

Types BEB or BEN

1. For type BEN, position the plate pack between the spacer and B hub. For type BEB, position the plate packs between the spacer and two B hubs.
2. Mount the spacer. Follow the instructions given in Section Assembling the spacer (Page 37).
3. Move the machines to be coupled close to one another. Comply with the distance S1 stated in Section Torques, speeds, geometry data and weights (Page 73).
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. Follow the instructions provided in Section Assembling the plate pack (Page 41) of the relevant assembly instructions.

5.2.4 Assembling the spacer

Procedure

1. Clean the spacer.
2. Check the 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 36).

5.2.5 Assembling the intermediate unit

The intermediate unit is supplied as individual parts

1. Clean the spacer.
2. Check the centering, the 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. Follow the instructions provided in Section Assembling the plate pack (Page 41) of the relevant assembly instructions.
4. Attach the spacers (81) and the bolts (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 the bolts (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 36).
7. Tighten the bolts (91) or nuts (92) finger-tight:
   - Type MCECM / MCHCM: Bolts (91)
   - Type MFEFM / MFHFM, ARN-6 up to size 268-6: Bolts (91)
   - Type MFEFM / MFHFM, ARN-6 as of size 291-6, ARN-8, ARN-10: Fitting bolts (91) and nuts (92)
8. Remove the bolts (82) and spacers (81).

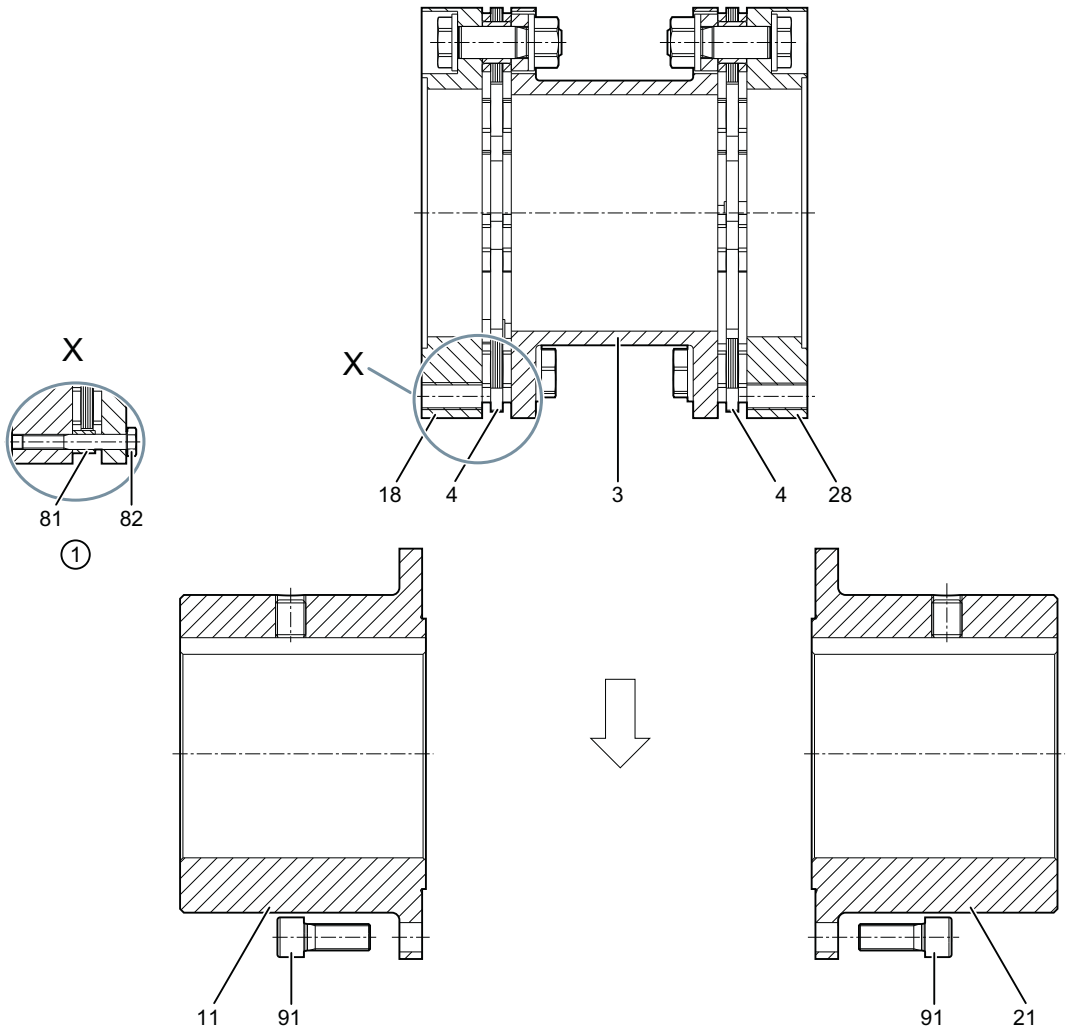
⚠ WARNING

Danger when operated with transport locks

Remove all of the transport locks (81 and 82), before you tighten bolts (91) or nuts (92) with the specified tightening torque.

9. Tighten the bolts (91) or nuts (92) in diagonal pairs and evenly.
   The tightening torques are listed in Section Threaded joint C flange with the M hub (Page 89) or Section Bolted joint F flange with the M hub (Page 90).

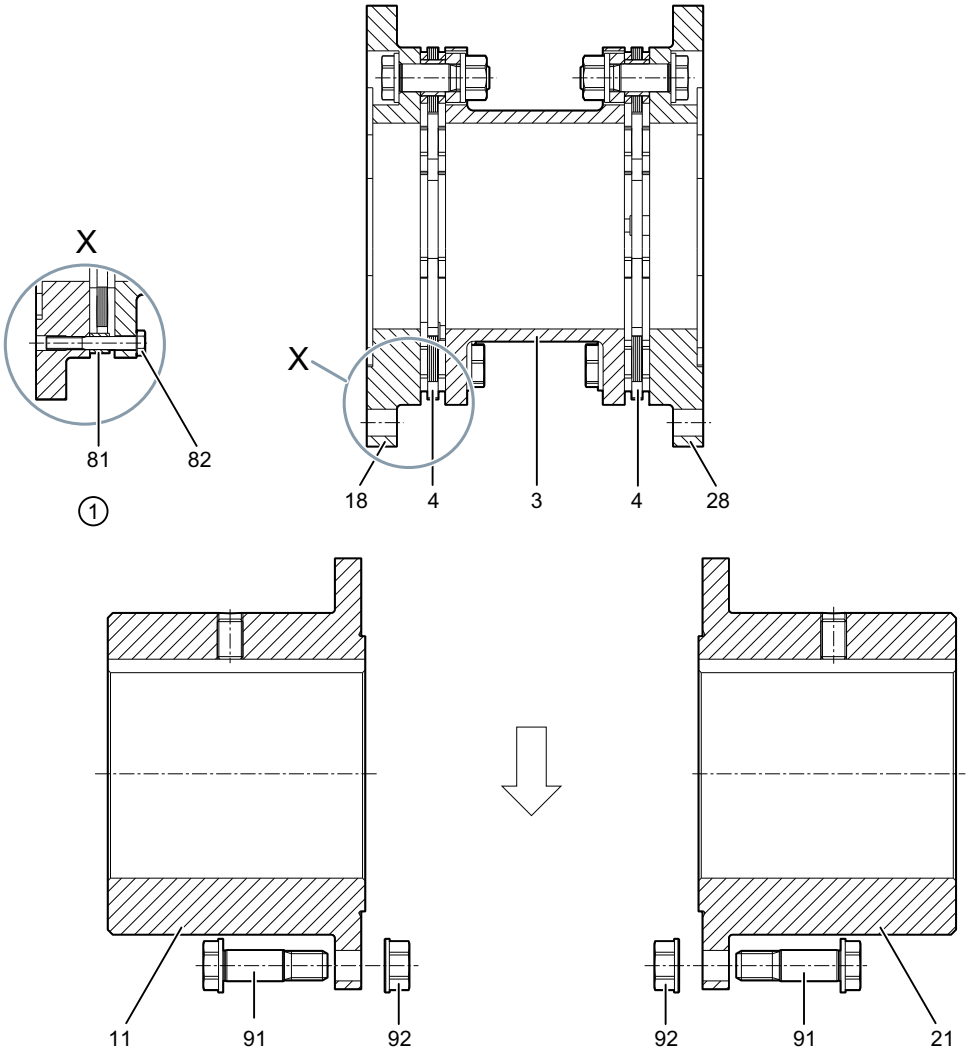
Intermediate unit CEC / CHC



3	E spacer / H spacer
4	Plate pack
11	Hub
18	C flange
21	Hub
28	C flange
81	Spacer (transport lock)
82	Bolt (transport lock)
91	Bolt
①	Individual unit X: Transport lock

Figure 5-6 Assembling the intermediate unit CEC / CHC

Intermediate unit FEF / FHF



3 E spacer / H spacer
4 Plate pack
11 Hub
18 F flange
21 Hub
28 F flange
81 Spacer (transport lock)
82 Bolt (transport lock)
91 Bolt: ARN-6 up to size 268-6
Fitting bolt: ARN-6 as of size 291-6, ARN-8, ARN-10
92 Nut: ARN-6 as of size 291-6, ARN-8, ARN-10
① Individual unit X: Transport lock

Figure 5-7 Assembling the intermediate unit FEF / FHF

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 bolt connection NEN, BEB, BEN, KEK, KEN, BEK NHN, KHK, KHN	AN 4280
	5-part; with fitting bolt connection MCECM, MFEFM MCHCM, MFHFM	
ARN-8	3-part; with taper connection NEN NHN	AN 4281
	5-part; with taper connection MCECM, MFEFM MCHCM, MFHFM	
ARN-10	3-part; with taper connection NEN NHN	AN 4281
	5-part; with taper connection MFEFM MFHFM	

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 88) and in accordance to the associated assembly instructions from Section Assembling the plate pack (Page 41).
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 49).
	Changed alignment	Follow the instructions given in Section Correcting the changed alignment (Page 49).
	Coupling not suitable for the operating conditions. Check the possible causes given in section Unsuitable coupling (Page 47).	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 48) und Specific assembly-related and maintenance-related causes (Page 48).	Reassemble the coupling in accordance with these instructions. Observe all of the specifications and regulations in Chapter Assembly (Page 27).
	Incorrect maintenance of the coupling. Check the possible causes in Section Maintenance-related causes (Page 48) und Specific assembly-related and maintenance-related causes (Page 48).	Observe all of the specifications and regulations in Chapter Maintenance (Page 51).
	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 51).

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 41).

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 45).

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 52).

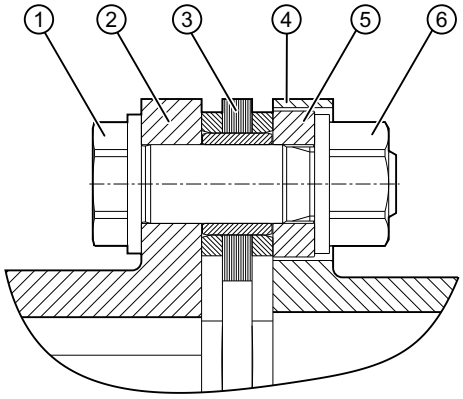
When removing and when re-assembling the plate packs, carefully follow the instructions in the associated assembly instructions from Section Assembling the plate pack (Page 41).

8.3 Disassembling the coupling

Disassembling the coupling involves the following steps:

- Disassembling the spacer (Page 53)
- Disassembling the intermediate unit (Page 54)
- Disassembling the hubs (Page 55)

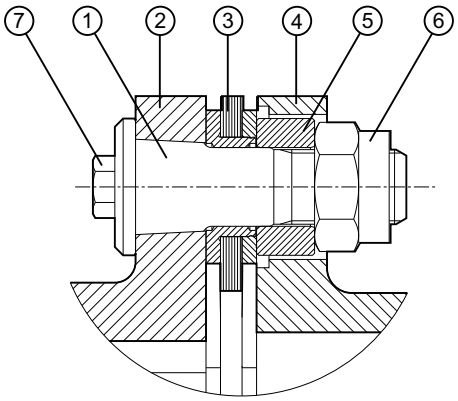
The bolted joint of the plate pack varies depending on the type and size. You will find the illustrations of the various bolted joints below:



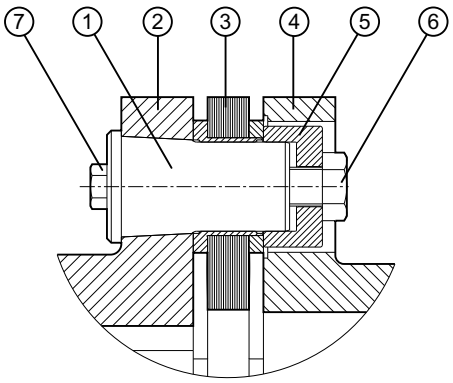
Type ARN-6

① Fitting bolt
② Flange
③ Plate pack
④ Flange
⑤ Guard ring
⑥ Nut

Figure 8-1 Detailed view of the fitting bolt connection



Type ARN-8, sizes 219-8 to 354-8



Type ARN-8, sizes 387-8 to 631-8
Type ARN-10, sizes 495-10 to 988-10

① Tapered bolt
② Flange
③ Plate pack
④ Flange
⑤ Guard ring
⑥ Nut
⑦ Hexagon bolt

① Tapered bolt
② Flange
③ Plate pack
④ Flange
⑤ Guard ring
⑥ Tensioning bolt
⑦ Hexagon bolt

Figure 8-2 Detailed view of the ball-pin connection

8.3.1 Disassembling the spacer

Procedure

1. Support the spacer.
2. Unscrew all of the nuts (6) / tensioning bolts (6) one after the other.
3. Remove the nuts (6), the fitting bolts (1) and the guard rings (5) on the ARN-6 series.
4. On the ARN-8 and ARN-10 series, remove the nuts (6) / tensioning bolts (6), the tapered bolt (1) and the guard rings (5).
5. For types without B hub, remove the spacer and the plate packs without moving the coupled machines.
6. For types with B hub, remove the spacer and the plate packs by shifting the coupled machines.
7. Check the hubs, spacer and the plate packs for damage.
8. Protect them against corrosion.
9. Replace damaged parts.

When reassembling the spacer, follow the information in Chapters Assembly (Page 27) and Commissioning (Page 43).

8.3.2 Disassembling the intermediate unit

Procedure

1. Attach the spacers (81) of the transport lock. Insert the bolts without tightening them (82).
2. Support the intermediate unit.
3. Remove the bolts (91) and nuts (92).
4. Tighten the bolts (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.
8. Protect them against corrosion.
9. Replace damaged parts.

When reassembling the intermediate unit, follow the information in chapters Assembly (Page 27) and Commissioning (Page 43).

Disassembling the intermediate unit

1. Secure the individual parts.
2. Unscrew all of the nuts (6) / tensioning bolts (6) one after the other.
3. Remove the nuts (6), the fitting bolts (1) and the guard rings (5) on the ARN-6 series.
4. On the ARN-8 and ARN-10 series, remove the nuts (6) / tensioning bolts (6), the tapered bolt (1) and the guard rings (5).
5. Remove the plate pack.
6. Check the individual parts for damage.
7. Protect them against corrosion.
8. Replace damaged parts.

When reassembling the intermediate unit, follow the information in chapters Assembly (Page 27) and Commissioning (Page 43).

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 55)
- Disassembling the hub with shaft and hub connected through a pressurized oil interference fit (Page 56)
- Disassembling the clamping hubs (Page 58)

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 27) and Commissioning (Page 43).

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:
  - Pull-off devices
  - Pumps

⚠ WARNING

Risk of injury as a result of the hub or the pull-off device suddenly releasing.

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

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

Note

Leaking oil

1. When removing 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 bolts or threaded spindles with nuts. Bolt and spindle material must have at least at least property class 10.9; material of the nuts depending on the material of the bolts 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 pull-off device.
3. Secure the hub and the pull-off device so that they cannot fall.
4. Remove the screw plugs (10) or (20) from the oil ducts. You will find a description of the screw plugs in Section Screw plug (Page 72).
5. Vent 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. Vent 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 pull-off device 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 27) and Commissioning (Page 43).

8.3.3.3 Disassembling the clamping hubs

⚠ WARNING

Risk of injury through incorrect disassembly

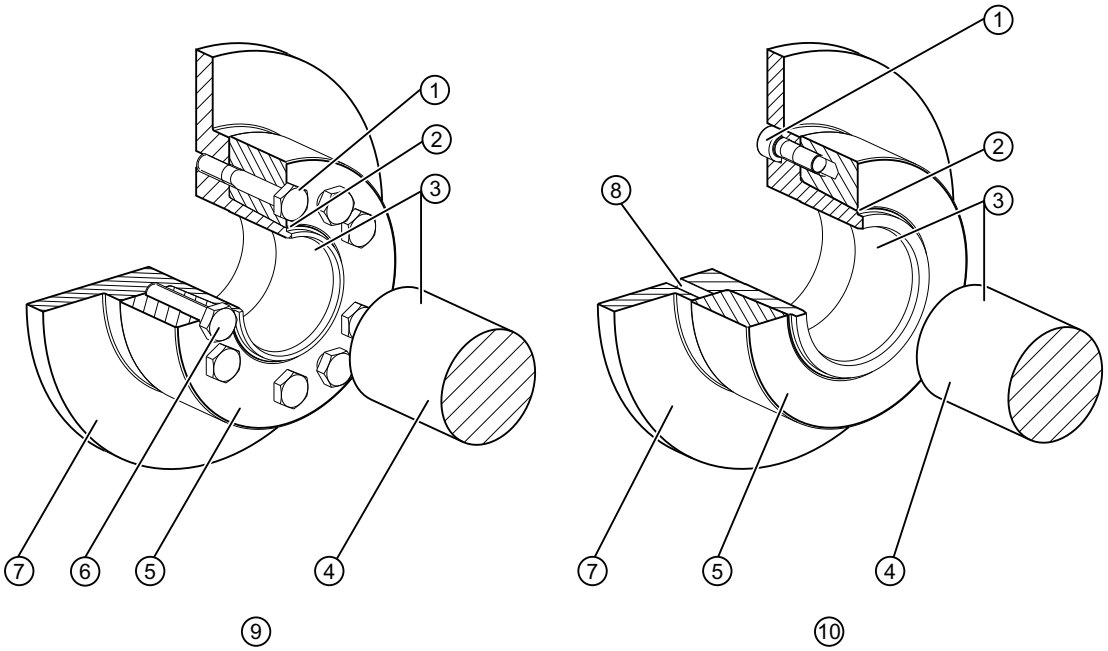
Risk of severe injury if the clamping ring (5) suddenly releases.

- 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 27) and Commissioning (Page 43).



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

Contact

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

Flender GmbH

Schlavenhorst 100

46395 Bocholt

Germany

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

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

Flender GmbH (http://www.flender.com)

Disposal

10

Disposal of the coupling

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

Spare parts 11

11.1 Ordering spare parts

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

Note

Original spare parts

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 66).

You will find our contact data for ordering spare parts in Service and support (Page 61).

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 66))
- 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 41).

11.2.1 Type NEN / NHN

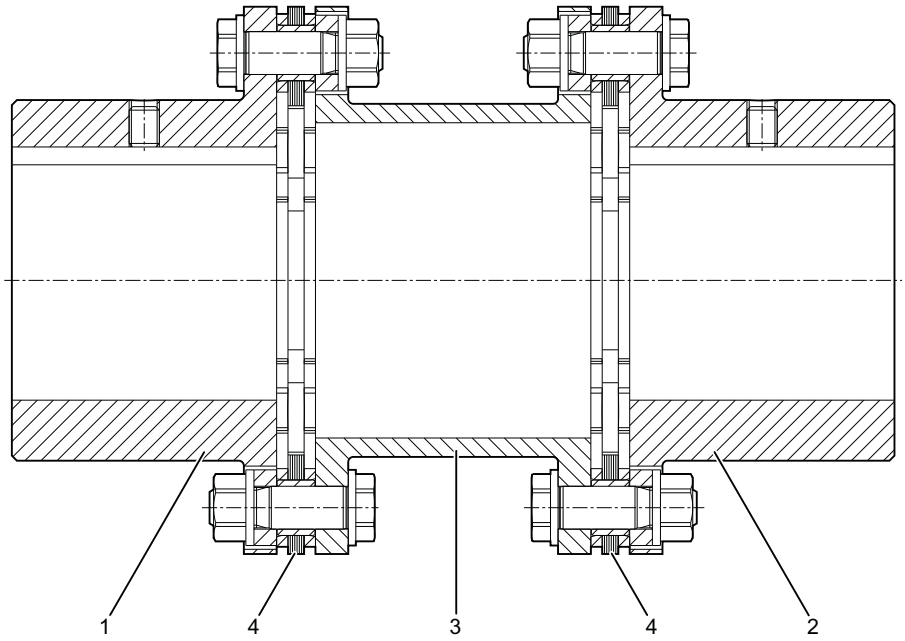


Figure 11-1 Spare parts drawing for type NEN / NHN

Table 11-1 Spare parts list for type NEN / NHN

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

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

[2)] ARN-6: Plate pack with bolted joint part no. 4
ARN-8/-10: Plate pack part no. 41, bolted joint part no. 42

You can find a description of the screw plugs in Section Screw plug (Page 72).

11.2.2 Type BEB

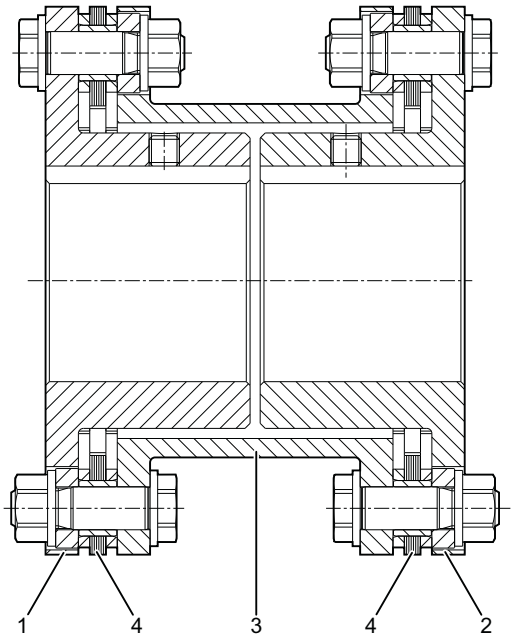


Figure 11-2 Spare parts drawing for type BEB

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 72).

11.2.3 Type BEN

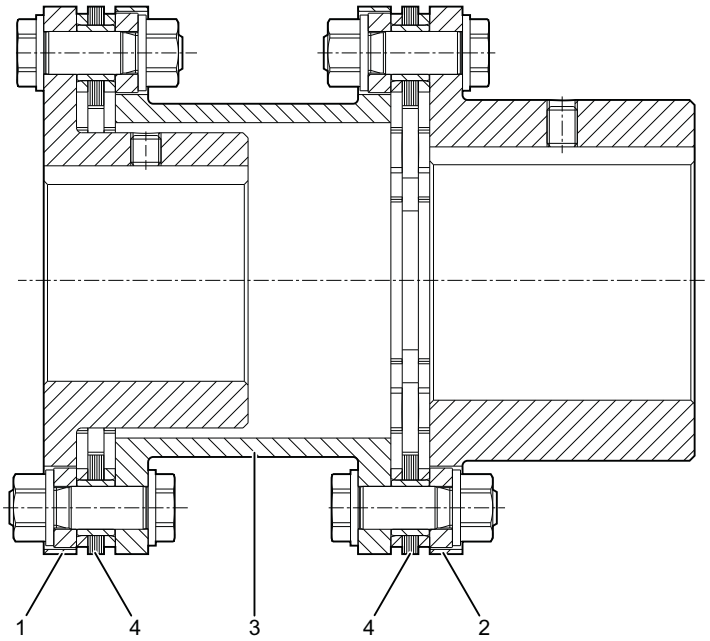


Figure 11-3 Spare parts drawing for type BEN

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 72).

11.2.4 Type MCECM / MCHCM

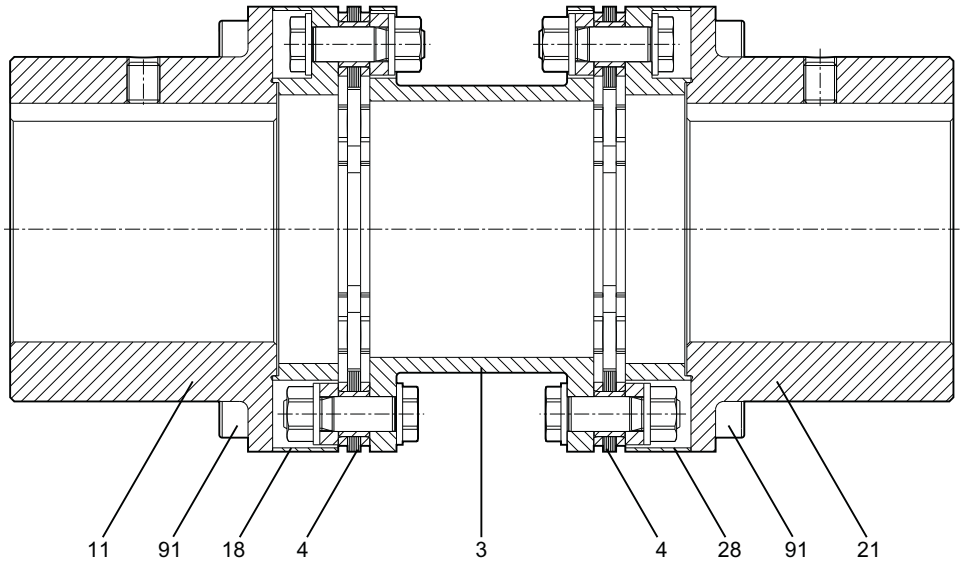


Figure 11-4 Spare parts drawing for type MCECM / MCHCM

Table 11-4 Spare parts list for type MCECM / MCHCM

Type MCECM		Type MCHCM	
Part number	**Designation**	**Part number**	**Designation**
3	E spacer[1)]	3	H spacer[2)]
4	Plate pack[1) 4)]	4	Plate pack[2) 4)]
10	Screw plug[3)]	10	Screw plug[3)]
11	M hub	11	M hub
18	C flange[1)]	18	C flange[2)]
20	Screw plug[3)]	20	Screw plug[3)]
21	M hub	21	M hub
28	C flange[1)]	28	C flange[2)]
91	Bolts	91	Bolts

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

2) The C flange (18), plate pack (4), H spacer (3), plate pack (4) and C flange (28), form the intermediate unit CHC

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

4) ARN-6: Plate pack with bolted joint part no. 4
ARN-8: Plate pack part no. 41, bolted joint part no. 42

You can find a description of the screw plugs in Section Screw plug (Page 72).

11.2.5 Type MFEFM / MFHFM

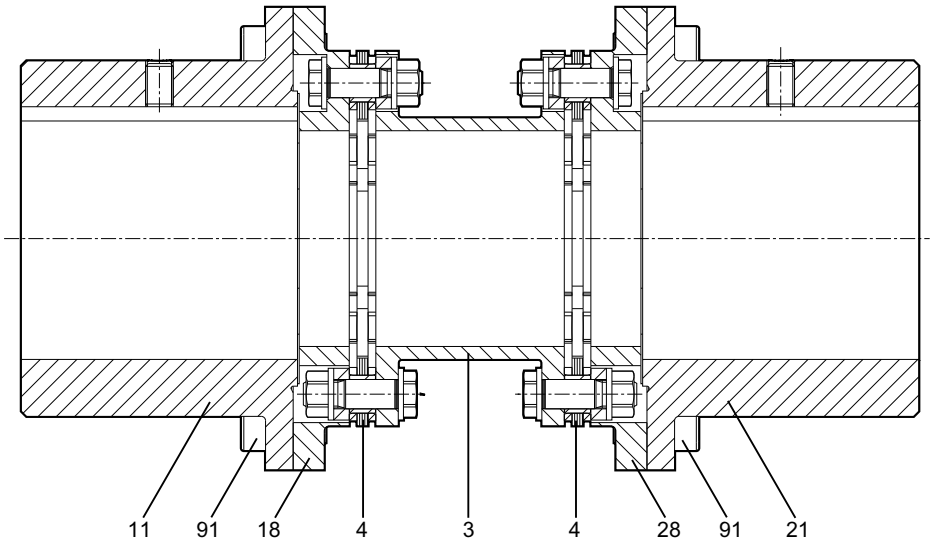


Figure 11-5 Spare parts drawing for type MFEFM / MFHFM

Table 11-5 Spare parts list for type MFEFM / MFHFM

Type MFEFM		Type MFHFM	
Part number	**Designation**	**Part number**	**Designation**
3	E spacer[1)]	3	H spacer[2)]
4	Plate pack[1) 6)]	4	Plate pack[2) 6)]
10	Screw plug[3)]	10	Screw plug[3)]
11	M hub	11	M hub
18	F flange[1)]	18	F flange[2)]
20	Screw plug[3)]	20	Screw plug[3)]
21	M hub	21	M hub
28	F flange[1)]	28	F flange[2)]
91	Bolt[4)] Fitting bolt[5)]	91	Bolt[4)] Fitting bolt[5)]
92	Nut[5)]	92	Nut[5)]

1) The F flange (18), plate pack (4), E spacer (3), plate pack (4) and F flange (28), form the intermediate unit FEF

2) The F flange (18), plate pack (4), H spacer (3), plate pack (4) and F flange (28), form the intermediate unit FHF

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

4) ARN-6 up to size 268-6

5) ARN-6 as of size 291-6, ARN-8, ARN-10

6) ARN-6: Plate pack with bolted joint part no. 4
ARN-8/-10: Plate pack part no. 41, bolted joint part no. 42

You can find a description of the screw plugs in Section Screw plug (Page 72).

11.2.6 Screw plug

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

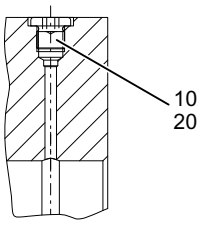


Figure 11-6 Screw plug

11.2.7 Additional hubs

11.2.7.1 Clamping hub complete

Instead of the N hub, type NEN, NHN or BEN, you can also use the complete clamping hub (12) or (22). Types KEK, KEN, KHK, KHN 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 84).

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 11-6 Spare parts list for types KEK, KEN or BEK

Part number	Designation	Type				
		KEK	KEN	KHK	KHN	BEK
1	B hub					x
2	N hub		x		x	
3	E spacer	x	x			x
3	H spacer			x	x	
4	Plate pack	x	x	x	x	x
10	Screw plug[1)]					
12	Clamping hub complete	x	x	x	x	
20	Screw plug[1)]					
22	Clamping hub complete	x		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 72).

Technical data

A

A.1 Torques, speeds, geometry data and weights

In this section, you will find dimension drawings and technical data for N-ARPEX couplings, series ARN-6, ARN-8 and ARN-10 of the following types:

- Type NEN / NHN, dimension drawing (Page 74) and technical data (Page 74)
- Type BEB, dimension drawing (Page 76) and technical data (Page 77)
- Type BEN, dimension drawing (Page 78) and technical data (Page 79)
- Type MCECM / MCHCM, dimension drawing (Page 80) and technical data (Page 80)
- Type MFEFM / MFHFM, dimension drawing (Page 82) and technical data (Page 82)
- Clamping hub complete, dimension drawing (Page 84) and technical data (Page 85)

A.1.1 Dimension drawing of type NEN / NHN

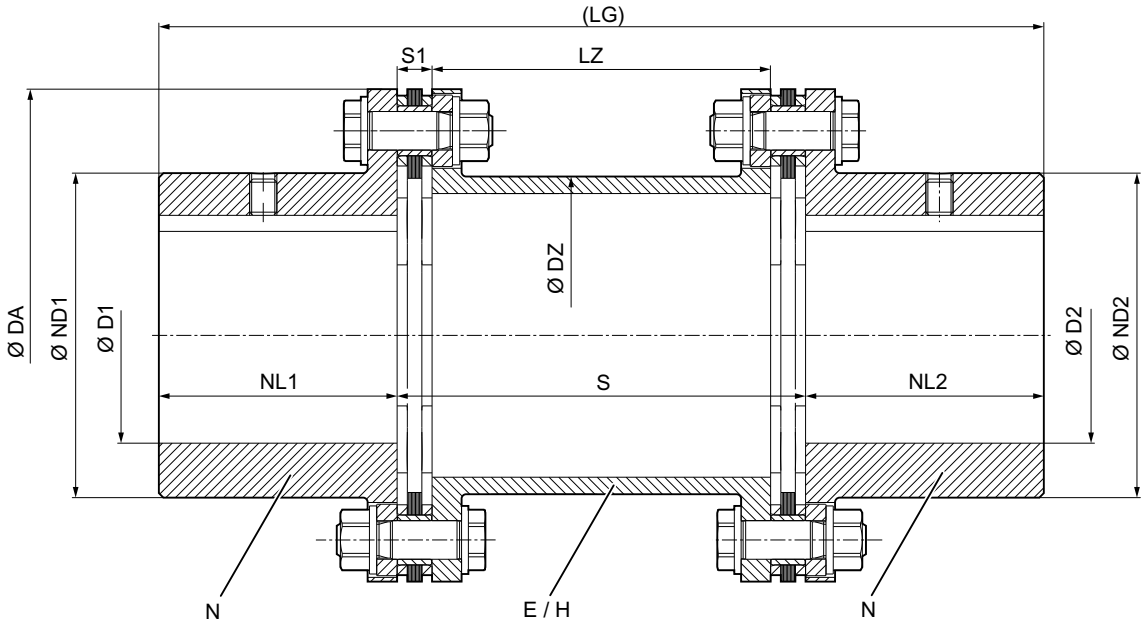


Figure A-1 Type NEN / NHN

A.1.2 Technical data of type NEN / NHN

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

Size	Rated torque	Speed	Maximum bore[1]			[2]		[3]			Weight[4]
DA	T_{KN}	n_{max}	D1 D2	ND1 ND2	NL1 NL2	DZ	S1	S	LZ	LG	m kg
	kNm	rpm	mm	mm	mm	mm	mm	mm	mm	mm	
86-6	0.35	24000	42	56	45	45	8.0	100	84	190	1.9
103-6	0.5	20000	55	73	55	60	8.4	100	83.2	210	3
122-6	0.95	17000	65	85	65	73	8.8	100	82.4	230	5.1
133-6	1.25	15000	75	96	75	85	9.6	100	80.8	250	6.4
159-6	2.1	13000	80	104	80	97	11.6	100	76.8	260	9.6
174-6	2.5	12000	90	118	85	116	12.8	100	74.4	270	11.8
184-6	3.8	11000	95	124	90	123	14.6	140	110.8	320	16.4
203-6	5	10000	100	135	95	128	15.0	140	110	330	21.3
217-6	6.2	9500	110	143	105	140	15.4	140	109.2	350	24.4
251-6	10.5	8000	120	160	110	160	20.6	180	138.8	400	38
268-6	13.8	7500	130	170	130	166	22.0	180	136	440	48.6
291-6	18.2	7000	145	190	140	188	22.8	180	134.4	460	62.8
318-6	23	6500	155	205	150	197	23.2	200	153.6	500	83.9

Size	Rated torque	Speed	Maximum bore[1]			[2]		[3]			Weight[4]
DA	T_{KN}	n_{max}	D1 D2	ND1 ND2	NL1 NL2	DZ	S1	S	LZ	LG	m kg
	kNm	rpm	mm	mm	mm	mm	mm	mm	mm	mm	
343-6	28	6000	170	230	160	223	24.0	200	152	520	104
219-8	10	9500	100	137	115	124	12.2	140	115.6	370	31.9
241-8	15	8700	110	150	127	135	12.6	140	114.8	394	41.3
262-8	20	8000	120	163	138	148	13.8	180	152.4	456	53.8
285-8	27	7300	130	177	150	162	15.2	180	149.6	480	70.8
302-8	35	6900	140	192	161	174	17.2	180	145.6	502	89.4
321-8	43	6500	150	206	173	189	21.0	200	158	546	109
354-8	56	5900	170	232	196	216	23.6	250	202.8	642	149
387-8	72	5400	190	258	219	240	26.0	250	198	688	193
411-8	93	5100	200	272	230	250	29.6	300	240.8	760	236
447-8	122	4600	220	299	253	275	32.6	300	234.8	806	299
495-8	160	4200	250	340	288	312	33.8	300	232.4	876	402
546-8	212	3800	280	381	322	351	40.0	300	220	944	547
587-8	270	3500	300	408	345	363	45.0	320	230	1010	690
631-8	350	3300	320	435	368	399	48.8	340	242.4	1076	835
495-10	200	4200	250	340	288	312	33.8	300	232.4	876	402
546-10	270	3800	280	381	322	351	40	300	220	944	547
587-10	352	3500	300	408	345	363	45	320	230	1010	690
631-10	450	3300	320	435	368	399	48.8	340	242.4	1076	834
694-10	630	3000	350	485	403	435	58	400	284	1206	1213
734-10	760	2800	370	512	426	459	63	440	314	1292	1463
790-10	950	2600	400	555	460	496	66	470	338	1390	1837
887-10	1400	2300	450	627	518	546	78	550	394	1586	2713
988-10	2000	2100	500	696	575	596	86	620	448	1770	3868

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

2) For large distances between shafts S, the E spacer can be executed as an H spacer
The tube diameters may then deviate slightly

3) Preferred dimension of the type NEN

4) Weight applies to one coupling type NEN with maximum bore

Note

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

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

Note

Torques and speeds may deviate depending on the order.
Follow the instructions in the dimension drawing supplied.

A.1.3 Dimension drawing of type BEB

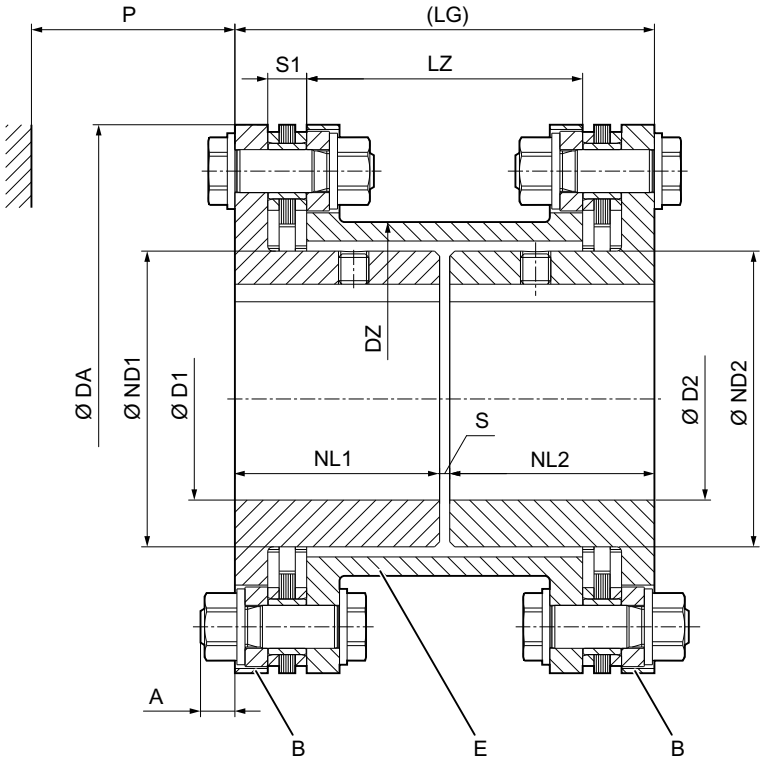


Figure A-2 Type BEB

A.1.4 Technical data of type BEB

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

Size	Rated torque	Speed	Maximum bore[1]										Weight[2]
DA	T_{KN}	n_{max}	D1	ND1	NL1	DZ	S1	S	LZ	A	P	LG	m
		rpm	D2	ND2	NL2								kg
	kNm		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
86-6	0.35	24000	22	35	30	45	8	12	44	8	32	72	1.5
103-6	0.5	20000	38	50	34	60	8.4	4	43.2	8	32	72	2
122-6	0.95	17000	48	62	56	73	8.8	4	82.4	8	38	116	4.2
133-6	1.25	15000	55	72	56	85	9.6	4	80.8	7	38	116	5.1
159-6	2.1	13000	65	84	57	97	11.6	6	76.8	9	48	120	8.1
174-6	2.5	12000	75	102	77	116	12.8	4	114.4	10	48	158	11.4
184-6	3.8	11000	80	106	80	123	14.6	6	110.8	15	64	166	15.2
203-6	5	10000	85	111	80	128	15.0	6	110	14	64	166	18.2
217-6	6.2	9500	90	124	81	140	15.4	4	109.2	14	66	166	22
251-6	10.5	8000	100	137	102	160	20.6	6	138.8	15	77	210	35.6
268-6	13.8	7500	108	143	105	166	22	12	136	11	89	222	44.8
291-6	18.2	7000	120	162	106	188	22.8	10	134.4	11	89	222	56.7
318-6	23	6500	130	164	118	197	23.2	6	153.6	20	100	242	70.2
343-6	28	6000	150	186	143	223	24.0	6	202	19	100	292	87.7

[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

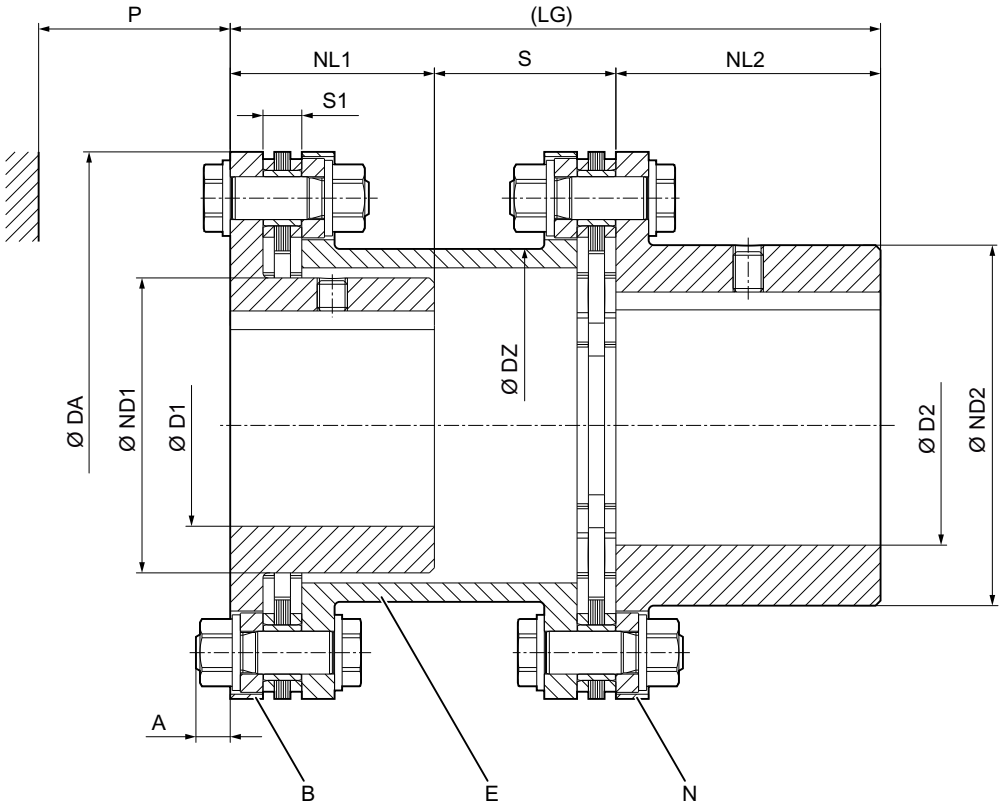


Figure A-3 Type BEN

A.1.6 Technical data of type BEN

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

Size	Rated torque	Speed	Maximum bore[1]												Weight[2]
DA	T_{KN}	n_{max}	D1	D2	ND1	ND2	NL1	NL2	DZ	S1	S	A	P	LG	m
	kNm	rpm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg
86-6	0.35	24000	22	42	35	56	30	45	45	8	36	8	32	111	1.6
103-6	0.5	20000	38	55	50	73	34	55	60	8.4	32	8	32	121	2.4
122-6	0.95	17000	48	65	62	85	56	65	73	8.8	52	8	38	173	4.7
133-6	1.25	15000	55	75	72	96	56	75	85	9.6	52	7	38	183	5.7
159-6	2.1	13000	65	80	84	104	57	80	97	11.6	53	9	48	190	8.8
174-6	2.5	12000	75	90	102	118	77	85	116	12.8	72	10	48	234	11.9
184-6	3.8	11000	80	95	106	124	80	90	123	14.6	73	15	64	243	15.8
203-6	5	10000	85	100	111	135	80	95	128	15	73	14	64	248	19.7
217-6	6.2	9500	90	110	124	143	81	105	140	15.4	72	14	66	258	23.2
251-6	10.5	8000	100	120	137	160	102	110	160	20.6	93	15	77	305	36.8
268-6	13.8	7500	108	130	143	170	105	130	166	22	96	11	89	331	46.7
291-6	18.2	7000	120	145	162	190	106	140	188	22.8	95	11	89	341	59.7
318-6	23	6500	130	155	164	205	118	150	197	23.2	103	20	100	371	77
343-6	28	6000	150	170	186	230	143	160	223	24	128	19	100	431	97.8

[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 / MCHCM

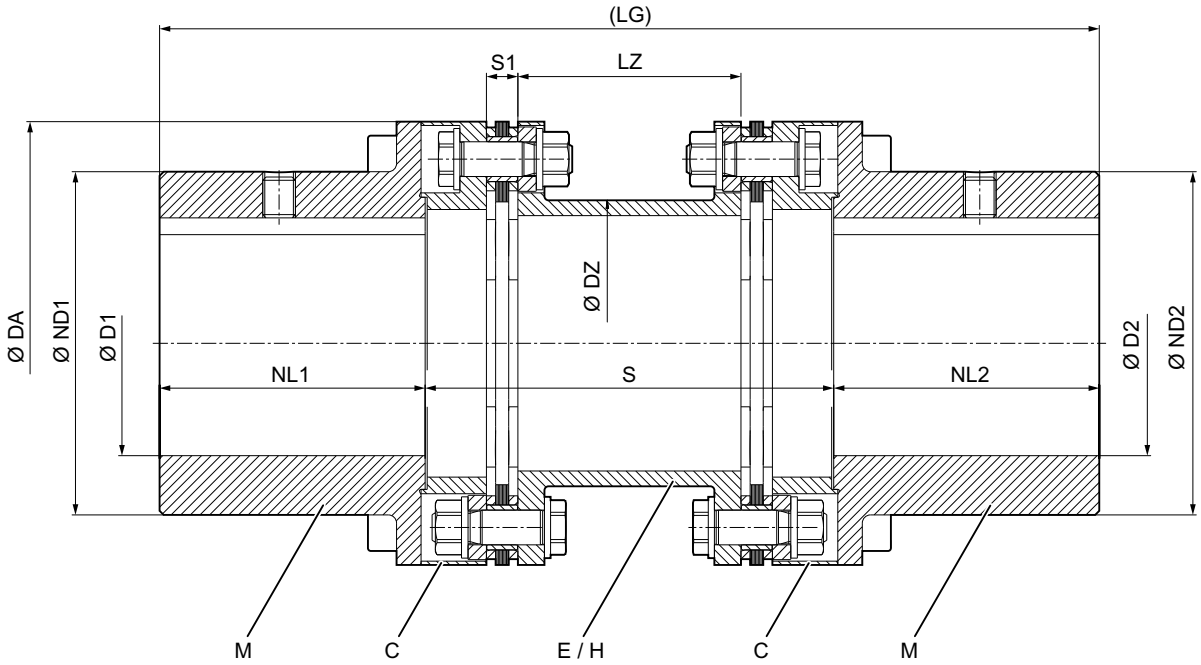


Figure A-4 Type MCECM / MCHCM

A.1.8 Technical data of type MCECM / MCHCM

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

Size	Rated torque	Speed	Maximum bore[1]			[2]		[3]			Weight[4]
			D1	ND1	NL1	DZ	S1	S	LZ	LG	m
DA	T_{KN}	n_{max}	D2	ND2	NL2	mm	mm	mm	mm	mm	kg
	kNm	rpm	mm	mm	mm						
86-6	0.35	24000	42	62	42	45	8	140	84	224	3.1
103-6	0.5	20000	55	72	55	60	8.4	140	83.2	250	4.7
122-6	0.95	17000	70	91	70	73	8.8	140	82.4	280	7.7
133-6	1.25	15000	80	103	80	85	9.6	140	80.8	300	9.6
159-6	2.1	13000	95	123	95	97	11.6	140	76.8	330	15.9
174-6	2.5	12000	105	136	105	116	12.8	140	74.4	350	19.3
184-6	3.8	11000	110	142	110	123	14.6	200	110.8	420	26.6
203-6	5	10000	115	150	115	128	15	200	110	430	33.7
217-6	6.2	9500	130	168	130	140	15.4	200	109.2	460	40.3
251-6	10.5	8000	150	193	150	160	20.6	250	138.8	550	64.4
268-6	13.8	7500	160	206	160	166	22	250	136	570	78.8
291-6	18.2	7000	170	221	170	188	22.8	250	134.4	590	98.3

Size	Rated torque	Speed	Maximum bore[1]			[2]		[3]			Weight[4]
						DZ					m
DA	T_{KN}	n_{max}	D1 D2	ND1 ND2	NL1 NL2	mm	S1	S	LZ	LG	kg
	kNm	rpm	mm	mm	mm		mm	mm	mm	mm	
318-6	23	6500	190	245	190	197	23.2	300	153.6	680	139
343-6	28	6000	205	267	205	223	24	300	152	710	168
219-8	10	9500	140	179	140	124	12.2	218	115.6	498	50.3
241-8	15	8700	155	201	155	135	12.6	222	114.8	532	68.2
262-8	20	8000	165	218	165	148	13.8	268	152.4	598	89
285-8	27	7300	185	239	185	162	15.2	278	149.6	648	115
302-8	35	6900	190	250	190	174	17.2	286	145.6	666	140
321-8	43	6500	205	269	205	189	21	312	158	722	171
354-8	56	5900	230	296	230	216	23.6	366	202.8	826	220
387-8	72	5400	255	329	255	240	26	342	198	852	275
411-8	93	5100	270	347	270	250	29.6	394	240.8	934	332
447-8	122	4600	290	375	290	275	32.6	402	234.8	982	419
495-8	160	4200	325	423	325	312	33.8	406	232.4	1056	561
546-8	212	3800	360	468	360	351	40	414	220	1134	752
587-8	270	3500	380	499	380	363	45	440	230	1200	945
631-8	350	3300	410	535	410	399	48.8	464	242.4	1284	1146

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

2) For large distances between shafts S, the E spacer can be executed as an H spacer
The tube diameters may then deviate slightly

3) Preferred dimension of the type MCECM

4) Weight applies to one coupling type MCECM with maximum bore

Note

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

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

Note

Torques and speeds may deviate depending on the order.
Follow the instructions in the dimension drawing supplied.

A.1.9 Dimension drawing of type MFEFM / MFHFM

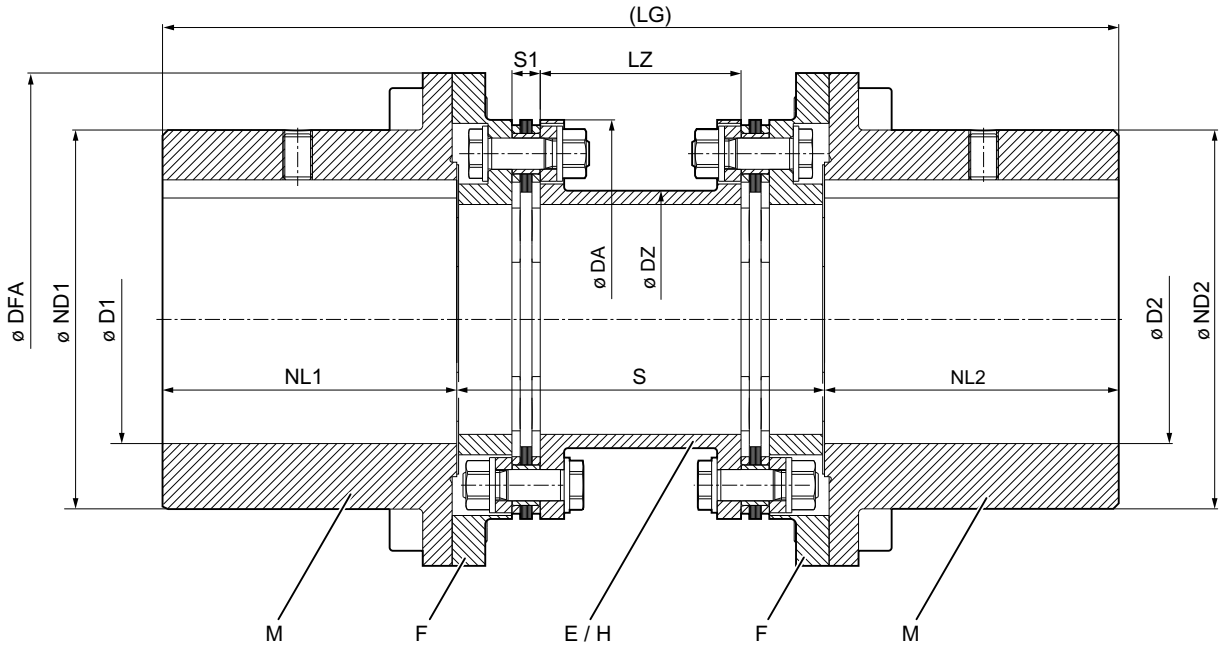


Figure A-5 Type MFEFM / MFHFM

A.1.10 Technical data of type MFEFM / MFHFM

Table A-5 Torques, speeds, geometry data and weights of type MFEFM / MFHFM

Size	Rated torque	Speed n_{max}	Maximum bore[1]				[2]		[3]			Weight[4]
DA	T_{KN}		D1	DFA	ND1	NL1	DZ	S1	S	LZ	LG	m
		rpm	D2		ND2	NL2						kg
	kNm		mm	mm	mm	mm	mm	mm	mm	mm	mm	
86-6	0.35	17000	70	122	91	70	45	8	140	84	280	6
103-6	0.5	15000	80	133	103	80	60	8.4	140	83.2	300	8
122-6	0.95	13000	95	159	123	95	73	8.8	140	82.4	330	13.6
133-6	1.25	12000	105	174	136	105	85	9.6	140	80.8	350	17.1
159-6	2.1	10000	115	203	150	115	97	11.6	140	76.8	370	22.9
174-6	2.5	9500	130	217	168	130	116	12.8	140	74.4	400	26.8
184-6	3.8	8000	150	251	193	150	123	14.6	200	110.8	500	40.1
203-6	5	8000	150	251	193	150	128	15	200	110	500	52.8
217-6	6.2	7500	160	268	206	160	140	15.4	200	109.2	520	63.4
251-6	10.5	6500	190	318	245	190	160	20.6	250	138.8	630	109
268-6	13.8	6000	205	343	267	205	166	22	250	136	660	136
291-6	18.2	5500	230	356	302	230	188	22.8	300	134.4	760	190
318-6	23	5500	245	375	321	245	197	23.2	300	153.6	790	221

Size	Rated torque	Speed	Maximum bore[1]				[2]		[3]			Weight[4]
		n_{max}	D1	DFA	ND1	NL1	DZ	S1	S	LZ	LG	m
DA	T_{KN}	rpm	D2		ND2	NL2						kg
	kNm		mm	mm	mm	mm	mm	mm	mm	mm	mm	
343-6	28	4500	270	424	354	270	223	24	300	152	840	284
219-8	10	7800	165	267	219	165	124	12.2	218	115.6	548	77.7
241-8	15	7200	185	289	241	185	135	12.6	222	114.8	592	98.6
262-8	20	6600	200	314	262	200	148	13.8	268	152.4	668	131
285-8	27	6100	215	339	285	215	162	15.2	278	149.6	708	169
302-8	35	5900	230	356	302	230	174	17.2	286	145.6	746	200
321-8	43	5600	245	375	321	245	189	21	312	158	802	237
354-8	56	4900	270	424	354	270	216	23.6	366	202.8	906	315
387-8	72	4500	295	457	387	295	240	26	342	198	932	384
411-8	93	4300	315	481	411	315	250	29.6	394	240.8	1024	460
447-8	122	4000	340	519	447	340	275	32.6	402	234.8	1082	586
495-8	160	3700	380	567	495	380	312	33.8	406	232.4	1166	758
546-8	212	3300	420	624	546	420	351	40	414	220	1254	1011
587-8	270	3100	450	669	587	450	363	45	440	230	1340	1270
631-8	350	2900	480	719	631	480	399	48.8	464	242.4	1424	1581
495-10	200	3700	380	567	495	380	312	33.8	406	232.4	1166	757
546-10	270	3300	420	624	546	420	351	40	414	220	1254	1010
587-10	350	3100	450	669	587	450	363	45	440	230	1340	1268
631-10	450	2900	480	719	631	480	399	48.8	464	242.4	1424	1578
694-10	630	2600	530	790	694	530	435	58	552	284	1612	2165
734-10	750	2500	560	830	734	560	459	63	604	314	1724	2586
790-10	950	2300	600	896	790	600	496	66	650	338	1850	3263
887-10	1400	2000	680	1013	887	680	546	78	756	394	2116	4716
988-10	2000	1800	760	1114	988	760	596	86	860	448	2380	6574

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

2) For large distances between shafts S, the E spacer can be executed as an H spacer
The tube diameters may then deviate slightly

3) Preferred dimension of the type MFEFM

4) Weight applies to one coupling type MFEFM with maximum bore

Note

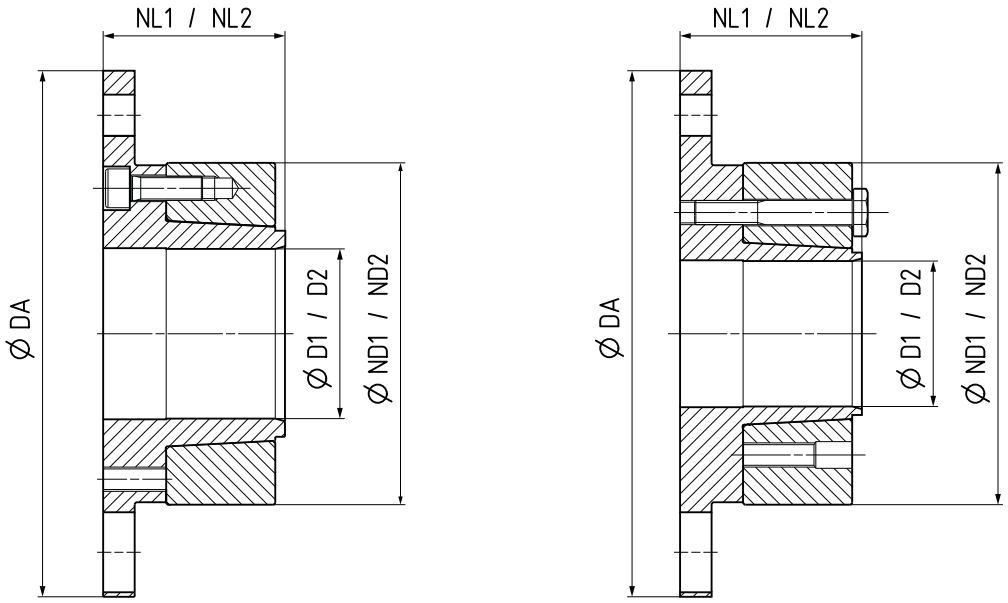
For a deviating LZ dimension, you can calculate the new S dimension as follows:

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

Note

Torques and speeds may deviate depending on the order.
Follow the instructions in the dimension drawing supplied.

A.1.11 Dimension drawing of the complete clamping hub



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

Figure A-6 Clamping hub

A.1.12 Technical data of the complete clamping hub

Table A-6 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-7 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-8 Maximum permissible shaft misalignment values during operation

Size	Permissible angular offset $\pm\Delta Kw_{perm}$										
	0°	0.1°	0.2°	0.3°	0.4°	0.5°	0.6°	0.7°	0.8°	0.9°	1°
	Permissible axial offset $\pm\Delta Ka_{perm}$ in mm										
86-6	1.2	1.1	1	0.8	0.7	0.6	0.5	0.4	0.2	0.1	0
103-6	1.4	1.3	1.1	1	0.8	0.7	0.6	0.4	0.3	0.1	0
122-6	2	1.8	1.6	1.4	1.2	1	0.8	0.6	0.4	0.2	0
133-6	2.2	2	1.8	1.5	1.3	1.1	0.9	0.7	0.4	0.2	0
159-6	2.6	2.3	2.1	1.8	1.6	1.3	1	0.8	0.5	0.3	0
174-6	3	2.7	2.4	2.1	1.8	1.5	1.2	0.9	0.6	0.3	0
184-6	3.2	2.9	2.6	2.2	1.9	1.6	1.3	1	0.6	0.3	0
203-6	3.4	3.1	2.7	2.4	2	1.7	1.4	1	0.7	0.3	0
217-6	3.4	3.1	2.7	2.4	2	1.7	1.4	1	0.7	0.3	0
251-6	4.1	3.7	3.3	2.9	2.5	2.1	1.6	1.2	0.8	0.4	0
268-6	4.2	3.8	3.4	2.9	2.5	2.1	1.7	1.3	0.8	0.4	0
291-6	4.6	4.1	3.7	3.2	2.8	2.3	1.8	1.4	0.9	0.5	0
318-6	5	4.5	4	3.5	3	2.5	2	1.5	1	0.5	0
343-6	5.3	4.8	4.2	3.7	3.2	2.7	2.1	1.6	1.1	0.5	0
219-8	1.7	1.28	0.85	0.43	0						
241-8	1.9	1.43	0.95	0.48	0						
262-8	2.1	1.58	1.05	0.53	0						
285-8	2.2	1.65	1.1	0.55	0						
302-8	2.4	1.8	1.2	0.6	0						
321-8	2.5	1.88	1.25	0.63	0						

Size	Permissible angular offset $\pm\Delta Kw_{perm}$										
	0°	0.1°	0.2°	0.3°	0.4°	0.5°	0.6°	0.7°	0.8°	0.9°	1°
	Permissible axial offset $\pm\Delta Ka_{perm}$ in mm										
354-8	3	2.25	1.5	0.75	0						
387-8	3.3	2.48	1.65	0.83	0						
411-8	3.4	2.55	1.7	0.85	0						
447-8	2.5	1.88	1.25	0.63	0						
495-8	3	2.25	1.5	0.75	0						
546-8	3.4	2.55	1.7	0.85	0						
587-8	3.6	2.7	1.8	0.9	0						
631-8	3.8	2.85	1.9	0.95	0						
495-10	2	1.33	0.67	0							
546-10	2.3	1.53	0.77	0							
587-10	2.4	1.6	0.8	0							
631-10	2.5	1.67	0.83	0							
694-10	2.7	1.35	0								
734-10	2.8	1.4	0								
790-10	3	1.5	0								
887-10	3.5	1.75	0								
988-10	3.9	1.95	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, NHN, KHN, KHK:
$\Delta Kr_{perm} = (S - S1) \times \tan(\Delta Kw_{perm})$

Type BEB, BEN, BEK, MCECM, MFEFM, MCHCM, MFHFM:
$\Delta Kr_{perm} = (LZ + S1) \times \tan(\Delta Kw_{perm})$

Note

The permissible shaft misalignments ΔKa_{perm}, ΔKr_{perm} and ΔKw_{perm} 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 41).

A.3.1 Threaded joint C flange with the M hub

Table A-9 Tightening torques and widths across flats for the bolted joint C flange with the M hub

Size	Bolt (91)	Tightening torque	Width across flats Hexagon socket
		T_A	SW
		Nm	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
219-8	M8	30	5
241-8	M8	30	5
262-8	M10	50	6
285-8	M10	50	6
302-8	M10	50	6
321-8	M10	50	6
354-8	M12	100	8
387-8	M12	100	8
411-8	M12	100	8
447-8	M16	220	10
495-8	M16	220	10
546-8	M16	220	10
587-8	M20	370	12
631-8	M20	370	12

Apply the recommended tightening torques as specified in Section Tightening procedure (Page 92).

A.3.2 Bolted joint F flange with the M hub

Table A-10 Tightening torques and widths across flats for the bolted joint F flange with the M hub

Size	ARN-6 Bolt (91)	ARN-8 ARN-10 Nut (92)	Tightening torque T_A Nm	Width across flats Hexagon socket SW mm
86-6	M8		25	6
103-6	M8		25	6
122-6	M10		49	8
133-6	M10		49	8
159-6	M14		135	12
174-6	M14		135	12
184-6	M16		210	14
203-6	M16		210	14
217-6	M18		290	14
251-6	M22		560	17
268-6	M22		560	17
291-6		M12	86	19
318-6		M12	86	19
343-6		M16	210	24
219-8		M10	49	17
241-8		M10	49	17
262-8		M12	86	19
285-8		M12	86	19
302-8		M12	86	19
321-8		M12	86	19
354-8		M16	210	24
387-8		M16	210	24
411-8		M16	210	24
447-8		M16	210	24
495-8		M16	210	24
546-8		M18	290	27
587-8		M18	290	27
631-8		M20	410	30
495-10		M16	210	24
546-10		M18	290	27
587-10		M18	290	27
631-10		M20	410	30
694-10		M22	560	34
734-10		M22	560	34

Size	ARN-6 Bolt (91)	ARN-8 ARN-10 Nut (92)	Tightening torque T_A Nm	Width across flats Hexagon socket SW mm
790-10		M24	710	36
887-10		M30	1200	46
988-10		M30	1200	46

Apply the recommended tightening torques as specified in Section Tightening procedure (Page 92).

A.3.3 Bolting of the complete clamping hub

Table A-11 Tightening torques and widths across flats for the bolted joint of the complete clamping hub

Size	Clamping bolt	Tightening torque	Width across flats	
			Type 124 Hexagon head	Type 125 Hexagon socket
		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	M12	120	19	10
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 as specified in Section Tightening procedure (Page 92).

A.4 Tightening procedure

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

Table A-12 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 EU declaration of conformity

EU declaration of conformity

Product:
FLENDER N-ARPEX® Couplings
Series ARN-6, ARN-8, ARN-10

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

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

This declaration refers to the product mentioned above.

The object of the declaration described above is in conformity with the relevant 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 ISO 80079-36 : 2016
EN ISO 80079-37 : 2016
EN ISO 80079-38 : 2017

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

Signed for and on behalf of:
Flender GmbH

Bocholt, 2019-02-28

Dr. Tim Sadek, Vice President, Applications Couplings

FLENDER COUPLINGS

N-ARPEX
Operating Instructions 8714en
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