FLENDER COUPLINGS

Flange coupling

Assembly and operating instructions M3553-01en
Version 04/2026

FLENDER

Original assembly and operating instructions

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Introduction 1

1.1 Legal information

Warning system

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

⚠ DANGER

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

⚠ WARNING

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

⚠ CAUTION

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

NOTE

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

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

Information

Information

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

Qualified personnel

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

Intended use of Flender products

Please note the following:

⚠ WARNING

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

Trademarks

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

Liability disclaimer

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

1.2 About these instructions

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

Read these instructions prior to handling the coupling. The instructions should be observed.

1.3 Text attributes

In addition to the warnings that you must observe for safety reasons, you will find the following text features in these instructions:

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

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

(1) Numbers in brackets are part numbers.

1.4 Copyright

The copyright of these instructions is held by Flender.

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

If you have any technical queries, please contact our factory or one of our service outlets (refer to Service and support (Page 39)).

Safety information

2

2.1 General information

Instructions

These instructions include all of the important information necessary for using this product safely. Ensure that the valid operating instructions are available for all work on the coupling. The currently valid operating instructions are available for download on the website of Flender GmbH (http://www.flender.com/). Earlier versions of the operating instructions are available upon request.

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 and/or personal injury. Flender does not accept any liability for damage or operating failures that are due to non-adherence to these instructions.

State of the art

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

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

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

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

Table 2-1 : General warnings

Explanation regarding Machinery Directive 2006/42/EC

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

Protective clothing

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

Using the coupling

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

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

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

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

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

Work on the coupling

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

Ensure that the drive aggregate cannot be inadvertently switched on. Attach an information notice to the start switch stating clearly that work is being carried out on the coupling. Ensure that the entire unit is not under load.

2.2 Intended use

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

When using the coupling please specifically observe the following:

- Do not make any modifications to the coupling that go beyond the permissible machining described in these instructions. This also applies to touch protection equipment.
- Use only original replacement parts from Flender. Flender only accepts liability for original replacement parts from Flender.
  Other spare parts are not tested and approved by Flender. Non-approved replacement parts may possibly change the design characteristics of the coupling and thus impact active and/or passive safety.
  Flender will accept no liability or warranty whatsoever for damage occurring as a result of the use of non-approved 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 39)).

2.3 General warnings

⚠ WARNING

Risk of injury if not used as intended

The coupling can burst. There is a risk of fatal injury from flying fragments. Personal injury, property damage and fire damage caused by sparks may occur.

- Use the coupling as intended.



⚠ WARNING

Risk of burning from hot coupling parts

Risk of burns on hot surfaces.

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



⚠ 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).



⚠ WARNING

Risk of crushing due to falling components

Falling components can cause crushing, serious injury and death. The components can be damaged.

- Secure the components to prevent them from falling
- Only use suitable and technically flawless hoisting gear and load lifting attachments.
- Only use hoisting gear and load lifting attachments with sufficient load-bearing capacity.

Description

3

The SKZF flange couplings described here are universally applicable, torsionally rigid couplings that are available in various sizes.

These instructions describe the assembly and operation of a flange coupling arranged horizontally with a shaft-hub connection made by a cylindrical or conical bore with pressurised oil interference fit or parallel key. To protect the shaft, the pressurised oil interference fit can also be equipped with a Bratt bush (55). Please consult Flender if you want to use a different type of installation.

Information

Due to the high bending forces, Flender recommends a shaft-hub connection with pressurised oil interference fit.
If you nevertheless choose a shaft-hub connection with parallel key, avoid bending moments.

Area of application

SKZF flange couplings are designed for use in all kinds of machines. They are designed to withstand high torques and harsh operating conditions.

Operation in the temperature range from -40 °C to +250 °C.

Flange couplings do not compensate for shaft displacement.

Structure

The SKZF flange coupling consists of the two coupling parts (1) and (2), which are fitted onto the machine shafts. The flanges of the coupling parts (1) and (2) are connected to each other with hexagon bolts (8) and nuts (9).

The spare parts drawings and spare parts list can be found under Spare parts drawing and spare parts list (Page 44).

The figure shows type SKZF with its constituent parts and their part numbers.

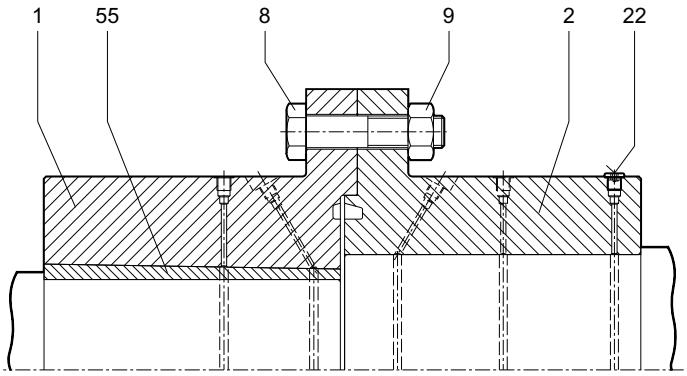


Figure 3-1: Flange coupling

1	Coupling part	2	Coupling part
8	Hexagon bolt	9	Hexagon nut
22	Screw plug	55	Bratt bush (optional)

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.

4.1 Transport of the coupling



⚠ WARNING

Risk of crushing due to improper transport

Falling components can cause crushing, serious injury and death. The components can be damaged.

- Only use suitable and technically flawless hoisting gear and load lifting attachments.
- Only use hoisting gear and load lifting attachments with sufficient load-bearing capacity.
- The symbols on the packaging must be observed.

Unless otherwise agreed contractually, the packaging complies with the HPE Packaging Guidelines.

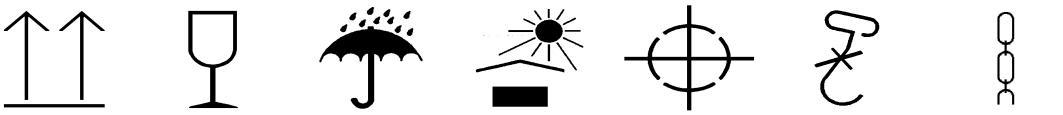


Figure 4-1: Transport symbols

4.2 Storage of the coupling

NOTE

Property damage due to improper storage

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

- Please observe the procedure for storing the coupling.

The coupling, unless specifically ordered otherwise, is supplied with preservation and can be stored for up to 3 months.

Information about storing the coupling

- Ensure that the storage room is dry (relative humidity < 65 %) and free of dust.
- Ensure that there is no condensation.

- Do not store the coupling together with corrosive chemicals, acids, caustic solutions, etc.
- Store the coupling on suitable supports or in suitable containers.
- Store Bratt bushes standing and wrapped in oil paper.

Long-term storage

NOTE

Property damage due to improper long-term storage

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

- Carefully observe the specifications for long-term storage.

1. You can find the required type of preservative 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.

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

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

Assembly 5

Assembly of the coupling comprises the following steps:

- Preparatory work (Page 21)
- Installing the coupling (Page 26)
- Aligning the coupling (Page 28)

⚠ WARNING

Risk of injury if specifications relating to assembly are not adhered to

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.

- Carefully observe all of the specifications relating to assembly.

Notes for assembling the coupling

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

⚠ CAUTION

Cutting hazard due to sharp edges

Sharp edges on the parallel keyway and parallel key groove may cause hand injuries.

- Wear protective gloves.

5.1 Preparatory work

5.1.1 Shaft-hub connection with pressurised oil interference fit

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

- Drilling the finished bore (Page 22)
- Arrangement of the oil channels and oil grooves (Page 23)

Information

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

5.1.1.1 Drilling the finished bore

The diameter of the finished bore depends on the shaft used.

Assigned fit

⚠ WARNING

Risk of injury and coupling damage due to incorrect assigned fit

The shaft may slip if there is play between the shaft and hub. The torque is not transmitted or transmitted insufficiently.
If the interference is too great, the coupling part cannot be mounted or can only be mounted with difficulty. It could lead to so-called “galling” through cold welding.
In both cases, there is a risk of injury and the coupling could be damaged.

- Calculate the pressurised oil interference fit carefully or consult with Flender.

Bore diameter

⚠ WARNING

Risk of injury if maximum bore diameter is exceeded

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

- Adhere to the maximum bore diameter specified.

The maximum diameters are listed in Section Speeds, geometry data and weights (Page 45).

Procedure

1. Remove the preservative and clean the coupling parts (1) and (2) to be machined.
2. Clamp the coupling parts according to the following figure.
3. Drill the finished bore according to the following figure.

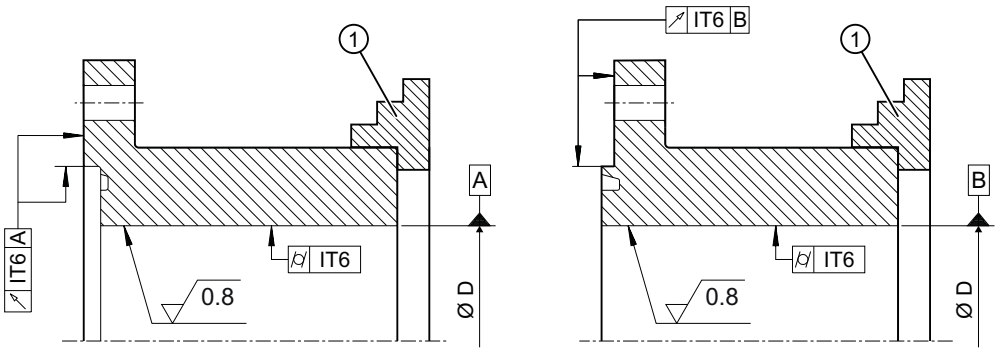


Figure 5-1: Tolerances for finished bore

① Clamping chuck

5.1.1.2 Arrangement of the oil channels and oil grooves

1. To prevent the centring from expanding, mill load relief grooves (Z) as shown in the drawing.
2. Offset the oil channels evenly around the circumference (X).
3. Machine 4 oil channels at the cylindrical interference fit for coupling sizes 700 and above.
   Position both middle oil channels evenly between the first and last oil channel.

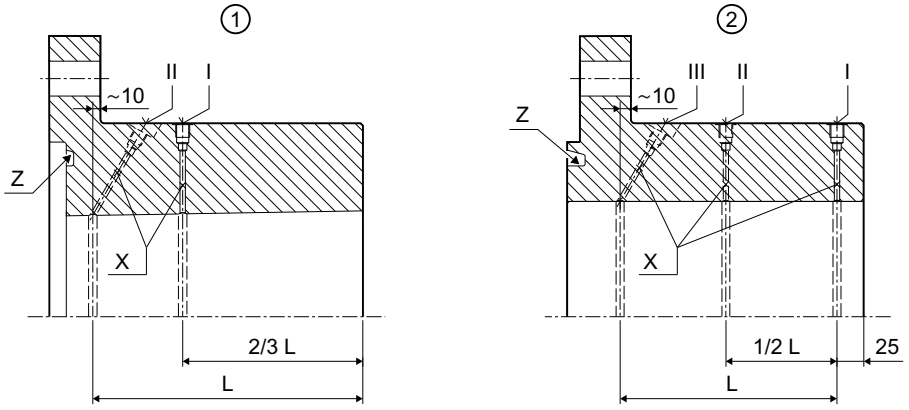


Figure 5-2: Arrangement of the oil channels and oil grooves

① Conical interference fit
② Cylindrical interference fit
X Offset the oil channels evenly around the circumference.
Z Relief grooves

5.1.2 Shaft-hub connection using parallel key

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:

- Drilling the finished bore (Page 24)
- Milling the parallel keyway (Page 25)
- Machining an axial locking mechanism (Page 25)

Information

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

5.1.2.1 Drilling the finished bore

The diameter of the finished bore depends on the shaft used.

Recommended assigned fits for shaft-hub connection using parallel key

In the following table, you can find the recommended assigned fits for bores with a parallel key connection.

Description	Interference fit					
Shaft tolerance	h6	k6	m6	n6	p6	s6
Bore tolerance	P7	M7	K7	J7	H7	F7

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

Bore diameter

⚠ WARNING

Risk of injury if maximum bore diameter is exceeded

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

- Adhere to the maximum bore diameter specified.

The maximum diameters are listed in Section Speeds, geometry data and weights (Page 45).

Procedure

1. Remove the preservative and clean the coupling parts (1) and (2) to be machined.
2. Clamp the coupling parts according to the following figure.
3. Drill the finished bore according to the following figure.

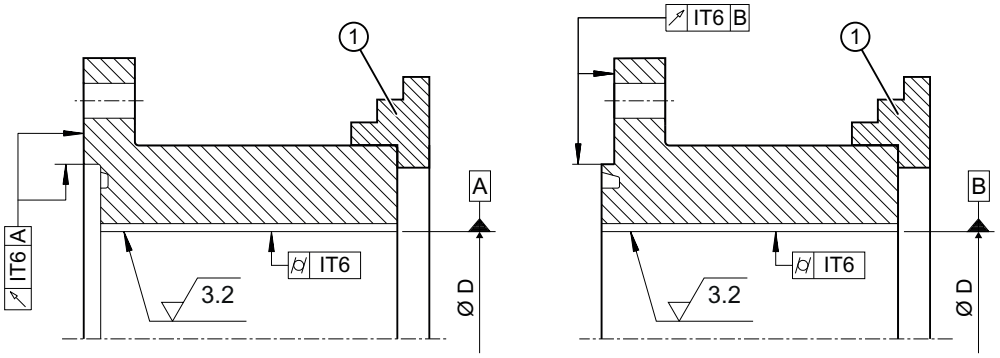


Figure 5-3: Tolerances for finished bore for parallel key connection

① Clamping chuck

5.1.2.2 Milling the parallel keyway

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.

5.1.2.3 Machining an axial locking mechanism

The coupling part (1) and/or (2) is secured by a set screw or an end plate to prevent axial movements.

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

Note the following when using a set screw:

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

Diameter and axial position of the threaded hole in the hub

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

The following tables contain the values for the diameter of the threaded hole depending on the finished bore.

Finished bore		Threaded hole	Tightening torque	Width A/F
Over mm	Up to mm	d_1	T_A Nm	Hexagon socket mm
8	30	M6	4	3
30	75	M8	8	4
75	95	M12	25	6

Finished bore		Threaded hole	Tightening torque	Width A/F
Over mm	Up to mm	d_1	T_A Nm	Hexagon socket mm
95	110	M16	70	8
110	150	M20	130	10
150	230	M24	230	12
230	540	M30	470	14

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

Apply the specified tightening torques as listed in Section Tightening procedure (Page 47).

Position of the threaded hole with respect to the parallel keyway

Position the threaded hole for the set screw on the parallel keyway.

Selection of the set screw

⚠ CAUTION

Risk of injury from protruding set screw

There is a risk of injury if the set screw protrudes out of the hub.

- Please observe the information about selecting the set screw.

Use set screws with hexagon socket and cup point in accordance with ISO 4029. The size of the set screw is determined by the threaded hole made. The set screw should fill out the threaded hole as much as possible and not protrude beyond the hub.

5.2 Installing the coupling

NOTE

Property damage due to improper handling

Improper handling can damage the shaft ends, coupling and/or parallel keys.

- Ensure that you do not damage the bores with hoisting gear or similar equipment.
- Follow the handling instructions regarding assembling the coupling parts.

Assembly of the coupling comprises the following steps:

- Assembling coupling parts with shaft-hub connection using a pressurised oil interference fit (Page 27)
- Assembling coupling parts with shaft-hub connection using a parallel key (Page 27)
- Assembling the coupling (Page 28)

5.2.1 Assembling coupling parts with shaft-hub connection using a pressurised oil interference fit

Procedure

1. Remove the screw plugs (22) from the coupling parts 1 (1) and 2 (2).
2. Clean, degrease, de-oil and dry the bores and shaft ends.
3. Clean and dry the oil channels and the oil circulation grooves.
4. If you have a version with a Bratt bush (55, 56), clean, degrease, de-oil and dry the Bratt bush (55, 56). Place the Bratt bush on the shaft.
5. Protect adjacent components against damage and impermissible heating.
6. Heat up the coupling parts 1 (1) and 2 (2) to the temperature specified in the dimension drawing.
   Make sure that no dirt or contaminants can soil the bores again during the heating process.
7. Mount the coupling parts 1 (1) and 2 (2) quickly on the shaft according to the instructions in the dimension drawing.
8. Secure the coupling parts 1 (1) and 2 (2) to stop them from moving until they have cooled down.
9. Allow the coupling parts 1 (1) and 2 (2) to cool down to the ambient temperature.
10. Use an end plate to secure the coupling parts 1 (1) and 2 (2) if they have a non-self-locking, tapered pressurised oil interference fit.
11. In order to protect the oil channels of the coupling parts 1 (1) and 2 (2) against corrosion, fill the oil channels with a suitable pressurised oil. Close the oil channels using the screw plugs (22).

5.2.2 Assembling coupling parts with shaft-hub connection using a parallel key

Procedure

1. Unscrew the set screw until a collision with the parallel key or the shaft is no longer possible.
2. Clean the bores and shaft ends.
3. Coat the bores of coupling parts 1 (1) and 2 (2) and the shafts with MoS_2 mounting paste (e.g. Microgleit LP 405).
4. Mount coupling parts 1 (1) and 2 (2) on the shaft.

⚠ WARNING

Risk of injury from incorrectly mounted coupling parts with conical bore

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

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

Information

Coupling parts with cylindrical bore

To make assembly easier, you can heat coupling parts with cylindrical bore up to a maximum of 120 °C if required.

5. Secure the coupling parts using a set screw or an end plate. When securing with an end plate, bolt on the end plate.
6. Tighten 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 25)).

5.2.3 Assembling the coupling

Procedure

1. Move the machines to be coupled close to one another.
2. Align the fitting holes of the flanges. Observe any markings that might be provided.
3. Insert the bolts (8) and tighten the nuts (9) to the specified tightening torque T_A (see Chapter Tightening torques and widths A/F (Page 46)).

5.3 Aligning the coupling

NOTE

The flange coupling does not compensate for deviations.

- Align the coupled machines carefully.

Commissioning 6

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

Testing before commissioning

⚠ WARNING

Risk of injury due to overload conditions during commissioning

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

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

1. Check the tightening torques of the bolts of the coupling in accordance with Section Tightening torques and widths A/F (Page 46).
2. Check the tightening torques of the foundation bolts of the coupled machines.
3. Check whether suitable housings (coupling guard, touch protection) have been installed and that the function of the coupling has not been adversely affected by the housing. This also applies to test runs and direction of rotation 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

⚠ WARNING

Risk of injury if any faults occur

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

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

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

1. Turn the drive off 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 from one of our Customer Service locations.

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

Risk of being pulled in by rotating parts

There is a danger of being caught or pulled in by rotating or moving parts and being injured as a result.

- Only carry out work on the coupling when it is at a standstill.
- Secure the drive aggregate against unintentional startup.
- Attach an information notice to the start 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 14).

7.2.2.1 Possible faults

Fault	Cause	Rectification
Sudden changes in the noise level and/ or sudden occurrences of shocks	Alignment changes	Follow the instructions given in Section Correcting the changed alignment (Page 34).
	Coupling not suitable for the operating conditions. Check the possible causes given in section Unsuitable coupling (Page 33).	Use a coupling that is suitable for the operating conditions.
	Incorrect coupling assembly. Check the possible causes given in Section Assembly-related causes (Page 34).	Reassemble the coupling in compliance with these instructions. Please observe all the stipulations and requirements given in chapter Assembly (Page 21).
	Incorrect maintenance of the coupling. Check the possible causes given in Section Maintenance-related causes (Page 34).	Please observe all the stipulations and requirements given in Chapter Servicing (Page 35).

Table 7-1 : Table of faults

7.2.2.2 Possible causes

7.2.2.2.1 Unsuitable coupling

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

7.2.2.2.2 Assembly-related causes

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

7.2.2.2.3 Maintenance-related causes

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

7.2.3 Correcting faults

7.2.3.1 Correcting the changed alignment

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

Procedure

1. Correct the cause for the change in alignment.
2. Carry out a visual inspection of the coupling for damage.
3. Check the locking elements that prevent axial movements and correct these as required.
4. Realign the coupled machines.

Servicing 8

8.1 Maintenance intervals

⚠ WARNING

Risk of injury if maintenance intervals are not adhered to

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

- Please observe all the specifications for coupling maintenance in this section.



⚠ WARNING

Risk of being pulled in by rotating parts

There is a danger of being caught or pulled in by rotating or moving parts and being injured as a result.

- Only carry out work on the coupling when it is at a standstill.
- Secure the drive aggregate against unintentional startup.
- Attach an information notice to the start 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 3 months for any heating and change in noise level.

8.2 Dismantling the coupling

Procedure

1. Loosen the bolt connection (8, 9).
2. Move the coupled machines apart.
3. Pull off coupling parts 1 (1) and 2 (2). Observe the instructions provided in Section Disassembling coupling part with shaft-hub connection using a parallel key (Page 37) or Disassembling coupling part with shaft-hub connection using a pressurised oil interference fit (Page 36).
4. Check the hub bore, the shaft and, if installed, the Bratt bushes (55) or (56) for damage.
5. Replace damaged parts.
6. Protect the hub bore, the shaft and, if installed, the Bratt bushes (55) or (56) from corrosion.

When reinstalling the coupling parts, please observe the information in Chapters Assembly (Page 21) and Commissioning (Page 29).

8.2.1 Disassembling coupling part with shaft-hub connection using a pressurised oil interference fit

⚠ WARNING

Risk of injury if oil pressure exceeds maximum permissible value

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

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

⚠ WARNING

Risk of injury due to improper handling

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.

- Use the fixtures and pumps as intended.
- Follow the manufacturer's instructions for handling the pulling fixtures and the pumps.

⚠ WARNING

Risk of injury as a result of coupling parts or the pulling fixture coming loose.

Falling coupling parts or pulling fixtures can cause crushing, serious injury and death. The coupling parts can be damaged.

- Use suitable hoisting gear to secure the coupling part and the pulling fixture.
- Attach an axial locking element if the pressurised oil interference fit is tapered.

⚠ CAUTION

Risk of injury and danger to the environment from spilled lubricant

There is a risk of injury from slipping. The lubricant may be harmful to the environment.

- Make sure you capture any lubricant that might escape.
- Dispose of the lubricant in accordance with applicable regulations.

Tools required

- One oil pump with pressure gauge (at least 2,500 bar) per oil channel.
  Or: One motor-driven oil pump. One connection that can be closed independently is required for each oil channel.
  Refer to the dimension drawing for the number of oil channels.
- With a stepped bore:
  A motor-driven oil pump at the oil channel located at the point of transition from the smaller to the larger bore. A large quantity of oil per unit of time is needed here.
- Suitable connections and pipes.

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

Procedure

1. Use a suitable pulling fixture.
2. Secure the coupling part 1 (1) and/or 2 (2), the Bratt bush (55, 56), if installed, and the pulling fixture against falling.
3. Remove the screw plugs (22) from the oil channels.
4. Deaerate an oil pump and connect it to the oil channel in the centre.
5. Pressurise the oil pump to the pressure specified in the dimension drawing until oil starts to escape from the adjacent connections or the front faces. Keep the pressure constant.
6. Deaerate the next oil pump and connect it to the adjacent oil channel.
7. Repeat steps 5 and 6 for the remaining oil ducts.
8. If so much oil escapes when pressure is applied that the pump cannot maintain the pressure, use a higher-viscosity oil.
9. Pressurise the hydraulic cylinder if oil escapes from both front faces as a closed oil ring. Make sure that the coupling part 1 (1) and/or 2 (2) is removed immediately in a swift, smooth movement.

NOTE

Removal in several strokes

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

10. If installed, pull the Bratt bush (55, 56) off.
11. Remove the oil pump and the pulling fixture.
12. Continue with Section Dismantling the coupling (Page 35).

8.2.2 Disassembling coupling part with shaft-hub connection using a parallel key



⚠ WARNING

Risk of burns from burners and hot coupling parts

Risk of burns due to burners and hot surfaces.

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

Procedure

1. Secure the coupling parts to prevent them from falling.
2. Remove the axial locking element (set screw, end plate).
3. Use a suitable pulling fixture.
4. Heat up the coupling part 1 (1) and/or 2 (2) using a burner above the parallel key along its length to maximum 120 °C.
5. Pull off the coupling part 1 (1) and/or 2 (2). Use suitable lifting gear when doing this.
6. Continue with Section Dismantling the coupling (Page 35).

Service and support 9

9.1 Contact

When ordering replacement parts, requesting a customer service technician or if you have any technical queries, contact our factory or one of our Customer Service addresses:

Flender GmbH

Schlavenhorst 100

46395 Bocholt

Germany

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

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

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

Further information

You can find further information about service and support online:

Service and support (https://www.flender.com/service)

Disposal

10

Disposal of the coupling

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

Spare parts 11

11.1 Ordering spare parts

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

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

You can find the available replacement parts for the coupling described here at Spare parts drawing and spare parts list (Page 44).

You can find our contact information for ordering spare parts under Service and support.

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 44))
- Dimensions of the spare part, for example:
  - Bore
  - Bore tolerance
  - Parallel keyway and balancing
- Special dimensions, for example, flange connection dimensions, intermediate sleeve length or brake drum dimensions
- Any special properties of the replacement part, such as, for example:
  - Temperature resistance
  - Electrical insulation
  - Operating fluid
  - Use in potentially explosive atmospheres
- Quantity

11.2 Spare parts drawing and spare parts list

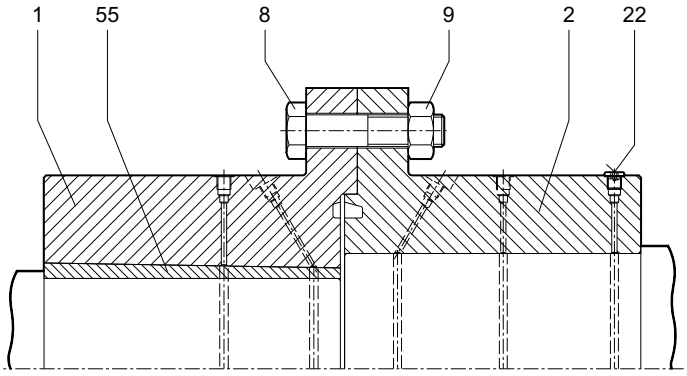


Figure 11-1: Spare parts drawing for SKZF flange coupling

Part number	Designation
1	Coupling part 1
2	Coupling part 2
8	Hexagon bolt
9	Hexagon nut
22	Screw plug [1]
55	Bratt bush [2]
56	Bratt bush [2]

Table 11-1 : Spare parts list for SKZF flange coupling

[1] Screw plugs (22) are only used in combination with a pressurised oil interference fit.

[2] Version with Bratt bush at the customer's request.

Information

You can find a description of the screw plug (22) in Section Screw plug (Page 44).

11.2.1 Screw plug

The diagram below shows the screw plug (22):

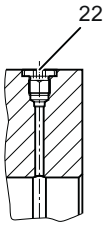


Figure 11-2: Screw plug (22)

Technical specifications

A

A.1 Speeds, geometry data and weights

In this chapter you can find dimension drawings and technical data for ZAPEX couplings of the following types:

- Dimension drawing for the SKZF type (Page 45)
- Dimension table (Page 45)

A.1.1 Dimension drawing for the SKZF type

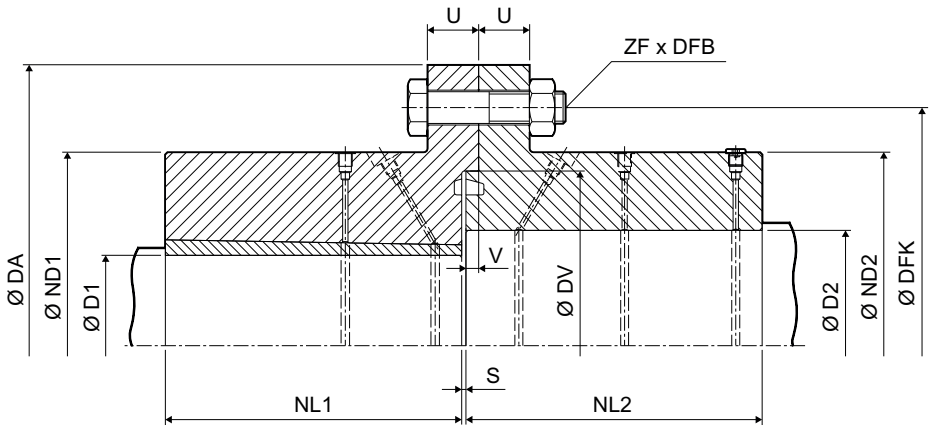


Figure A-1: Dimension drawing for the SKZF type

A.1.2 Dimension table

Size	Rated torque T_N [1]	Speed $n_{max.}$	Bore D1, D2 max.	DA	ND1 ND2	NL1 NL2	U	V	S	DV	DFK	DFG	ZF	Weight [2]
	Nm	rpm	mm	mm	mm	mm	mm	mm	mm	mm	mm		Quant-ity	kg
290	24,000	7,200	130	290	190	160	25	7	4	180	250	M20	16	52
360	42,000	5,800	150	360	230	160	30	8	4	215	310	M24	16	88
400	60,000	5,200	170	400	260	190	38	10	4	240	350	M24	18	135
430	82,000	4,800	190	430	290	220	38	10	4	270	380	M24	20	180
470	115,000	4,400	200	470	310	220	42	10	4	290	410	M30	16	215
490	135,000	4,200	220	490	330	240	42	10	4	310	430	M30	20	250

Size	Rated torque T_N [1]	Speed $n_{max.}$	Bore D1, D2 max.	DA	ND1 ND2	NL1 NL2	U	V	S	DV	DFK	DFG	ZF	Weight [2]
	Nm	rpm	mm	mm	mm	mm	mm	mm	mm	mm	mm		Quant-ity	kg
530	180,000	3,900	245	530	370	280	48	12	4	330	450	M30	20	350
580	240,000	3,600	270	580	410	320	55	15	4	380	500	M30	22	490
620	320,000	3,300	290	620	440	320	55	15	4	410	540	M30	24	560
660	400,000	3,100	310	660	470	370	60	16	4	420	570	M36	20	730
700	490,000	3,000	330	700	500	370	60	16	4	450	610	M36	22	820
740	580,000	2,800	350	740	530	420	65	17	4	470	650	M36	24	1,050
780	670,000	2,600	380	780	580	420	65	17	4	510	690	M36	26	1,200
820	770,000	2,500	400	820	600	460	70	18	4	525	720	M42	20	1,400
860	870,000	2,400	420	860	630	460	70	18	4	540	760	M42	20	1,550
900	980,000	2,300	440	900	660	510	80	19	4	560	800	M42	22	1,900
940	1,100,000	2,200	460	940	700	510	80	19	4	580	840	M42	24	2,150
1,000	1,330,000	2,100	480	1,000	730	560	90	20	4	600	890	M48	22	2,600
1,050	1,600,000	2,000	520	1,050	790	560	90	20	4	640	940	M48	24	3,000

Table A-1 : Geometry data and rated torque

[1] The coupling torques cannot be transferred to the shaft-hub connection without limitation. Additional bending moments which occur can reduce the transmitted torque. A corresponding design can be made on request.
The rated torque must not be exceeded in any operating condition.

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

A.2 Tightening torques and widths A/F

Use screws/bolts of strength class 8.8.

Size	Tightening torque T_A Part No. 9 Nm	Width A/F SW Part No. 9 [1] mm
290	610	30
360	1,050	36
400	1,050	36
430	1,050	36
470	2,100	46
490	2,100	46
530	2,100	46

Size	Tightening torque T_A Part No. 9 Nm	Width A/F SW Part No. 9 [1)] mm
580	2,100	46
620	2,100	46
660	3,560	55
700	3,560	55
740	3,560	55
780	3,560	55
820	5,720	65
860	5,720	65
900	5,720	65
940	5,720	65
1,000	8,640	75
1,050	8,640	75

[1)] Hexagon head

A.3 Tightening procedure

Tightening torques must be observed taking into account the following table:

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

Table A-2 : Tightening procedure

Information

The tightening torques apply to:

- Screws with untreated surfaces that are not oiled or are only lightly oiled. Use of lubricant coating or lubricant is not permitted.
- Screws that should be used with screw locking agent.

FLENDER COUPLINGS

Flange coupling
Assembly and operating instructions M3553-01en
Version 04/2026

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