



tz-Claw Coupling

- SDD/DU (duplex)**
- torsionally Flexible**

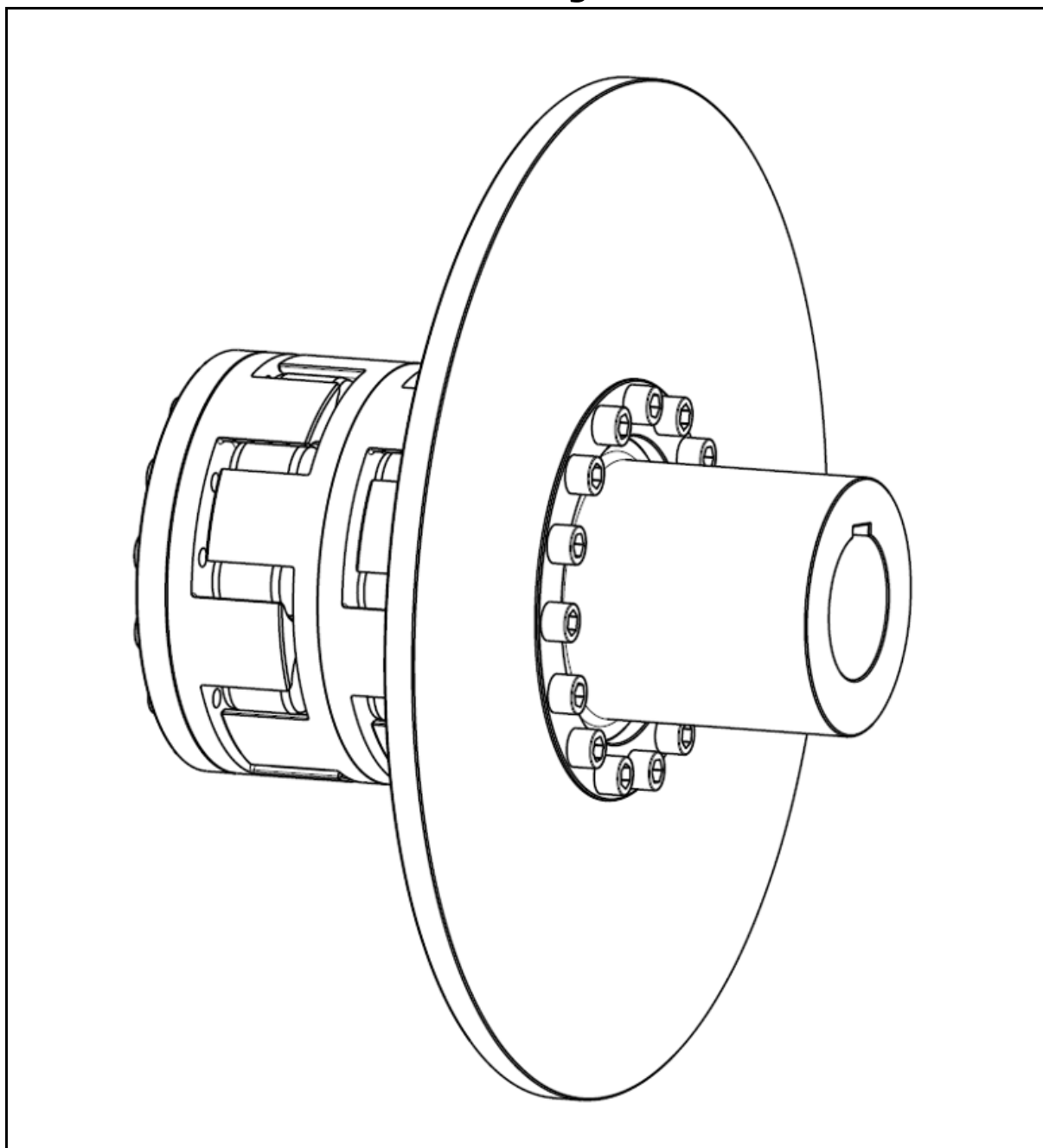


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Particular Safety Instructions and Symbols Used

In the following operating manual, concrete safety instructions are provided to advise against unavoidable residual hazards involved in the operation of the device. These residual hazards include danger posed to:

- persons
- product and machines
- environment

The symbols used in this operating manual are primarily intended to draw attention to the safety instructions!

The most important objective of the safety instructions is to avoid damage to persons. The respective symbol used cannot replace the text of the safety instructions. Therefore, the text must always be read completely!





<p>This symbol shows that dangers to persons are primarily to be expected. (Danger of death, risk of injury)</p>	
<p>This symbol shows that dangers regarding hand injuries are primarily to be expected.</p>	
<p>This symbol shows that dangers regarding hand injuries from hot surfaces are primarily to be expected.</p>	
<p>This symbol warns of dangers that can affect the explosion protection or cause a danger of explosion.</p>	

Table 1: Symbols Used

1 General Information

Copyright

Tüschen & Zimmermann holds the copyright for all documents bearing the signature of Tüschen & Zimmermann (tz) and which you received together with the product or otherwise from Tüschen & Zimmermann. Such documents may neither be made available to third parties nor otherwise improperly used without the prior written approval by Tüschen & Zimmermann.

In-house Use of the Documentation

Tüschen & Zimmermann allows you to use the documentation only for your own in-house use.

1.1 Foreword, General Notes

This installation and operating manual is intended to aid you in safely, correctly and economically using the torsionally flexible tz-claw coupling SDD/DU. Observing the instructions given in this manual will help you

- to increase the reliability and service life of the brake system,
- avoid dangers,
- avoid repairs and downtimes.

This manual must be kept at hand at all times while installation, maintenance and repair works are carried out and it must be read and observed by every person carrying out work on the brake system.

The torsionally flexible tz-claw coupling SDD/DU has been built in accordance with state-of-the-art technology and in compliance with the generally accepted regulations on technical safety. Nevertheless, there still may be possible risks to the life and limb of the user or third persons and/or risks of damage to the machine or other property if the product is used or handled incorrectly.

In addition to this operating manual, the relevant country-specific statutory provisions and regulations on accident prevention must be observed. Comply with the safety and accident prevention regulations of

- the mine,
- the mining authority,
- the Bergbauberufsgenossenschaft (professional mining association) or other competent professional associations.

Furthermore, read attentively and carefully the operating manual on the components required for the operation, such as those belonging to the gearbox, the electric motor, the conveyor, etc. Clarify any questions that may arise before starting work.

The manufacturer reserves the right to make changes to improve the product properties without providing any particular announcement.

1.1.1 Intended Use

Strictly observe the warnings according to 4.4 , as well as safety instructions according to 4.5 .

The torsionally flexible tz-claw coupling SDD/DU is solely intended to connect gearbox and motor shafts that are almost in alignment.

Any different use or use in excess of this is not regarded as intended use.

The coupling is suitable for operation in potentially explosive atmospheres under RL 2014/34/EC. The coupling is classified for device groups I and II in device categories 2 and 3, and hence for use in zones where explosive atmospheres can occur as a result of gases, vapours or dust-air mixes. The temperature classes are dependent on the maximum permitted ambient temperatures in the vicinity of the coupling, at 80°C, 45°C and 30°C for T4, T5 and T6. This applies on the condition that the temperature of the machine shaft also does not exceed these values during operation.



In order to ensure the long and trouble-free operation of the coupling, the coupling must be designed with an operating factor that is appropriate to the operating conditions, in compliance with the design specifications, e.g. DIN 740, Part 2 (or also the tz data sheet).

Apart from drilling a finish-bore with a keyway, no other changes to the coupling are permitted.

The coupling must only be used and operated within the framework of the conditions specified in the service and delivery contract.

Each change to the operating conditions or operating parameters necessitates the review and verification of the coupling design.

Intended use also includes compliance with this operating manual and adherence to the inspection and maintenance instructions and/or intervals and the measures of the relevant ATEX regulations.

The measures are within the operator's area of responsibility and must be verified by the installation company of the plant.

Damage resulting from any use other than the intended use shall not be the responsibility of the manufacturer. The risk is solely borne by the user/operator. Spare parts must comply with the technical requirements stipulated by tz. This is always ensured when original spare parts are used as they are subject to continuous quality control.

1.1.2 Instructions and Notes for the Use of the Product in Explosive Atmospheres

- The devices may be installed in underground mines for the danger zone "potentially explosive atmosphere" according to DIN EN 1127-2 (required design of the device according to Group I, Category M2) and must be included in the cut-off circuit in case of a CH4 hazard.
- The EC type examination certificates and any 'special instructions', which may be contained in these certificates must be complied with.
- The applicable installation and assembly regulations must be complied with.

ATTENTION!

The torsionally flexible tz-claw coupling SDD/DU is a combination of aluminium and steel. Aluminium and steel parts are not allowed to collide in potentially explosive atmospheres. The particular conditions during the operation, maintenance, servicing and transport of the product must be strictly observed.



1.2 General Safety Instructions

1.2.1 Work on the torsionally flexible tz-claw coupling SDD/DU

DANGER!

While working on the torsionally flexible tz-claw coupling SDD/DU, make sure that the drive motor and driven machines are at a standstill and that they cannot be accidentally started again under any circumstances.



1.2.2 Protection against Rotating Parts

WARNING!

The torsionally flexible tz-coupling must be secured by the customer with suitable protective devices (at least IP2X) in order to exclude all risk of physical contact with the operator.



1.2.3 Protection against Thermal Radiation

CAUTION!

Depending on the application, the temperatures at the tz-coupling of the plant as well as in its vicinity can reach up to 150°C during operation. Appropriate measures must be taken by the customer in order to prevent contact with hot parts.



1.2.4 Handling of Oils and Greases

ATTENTION!

Follow the applicable safety regulations when handling oils, greases and other chemical substances.



Skin contact:	Avoid longer and repeated contact; after contact clean affected part of the body with soap and water. Use skin protection products during work. Possibly wear oil-resistant protective clothing (e.g. safety gloves, safety goggles). Do not wash hands with petroleum, solvents or emulsions.
Eye contact:	Rinse eyes with plenty of water. If eye irritation remains, seek medical advice.
Ingestion:	Do not induce vomiting. Seek medical aid immediately.
Environment:	The environment can be polluted by operating media. Therefore, they must not get into air, soil or water.
Safety data sheets:	They contain details on health, accident and environmental protection and can be obtained from the manufacturer.

Table 2: Handling of Oils and Greases

1.2.5 Transportation, Assembly and Disassembly

ATTENTION!

During transportation, installation and removal work, the transport units, sub-assemblies or individual parts must be carefully attached and secured to lifting appliances and load-lifting equipment with sufficient load-carrying capacity, and secured against tipping and rolling.



You can be severely injured or killed by falling objects. Only use appropriate load-lifting equipment.

If the fully installed tz-couplings have to be transported attached to other parts or systems, they must be protected against mechanical damage (e.g. impacts) by means of the appropriate protective hoods.

1.2.6 Personnel

The personnel working on the brake system must be familiar with the operating manual, and in particular, with Chapter 1. The generally accepted technical regulations must be observed when assembling and disassembling the product. The specific safety regulations must be complied with in particular while carrying out any work on electrical, pneumatic or hydraulic equipment. In Germany, the current version of the "Sicherheitslehrbrief für Handwerker (Safety Requirements for Craftsmen)" must be complied with.

1.2.7 Operation, Maintenance and Servicing

Strictly observe the warnings according to 4.4 , as well as safety instructions according to 4.5 .

The safety and accident prevention regulations apply during operation.

This device coupling has been equipped with protective equipment. Modifications, attachments to and/or conversions of the torsionally flexible tz-claw coupling SDD/DU may affect safety and must never be performed without the approval of tz.



ATTENTION!

The torsionally flexible tz-claw coupling SDD/DU must be checked for mechanical damage and other defects at least once per month. If necessary, operation of the plant has to be stopped immediately and secured against unauthorised restart. Spare parts must comply with the technical requirements stipulated by tz. This is always ensured when original spare parts are used.



Appropriate workshop equipment must be used when performing repair or work. The rules and regulations for electrical installations must be complied with. Failure to comply with the relevant safety regulations and instructions when using, operating, servicing or repairing the equipment may cause serious and/or fatal injuries.

While working on the torsionally flexible tz-claw coupling SDD/DU, make sure that the drive motor and driven machines are at a standstill and that they cannot be accidentally started again under any circumstances.

1.2.8 Protection of the Environment

ATTENTION!

Operating resources, auxiliaries and replaced parts must always be disposed of in a safe and environmentally compatible manner. The relevant country-specific regulations must be observed. When handling oils, greases and other chemical substances, the safety instructions and regulations for this product must be complied with.



1.2.9 Residual Hazard

In order to avoid these residual hazards, the respective safety instructions contained in this operating manual must be strictly observed!

This section contains a summary of residual hazards which may occur during the transportation, storage, installation, operation, maintenance and repair works.

Mechanical hazards:

- Crushing or shearing in between the moving parts of the torsionally flexible tz-claw coupling SDD/DU and the surrounding area
- Slipping off the torsionally flexible tz-claw coupling SDD/DU
- Insufficient stability


Thermal hazard:

Burns due to contact with hot parts. Ignition due to sparks.

Hazard due to the temporary failure of protective devices:

Temporarily missing protective devices or bridging of control devices or similar items. During repairs or servicing.

The hazards that may be caused by the consequences of the failure of electrical, pneumatic or hydraulic energy must be taken into account by the builder of the main plant through appropriate measures, and must be included in his risk analysis.

Coupling SDD/DU	 Tüschen & Zimmermann
General Information	

1.3 General Information

The torsionally flexible tz-claw coupling SDD/DU has been designed and built for use as a connecting coupling between the motor and the driven machine.

The device corresponds to:

- the CE Guidelines (see EC declaration of conformity for the product)
- the applicable EC declarations of conformity for the components
- the regulations for potentially explosive areas according to Directive 2014/34/EC (ATEX) and is suited for work below ground, Device Group I, Category M2, and Device Group II, Categories 2 and 3.

ATEX-Marking:	Ⓢ I M2 Ⓢ II 2G T4 / T5 / T6 -20°C ≤ Ta ≤ 80 / 45 / 30°C Ⓢ II 2D T130°C	
Manufacturer:	Tüschen & Zimmermann GmbH & Co. KG (Address: see cover sheet)	
Definition:	torsionally flexible tz-claw coupling SDD/DU	
Product Identification:	see label	
Technical Data:	Weight:	see Table 5
	Dimensions:	see Figure 1 see Table 4
	for torques:	see Table 5
	Ambient temperature:	-20 °C to +30 °C
	Mounting position:	any
	additional information	see Annexes
	Scope of delivery:	1 pc. torsionally flexible tz-claw coupling SDD/DU 1 pc. Installation and Operating Manual 1 pc. Declaration of conformity coupling
© Copyright tz 2009		Protection mark according to DIN 34

Table 3: General Information

1.4 Device description

1.4.1 Design

The torsionally flexible tz-claw coupling SDD/DU consists of:

- Hub flange, motorside (1)
- Hub flange, gearbox-side (2, without brake disc at the top, with brake disc at the bottom)
- Duplex claw ring (3)
- Elastomer buffer ring (4)
- Claw ring (5)
- Set of connection bolts (6)
- Brake disc (7)
- tz-lock washer (8)

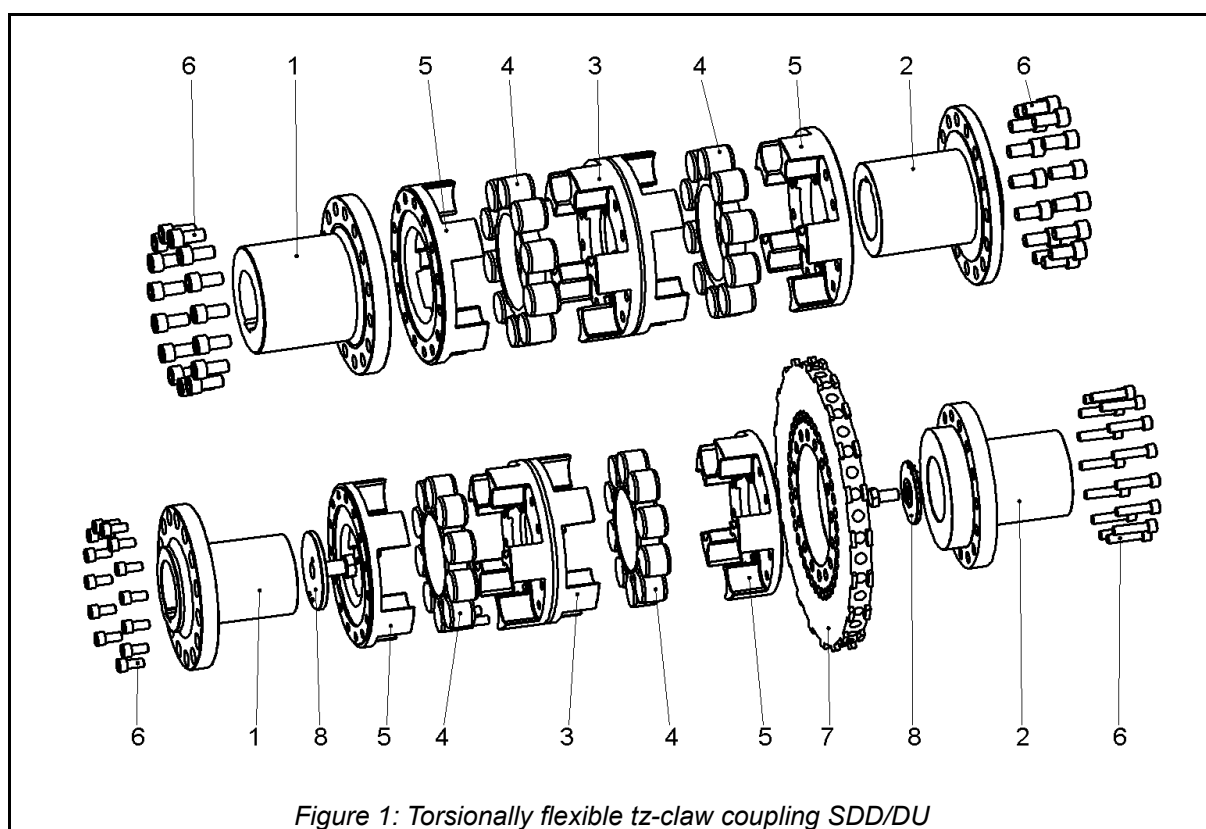


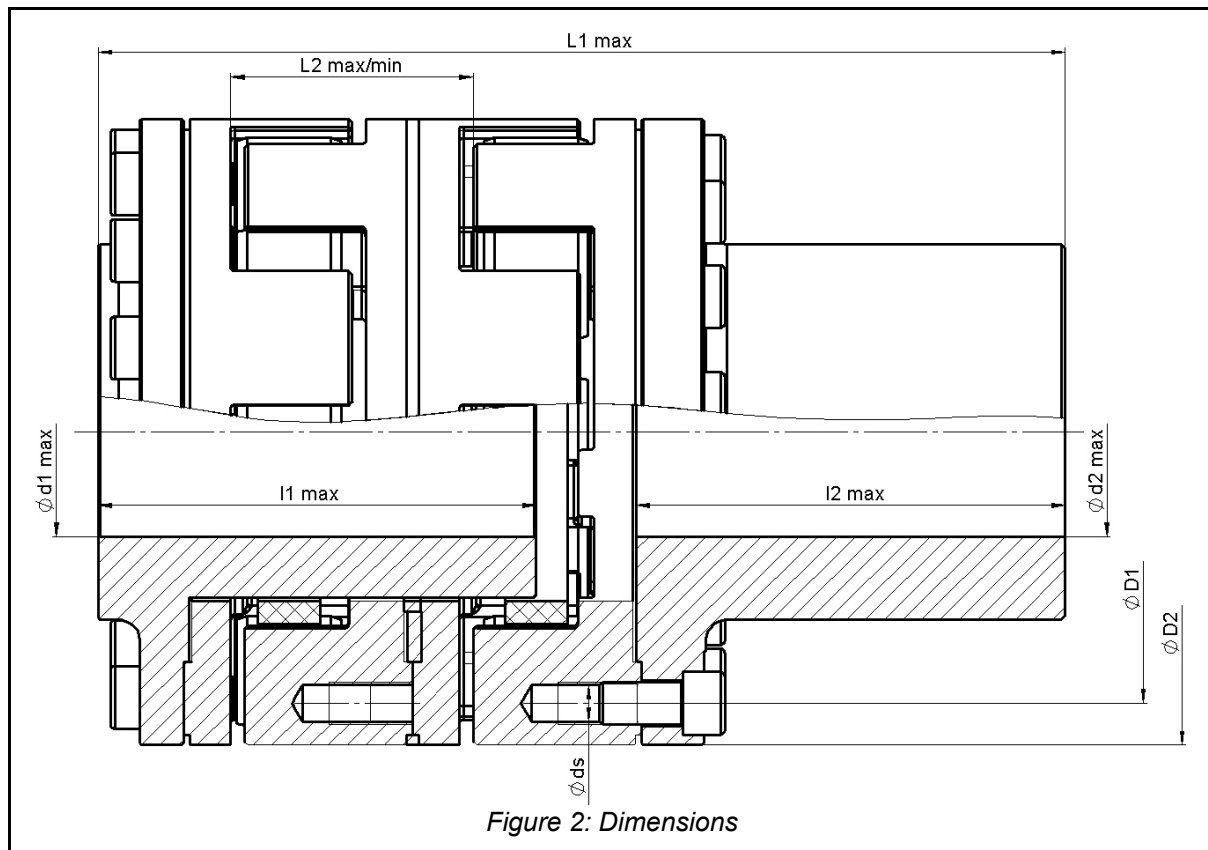
Figure 1: Torsionally flexible tz-claw coupling SDD/DU

1.4.2 Operating Principle

The torsionally flexible tz-claw coupling SDD/DU is a coupling with rotation flexibility and is puncture-proof. It compensates for angular, radial and axial shaft misalignment within defined tolerances. The torque is transmitted through two elastomer buffer rings loaded in compression. The elastomer buffer ring dampens shocks and torsional vibrations, is resistant to oil and is largely insensitive to temperature.

The tz claw coupling SDD/DU can be fitted with a brake disc if required.

1.4.3 Dimensions



Size	Dimensions									
	d1max [mm]	d2max [mm]	D1 [mm]	D2 [mm]	z x ds [mm]	L1max ¹⁾ [mm]	L2min [mm]	L2max [mm]	l1max ¹⁾ [mm]	l2max ¹⁾ [mm]
230SDD/DU	80	80	200	230	15xM14	516	93	96,5	172	172
260SDD/DU	100	110	230	260	15xM16	626	109	113	212	212
300SDD/DU	100	125	260	300	15xM20	646	119	123	212	212

¹⁾ Dimensions variable, if necessary consultation with tz

Table 4: Dimensions

As standard, all couplings are manufactured with a keyway according to DIN 6885 and bores of the tolerance class G6.

Refer to the tz catalogue for information and data on brake discs.

1.4.4 Approximate Determination of the Coupling Size

Size	Torque (VKB)		Torque (VKG)		Torque (VKR)		Speed ²	Mass ¹ unbored
	T _{KN} [Nm]	T _{K max} [Nm]	T _{KN} [Nm]	T _{K max} [Nm]	T _{KN} [Nm]	T _{K max} [Nm]	n _{max} [rpm]	m [kg]
230SDD/DU	980	2940	1700	5150	1700	5150	3250	62
260SDD/DU	1530	4590	2650	7950	2650	7950	3000	108
300SDD/DU	2280	6840	3900	11700	3900	11700	2500	148

- 1) The stated total weight refers to l_{1max} without brake disc
- 2) Depending on the diameter of the brake disc, the admissible speed may vary. Consult tz when using brake discs and a speed greater than 1500 rpm.

VKB = polyurethane buffer ring / blue (for all applications below and above ground)

VKG = polyurethane buffer ring / green (for all applications below and above ground)

VKR = polyurethane buffer ring / red (only Zone 2/22)

Table 5: Approximate Determination of the Coupling Size

1.4.5 Elastomer buffer ring

1.4.5.1 General Information on the elastomer buffer ring

The suitability for use in potentially explosive atmospheres has been attested by the type examination certificate

BVS 03 H 030 X according to Directive 2014/34/EC.

For mass greater than 0.5 kg and when using below ground, the user must check whether fire protection and/or hygiene provisions of the respective country of the operator are met.

1.4.5.2 VKB and VKG Buffer Rings

The polyurethane buffer ring (VKB) or (VKG) allows the reduction of the surface resistance "R₀", which is responsible for the electrostatic charge, to a value of:

VKB: 1.8 x 10⁸ Ω

VKG: 7.0 x 10⁸ Ω

The suitability for use in potentially explosive atmospheres has been attested by the type examination certificate BVS 03 H 030 X according to Directive 2014/34/EC.

1.4.5.3 VKR Buffer Rings

The VKR buffer ring is flame-resistant but not electrostatically conductive. The VKR buffer ring may be used on all machines that only use one buffer ring.

The use of two buffer rings is not permitted in Zone 1 / 21 (Category 2GD) and within Danger Zone 2 (Category M2) if the isolated metallic intermediate part has not been additionally earthed.

2 Installation

2.1 To be Observed Prior to Installation

Make sure that the intended speeds and torques (see 1.4.4) and the operating temperatures (see general notes) do not exceed the permissible values.

Standard tolerances for finish-bores are designed in accordance with ISO tolerance G6 (DIN ISO2862).

Standard keyways are designed in accordance with DIN 6885.

Set screws as required.

WARNING!

The motor must always be switched off prior to any work on the torsionally flexible tz-claw coupling SDD/DU.

Make sure that the motor is secured against unintentionally re-starting.

Note!

For easier assembly an even heating of the tz hub flange SDD/DU (Items 1 and 2, Figure 1) to a uniform 80°C to 120°C can be safely effected. Before heating, always remove the elastomer buffer ring (Item 4, Figure 1).

Allow the tz-hub flange SDD/DU to cool down to ambient temperature before inserting the buffer ring.

WARNING!

Always wear gloves to protect against hot parts.

2.2 Assembling the torsionally flexible tz-claw coupling SDD/DU

(see Figure 1)

When assembling the torsionally flexible tz-claw coupling SDD/DU, appropriate assembly aids must be used.

The bores of the tz-coupling hub SDD/DU (Items 1 and 2, Figure 1) and the shaft ends must be cleaned before assembly.

Fit the fully assembled tz-hub flanges SDD/DU (Items 1 und 2, Figure 1) with claw rings (Item 5, Figure 1), and brake disc if available (Item 7, Figure 1) and set of connection bolts (Item 6, Figure 1) onto the shafts up to the shaft collar.

Secure the tz-hub flanges SDD/DU (Items 1 und 2, Figure 1) with a lock washer or set screw. Insert the elastomer buffer rings (Item 4, Figure 1) into the claw rings (Item 5, Figure 1). Slide the complete tz-hub flanges SDD/DU (Items 1 und 2, Figure 1) with assembled shaft ends into the duplex claw ring (Item 3, Figure 1).

ATTENTION!

When sliding the complete tz-hub flanges SDD/DU (Items 1 und 2, Figure 1) into the duplex claw ring (Item 3, Figure 1), observe the claw position of the duplex claw ring (Item 3, Figure 1) in order to avoid damage.



Tightening torques for connection bolts (Item 1.6, Fig. 1) between claw ring (Item 1.5, Fig. 1) and tz-hub flange SDD/DU (Item 1.1 and 1.2, Fig. 1):		
Size	Screws	Tightening torque [Nm]
230SDD/DU	15 x M14	140
260SDD/DU	15 x M16	215
300SDD/DU	15 x M20	430

Table 6: Tightening torques for screws

2.3 Aligning the torsionally flexible tz-claw coupling SDD/DU

WARNING!

The motor must always be switched off prior to any work on the torsionally flexible tz-claw coupling SDD/DU.

Make sure that the motor is secured against unintentionally re-starting.

Note!

Precise alignment of the torsionally flexible tz-claw coupling SDD/DU prolongs the service life of the elastomer buffer ring.

The maximum permissible misalignment values specified in Table 7 and Table 8 are general guideline values. During the initial alignment process, the misalignment values should not exceed 50% of these tolerances.

In special circumstance with high requirements concerning the smoothness of running or higher speeds, alignment accuracies of less than 0.1 mm may be required.



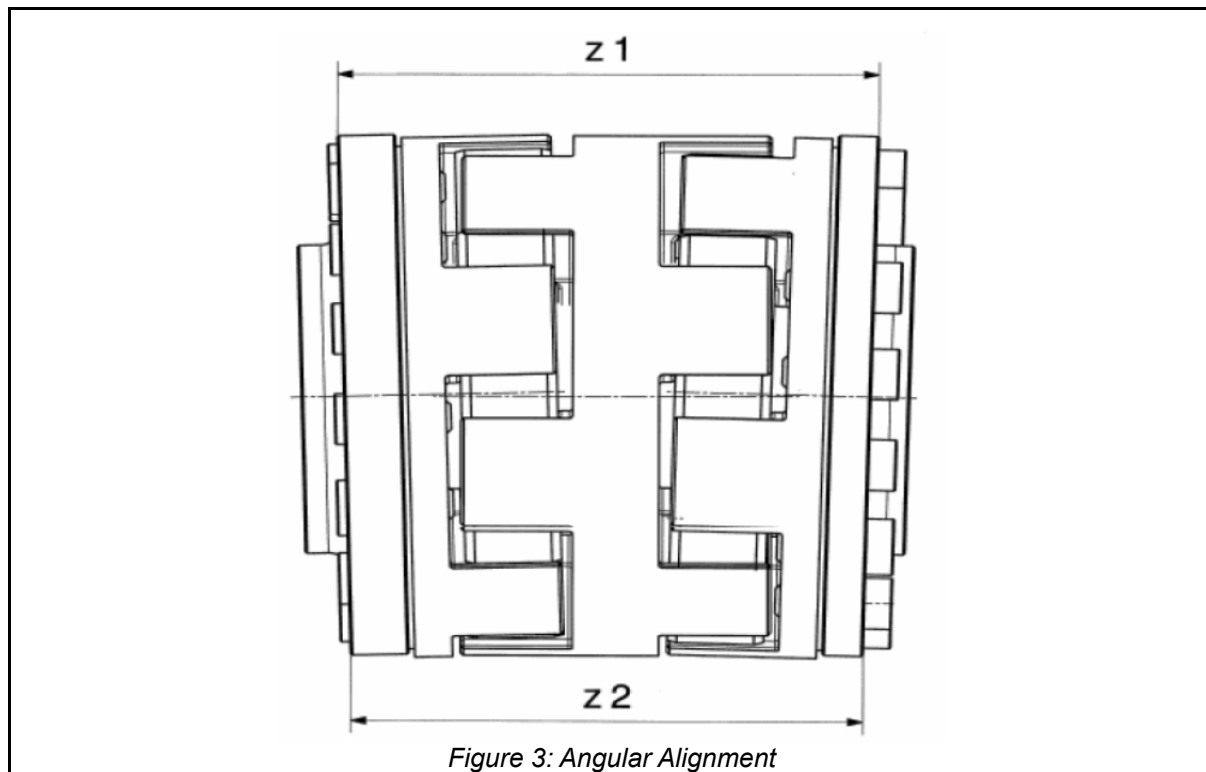
2.3.1 Angular alignment

WARNING!

The motor must always be switched off prior to any work on the torsionally flexible tz-claw coupling SDD/DU.

Make sure that the motor is secured against unintentionally re-starting.

- Always measure one complete rotation (360°).
- In doing so, determine the largest deviation z_1 as well as the smallest deviation z_2 . The angular misalignment Δz is then calculated ($\Delta z = z_1 - z_2$).
- When aligning, the maximum permissible angular misalignment Δz_{\max} for the respective coupling size according to Table 7 must be complied with.
- The values under Table 7 are valid for a reference speed of 1500 rpm.



Size	Angular misalignment Δz_{\max} [mm]
230SDD/DU	1.2
260SDD/DU	1.2
300SDD/DU	1.2

Table 7: Angular Alignment - Dimensions

2.3.2 Radial Alignment

WARNING!

The motor must always be switched off prior to any work on the torsionally flexible tz-claw coupling SDD/DU.

Make sure that the motor is secured against unintentionally re-starting.



- Always measure one complete rotation (360°).
- The largest deviation y_1 and the smallest deviation y_2 must be calculated. From this, the radial misalignment Δy is calculated [$\Delta y = 0.5 \times (y_1 - y_2)$].
- When aligning, the maximum permissible radial misalignment Δy_{\max} for the respective coupling size according to Table 8 must be complied with.
- The values under Table 8 are valid for a reference speed of 1500 rpm.

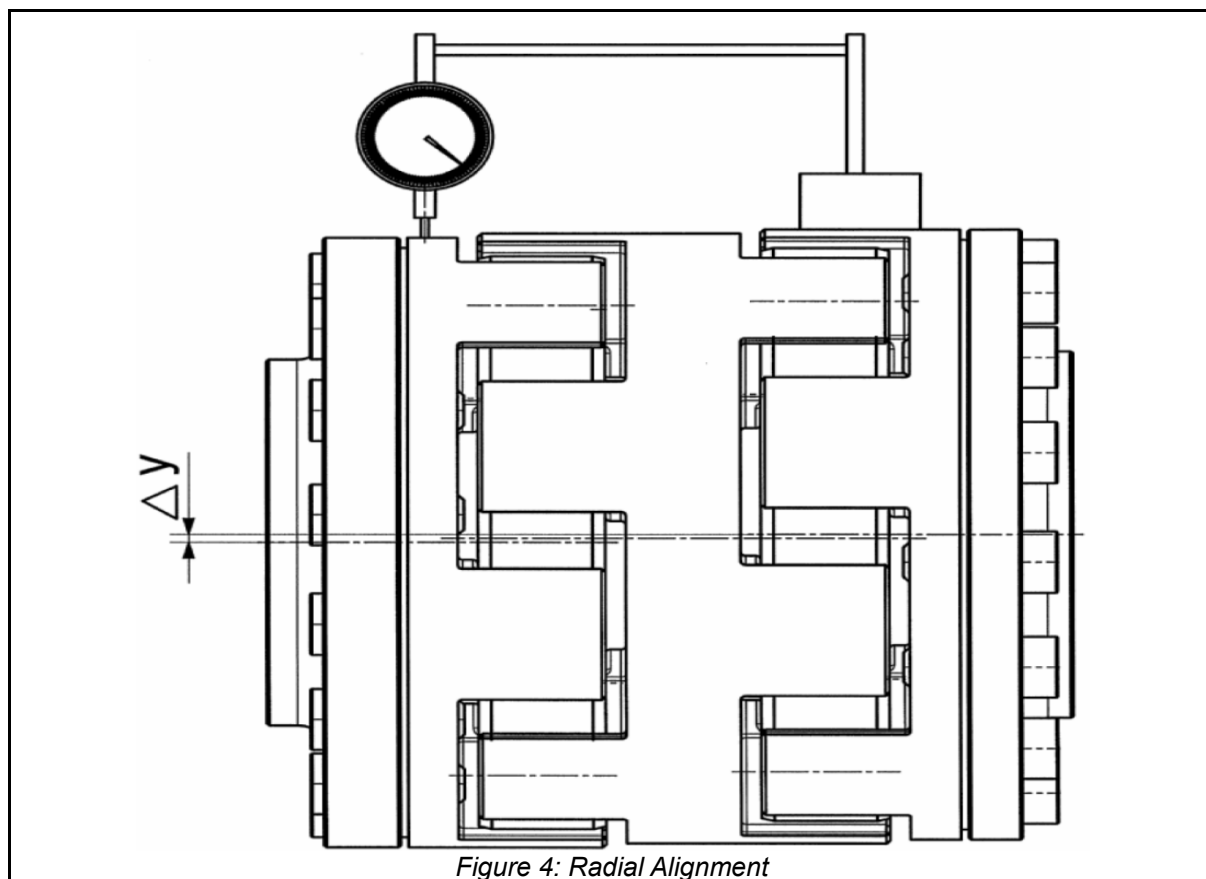


Figure 4: Radial Alignment

Size	Radial misalignment Δy_{\max} [mm]
230SDD/DU	1.6
260SDD/DU	1.8
300SDD/DU	1.8

Table 8: Radial Alignment - Dimensions

2.3.3 Axial Alignment

The torsionally flexible tz-claw coupling SDD/DU is a coupling with length compensation. The permissible tolerances for length compensation are indicated in Table 4.

The elastomer buffer rings (Item 4, Figure 5) must be properly seated in their full width in the claw ring pockets of the duplex claw ring (Item 3, Figure 5) and the claw rings (Item 2, Figure 5).

After axially aligning the torsionally flexible tz-claw coupling SDD/DU, the claw rings (Item 2, Figure 5) and the claw ring of the duplex claw ring (Item 3, Figure 5) must not be touching.

Secure the tz-hub flanges SDD/DU (Item 1, Figure 5) with the claw rings (Item 2, Figure 5) against axial displacement. A radially arranged set screw or a lock washer can be used for this purpose.

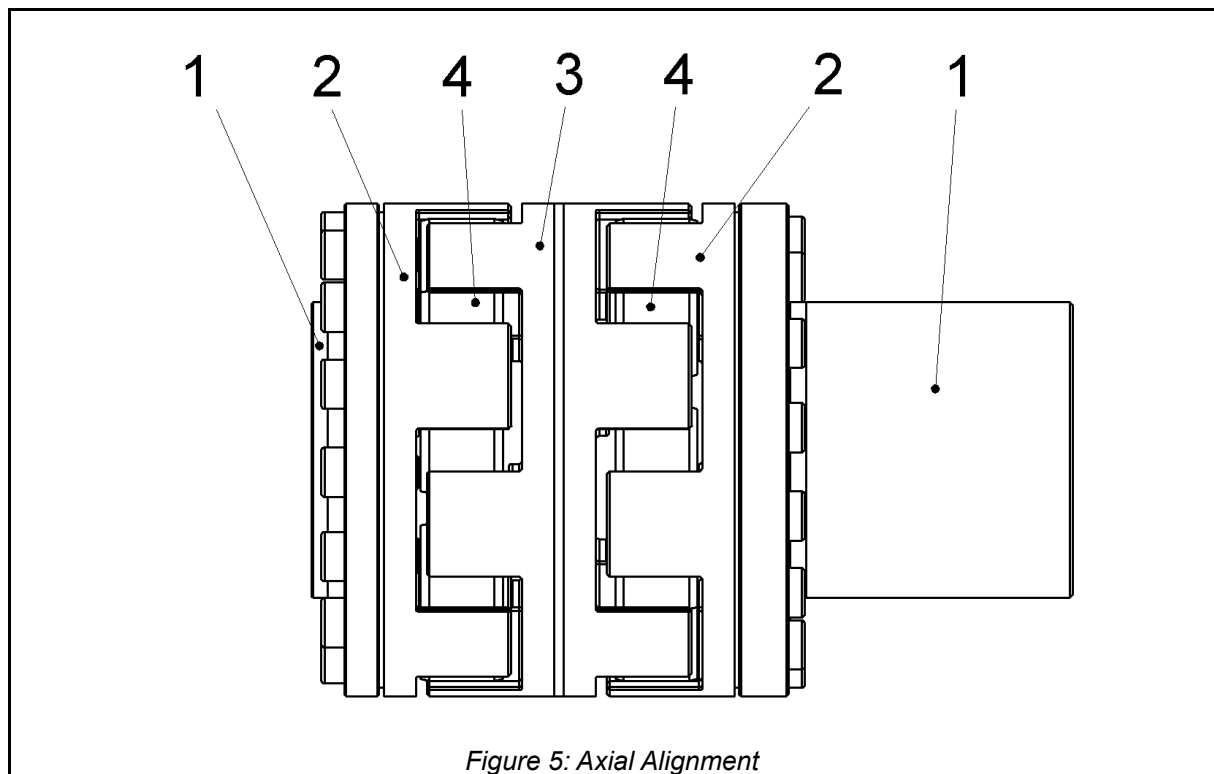


Figure 5: Axial Alignment

3 Commissioning

When using the tz-claw coupling SDD/DU, its characteristic data must be observed (see 1.4.3 , 1.4.4 and 1.4.5). The technical data must never be exceeded without prior written approval from Tüschen & Zimmermann.

In order to ensure the long and trouble-free operation of the tz-claw coupling SDD/DU, the coupling must be designed with an operating factor that is appropriate to the operating conditions, in compliance with the design specifications, e.g. DIN 740, Part 2 (or also the tz data sheet).

Every change in operating conditions or operating parameters necessitates a review of the coupling design.

WARNING!

- Before commissioning, check the alignment of the torsionally flexible tz-claw coupling SDD/DU and all screwed connections for the prescribed tightening torque and firm fitting.
- Before commissioning, all moving or freely rotating parts must be protected against unintentional contact and falling objects by means of permanently installed guards (enclosures).
- The guards (enclosures) must at least comply with the requirements of the protection type IP2X.
- The covers should be designed to prevent dust from being deposited on the torsionally flexible tz-claw coupling SDD/DU.
- If you discover irregularities during operation of the torsionally flexible tz-claw coupling SDD/DU, turn off the drive system immediately. There may be danger of explosion.



In the event of faults, take into account specific safety measures, and use Table 11 to determine and correct the cause of the fault.

4 Service

4.1 Maintenance

WARNING!

The motor must always be switched off prior to any work on the torsionally flexible tz-claw coupling SDD/DU.

Make sure that the motor is secured against unintentionally re-starting.



The torsionally flexible tz-claw coupling SDD/DU is low-maintenance during operation. The time in which the wear limit of the elastomer buffer ring is reached depends on the operating parameters and operating conditions.

During routine inspections of the drive system:

- the alignment of the torsionally flexible tz-claw coupling SDD/DU must be checked.
- the condition of the elastomer buffer ring must be checked.
- dust deposits must be removed from the torsionally flexible tz-claw coupling SDD/DU and the elastomer buffer ring.
- the elastomer buffer ring must be replaced at the latest after 3 years, or sooner in the case of heavy wear.

4.1.1 Wear Inspection of the Elastomer Buffer Rings

After initial commissioning, the elastomer buffer ring must be visually inspected and checked for wear after 200 hours, at the latest however after 14 days.

If only minor wear or no wear of the buffer rings is found during this first inspection, further inspections can be carried out at regular intervals of 2000 hours, but every 3 months at the latest, provided that the operating states do not change.

If disproportionately high wear is discovered at the first inspection, it must be examined whether the high wear may be the result of a cause described in Table 11 .

The inspection intervals must then be adapted to the prevailing operating conditions (inspection and replacement intervals must be shortened).

If the wear limit has been reached or exceeded, replace the elastomer buffer ring immediately, irrespective of the inspection intervals for the overall plant.

It is recommended that the elastomer buffer ring should be replaced during maintenance work on the output side.

4.1.2 Wear Inspection while the Overall Plant is at a Standstill

WARNING!

The motor must always be switched off prior to any work on the torsionally flexible tz-claw coupling SDD/DU.

Make sure that the motor is secured against unintentionally re-starting.



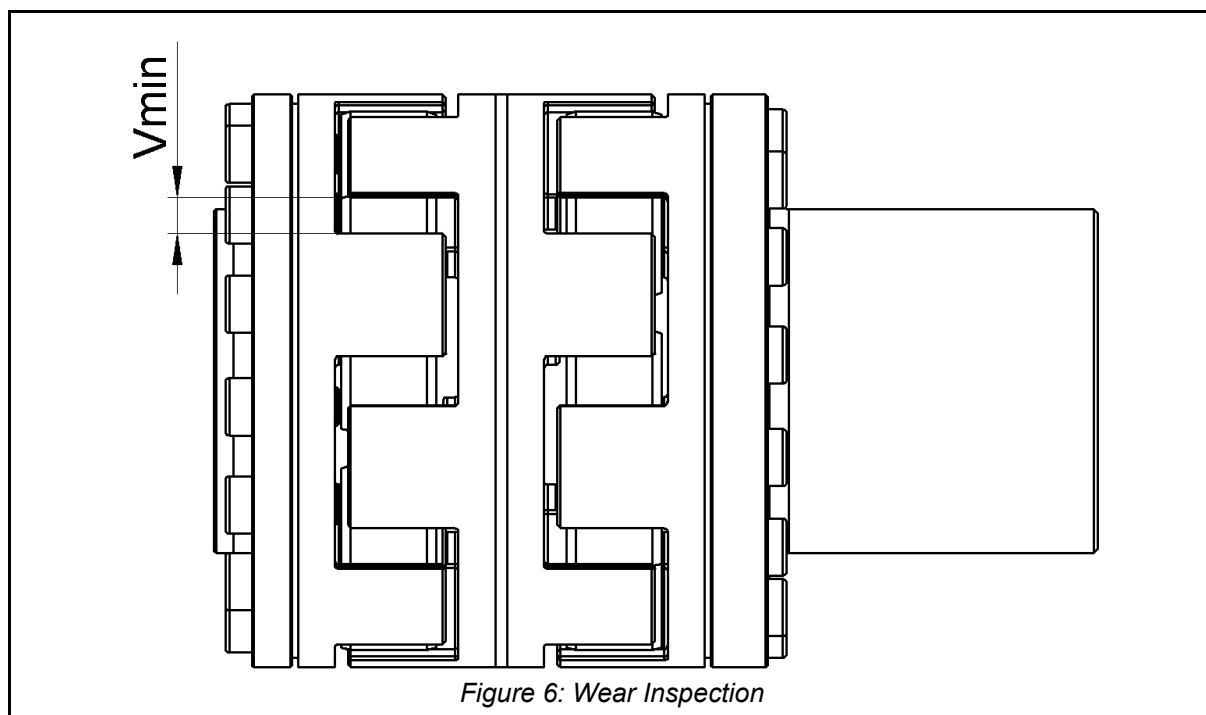
In order to examine the buffer for wear while the plant is switched off and unloaded, turn the tz-coupling parts in such a manner that the claws rest against the elastomer buffer ring without clearance.

As shown in Figure 6 the claw clearance V is measured in a circumferential direction over the buffers that the claws are touching on both sides. The adjacent buffers are not in contact with the claws.

Repeat this measurement on the adjacent buffers after the tz-coupling parts have been turned in opposite directions from one another.

If the dimension V reaches or falls below the value for the respective tz-coupling size stated in Table 9 V_{min} , the elastomer buffer ring must be replaced immediately.

After the wear inspection, all safety devices must be remounted before operation is resumed.



Size	Wear dimensions V_{min} [mm]
230SDD/DU	15.4
260SDD/DU	15.3
300SDD/DU	12.1

Table 9: Wear Dimensions

4.1.3 Servicing works and Transportation of Spare Parts

Servicing works should only be carried out in a specialist company. Professional maintenance and repair can only be guaranteed by tz. Interventions carried out on the plant by a third party may alter specified characteristics and may lead to faults and malfunctions for which tz does not assume any liability.

ATTENTION!

If repairs in potentially explosive atmospheres are unavoidable, proceed as follows:

- The personnel assigned to work on the torsionally flexible tz-claw coupling SDD/DU must be familiar with the operating manual, and in particular with Chapter 1 . Approval to start the maintenance work is given by the supervisors in charge after they have convinced themselves that there is no explosive atmosphere present which might represent a hazard when the work is carried out.
- The coupling parts to be replaced must be transported to the site of installation in suitable transport containers. They must only be taken out of the transport container immediately before being used. The dismantled coupling parts must be removed from the danger zone immediately following repair work.
- When transporting entire couplings or coupling-brake systems, the coupling parts must be protected in such a manner that they do not constitute a source of danger in potentially explosive atmospheres.



4.1.4 Storage of Elastomer Buffer Rings and Coupling Parts

The following storage conditions have been defined to retain the quality and to achieve as long a service life as possible:

The coupling parts can be stored in their condition as delivered in a dry and roofed area at normal ambient temperatures for a period of 6 months. Storage for a longer period requires the application of a long-term preservation product, for which tz should be contacted in advance.

Do not expose the elastomer buffer rings to an atmosphere containing ozone. Ozone-generating devices such as all light sources which emit ultraviolet radiation and high-voltage electrical systems have a harmful effect on the elastomer buffer rings. Dimmed light should be used. The storage areas must not be exposed to direct sunlight. Windows are to be coated with a red or orange protective paint (never use blue paint). The relative air humidity should not exceed 65%. If properly stored, the characteristics of the elastomer buffer rings remain almost unchanged for up to three years.

4.1.5 Replacing the elastomer buffer ring

WARNING!

The motor must always be switched off prior to any work on the torsionally flexible tz-claw coupling SDD/DU.
 Make sure that the motor is secured against unintentionally re-starting.



The procedure for replacing the elastomer buffer ring is described below.

- 1) Remove covers or coupling guard.
- 2) Disconnect the motor including the tz-hub flange SDD/DU (Item 1, Figure 1).
- 3) Remove the duplex claw ring (Item 3, Figure 1) from the gearbox-side claw ring (Item 5, Figure 1, right-hand side).
- 4) Using a lever, press out the elastomer buffer rings (Item 4, Figure 1) from the claws of the claw rings (Item 5, Figure 1) and remove.
- 5) Apply appropriate lubricant (e.g. commercially available roll bearing grease for polyurethane Vk) to new elastomer buffer rings (Item 4, Figure 1) and reinstall it in the reverse order.
- 6) Disconnect the motor including the tz-hub flange SDD/DU (Item 1, Figure 1) and replace the covers and coupling guard.

4.1.6 Spare parts

Spare part	Size	Spare Part Article No.:
VKB elastomer buffer ring	230SDD/DU	900230VB0000
VKG elastomer buffer ring		900230VG0000
VKR elastomer buffer ring		900230VR0000
VKB elastomer buffer ring	260SDD/DU	900260VB0000
VKG elastomer buffer ring		900260VG0000
VKR elastomer buffer ring		900260VR0000
VKB elastomer buffer ring	300SDD/DU	900303VB0000
VKG elastomer buffer ring		900303VG0000
VKR elastomer buffer ring		900303VR0000

Table 10: Spare Parts

4.2 Operation Faults and Possible Causes

ATTENTION!

Turn off drives immediately in case of operation faults. Correct fault immediately, since otherwise there is an ignition hazard due to hot surfaces and possible spark formation.



Fault	Cause	Correction
Irregular running noises / vibrations	Alignment fault	<ul style="list-style-type: none"> • Correct cause of alignment fault • Realign coupling • Inspect the elastomer buffer ring for wear
	Elastomer buffer ring worn out	<ul style="list-style-type: none"> • Inspect coupling parts for damage – replace parts if necessary • Replace elastomer buffer ring
	Imbalance	<ul style="list-style-type: none"> • Check balance state of plant components and correct the same, if necessary • Inspect the elastomer buffer ring for wear
	Loose screwed connection	<ul style="list-style-type: none"> • Inspect coupling parts for damage – replace parts if necessary • Check alignment of the coupling • Tighten screws with the stipulated tightening torque and secure them against working loose automatically if necessary • Inspect the elastomer buffer ring for wear
Premature wear of the elastomer buffer ring	Alignment fault	<ul style="list-style-type: none"> • Correct cause of alignment fault • Realign coupling • Inspect the elastomer buffer ring for wear
	Impermissible temperature	<ul style="list-style-type: none"> • Replace elastomer buffer ring • Realign coupling • Adjust ambient temperature
	Contact with aggressive media	<ul style="list-style-type: none"> • Inspect coupling parts for damage – replace parts if necessary • Replace elastomer buffer ring • Check alignment of the coupling • Prevent contact with aggressive media
	Torsional vibrations in the drive train	<ul style="list-style-type: none"> • Analyse and correct cause of torsional vibrations • Inspect coupling parts for damage – replace parts if necessary • Replace elastomer buffer ring • Consult tz concerning possible use of another Shore hardness • Check alignment of the coupling
Claw breakage	Buffer ring worn out → Claw contact	<ul style="list-style-type: none"> • Replace coupling • Shorten wear inspection intervals
	Overload due to too high torque	<ul style="list-style-type: none"> • Inspect coupling design in cooperation with tz • Replace coupling • Introduce larger coupling if necessary

Table 11: Operation Faults

4.3 Repair and inspection

ATTENTION!

Repairs and adjustment operations to the torsionally flexible tz-claw coupling SDD/DU that exceed the scope of normal inspection operations may only be carried out at the manufacturer's factory.

Professional repair or reconditioning can only be guaranteed by the manufacturer.

Interventions carried out on the plant by a third parties may alter specified characteristics and may lead to significant faults and malfunctions for which tz shall not assume liability.



4.4 Warnings

ATTENTION!

All screwed connections released must be properly tightened before operating the equipment again.



4.5 Safety Instructions

ATTENTION!

Maintenance and repair work must always be performed when the plant is at a standstill. Always turn off the motor prior to any work on the torsionally flexible tz-claw coupling SDD/DU. Make sure that the motor is secured against unintentionally re-starting.



Annex	 Tüschen & Zimmermann
Marking	

TÜSCHEN & ZIMMERMANN

D-57368 Lennestadt

Definition:

TZ art. no.:

Year of construction:

CE 0158 

II 2G T4/T5/T6 $-20^{\circ}\text{C} \leq T_a \leq 80^{\circ}\text{C}$ / 45°C / 30°C

II 2D T130 °C

I M2