



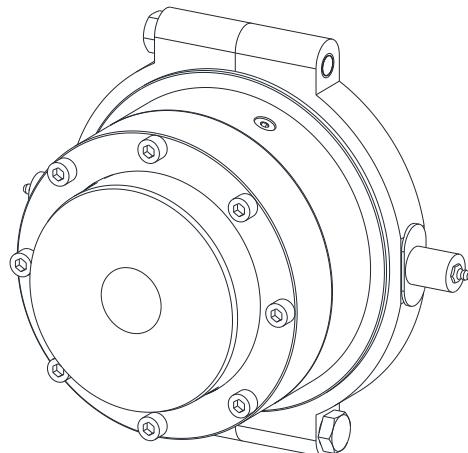
KTR-Group

GEARex® SD  
Operating/Assembly instructionsKTR-N 40311 EN  
Sheet: 1 of 22  
Edition: 6

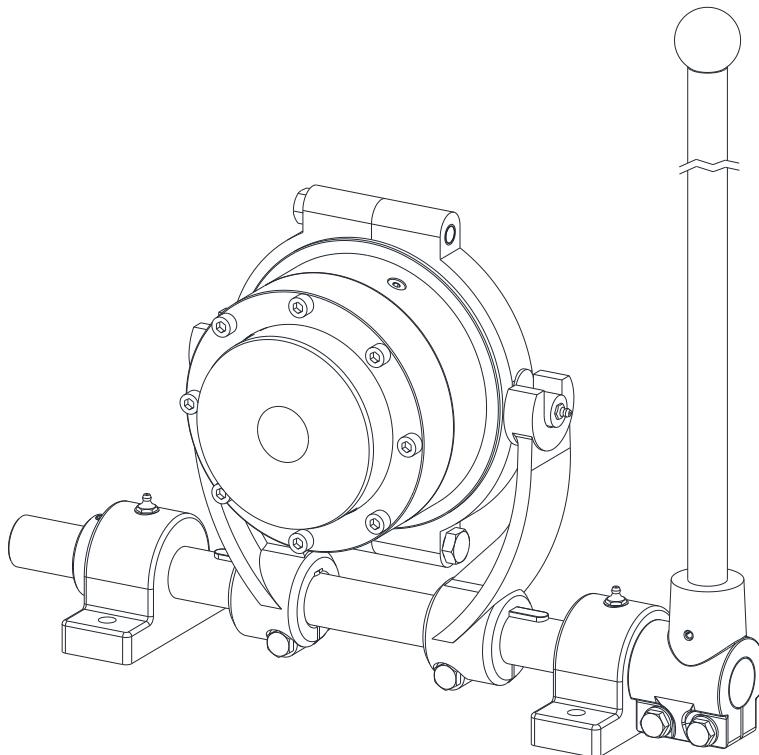
# GEARex®

All-steel gear couplings type SD along with combinations

for finish bored, pilot bored and unbored couplings



Type SD



Type SD with shiftable linkage

Please observe protection note ISO 16016.	Drawn: 2023-01-20 Ka/Ku Verified: 2023-06-22 Ka	Replacing: KTR-N dated 2016-12-14 Replaced by:
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The **GEARex®** all-steel gear coupling is a flexible shaft connection shiftable at standstill. It is able to compensate for shaft misalignment, for example caused by manufacturing inaccuracies, thermal expansion, etc.

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## 1 Technical data

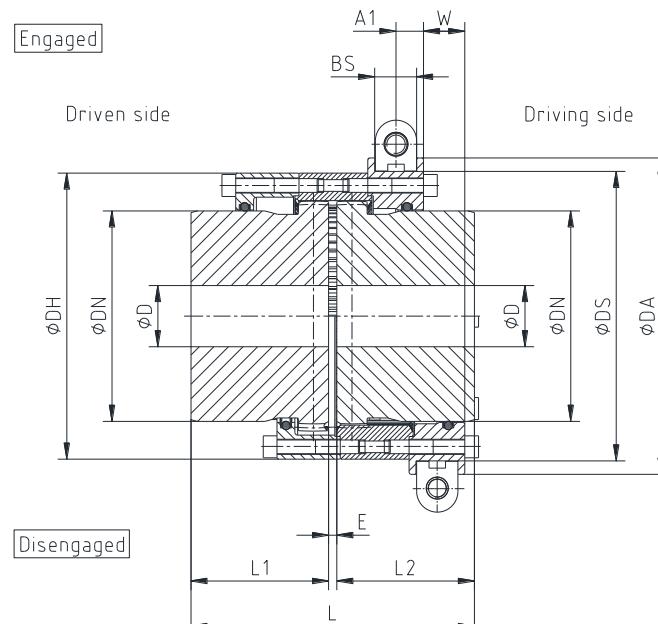


Illustration 1: Type SD

Table 1: Dimensions and technical data - SD

Size	Torque in Nm		Pilot bore	Max. finish bore D	Dimensions in mm								
	T <sub>KN</sub>	T <sub>Kmax</sub>			L	L1, L2	A1	BS	DA	DH	DN	DS	W
10	1580	3160	26	50	103	50	13.75	18	125	110	67	112.5	16.0
15	3300	6600	26	64	123	60	20	20	145	132	87	131	19.0
20	6300	12600	31	80	146	70	17.5	25.5	185	152	108	165	21.0
25	11000	22000	38	98	165	80	20	30.5	230	183	130	210.5	28.0
30	17400	34800	44.5	112	206	100	20	30.5	230	208	153	210.5	30.0
35	28800	57600	46	133	226	110	22.5	35.5	270	238	180	250.5	35.0
40	48500	97000	52	160	286	140	27.5	38.5	320	282	214	300.5	40.0
45	62000	124000	80	175	308	150	27.5	38.5	320	301	233	300.5	45.0
50	86000	172000	80	195	348	170	30	40	386	330	260	362	50.0
55	110000	220000	90	210	390	190	40	40	386	354	283	362	55.0



In case if a dimensional drawing was prepared for the coupling, the dimensions specified have to be primarily observed.

The operator of the machine is to be provided with the dimensional drawing.



Max. circumferential speed v = 20 m/s, referring to DS.

Standard GEAREx® SD couplings are not designed for continuous operation.



## 1 Technical data

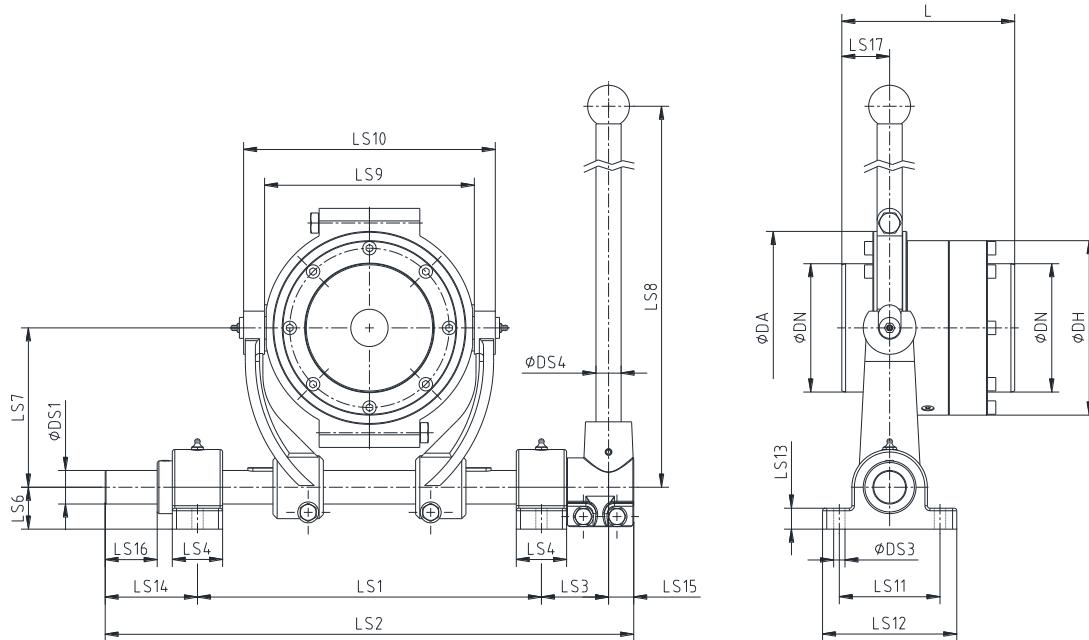


Illustration 2: Type SD with shiftable linkage

Table 2: Dimensions - SD with shiftable linkage

Size	Shiftable linkage size	Slip ring size	Dimensions in mm							
			DS1	DS3	DS4	LS1	LS2	LS3	LS4	LS6
10	Size 3	Size 3.3	30	13.5	20	310	490	70	60	40
15	Size 3	Size 4.4	30	13.5	20	310	490	70	60	40
20	Size 4	Size 5.5	35	13.5	30	365	565	70	60	50
25	Size 5	Size 6.6	40	13.5	30	410	630	80	60	50
30	Size 5	Size 6.6	40	13.5	30	410	630	80	60	50
35	Size 5	Size 7.7	40	13.5	30	410	630	80	60	50
40	Size 6	Size 8.8	40	13.5	30	540	760	80	60	50
45	Size 6	Size 8.8	40	13.5	30	540	760	80	60	50
50	Size 6	Size 9.9	40	13.5	30	540	760	80	60	50
55	Size 6	Size 9.9	40	13.5	30	540	760	80	60	50

Size	Dimensions in mm										
	LS7	LS8	LS9	LS10	LS11	LS12	LS13	LS14	LS15	LS16	LS17
10	120	600	140	180	100	140	25	90	20	44	28
15	120	600	170	210	100	140	25	90	20	44	34.5
20	147.5	750	200	244	120	160	25	100	30	54	36.5
25	190	1085	250	300	120	160	25	110	30	62	40.5
30	190	1085	250	300	120	160	25	110	30	62	57
35	190	1085	300	350	120	160	25	110	30	62	60
40	265	1068	360	420	120	160	25	110	30	62	77
45	265	1068	360	420	120	160	25	110	30	62	83
50	265	1068	420	480	120	160	25	110	30	62	90
55	265	1068	420	480	120	160	25	110	30	62	106



In case if a dimensional drawing was prepared for the coupling, the dimensions specified have to be primarily observed.  
The operator of the machine is to be provided with the dimensional drawing.



## 2 Advice

### 2.1 Coupling selection

For drives subjected to torsional vibrations (drives with cyclic stress due to torsional vibrations) it is necessary to perform a torsional vibration calculation to ensure a reliable selection. Typical drives subjected to torsional vibrations are e. g. drives with piston pumps, piston compressors etc. If requested, KTR will perform the coupling selection and the torsional vibration calculation.



**For a long-lasting and failure-free operation of the coupling it must be selected according to the selection instructions for the particular application (see catalogue drive technology "GEARex®").**

**If the operating conditions (performance, speed, modifications on engine and machine) change, the coupling selection must be reviewed.**

**The transmittable torque of the shaft-hub-connection must be reviewed by the customer and is subject to his responsibility.**

### 2.2 General advice

Please read through these operating/assembly instructions carefully before you start up the coupling.  
Pay special attention to the safety instructions!

The operating/assembly instructions are part of your product. Please store them carefully and close to the coupling.

The copyright for these operating/assembly instructions remains with KTR.

### 2.3 Safety and advice symbols



#### Warning of personal injury

This symbol indicates notes which may contribute to preventing bodily injuries or serious bodily injuries that may result in death.



#### Warning of product damages

This symbol indicates notes which may contribute to preventing material or machine damage.



#### General advice

This symbol indicates notes which may contribute to preventing adverse results or conditions.



#### Warning of hot surfaces

This symbol indicates notes which may contribute to preventing burns with hot surfaces resulting in light to serious bodily injuries.

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## 2 Advice

### 2.4 General hazard warnings



For a long-lasting and failure-free operation of the coupling it must be selected according to the selection instructions for the particular application (see catalogue drive technology "GEARex®").

If the operating conditions (performance, speed, modifications on engine and machine) change, the coupling selection must be reviewed.

The transmittable torque of the shaft-hub-connection must be reviewed by the customer and is subject to his responsibility.

- All operations on and with the coupling have to be performed taking into account "safety first".
- Make sure to switch off the coupling and power packs connected before you perform your work.
- Secure the power pack against accidental switch-on, e. g. by providing warning signs at the place of switch-on or removing the fuse for current supply.
- Do not reach into the operating area of the coupling as long as it is in operation.
- Secure the coupling against accidental contact. Provide for the necessary protection devices and covers.

### 2.5 Proper use

You may only assemble, operate and maintain the coupling if you

- have carefully read through the operating/assembly instructions and understood them
- had technical training
- are authorized by your company

The coupling may be used in accordance with the technical data only (see table 1 and 2). In addition please make sure that the coupling may be shifted at standstill only. The coupling may only be shifted a new if the teeth of the sleeve are flush with the gaps of the hub spline.

Unauthorized modifications on the coupling design are not admissible. We will not assume liability for any damage that may arise. In the interest of further development we reserve the right for technical modifications. The GEARex® SD described in here corresponds to the technical status at the time of printing of these operating/assembly instructions.

## 3 Storage, transport and packaging

### 3.1 Storage of the coupling

Unless explicitly ordered differently, the coupling is supplied with preservation and may be stored in a dry and roofed place for a period of up to 3 months.

In case of a longer storage period please consult with KTR.

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### 3 Storage, transport and packaging

#### 3.2 Storage of O-rings

Proper storage conditions increase the service life of O-rings. For the storage of O-rings basically DIN 7716 (standards for storage, maintenance and cleaning of rubber products) or ISO 2230 (rubber products - standards for storage) applies.

The physical characteristics and period of operation may be subject to numerous negative influences like, as an example, light, heat, moisture, oxygen, ozone, etc.

In general the optimum storage condition is said to be welded in polyethylene bags with temperatures between + 5 °C to + 20 °C.



**The O-rings (component 10) must not be stored being mounted to the hubs (component 1 and 2).**



**The storage space should be dry and free from dust. The O-rings (component 10) must not be stored together with chemicals, polar solvents, fuels, acids, etc.**

#### 3.3 Transport and packaging



**In order to avoid any injuries and any kind of damage always make use of proper transport and lifting equipment.**

The couplings are packed differently each depending on size, number and kind of transport. Unless otherwise contractually agreed, packaging will follow the in-house packaging specifications of KTR.

### 4 Assembly



**Observe the manufacturer's instructions regarding the use of solvents.**



**Driving components falling down may cause injury to persons or damage on the machine. Secure the driving components with assembly resp. disassembly.**

The coupling is generally supplied in pre-assembled condition. Before assembly the coupling has to be inspected for completeness.

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## 4 Assembly

### 4.1 Components of the couplings

#### Type SD

Component	Quantity	Description
1	1	SD hub
2	1	SD hub
3	1	SD sleeve
4	1	SD cover
5	1	SD Grinding component
6	see table 3	Cap screws DIN EN ISO 4762
7	see table 3	Cap screws DIN EN ISO 4762
8	2	Washers DIN 7603
9	2	Screw plugs DIN 908 <sup>1)</sup>
10	2	O-rings - material 70 NBR

1) With size 10 cap screws DIN 7984 - 8.8

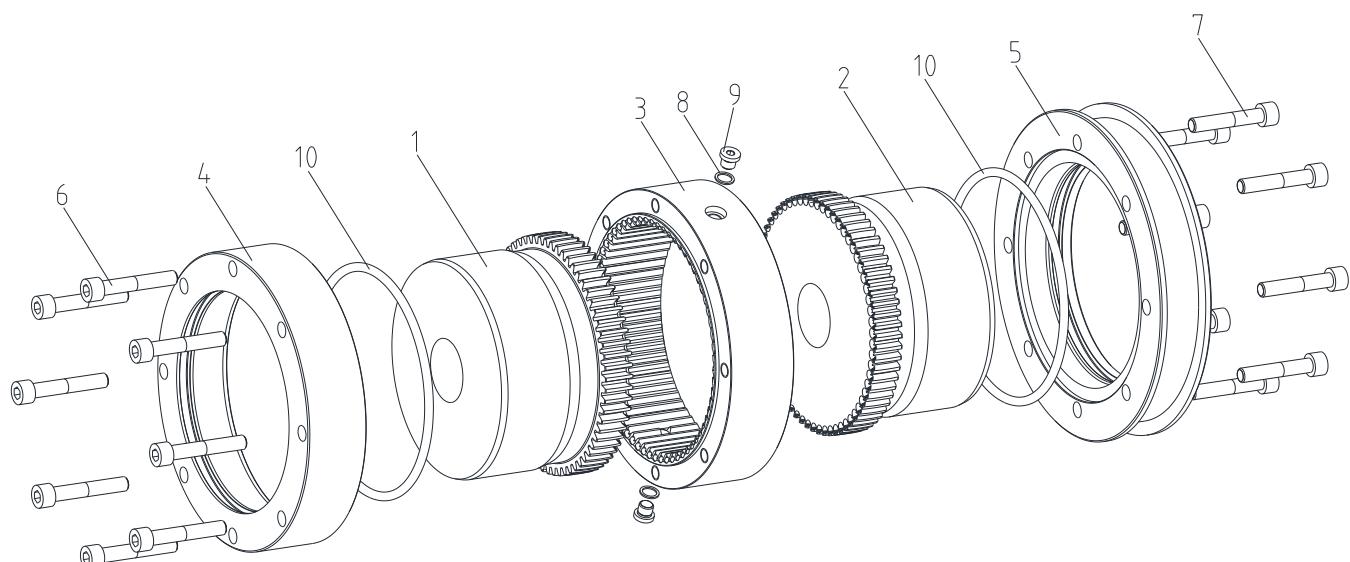


Illustration 3: GEARex®, type SD

**Table 3:**

GEARex® size	10	15	20	25	30	35	40	45	55	55
Thread size	M6	M6	M8	M10	M10	M10	M12	M12	M12	M12
Number of component 6	8	8	8	6	8	12	6	8	8	12
Number of component 7	8	8	8	6	8	12	6	8	8	12

**4 Assembly****4.2 Advice for finish bore**

**The maximum permissible bore diameters D (see table 1 - technical data) must not be exceeded. If these figures are disregarded, the coupling may tear. Rotating particles may cause danger to life.**

- Hub bores machined by the customer have to observe concentricity resp. axial runout (see illustration 4).
- Please make absolutely sure to observe the figures for ØD (see table 1).
- Carefully align the hubs when the finish bores are drilled.
- Please provide for a setscrew according to DIN EN ISO 4029 with a cup point, an end plate or shrinking to fasten the hubs axially (see illustration 4 and table 4).
- If any other shaft-hub-connections (e. g. clamping elements, spline, taper bores, etc.) are to be used, please consult with KTR.



**Please make sure not to damage the sealing surface with any remachining to be performed on component 1, since it serves as a clamping surface at the same time.**



**The customer bears the sole responsibility for all machining processes performed subsequently on unbored or pilot bored as well as finish machined coupling components and spare parts. KTR does not assume any warranty claims resulting from insufficient remachining.**

**Table 4: Setscrews DIN EN ISO 4029**

Size	10	15	20	25	30	35	40	45	50	55
Dimension G in mm	M6	M8	M10	M10	M12	M12	M16	M16	M20	M20
Dimension T in mm	35	40	45	55	70	70	95	95	110	125
Tightening torque $T_A$ in Nm	4.8	10	17	17	40	40	80	80	140	140

Sealing/clamping surface

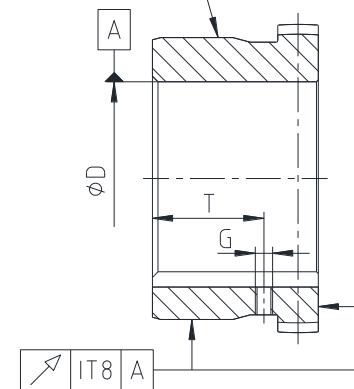


Illustration 4: Clamping/sealing surfaces of component 1



## 4 Assembly

### 4.3 Assembly of the coupling (general)



In case if a dimensional drawing was prepared for the coupling, the dimensions specified have to be primarily observed.

The operator of the machine is to be provided with the dimensional drawing.



We recommend to inspect bores, shaft, keyway and feather key for dimensional accuracy before assembly.



Heating the hubs lightly (approx. 80 °C) allows for an easier mounting on the shaft.



Touching the heated components causes burns.  
Please wear safety gloves.



With the assembly please make sure that the distance dimension E (see table 1) is observed to allow for axial clearance of the sleeve while being in operation.  
Disregarding this advice may cause damage to the coupling.

### 4.4 Assembly of type SD

- Clean all components and shaft ends carefully (see chapter 6.5). The O-rings (component 10) must not get in touch with polar solvents and detergents.
- Lightly grease the O-rings (component 10) and insert in the corresponding keyway of the SD cover (component 4) and SD grinding component (component 5).
- Fit the SD cover (component 4) on the shaft end of the driven side and the SD grinding component (component 5) on the shaft end of the driving side.
- Lightly grease the sealing surfaces on the face of the SD sleeve (component 4) and SD grinding component (component 5). Push them over the shaft ends. Make sure the O-rings (component 10) are not damaged.



To facilitate the assembly, please heat the hubs (component 1 and 2) evenly by inductive heating (approx. 80 °C) either in the furnace or by means of a torch.

- Shift the hubs (component 1 and 2) onto the shaft of the driving and driven side until the hub faces are flush with the shaft ends. When the hubs are heated, any contact with the O-rings (component 10) should be avoided.



Make sure with the assembly that the shaft ends do not protrude over the front faces of the hub.

• **Valid with coupling hubs with feather keyway and setscrews only:**

Fill the tapping for axial fastening with sealing compound for 2/3.

- Secure the hubs (component 1 and 2) axially by tightening the setscrews DIN EN ISO 4029 by means of a cup point (tightening torque  $T_A$  see table 5), an end plate or by shrinking.



Basically make sure with the assembly that the shaft-hub-connection is sealed such that grease cannot escape from the coupling.

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**4 Assembly****4.4 Assembly of type SD**

**Before filling with grease coupling hubs with feather keyway and setscrew have to be cooled down to ambient temperature in order to prevent escaping of lubricant in the area of the feather key.**

- Shift the power packs in axial direction until the distance dimension E is achieved (see table 1).
- Align both shafts and inspect the permissible displacement figures as per chapter 4.5.
- Grease the spline of the hubs (component 1 and 2) (grease capacity see table 1 resp. 7), afterwards push the SD sleeve (component 3) over the spline of the hubs (component 1 and 2) and keep them in place.
- Screw the SD cover (component 4) to the SD sleeve (component 3) via the cap screws (component 6) (tightening torque  $T_A$  see table 5).
- Screw the SD grinding component (component 5) with the cap screws (component 7) to the SD sleeve (component 3) (tightening torque  $T_A$  see table 5).
- Observe the instructions specified in chapter "start-up and lubrication" (see chapter 5).

**Table 5: Tightening torques of the cap screws DIN EN ISO 4762**

GEARex® size	10	15	20	25	30	35	40	45	50	55
Thread size	M6	M6	M8	M10	M10	M10	M12	M12	M12	M12
Tightening torque $T_A$ in Nm (component 6 & 7)	10	25	25	49	49	49	85	85	85	85

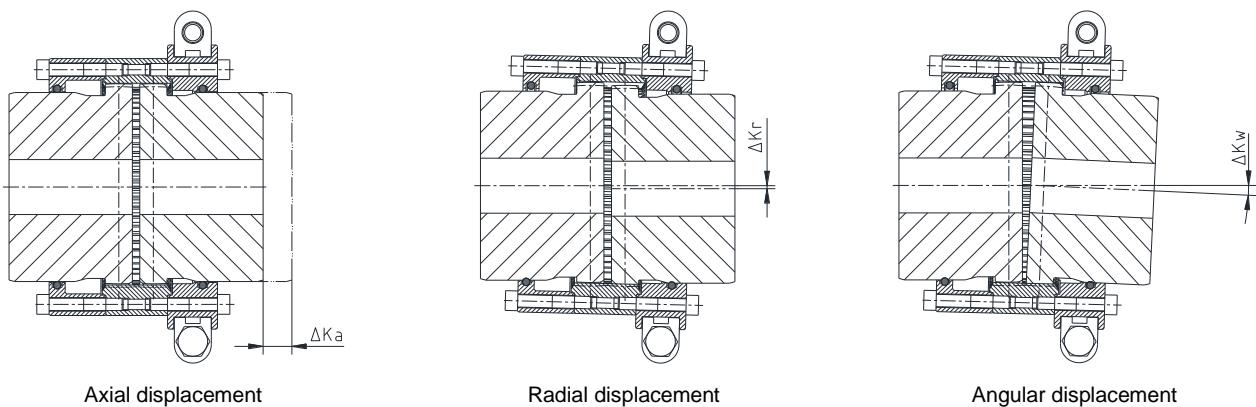
**4.5 Displacements - alignment of the coupling**

Illustration 6: Displacements

**Table 6: Displacement figures**

Size	10	15	20	25	30	35	40	45	50	55
Max. axial displacement $\Delta K_a$ in mm	$\pm 0.1$									
max. radial displacement $\Delta K_r$ <sup>1)</sup> in mm	0.05    0.06    0.07    0.10    0.10    0.10    0.15    0.18    0.18    0.20									
max. angular displacement $\Delta K_w$ <sup>1)</sup> in degree with n =	0.25° each hub									

- 1) Please make absolutely sure to adhere to the distance dimension E, specifically with radial and angular displacements (see table 1).



**In order to ensure a long service life of the coupling we recommend to align the coupling to 20 % of the displacement combinations that may arise during operation (see illustration 6 and 7). Please absolutely observe the displacement figures specified (see table 6). If the figures are exceeded, the coupling will be damaged.**

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## 4 Assembly

### 4.5 Displacements - alignment of the coupling



In order to improve the lubrication effect of the coupling, we recommend a minimum angular displacement of 0.1° per displacement level.

Misalignment of the coupling components to one another may have been generated by incorrect alignment with assembly or operation of the machine (thermal expansion, shafts bending, elastic machine mounts, etc.).

The displacement figures specified in table 6 are maximum figures which must not arise in parallel. If axial, radial and angular displacement arises at the same time, these values must be reduced (see illustration 7).

Examples of the displacement combinations specified in illustration 7:

Example 1:

$\Delta K_r = 30\%$

$\Delta K_w = 70\%$

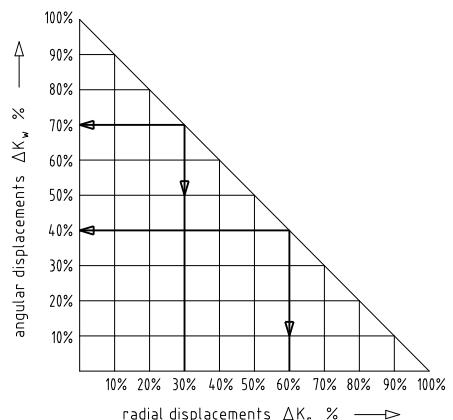
Example 2:

$\Delta K_r = 60\%$

$\Delta K_w = 40\%$

$$\Delta K_{\text{total}} = \Delta K_r + \Delta K_w \leq 100\%$$

Illustration 7:  
Displacement figures



### 4.6 Components of the shiftable linkage

Before starting the assembly the shiftable linkage has to be inspected for completeness.

Component	Quantity	Description
11	1	Slip ring
12	2	Shifting fork
13	1	Shift lever with clamp
14	2	Eye type bearing DIN 504 with lubricating nipple
15	1	Shifting shaft
16	1	Clamping ring
17	2	Clamping screws slip ring
18	2	Clamping screws of shifting fork
19	2	Clamping screws of shift lever

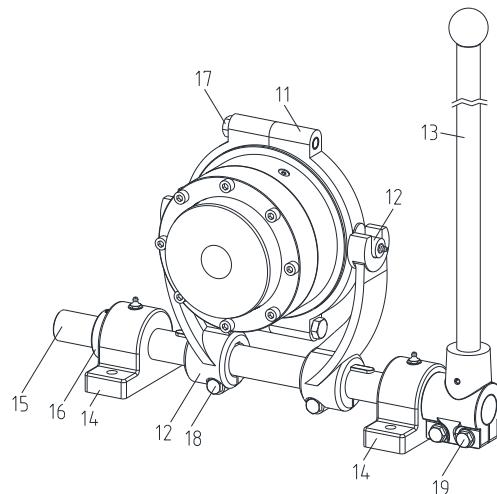


Illustration 8: GEARex® SD with shiftable linkage

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**4 Assembly****4.7 Assembly of the shiftable linkage**

- Assemble slip ring (component 11), tighten the screws (component 17) as per table 7.
- Please insert the spigot of the slip ring (component 11) into the shifting fork (component 12, see illustration 8).
- Align the shifting forks, shifting shaft and eye type bearings flush with the SD sleeve. The dimensions LS7 and LS9 have to be observed (see table 2). Please make sure that the shifting forks fit with the spigots of the shifting part evenly.



**For setting unscrew the clamping screws of the shifting forks, if necessary.**



**The shifting forks have to be arranged vertically to the base plate.**



**Getting stuck and jamming of the slip ring during operation.**



**With a continuous base plate the dimension LS6 (see table 2) with shiftable linkage size 5 has to be increased by 10 mm at the minimum and with shiftable linkage size 6 by 15 mm at the minimum. The brackets of the driving and driven side have to be adjusted accordingly.**

**Table 7:**

Slip ring size	3.3	4.4	5.5	6.6	7.7	8.8	9.9
Slip ring Clamping screw (component 17, illustration 8)	M8	M10	M12	M16	M16	M16	M20
Tightening torque $T_A$ in Nm	23	46	79	195	195	195	395

Shiftable linkage size	3	4	5	6
Shifting fork Clamping screw (component 18, illustration 8)	M8	M12	M12	M12
Tightening torque $T_A$ in Nm	25	85	85	85
Shift lever Clamping screw (component 19, illustration 8)	M8	M12	M12	M12
Tightening torque $T_A$ in Nm	25	85	85	85

- Fasten the shift lever on the shifting shaft.
- Tighten the clamping screws of the shift lever (component 19) as per table 7.
- When the coupling is engaged, the shifting lever has to be installed vertically.



**When the coupling hub is in operation the slip ring has to be disengaged. Support or fasten the shifting lever in vertical position.**



**Getting stuck and jamming of the slip ring during operation.**

- Axially fasten the shifting shaft via clamping element, shift lever and clamping ring (see illustration 8).
- Having finished the assembly lubricate the eye type bearing with bearing grease.

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## 5 Start-up and lubrication

### 5.1 Start-up of the coupling

Before start-up of the coupling, inspect the tightening of the setscrews in the hubs, the alignment and the distance dimension E and adjust, if necessary, and also inspect all screw connections for the tightening torques specified.

Finally the coupling protection against accidental contact must be fitted. It is required in accordance with DIN EN ISO 12100 (Safety of Machinery) and directive 2014/14/EU and must protect against

- access with a little finger
- falling down of solid foreign objects.

The coupling protection is not part of KTR's scope of delivery and is the customer's responsibility. It must have sufficient distance to the rotating components to avoid contact safely. Depending on the outside diameter DH of the coupling, we recommend the following minimum distance:  
 ØDH to 120 mm = 10 mm, ØDH from 120 mm = 15 mm.

Please check if a proper enclosure (ignition protection, coupling protection, contact protection) has been mounted and the operation of the coupling is not affected by the enclosure. The same applies for test runs and rotational direction inspections.

The cover may provide for openings intended for necessary heat dissipation. These openings have to comply with DIN EN ISO 13857.

During operation of the coupling, please pay attention to

- different operating noise
- vibrations occurring.



If you note any irregularities with the coupling during operation, the drive unit must be switched off immediately. The cause of the breakdown must be specified by means of the table „Breakdowns“ and, if possible, be eliminated according to the proposals. The potential breakdowns specified can be hints only. To find out the cause all operating factors and machine components must be considered.

### 5.2 Types of grease recommended



Only those greases recommended by KTR may be used.

Claims to warranty caused by the use of unrecommended greases are disregarded by KTR.

Manufacturer of grease			
Product description <sup>1) 2)</sup>	Mobilux EP 004	Klüberplex GE 11-680	Tribol GR 100 PD 00
Manufacturer of grease			
Product description <sup>1) 2)</sup>	Gadus S2 V220 00	RENOLIT GFW 00	

1) The greases mentioned above are suitable for operating temperatures from -20 °C to +80 °C.

2) Greases are recommended for a speed of > 1 m/s.

With a speed of < 1 m/s we recommend the grease RENOLIT EP X1 of Fuchs.

With a speed of < 2 rpm, please consult with KTR.



Please observe the manufacturer's instructions on handling greases.

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## 5 Start-up and lubrication

### 5.3 Grease feeding

Size	10	15	20	25	30	35	40	45	50	55
Grease feeding in dm <sup>3</sup> (kg)	0.02	0.04	0.08	0.12	0.18	0.22	0.35	0.45	0.70	0.90

### 5.4 Grease capacity



Greases of various types and manufacturers must not be mixed!

#### Procedure of grease capacity:

- Turn the coupling so that the screw plugs (component 9) are in horizontal position (see illustration 9).
- Remove the screw plugs (component 9) along with the sealing washers (component 8) and fill in the grease, e. g. by means of a grease injector.
- Afterwards screw in the screw plugs (component 9) and the gaskets (component 8) again and prove for tightness.

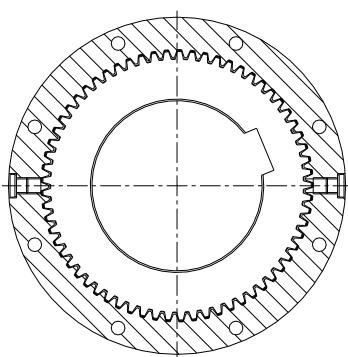


Illustration 9: Horizontal position of screw plugs

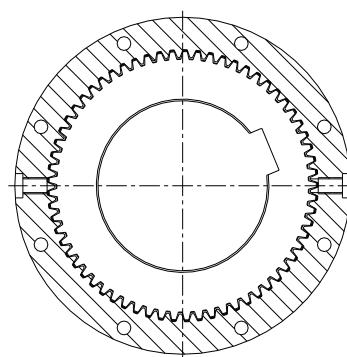


Illustration 10: Removing the screw plugs and sealing washers



**Both screw plugs (component 10) have to be removed.  
One hole serves as a filler hole, the other one as venting hole.**



**In order to ensure a long service life of the coupling and avoid damages on the coupling, make sure to adhere to the quantities of grease specified for the different coupling sides.**



## 6 Breakdowns, causes and elimination

The failures specified below can lead to a use of the **GEARex®** coupling other than intended. In addition to the specifications given in these operating/assembly instructions make sure to avoid such failures.

The errors listed can only be clues to search for the failures. When searching for the failure the adjacent components must generally be considered.



**Disregarding the hints and inappropriate use may cause damages on the coupling.  
The failure on the coupling may cause standstill of the drive and the overall machine.**

### General failures with improper use:

- Important data for the coupling selection were not forwarded.
- The calculation of the shaft-hub-connection was disregarded.
- Coupling components with damage occurred during transport are assembled.
- If the heated hubs are assembled, the permissible temperature is exceeded.
- If mounted in heated condition, the O-rings are heated excessively/damaged.
- The clearance of the components to be assembled is not coordinated with one another.
- Tightening torques are fallen below/exceeded.
- Components are mixed up by mistake/assembled incorrectly.
- No original **KTR** components (purchased parts) are used.
- Old/already worn out coupling components stored for too long are used.
- Maintenance intervals are not observed.
- No lubricants recommended by **KTR** are used.
- Operating temperatures are exceeded.
- Axial fastening of hubs is not available or working loose.
- Insufficient or inappropriate lubrication.
- Operating conditions were modified inappropriately.

Breakdowns	Causes	Elimination
Different operating noise and/or vibrations occurring	Misalignment/the permissible displacement figures are exceeded	1) Set the unit out of operation 2) Eliminate the reason for the misalignment (e. g. loose foundation bolts, breaking of the engine mount, heat expansion of unit components, modification of the installation dimension E of the coupling) 3) Inspection of wear 4) Re-align the coupling
	Axial fastening of hub working loose	1) Set the unit out of operation 2) Inspect alignment of coupling 3) Inspection of wear 4) Secure the hubs axially and against working loose
	Lack of grease	1) Set the unit out of operation 2) Inspection of wear 3) Grease has to be replaced 4) Inspect the gaskets and replace gaskets, if necessary
Excessive wear of spline	Vibrations of drive	1) Set the unit out of operation 2) Disassemble the coupling and remove residues of wear 3) Inspect coupling components and replace coupling components that are damaged 4) Find out the reason for vibrations 5) Assemble new coupling components 6) Inspect alignment, adjust if necessary

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## 6 Breakdowns, causes and elimination

Breakdowns	Causes	Elimination
Excessive wear of spline	Misalignment/the permissible displacement figures are exceeded	<ol style="list-style-type: none"> <li>1) Set the unit out of operation</li> <li>2) Eliminate the reason for the misalignment (e. g. loose foundation bolts, breaking of the engine mount, heat expansion of unit components, modification of the installation dimension E of the coupling)</li> <li>3) Inspection of wear</li> <li>4) Re-align the coupling</li> </ol>
	Lack of grease	<ol style="list-style-type: none"> <li>1) Set the unit out of operation</li> <li>2) Inspection of wear</li> <li>3) Grease has to be replaced</li> <li>4) Inspect the gaskets and replace gaskets, if necessary</li> </ol>
Leakages/ escape of grease	O-rings have worn off	<ol style="list-style-type: none"> <li>1) Set the unit out of operation</li> <li>2) Inspection of wear</li> <li>3) Drain lubricating grease</li> <li>4) Replace gaskets</li> <li>5) Filling of lubricating grease</li> </ol>
	O-rings have been damaged subject to incorrect storage or during the assembly	<ol style="list-style-type: none"> <li>1) Set the unit out of operation</li> <li>2) Inspection of wear</li> <li>3) Drain lubricating grease</li> <li>4) Replace O-rings</li> <li>5) Make sure proper storage of the O-rings or correct errors in assembly, respectively</li> <li>6) Filling of lubricating grease</li> </ol>
	O-rings are in contact with aggressive liquids/oils, influence of ozone, too high ambient temperatures	<ol style="list-style-type: none"> <li>1) Set the unit out of operation</li> <li>2) Inspection of wear</li> <li>3) Drain lubricating grease</li> <li>4) Eliminate negative influences on the O-rings</li> <li>5) Replace O-rings</li> <li>6) Filling of lubricating grease</li> </ol>
Fracture of spline/ fracture of sleeve	Fracture of spline/sleeve subject to high dynamic energy/overload	<ol style="list-style-type: none"> <li>1) Set the unit out of operation</li> <li>2) Disassemble the coupling and remove the residues of fracture</li> <li>3) Find out the reason for overload</li> <li>4) Inspect coupling components and replace coupling components that are damaged</li> <li>5) Insert sleeve, assemble coupling components</li> </ol>
	Operating parameters do not meet with the performance of the coupling	<ol style="list-style-type: none"> <li>1) Set the unit out of operation</li> <li>2) Disassemble the coupling and remove the residues of fracture</li> <li>3) Review the operating parameters and select a bigger coupling (consider mounting space)</li> <li>4) Assemble, align and lubricate the new coupling size according to the GEARex® operating/mounting instructions</li> </ol>
	Operating error of the unit	<ol style="list-style-type: none"> <li>1) Set the unit out of operation</li> <li>2) Disassemble the coupling and remove the residues of fracture</li> <li>3) Inspect coupling components and replace coupling components that are damaged</li> <li>4) Insert sleeve, assemble coupling components</li> <li>5) Instruct and train the service staff</li> </ol>

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## 6 Breakdowns, causes and elimination

Breakdowns	Causes	Elimination
Fracture of spline/ fracture of sleeve	Lack of grease	1) Set the unit out of operation 2) Disassemble the coupling and remove the residues of fracture 3) Inspect the gaskets and coupling components and replace, if necessary 4) Assemble, align and lubricate the new coupling components/gaskets as per GEARex® operating/mounting instructions
Fracture of spline/ fracture of sleeve	Misalignment/permissible displacement figures are exceeded	1) Set the unit out of operation 2) Disassemble the coupling and remove the residues of fracture 3) Inspect the gaskets and coupling components and replace, if necessary 4) Assemble, align and lubricate the new coupling components as per GEARex® operating/mounting instructions

## 7 Maintenance and service

### 7.1 Intervals of maintenance

The coupling has to be regularly inspected for leakages/grease capacity, unregulated heating and modifications of the running noise. The inspection has to be performed during the general maintenance intervals, at least every quarter of a year.

Moreover, the correct fit of the protective device for rotating parts has to be inspected.

**The following items of inspection are the main components of maintenance work:**

- |                      |  |
|----------------------|--|
| Grease:              | grease capacity, replacement of grease (see chapter 5.3 and 7.2) |
| Sealing elements:    | leakages, replacing of sealing elements (see chapter 7.3)        |
| Shaft displacements: | re-aligning the coupling (see chapter 4.5)                       |
| Spline:              | wear   |

### 7.2 Replacement of grease



**In order to ensure a long service life of the coupling and avoid damages on the coupling, the quantities of grease specified for the different coupling sides and the intervals of replacement of lubricant absolutely have to be observed!**



**Please observe the manufacturer's instructions on handling greases.**

The replacement of grease depends on various operating conditions such as load, ambient temperature, speed, shaft displacements and operating period. Anyway, a replacement of grease is recommended for an operation up to 70 °C after about 8,000 hours of operation, a maximum of 2 years and for an operation exceeding 70 °C after about 3,000 hours of operation, a maximum of 1 year.

Please note that when you replace the grease the remaining quantities in the coupling should be kept as small as possible.

Please have the manufacturer confirm the compatibility of the new grease with remainders of the former lubricant.



**Greases of various types and manufacturers must not be mixed!**

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## 7 Maintenance and service

### 7.2 Replacement of grease

#### Procedure for the replacement of grease:

- Inspect tightness and replace the sealing elements, if necessary.
- Turn the coupling until the screw plugs are in vertical position (see illustration 11).
- Remove the screw plugs (component 9) along with the sealing washers (component 8) and afterwards drain the grease into a suitable tank. To facilitate the replacement you may add thin oil.



**Please check the compatibility of the oil with the grease!**

- Perform grease feeding as per chapter 5.4.

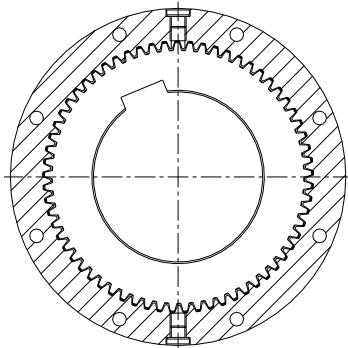


Illustration 11: Vertical position of screw plugs

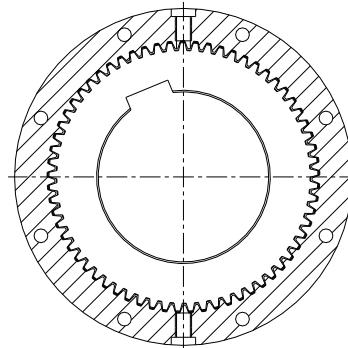


Illustration 12: Removing the screw plugs and sealing washers

### 7.3 Replacement of sealing elements



**In case of leakages (escape of grease) defective sealing elements have to be replaced immediately!**

**The coupling may be damaged if these hints are disregarded.**

**The grease escaped has to be fully collected and disposed of according to the regulations that apply.**

#### Replacement of O-rings (component 10):

The O-rings (component 10) can be replaced with no need to shift the power packs to be connected, provided that the shaft shoulder is not bigger than the outside diameter DN of the hubs (component 1 and 2).

- Drain the grease as per chapter 7.2.
- Unscrew and remove the screwing (component 6 and 7) of the shifting part and cover.
- Push the SD cover (component 4) and the SD grinding component (component 5) from the spline and the hubs (component 1 and 2) until the O-ring (component 10) can be taken out.
- Cut a new O-ring (component 10) radially in one position or cut the O-ring to peripheral length.
- Fit the O-ring (component 10) around the shaft and afterwards bond the separation line, e. g. with Loctite 401.

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## 7 Maintenance and service

### 7.3 Replacement of sealing elements

- Insert the O-ring (component 10) in the keyways of the SD cover (component 4) and the SD grinding component (component 5).
- Assemble the SD cover (component 4) and the SD grinding component (component 5) according to chapter 4 and 5 and start up.



If O-rings (component 10) are to be used, the power packs to be combined have to be shifted and the coupling has to be disassembled as per chapter 7.5.



Protect O-rings (component 10) on the driving and driven side against damages and heat.



Observe the manufacturer's instructions regarding the use of adhesives.

### 7.4 Cleaning of the coupling



Ensure sufficient ventilation and follow the detergent manufacturers' notes regarding the handling of solvents and detergents.  
Avoid any kind of ignition sources.

With assembly/disassembly of the coupling, the coupling components should be subject to careful cleaning. Specifically the sealing surfaces and the area of the spline should be free from dirt, wear and old grease. A subsequent correct assembly (chapter 4) and start-up (chapter 5) has to be ensured.

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## 7 Maintenance and service

### 7.5 Disassembly of the coupling



**With disassembly, operation and maintenance of the coupling it has to be made sure that the entire drive train is secured against accidental switch-on.**



**In case if a dimensional drawing was prepared for the coupling, the dimensions specified have to be primarily observed.  
The operator of the machine is to be provided with the dimensional drawing.**

It is necessary to disassemble the coupling if coupling components have to be inspected for damages or have to be replaced. Moreover, disassembly is necessary to replace the sealing elements.

- Drain the grease as per chapter 7.2.
- Unscrew and remove the screwing (component 6 and 7) of the SD shifting part and SD cover.
- Shift the SD cover (component 4) and the SD grinding component (component 5) axially backwards until the spline is no longer engaged.
- Mark the spline of the SD sleeve (component 3) versus the hubs (component 1 and 2).
- Move the power packs apart.
- Clean the coupling (see chapter 7.5) and inspect the coupling components, sealing surfaces and spline.
- Replace damaged components.
- Reassembly has to be performed as per chapters 4 and 5.



**Components that are damaged or worn off have to be replaced!**



**With each re-assembly of the coupling we would recommend to replace the O-rings (component 10).**

If the coupling hubs (component 1) have to be disassembled, the axial fixing of the hubs has to be removed first. With constant heating (approx. 80 °C) of the coupling hubs (component 1) by means of a burner and a puller, the hubs (component 1) can be pulled from the shafts of the power packs.

The sealing surfaces, the spline, the hub bore and the shaft have to be inspected for damages.  
Reassembly has to be performed as per the instructions in chapter 4 and 5.



**Never use the SD sleeve (component 3), the SD cover (component 4) and the SD grinding component (component 5) to pull off the hubs (component 1 and 2)!**



**Please make use of proper pullers. The shaft bearing must not be loaded.**

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## 8 Disposal

In respect of environmental protection we would ask you to dispose of the packaging resp. products on termination of their service life in accordance with the legal regulations resp. standards that apply.

- **Metal**

Any metal components have to be cleaned and disposed of by scrap metal.

- **Gaskets**

Gaskets can be disposed of by residual waste.

- **Lubricants**

Lubricants have to be collected in suitable containers and disposed of by a waste disposal company.

## 9 Spares inventory, customer service addresses

A basic requirement to ensure the readiness for use of the coupling is a stock of the most important spare parts on site.

Contact addresses of the KTR partners for spare parts and orders can be obtained from the KTR homepage at [www.ktr.com](http://www.ktr.com).

**The following details should be specified when ordering spare parts:**

- Original order number
- Material number
- Description and number



**KTR does not assume any liability or warranty for the use of spare parts and accessories which are not provided by KTR and for the damages which may incur as a result.**

**KTR Systems GmbH**  
Carl-Zeiss-Str. 25  
D-48432 Rheine  
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