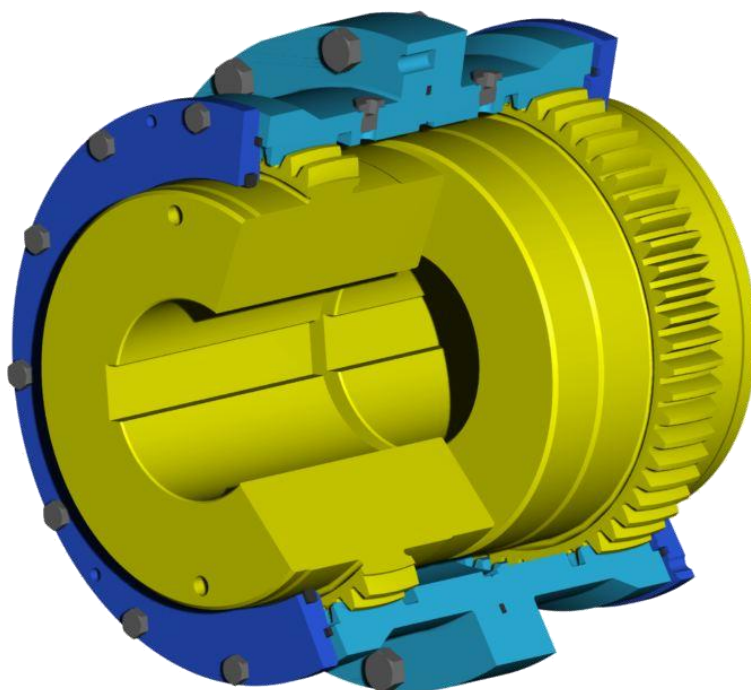


OPERATION MANUAL

For gear couplings of the series ZAKU-N
according to KWN 21017



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Table of Contents

INSTRUCTIONS AND SAFETY SIGNS	4
1. SPECIFICATIONS	5
2. GENERAL GUIDELINES.....	5
2.1. General.....	5
2.2. Information on the Machine Directive 2006/42/EG	6
3. SAFETY GUIDELINES	6
3.1. General notes	6
3.2. Important notes on the operation of the coupling in explosive areas	7
4. TRANSPORT AND STORAGE.....	8
5. TECHNICAL DESCRIPTION	8
6. ASSEMBLY	9
6.1. Fitting of the coupling joint	10
6.2. Alignment of the coupling components	11
6.3. Further assembly steps.....	15
7. START-UP	16
7.1. Lubrication	17
7.2. Filling quantities	18
8. MAINTENANCE AND REPAIR.....	19
8.1. Lubricant change.....	20
8.2. Disassembly of the coupling	21
8.3. Cleaning of the coupling components	21
8.4. Replacement of couplings	22



OPERATION MANUAL

KWN 31272

Production series ZAKU-N

Version: E

9.	SPARE PARTS.....	22
10.	TROUBLESHOOTING	22
10.1.	General.....	22
10.2.	Possible faults.....	23

Instructions and Safety Signs

Safety signs for explosion prevention



All safety signs marked as such must be strictly observed with respect to the prevention of explosions. Non-observance may lead to fatal or severe injuries and considerable material damages.

Warning for possible personal damages



All safety signs marked as such must be strictly observed observed. Non-observance may lead to fatal or severe injuries.

Observe safety signs



All safety signs marked as such must be strictly observed with respect to the prevention of damages. Non-observance may lead to material and personal damages.

1. Specifications

The specifications provided for the operation of the described coupling must be observed by the operator. The specifications are set out in the latest prospectus, which at the same time represents the works standard of Kupplungswerk Dresden AG (KWN 21017) and, in case of deviations from this standard provide a corresponding drawing.



Couplings for the use in explosive areas, as are specified in Directive 2014/34/EU, are marked with a special label.

2. General Guidelines

2.1. General

This operation manual (OM) constitutes part of the delivery of the coupling and can be reviewed on the website of the coupling manufacturer (<http://www.kupplungswerk-dresden.de>). The couplings described herein meet the technical state-of-art at the time of the print of this OM. This OM must always be kept near to the operation site of the coupling.



The staff responsible for the performance of assembly works; maintenance and repair works; as for the operation of the coupling; must have read, understood, and observe the instructions set out within this manual. The non-observance of the manual may lead to product-, material- and/or personal damages. Damages resulting from the non-observance of this operation manual lead to the disclaimer of the manufacturer.

The observance of all guidelines and instructions with respect to the appropriate transport, appropriate storage, installation, assembly, start-up, operation, and maintenance guarantee the faultless function of the coupling within the scope of specifications. The coupling is solely intended for the use under the requirements stated in the KWN 21017 (leaflet) or operation manual. Variations from the standard operation parameters are subject to extension of the contractual agreement with the manufacturer. The permissible ambient conditions must be stringently followed.



The manufacturer accepts no liability for any damages and operational errors which result from the non-observance of this OM.

As we strive for continuous improvement, we reserve the right to implement changes on individual assembly groups and equipment parts to enhance the performance and safety. However, the key features will remain unchanged.

The applicable regulations concerning work-safety and environmental protection are to be observed with respect to the transport, assembly, disassembly, operation, and maintenance.



When using any hoisting devices or load lifting appliances to enable the transport of the gear coupling, it must be ensured that these are capable of bearing the weight of the coupling.

The coupling components are to be disposed of separately or recycled in accordance with the applicable national regulations.

If there is any conflict in meaning between the original German language version of this operation manual and any version of translation of this operation manual in any other language, the German language version shall prevail.

2.2. Information on the Machine Directive 2006/42/EG

As defined by the EG-Machine Directive 2006/42/EG, KWD-couplings are to be categorized as components. KWD is therefore not obliged to issue a declaration of incorporation. Information related to the correct assembly, start-up, and operation can be obtained from this OM under consideration of the warning notices.

3. Safety guidelines

3.1. General notes

The design of the coupling meets the state of the art at the time of production and is delivered in a fail-safe condition. The coupling must only be used and operated within the scope of the specifications set out in the service level agreement and in accordance with the labeled conditions of Directive 2014/34/EU.

Labeling of couplings which are designed for the use in explosive areas according to Directive 2014/34/EU:



KWD Kuplungswerk Dresden AG
01159 Dresden

II 2G Ex h IIC T4 Gb X
II 2D Ex h IIIC T120°C Db X
- 20 °C ≤ Ta ≤ + 60 °C

Both the performance of maintenance and service works as well as the operation of the coupling must be carried out by authorized and qualified staff only. All works are to be performed according to

the „Principle of Safety“. The coupling must always be in an idle state, before attempting works on it. The drive unit must be prevented from being switched on accidentally (e.g. disconnection from power supply). The power switch of the coupling must be provided with a warning note during the performance of works on the coupling. The drive unit must be shut down immediately, if any changes occur on the coupling whilst it is being operated. The coupling must be protected against accidental contact by means of installing appropriate guards which meet the applicable standard.

Unauthorized changes are not allowed. This applies also to guards serving as protection against contact.



In order to avoid potential ignition sources, it is recommended to conduct a risk analysis before installing a protection cover. This analysis does, however, not constitute a part of the delivery of the coupling manufacturer.



All attachment parts must meet the requirements of the directive 2014/34/EU. Monitoring devices not meeting the above-mentioned standard must be operated with a switch amplifier.



The incorporation of this coupling into devices or machines obliges the manufacturer of these to integrate the provisions, instructions, and descriptions stated in the OM into his OM.



When performing assembly or disassembly works, it must be ensured that the surroundings are free from explosive gas mixtures and dust concentrations



Do not touch the coupling immediately after the operation. Risk of burning.



The performance of lubricant changes may entail the risk of scalding due to leaking hot lubricant fluid.

3.2. Important notes on the operation of the coupling in explosive areas

The coupling meets the operating conditions specified in accordance with directive 2014/34/EU:

- Equipment group II (Above ground use) of category 2 and 3 for areas, where the air may contain explosive gas, vapour, mist, or air mixtures, as well as for areas, where dust may generate explosive atmosphere.



When using painted couplings in explosive areas, the requirements concerning the conductivity of the paint and the maximum tolerated coating thickness of the paint as is specified in DIN EN ISO 80079-36 must be observed.

4. Transport and Storage

The content of the delivery is set out in the delivery documents. Check the order for completeness right upon the receipt of the delivery. Transport damages and incomplete orders must be immediately reported in writing.

Your order will be delivered in components or assembly groups as a ready-to-install solution, however, the **coupling comes without filling**. The couplings must be protected from impacts, crashes and damages resulting from contact when transporting them. Use only load suspension devices that are non-metallic and suitable with respect to the safety when transporting, lifting, or assembling the coupling.

The couplings are to be stored in closed and dry rooms, which are free from dust and detrimental impacts such as condensates, excessive humidity ($\geq 70\%$) and ozone influence.



If any damages on the coupling are noticed, it must neither be installed nor put it into operation.

The couplings are provided with a temporary anticorrosive coating and can, under consideration of the above-stated requirements, be stored for a period of up to 6 months starting from the date of delivery.

5. Technical Description

Gear couplings are non-switchable, deflectable couplings with a self-centering gearing. They transmit the torque by means of external and internal teeth which are axially interlocked and equipped with an involute hub resp. sleeve profile.

Gear couplings are suitable for adjusting axial displacements of the shafts to be connected. The provision of a tooth clearance and the angle flexibility resulting therefrom between the hubs and sleeves allows for angular shaft displacements to the same extent with one-cardanic gear couplings and with double-cardanic gear couplings even for shaft locations within the tolerable range depending on the construction parameters.

The radial and angular displacements to be balanced by the couplings result from the displacements which have occurred in the installation process or during their operation and must not exceed the values of Δk_a and Δk_w as are specified in the coupling leaflet.

This way, relative movements, uneven load distribution, and the consequent occurrence of signs of wear can be reduced to a minimum, which in turn, increases the service life.

The gear couplings are not capable of absorbing radial forces and can't cope with bending moments.

6. Assembly

It is imperative that the instructions set out in Chapter 3 „Safety guidelines“ are observed when carrying out the assembly.



Values and specifications deviating from the works standard are always stated in the respective drawing. Any such deviations can be gathered from there and are deemed applicable.



The assembly of the coupling must not be carried out in explosive areas.

The assembly must be performed carefully and by qualified professionals, only. Damages resulting from improperly performed assembly works will lead to the exclusion of liability and loss of warranty. It should be provided for sufficient clearance around the installed coupling so that the performance of future maintenance and cleaning works are not impeded.



The operator must ensure that the functionality of the coupling will not be affected through contact with foreign objects (e.g. falling objects, spillover or the like).

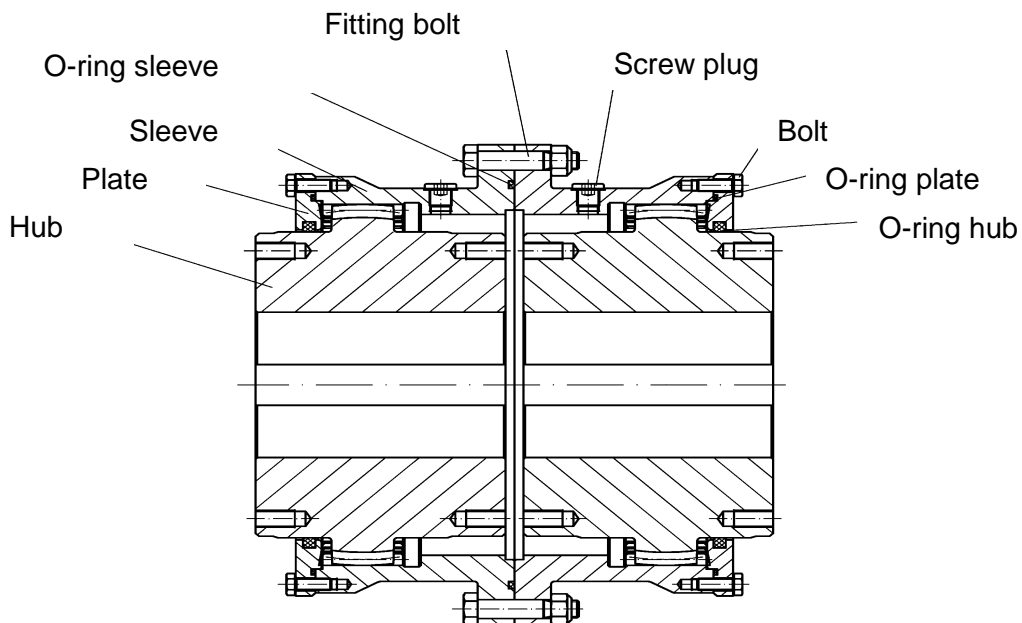


Fig. 1 – Assembly of a gear coupling series ZAKU-N, Type A

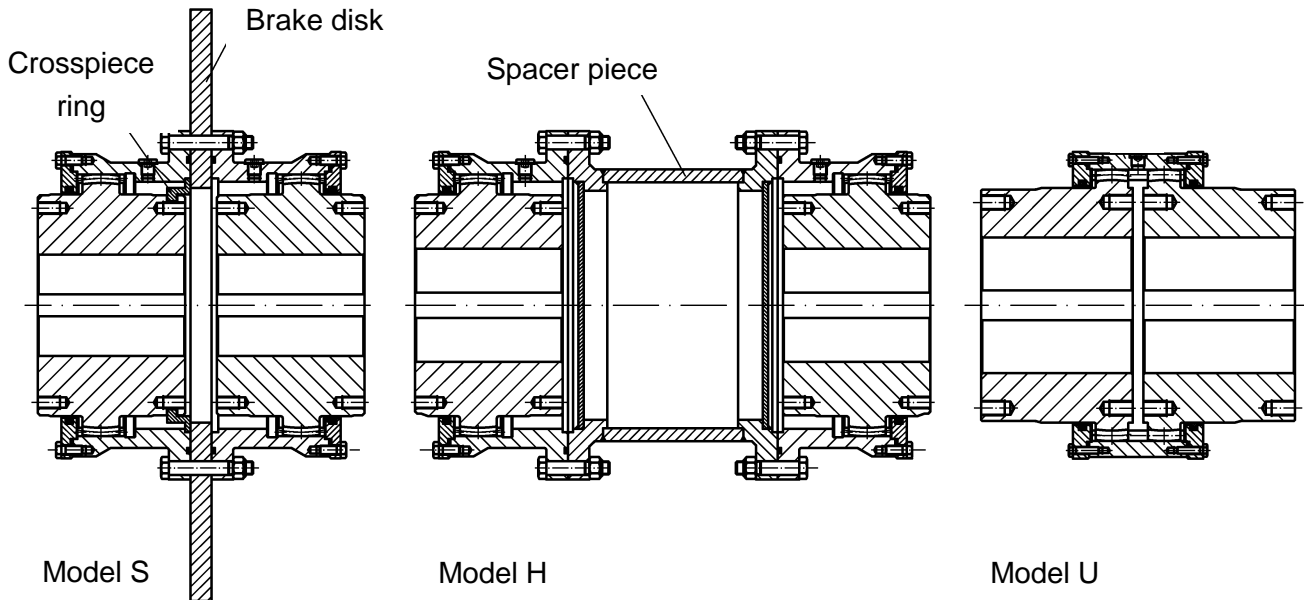


Fig. 2 – Assembly of a gear coupling series ZAKU-N, Type S, H and U

6.1. Fitting of the coupling joint

1. If the coupling is delivered pre-assembled parts, the marked fixing point must be put through the bearing of the components (flange hub and/or sleeve).
2. Disconnect the flange connection of the coupling to be installed.
3. Remove the anticorrosive coating on sealed surfaces and hub drillings by means of suitable detergents.



When performing cleaning works on the coupling it must be made sure that there are no potential ignition sources. Provide for sufficient ventilation. The recommendations and instructions of the detergent producer must be observed every time when performing cleaning works using soluble means or detergents.

4. Prepare the shaft ends for the incorporation of the coupling.
5. Fit the hubs together with the sleeves using a fitting device or suitable tools. The assembly process can be facilitated by heating the hubs evenly by means of an appropriate heat source.



Risk of burning



O-rings must not exceed > 90 °C while the assembly process takes place'

6. When carrying out the assembly with heated hubs, the plate holding the O-rings must be placed onto the aggregate's shaft before fitting the hub. It's not possible to carry out the assembly afterwards or later.
7. Put the sleeves back onto the hub gearing.



The hub must not be hammered or forced into position!

6.2. Alignment of the coupling components

Put the devices or aggregates in close position to each other so that they face each other. The coupling should be aligned with the clearance $s_{1,2,3}$ (see Table 1). Check the clearances $s_{1,2,3min}$, $s_{1,2,3max}$ resp. l_{4min} , l_{4max} (Installation tolerance $\pm 0,2$ mm).

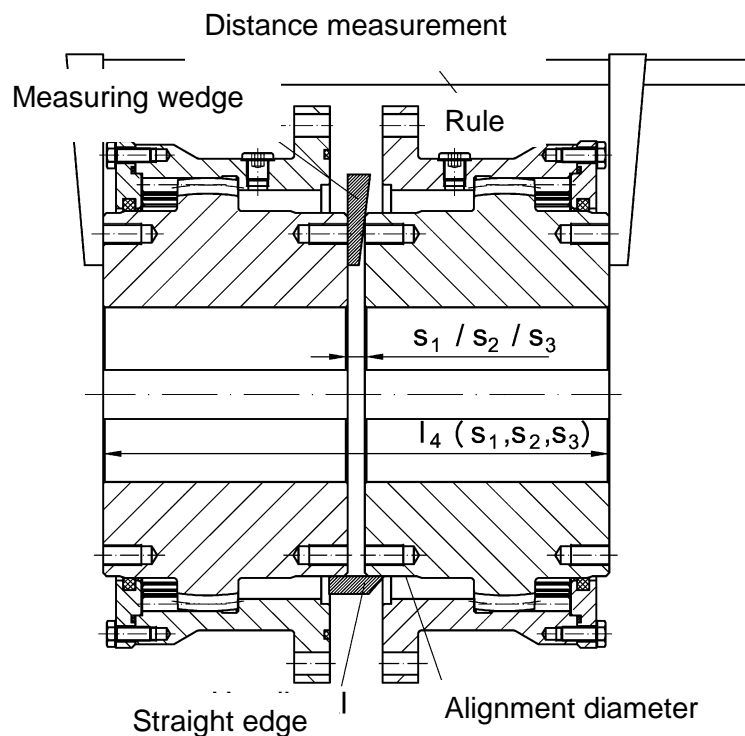


Fig. 3 – Clearance measurement using straight edge resp. control wedge and alignment using straight edge



With gear couplings it has to be seen to that the Table 1 values given for $s_{1,2,3}$ and l_4 must not drop under neither exceed the specified range for axial displacements, even if the displacement occurs due to operational conditions, i.e. while operation is running.

Nominal value	Axial displacement ΔK_a in mm	Clearance s_1 in mm	Clearance s_2 in mm	Clearance s_3 in mm	l_4 bei s_1	l_4 bei s_2	l_4 bei s_3
1250	± 2	8	19	30	208	219	230
2000	± 2	8	20	32	228	240	252
2500	± 3	10	25	40	260	275	290
4000	± 3	10	30	50	290	310	330
5000	± 3	10	30	50	330	350	370
6300	± 3	12	42	72	372	402	432
10000	± 3	12	42	72	412	442	472
12500	± 3	16	106	196	536	626	716
16000	± 4	16	96	176	496	576	656
25000	± 4	16	106	196	536	626	716
31500	± 4	16	126	236	576	686	796
40000	± 4	20	150	280	640	770	900
50000	± 4	20	149	278	680	809	938
63000	± 4	20	166	312	720	866	1012
80000	± 4	20	180	340	780	940	1100
100000	± 6	25	176	327	825	976	1127
125000	± 6	25	185	345	865	1025	1185

Table 1 – Applicable parameters for alignment with standard model



The service life of the couplings is in general dependent on the alignment accuracy of the shaft axes. The parameters given for the admissible displacements must be observed (see Table 2).



When using the aggregate in explosive areas, the parameters given for the max. displacement must be halved in order to ensure the prevention of an ignition source due a potential collision of the individual coupling parts.



Non-observance of the guidelines may lead to the bursting of the coupling, which in turn might cause a risk of life and limb.

With these types of couplings, the alignment of the shafts should be made by means of a control wedge and straight edge (see Fig. 2). The hub clearance should be checked at 4 points which are each shifted by 90°. If the machine is operated at an output speed $> 0.6 \times n_{\max}$ (n_{\max} according to specifications set out in coupling leaflet KWN 21017), it is recommended to make an additional alignment using a probe indicator. The difference between the largest and smallest measurement value equals the doubled size of the present radial displacement.

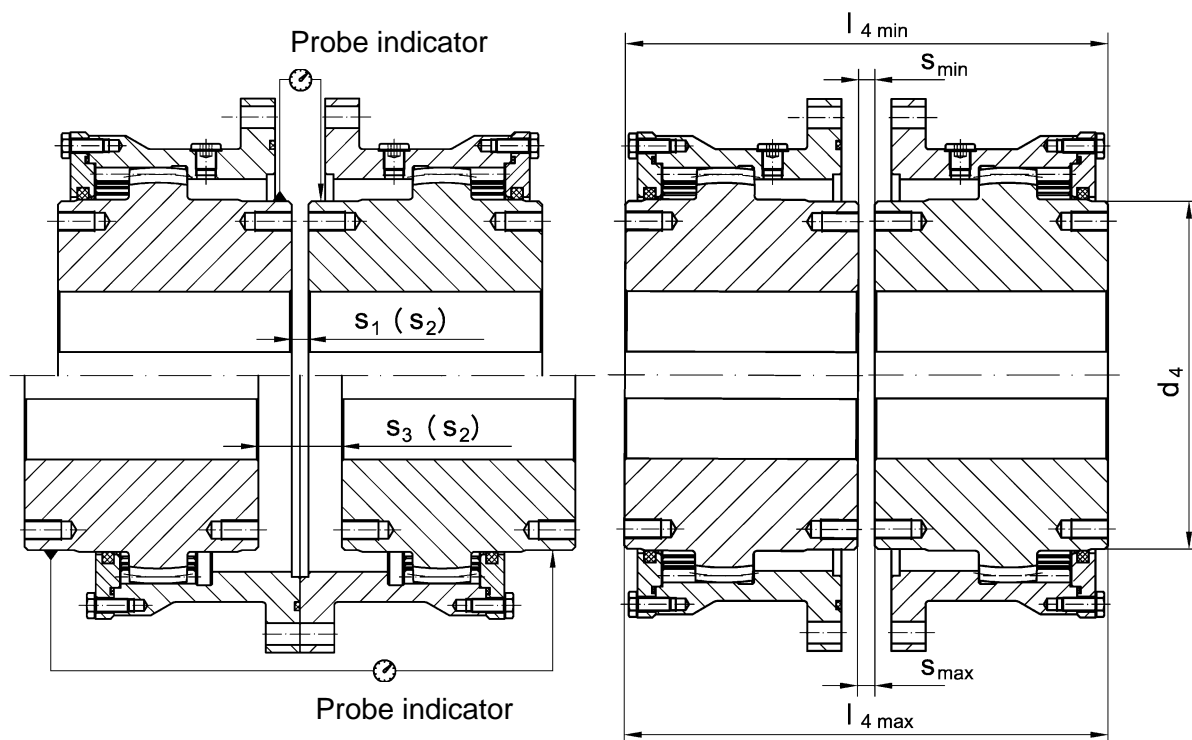


Fig. 4 – Alignment using a probe indicator (inside or outside)

The check for compliance with the admissible angle displacement $\Delta K_{w\max} = 1,25^\circ$ is based on the following correlation.

$$\Delta s = s_{\max} - s_{\min} \leq d_4 \cdot \tan 1,25^\circ$$



The couple must be operated under observance of this requirement.



For an ideal lubrication, the angular displacement should be at least at 0.1° per each joint level.

The calculation of the angular displacement is made on the basis of the size-dependent support width l_0 (Design types A, B, C - Table 2 ; Designs S, H, U - Leaflet KWN 21017) and under consideration of the radial displacement to be adjusted.

$$\Delta K_{r \min} = \tan 0,1^\circ \cdot l_0$$

Nominal value	$\Delta K_{r \max}$ bei $\Delta K_w = 0^\circ$ in mm	Support width l_0^* in mm	Hub d 4 in mm
1250	2,6	119	135
2000	2,8	130	160
2500	3,3	150	185
4000	3,7	170	210
5000	4,1	190	230
6300	4,8	222	255
10000	5,3	242	290
12500	6,4	294	320
16000	7,3	336	360
25000	8,0	366	400
31500	8,9	406	440
40000	10,0	460	480
50000	10,5	479	520
63000	11,3	516	560
80000	12,2	560	600
100000	12,6	576	650
125000	13,2	605	710

Table 2 – Admissible displacements (* - l_0 applicable to designs A, B, C – see leaflet KWN 21017 or drawing for other design types)

Both of the actual displacements (ΔK_w und ΔK_r) must be compared with the given operating conditions (torque, output) according to the specifications set out in leaflet KWN 21017 (Section Intended use of the coupling). The final adjustment of the aggregates can be made after the alignment.

6.3. Further assembly steps

1. The tooth gaps of the hubs and sleeves must be lubricated.



The specified filling quantity of the lubricant must be observed by all means otherwise the coupling poses a potential ignition source.

2. When joining the both coupling sleeves with the design types C and S, the crosspiece ring must be inserted into the hub and the alignment of the sleeves without canting it.
3. The allocation designation and the required tightening torque according to Table 3 must be observed when screwing the both sleeves resp. flange hub with sleeve together.



The use of impact drivers is not allowed!

The tightening torques apply to bolts with untreated, non-lubricated surfaces (coefficient of friction $\mu = 0.13$). The use of substances affecting the coefficient of friction, such as lubricant varnish or grease is not allowed.

4. The topping hole must be locked with the locking bolt and using the provided sealing.
5. Before the initial operation the coupling must be provided with an appropriate contact protection.



All screw connections should be checked for their tightness after completion of the assembly works. Loose screws pose a high risk of ignition. The specified tightening torque must be considered when fastening the screws.



The mounting of a protective cover is subject to the prior conduction of a risk analysis in order to prevent the formation of ignition sources. This analysis doesn't constitute a part of the delivery of the coupling manufacturer.



All attachment parts must meet the requirements of directive 2014/34/EU.

Nominal value	Tightening torque Fitting bolt in Nm	Tightening torque of bolts for plate (lid) in Nm
1250	47	9,5
2000	47	23
2500	80	23
4000	80	47
5000	195	47
6300	195	47
10000	195	47
12500	195	47
16000	395	80
25000	395	80
31500	675	80
40000	675	80
50000	1340	195
63000	1340	195
80000	1340	195
100000	2400	195
125000	2400	195

Table 3 – Tightening torques of screw connections ZAKU-N

7. Start-up



Using this coupling against its intended use and the unauthorized implementation of modifications on this coupling leads to the exclusion of warranty and liability. This applies also to the use/or incorporation of spare parts which are no original KWD components.

Prior to the start-up, all screw connections must be checked and, if required, tightened.



Please refer to Table 3 or the corresponding drawing for the tightening torques of the screws. All specifications are binding!

The alignment of the coupling should be checked once more. In a last step, the coupling must be provided with a contact protection. If you notice any strange sounds or impacts on the coupling during the operation, the plant must be shut down immediately and the fault must be removed.



If the fault detection fails, contact the manufacturer!

The following visual inspections must be carried out prior to the start-up of the plant:

- As is specified: Check for provision of ex-marking
- Has the coupling been filled with lubricant?
- Check for tightness of the hub sealing
- Check for contact clearance at the rotating parts
- Check for possible lubricant leakages at the housing and hub sealings



If the coupling is used in explosive areas, it should be provided with a robust housing, which prevents the formation of ignition risks as may be caused by impacts, friction or friction sparks. Any deposition of heavy metal oxides on the coupling must be prevented by means of an appropriate casing or housing.



If you notice any acoustic changes of the plant sound after the start-up of the coupling, the plant must be shut down immediately and inspected for damages.

In the event of occurring irregularities, please check the troubleshooting Table 6 under Section 10.2 in order to clarify the cause and find corresponding remedies.

7.1. Lubrication

A basic requirement is the adequate lubrication of the gearing, which is optimally adjusted to the operating conditions and especially to the ambient temperature.



Lubricant leakages should be avoided!



The specified filling quantity for lubricant must be observed, as the coupling might otherwise pose an ignition source.



Leaking grease should be completely removed and disposed of in accordance with the legal regulations.

We recommend the use of the lubricant: EP-bearing or EP-Getriebefett:

- Consistency acc. to DIN 51 818: NLGI-class 0 resp. 1
- Labeling acc. to DIN 51 502: KP 0, (1) resp. GP 0, (1)

With operating outputs ≥ 60 % of the max. output specified in leaflet KWN 21017, it is recommended to use a lubricant of NLGI-class 00. Table 4 provides a recommendation list of lubricants.

Manufacturer	Designation	Manufacturer	Designation
ADDINOL	Eco Grease PD 1-400 PLUS	KLÜBER	Klübersynth BE 44-2001
CASTROL	TRIBOL 3020/1000	MOBIL	Mobilux EP
CHEVRON/TEXACO	Multifak CG	SHELL	Gadus S2 V220
FUCHS	RENOLIT DURAPLEX EP		

Table 4 – Lubricant recommendation ZAKU-N

In order to achieve an even lubrication of the gear couplings, there might be, dependent on the operating conditions, min. radial or angular displacements required. Lubricants are not included in the scope of delivery. Never combine different kinds of lubricants.

7.2. Filling quantities

The lubricant quantity to be filled in depends on the nominal value of the coupling, which can be obtained from Table 5.



Parameters deviating from the works standard are to be obtained from the corresponding table and are deemed applicable!

Nominal value	Design type A, B, C , S, H – Grease quantity in kg	Design type U – Grease quantity in kg
1250	0,2	0,2
2000	0,3	0,2
2500	0,4	0,2
4000	0,6	0,3
5000	0,8	0,4
6300	1	0,4
10000	1,7	0,4
12500	2,0	0,5
16000	3	1
25000	3,6	1,1
31500	4,4	1,2
40000	6,9	1,4
50000	7,9	1,7
63000	9,4	2,3
80000	10,6	2,1
100000	11,2	3,7
125000	12,5	4,1

Table 5 – Recommended grease quantities ZAKU-N

8. Maintenance and Repair

The guidelines set out in Chapter 2 „Safety Guidelines“ and in Chapter 10 „Troubleshooting“ are to be observed. The maintenance and repair works are to be carried out carefully and by trained and authorized staff only.

The maintenance works are related to the check of the lubricant (lubricant change); the sealing elements (replacement of o-rings); and the shaft displacements (new alignment).



If the manufacturer has provided a technical drawing for the coupling, the values and specifications contained therein are deemed applicable.



The coupling must be protected from the impact of falling objects.



Protection devices for rotating parts must be checked for proper fitting. Rotating parts must not contact each other.

8.1. Lubricant change



Lubricant leakage should be avoided!

The change interval depends primarily on the operating conditions of the coupling (load, output, shaft displacement, ambient temperature, duration of operation).

The standard values are:

- Refill approx. every 1,000 operating hours or max. every half year by 10 % of the grease quantity given in Table 5.
- Change of the full lubricant amount approx. every 8,000 operating hours resp. max. every 3 years
- The refill process must always take place at dismantled and shifted sleeve (see disassembly of coupling)



The operation under other operating conditions requires the prior approval of the manufacturer.



If the coupling is used in explosive areas, the checks are to be performed much more frequently.

The couplings are to be checked for proper function after approx. 200 operating hours or max. once a month!

8.2. Disassembly of the coupling

The coupling must be dismantled for the replacement of the sealing rings and partly dismantled for the lubricant change. The following steps are to be carried out in accordance with the specified order:

1. Loosen the fitting screw and remove the sleeves from the flange.
2. Release and remove plate.
3. Put the aggregates in a position allowing for the disassembly (e.g. shift coupled aggregates apart).
4. Mark the exact position of sleeves and hubs to each other at both components.
5. Shift the sleeves into the axial end position.
6. Clean the coupling.
7. Check the gearing.
8. Replace damaged parts, if any.
9. Fill gearing and sleeves with lubricant.

In case of other maintenance and service works (e.g. replacement of o-ring) it may be necessary to dismantle the coupling halves. For this purpose the hubs are to be pulled off using suitable support means.

The instructions set out in Chapter 6 and 7 are to be observed when carrying out the re-assembly.



Never use the sleeve to pull off the hubs!

8.3. Cleaning of the coupling components



The cleaning works on the coupling must not take place in an explosive area. All kinds of ignition sources are to be avoided.



Provide for sufficient ventilation. Always observe the instructions of the detergent producer when performing works using soluble means or detergents.

When carrying out the disassembly process, it should be ensured that the coupling components are thoroughly cleaned before they are re-assembled. This goes especially for the area around the gearing, as it's prone to the deposition of residual lubricant and abrasion debris.

8.4. Replacement of couplings

If the gearing has been exposed to excessive use and shows accordingly considerable signs of wear, which is due to a pronounced circumferential backlash within the coupling, we recommend to carry out the replacement of all couplings.



The replacement of parts belonging to the hub and sleeve must take place pairwise with each coupling side.

After loosening the screw connections (and removal of the intermediate shaft as is the case with design type H), the hubs can be pulled off from the shaft ends using the release threaded holes or appropriate universal releasers.

The instructions set out in Chapter 6 and 7 are to be observed when carrying out the re-assembly.

9. Spare Parts

The description of the spare parts provides a item no. and the corresponding position no. allowing for the easy placement of order with the manufacturer. It is recommended to exclusively use spare parts manufactured and distributed by KWD.

10. Troubleshooting



If the manufacturer has provided a technical drawing for the coupling, the values and specifications contained therein are deemed applicable.

10.1. General

The faults and errors described under Section 10.2 are merely points of reference for the detection of the faults source. In case of complex machines and plants, you should consider all underlying conditions to solve the problem. As a general rule, the coupling should always run at a low noise level and vibration-free regardless the operating condition.

10.2. Possible faults

Faults	Causes	Hazard warning in ex-areas	Remedy
<ul style="list-style-type: none"> - Vibrations - Changes of the operating noise 	<ul style="list-style-type: none"> - Exceedance of the admissible displacement values - Coupling is not operated under the specified conditions - Lack of lubricant 	<ul style="list-style-type: none"> - Hot surfaces and the formation of sparks incur a risk of ignition - Risk of ignition due to sparks from metal contact of the gearing - Risk of ignition due to sparks from metal contact at the coupling lid. 	<ul style="list-style-type: none"> - Shut down the plant - Check alignment and E-mass and make re-alignment, if necessary - Check geared components - Perform lubricant change - And check sealings, replace sealings, if necessary.
<ul style="list-style-type: none"> - Increased operating temperature 	<ul style="list-style-type: none"> - Lubricant level too high or too low - Coupling is not operated under the specified conditions - Exceedance of the admissible displacement values - Lubricant change required 	<ul style="list-style-type: none"> - Hot surfaces and the formation of sparks incur a risk of ignition - Risk of ignition due to sparks from metal contact of the gearing 	<ul style="list-style-type: none"> - Shut down the plant - Check geared components - Perform lubricant change and check sealings, replace sealings, if necessary - Check date of latest lubricant change and perform lubricant change, if necessary.
<ul style="list-style-type: none"> - Gearing damage 	<ul style="list-style-type: none"> - Coupling is not operated under the specified conditions - Exceedance of the admissible displacement values - Lubricant change required 	<ul style="list-style-type: none"> - Hot surfaces and the formation of sparks incur a risk of ignition - Risk of ignition due to sparks from metal contact of the gearing 	<ul style="list-style-type: none"> - Shut down the plant - Replace coupling or perform repair using original KWD spare parts - Assembly according to OM.
<ul style="list-style-type: none"> - Excessive gearing wear 	<ul style="list-style-type: none"> - Coupling is not operated under the specified conditions - Exceedance of the admissible displacement values - Lubricant change required 	<ul style="list-style-type: none"> - Hot surfaces and the formation of sparks incur a risk of ignition - Risk of ignition due to sparks from metal contact of the gearing 	<ul style="list-style-type: none"> - Shut down the plant - Check alignment and E-mass and make re-alignment, if necessary - Perform lubricant change - And check sealings, replace sealings, if necessary.

Table 6 – Possible faults



OPERATION MANUAL

KWN 31272

Production series ZAKU-N

Version: E

Amendment notes :

<i>Index</i>	<i>Date</i>	<i>Amendments</i>
A	25.04.2012	First edition
B	06.06.2013	Reference to German OM
C	31.07.2013	Revision 10.2
D	16.01.2020	Update ATEX standards
E	21.11.2025	Size 12500 added ATEX information updated Lubricant recommendation list updated

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