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Installation and Operation Manual TSCHAN®
Torsionally Rigid Coupling

POSIFLEX® ZEAF, ZEBF

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This Installation and Operation Manual is applicable to the coupling type POSIFLEX®-ZEAKF, ZEAU(U)F, ZEAU(U)KF, ZEBKF, ZEBU(U)F, ZEBU(U)KF.

1 Safety Instructions

This installation and operation manual is an essential component of the coupling delivery. Always keep this manual in a readily accessible place near the coupling. The German version of this AOI is leading and binding.
Take care that all persons being charged with the installation, operation, maintenance and repair of the coupling have read and understood this manual and that all instructions contained therein are carefully observed in order to:

- avoid danger to life and limb of the user or third persons,
- ensure the operational safety of the coupling,
- preclude operation failures and environmental damages due to wrong handling and misuse.

Except for the production of a finish-bore with keyway (see 6.2 ‘Finish Bore’), no further modifications are allowed to be performed to the coupling without the prior written approval by TSCHAN GmbH.
The relevant instructions and regulations regarding safety at work and environmental protection have to be observed while transporting, mounting and dismounting the coupling.
Make sure that suitable handling and transportation means are at disposal.
The coupling shall be operated, mounted, maintained and repaired by authorized, trained and instructed personnel only.

The user must take into account that the bolting elements of coupling parts may be adversely affected by the heat produced by a brake disk/ brake drum due to the resultant friction. Make sure that the combination of the employed brake lining with the material of the brake disk/ brake drum does not lead to sparks or impermissible thermal growth. The brake disk is normally made of steel, and the brake drum is normally made of cast iron with nodular graphite. In case of any doubt, please consult the supplier!
In the interest of further development, we reserve the right to carry out modifications serving the technical progress.
We do not assume any liability or warranty for any damages resulting from the use of accessories and parts that are not originally manufactured by TSCHAN GmbH.

2 Function

The TSCHAN® POSIFLEX®-coupling is a torsionally stiff gear coupling with a certain backlash. It compensates for angular, parallel and axial shaft misalignments within defined ranges. Parallel shaft offset can only be compensated by the double engagement design with two toothing planes. The coupling transmits the torque via hubs with crowned gear teeth which are in permanent mesh with the straight gear teeth of the sleeves. There must be a certain gear tooth circumferential clearance in order to compensate misalignments of the connected machines.
The spacer can be radially mounted and dismounted without having to move the connected machines. The distance dimension 'E' between the flange hubs can then be used, for example, to service connected machines. Avoid pollution of the environment due to leaking lubricants.
When the spacer is dismounted, a check of the rotational direction of the drive can easily be performed.
The coupling is suitable for horizontal installation in each direction of rotation. For applications involving other than horizontal position, it may be necessary to support the housing or the spacer. Please contact TSCHAN GmbH, if this has not been taken into account when selecting the coupling size.
It is imperative to use a lubricant that is appropriate for the specific requirements of the gear coupling in order to ensure reliable and continuous operation.

2.1 Intended Application

- The coupling shall only be used in normal industrial air. Aggressive media can corrode coupling parts as bolts and sealings and are dangerous for the reliability of the coupling. Consult TSCHAN GmbH in these cases.
- In order to ensure trouble-free and reliable performance of the coupling, the coupling has to be designed e.g. according to the selection specifications in the TSCHAN catalogue POSIFLEX® using a service factor that is appropriate to the operation conditions. See catalog 'Coupling Size Selection'.
- The values for max. torque, max. speed and max. misalignment as stated in the catalog dimension sheets must not occur simultaneously. See catalog 'Coupling Size Selection'.
- The coupling shall only be used and operated within the frame of the conditions as defined in the performance or delivery contract.
- Any change in the operation conditions or service parameters requires the verification of the coupling design.

3 Storage

On receipt of the goods, immediately check that all parts are on hand and have been delivered as ordered. Shipping damages and/or missing parts have to be reported to TSCHAN GmbH in writing.
The coupling parts can be stored as delivered in a dry place indoors at normal ambient temperatures for a period of 18 months. In closed rooms with a high air humidity, the coupling parts can be stored for 12 months, outside of closed rooms they can be stored under a cover for 9 months, and without a cover for 3 months. Storage for a longer period requires the application of a long-term preservation. (Please consult TSCHAN GmbH regarding this subject).
The coupling parts must not be exposed to aggressive products, extreme temperatures or direct humidity. The seals must not be stored together with acids, caustic solutions or other caustic chemicals; they must not be exposed to ozonic media, direct sun light or intensive light sources with UV light. The place of storage should be dry and free from dust. The air humidity must not exceed 65% and condensation is not permissible.

4 Construction

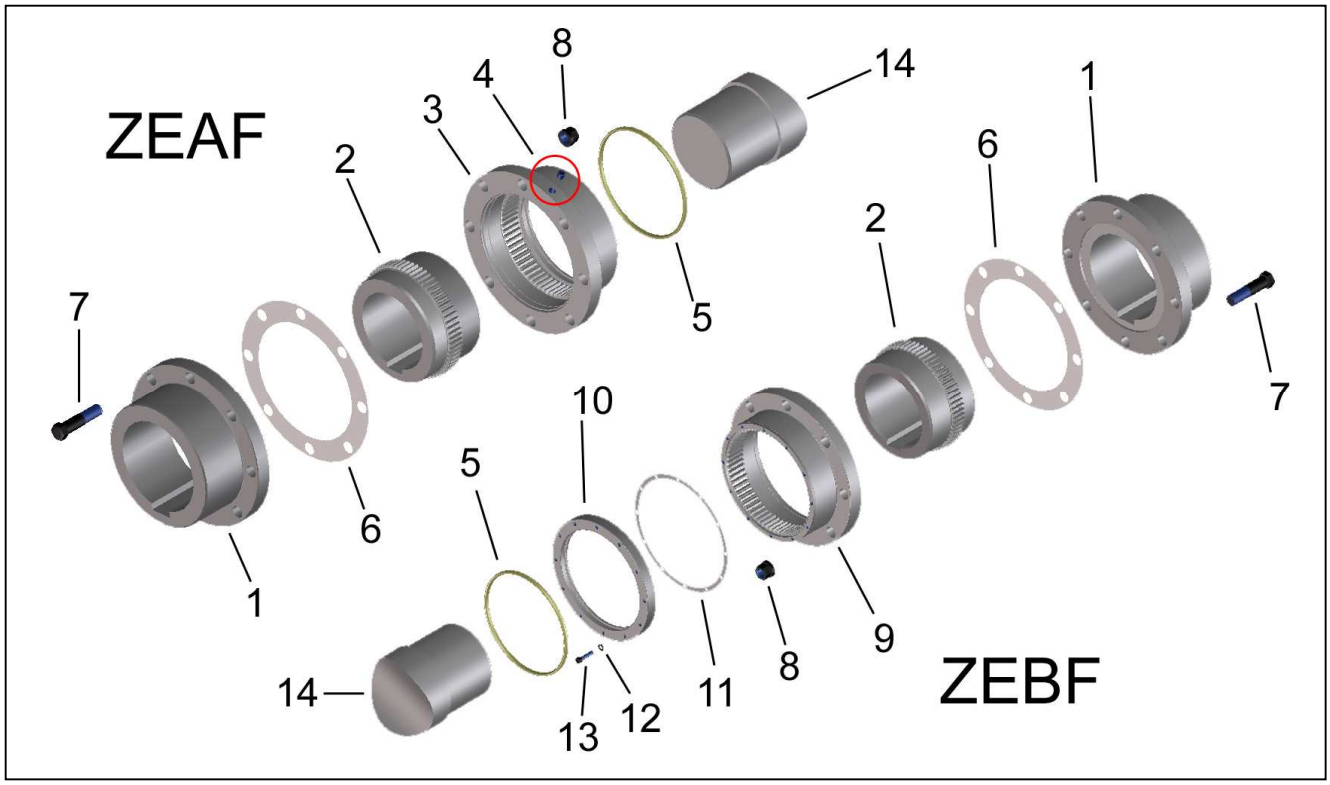


Bild / Fig. 1 Construction POSIFLEX® ZEAF / ZEBF

Item.	Description
1	Flange hub part ZEAF part 676
2	Hub part 671 / 672 = U-hub extended
3	Sleeve ZEA-type, part 670
4	Screw plug
5	O-ring, part 673
6	Flange seal, part 674
7	Fitted bolt, part 675
8	Hexagon nut, part 675
9	Sleeve ZEB-type, part 680
10	O-ring carrier/ cover, part 678
11	Cover seal, part 679
12	Locking washer
13	Cheese head screw
14	Spacer part 687

Important notes:
The spacer is delivered with the hubs and sleeves already mounted to it by TSCHAN GmbH. Balanced assemblies are match marked. Fitted bolts and nuts of balanced couplings are weight balanced. These sets must not be mixed with bolt sets of other couplings!
The couplings are not filled with grease when they are delivered.

5 Technical Data

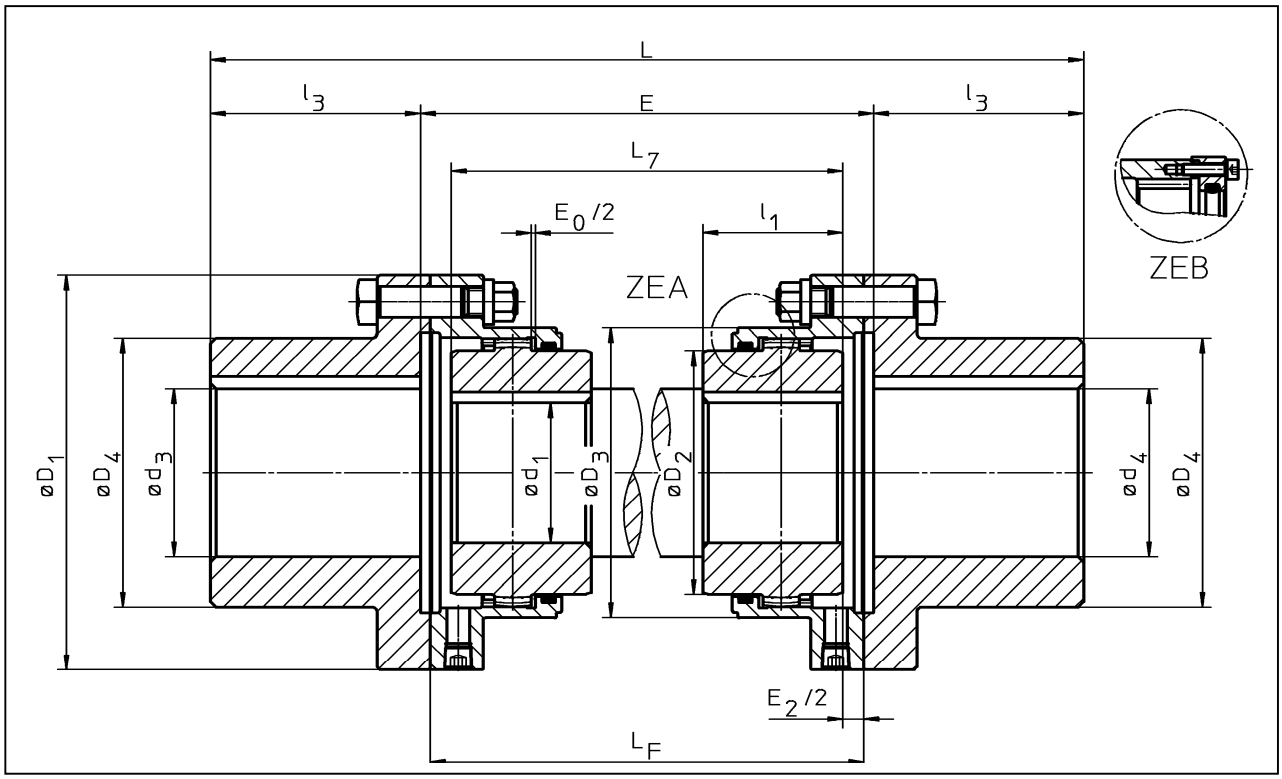


Bild / Fig. 2 POSIFLEX® ZEAF / ZEBF

Table 1 Technical Data:

Size	T_{Knenn} [Nm]	T_{Kmax} [Nm]	d_{1max} [mm]	d_{3max} d_{4max} [mm]	Sleeve l_1 [mm]	Flange hub l_3 [mm]	L_7 min [mm]	L min [mm]	L_F min [mm]	E min [mm]	E_0 [mm]	E_2 [mm]	D_1 [mm]	D_2 [mm]	D_3 [mm]	D_4 [mm]
67	1300	2600	45	55	43	40	86	194	107	114	3	21	111	67	80	80
87	2800	5600	60	75	50	47	100	216	115	122	3	15	141	87	103,5	103,5
106	5000	10000	75	95	62	58	124	278	155	162	3	31	171	106	129,5	126
130	10000	20000	95	110	76	74	152	336	181	188	5	29	210	130	156	152
151	16000	32000	110	130	90	87	180	394	113	220	5	33	234	151	181	178
178	22000	44000	130	155	105	101	210	459	250	257	6	40	274	178	209	208
213	32000	64000	155	180	120	113	240	515	282	289	6	42	312	213	247	245
235	45000	90000	175	200	135	129	270	586	320	328	8	50	337	235	273	270
263	62000	124000	195	230	150	150	300	664	356	364	8	56	380	263	307	305
286	84000	168000	215	250	175	175	350	778	420	428	8	70	405	286	338	330
316	115000	230000	240	280	190	190	380	856	464	476	8	84	444	316	368	362
372	174000	348000	275	330	220	220	440	972	520	532	10	76	506	372	426	419
394	244000	488000	280	360	280	280	560	1186	610	626	10	50	591	394	472	472
432	290000	580000	320	400	292	292	584	1237	637	653	13	53	640	432	518	518
480	370000	740000	360		305						13	83	684	480	562	562
530	450000	900000	400		330						13	93	742	530	620	620
594	560000	1120000	450		350						13	109	804	594	682	682

The torques T_{Cnom} and T_{Cpeak} are valid for:

- Ambient temperatures of –20 °C to +65 °C.
- Operation within the range of the specified alignment values.

The max. permissible operating speed and the weight of the coupling depend on the length of the spacer.
For longer spacers, or circumferential speeds of more than 30 m/s, referred to the outer diameter of the coupling, we recommend to balance the coupling parts.

6 Installation

6.1 To be observed prior to Installation

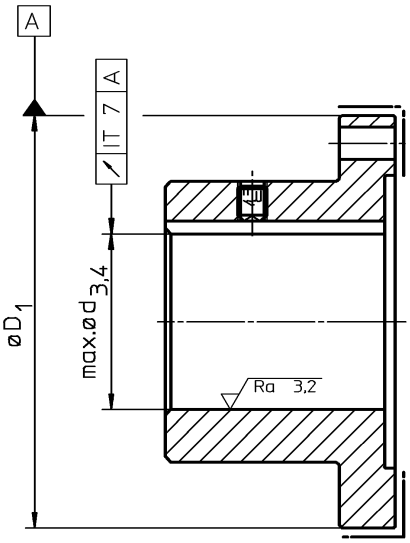
- **Danger of injuries!**
- **Disconnect the drive before carrying out any work on the coupling!**
- **Secure the drive against unintentional re-start and rotation!**
- **Incorrectly tightened bolts can cause serious personal injuries and property damages!**
- **If possible, assemble the coupling outside of the danger zone.**
- **Take care that suitable transportation means are at disposal and that the transportation ways are free of obstacles.**
- **In compliance with accident prevention regulations, you are obliged to protect all freely rotating parts by means of permanently installed guards against unintentional contact and falling objects. The screw plugs of the sleeves partially have a diameter of 6 mm only!**
- **As a minimum, the covers have to fulfil the requirements of protection type IP2X.**
- **The covers have to be designed to prevent dust from depositing on the coupling.**
- **The cover must not contact the coupling or impair the proper function of the coupling.**
- **In order to avoid static charge, the coupling must not be mounted electrically insulated. Provide for an equipotential bonding between input and output.**

- Take appropriate measures, such as sufficient ventilation of the operation site, good illumination, proper electrical tools etc. to ensure safety, before mounting or putting the coupling into operation and before carrying out any maintenance work.
- Before starting to install the coupling, make sure that the necessary tools are at disposal:
  - to handle the parts
  - to join the interfaces
  - to align the coupling
  - to tighten the screw connections
- When carrying out assembly or maintenance work on the coupling, always take care to avoid polluting the environment due to escaping lubricant.
- Make sure that the speeds, torques and ambient temperatures as stated in chapter 6 ‘Technical Data’ are not exceeded.
- The maximum permissible bore diameters must not be exceeded.
- Check whether the shaft-hub connections safely transmit the occurring operating torques.
- The standard tolerance of TSCHAN for finish bores is fit H7.
- Standard keyways comply with DIN 6885, sheet 1, fit P9.
- Check the dimensions and tolerances of shafts, hub bores, keys and keyways.
- Secure the hubs against axial movement on the shaft ends by using setscrews, shaft end plates or by means of a sufficient interference fit.

6.2 Finish bore in a flange hub

The following procedure has to be observed to produce a finish bore in a flange hub:

- Clean and remove all preservatives from the flange hub.
- Mount the flange hub between the surfaces marked with ⌈ and carefully align the flange hub according to the outer diameter $ØD_1$ and the flange contact surface.
- The values for $ød_{3max}$, $ød_{4max}$ listed in table 1 are valid for keyed connections according to DIN 6885/1 and must not be exceeded.
- Select the bore fit so that an interference fit such as H7/m6 results when mating it with the shaft tolerance.
- Lock the hub with a setscrew, shaft end disk or an appropriate interference to prevent axial movement of the hub.



Consult TSCHAN GmbH in case of other shaft-hub connections.

- **The stated maximum bore diameters are valid for keyed connections according to DIN 6885/1 and must not be exceeded.**
- **If these values are exceeded, the coupling can break.**
- **Flying coupling debris are a danger to life!**

6.3 Coupling Installation

- Prior to installation, carefully clean the bores of the coupling hubs and the shaft ends. The surfaces must be clean, dry and free of grease.
- Use suitable installation tools and hoists such as cranes or pulley blocks for larger couplings.

Note:
To facilitate mounting, the hub can be uniformly heated to the range of 80°C to 120°C.

- **Warning!**
- **Always wear heat-resistant gloves to protect yourself against injuries due to hot coupling components!**

- Mount the flange hubs in such a manner that the shaft end is even with the inner bore opening (Fig. 3).
- Observe other mounting arrangements that may have been agreed upon! In case of doubt, please contact TSCHAN GmbH.
- When tightening setscrews, secure them with an adhesive, such as e.g. Loctite 222, to prevent the screws from working loose and dropping out.

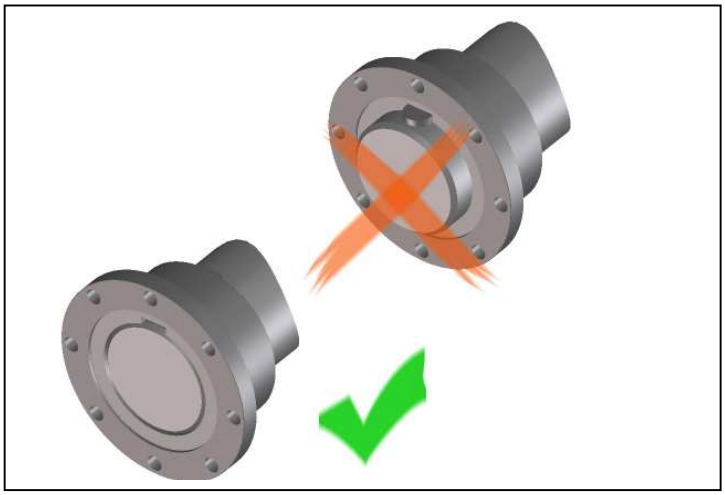


Bild / Fig. 3 Mounting of flange hub on shaft end

- Check the flange distance "L_F" and adjust it according to Table 1 or to the approved order drawing. Please consult TSCHAN GmbH in case of doubt.
- Align the coupling according to the instructions given in chapter 8 'Coupling Alignment'.
- The threaded holes of setscrews have to be covered with an adhesive tape, so as to prevent damaging the O-rings while fitting them.
- Slightly rub the housing teeth and hub teeth with a suitable lubricant according to table 7.
- Slide the housing halves over the hubs.

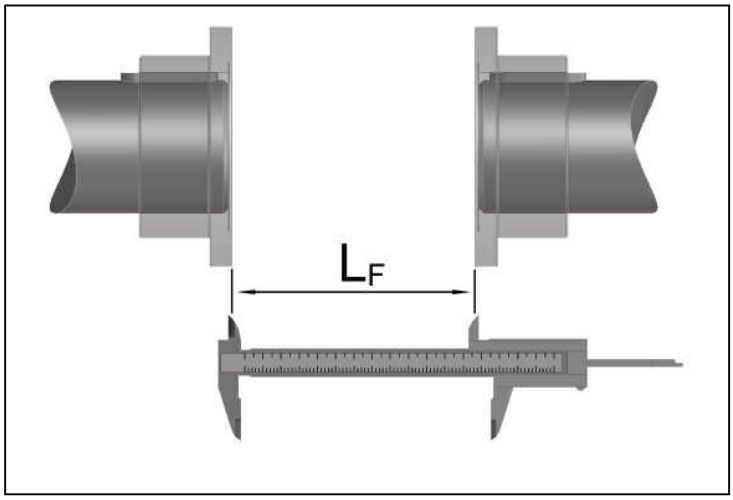


Bild / Fig. 4 Flange distance L_F

- **Type ZEB:**
  Insert the paper seal in between the O-ring cover and the hub and bolt down the cover to the housing. Properly tighten the cover bolts with the tightening torque stated in table 2.

- Mount the spacer together with the flat seals in between the flange hubs - see Fig. 5. The contact faces on the flanges must be clean, dry and free from grease.
- Assemble the flange hubs with the sleeve. Make sure that the parts do not get canted at the centerings, and that the flange surfaces are flush to each other.

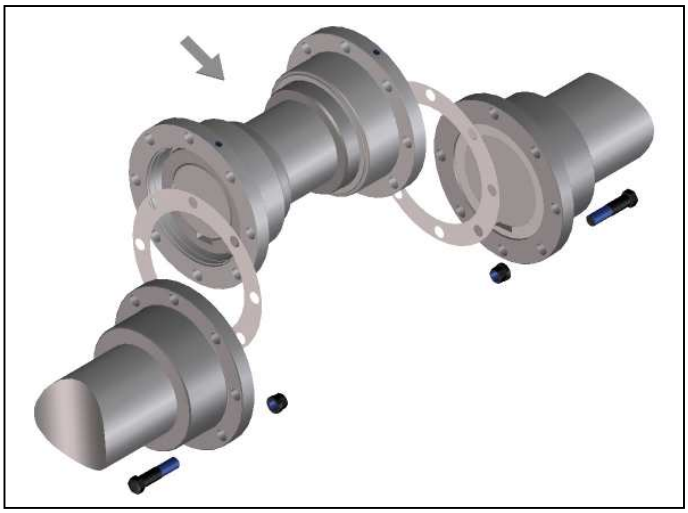


Bild / Fig. 5 Assembly spacer

Use the fitted bolts and nuts as delivered.
The fastening means must not be cleaned or additionally lubricated!

- Slightly tighten the nuts by hand.
- Exactly tighten the hexagon nuts to the tightening torque M_A according to table 3. Secure the fitted bolts against turning!
- It must be possible to easily move to-and-fro the spacer by the dimension E_0 of Table 1, relative to the firmly mounted flange hubs.

Table 2 Tightening torques T_{an} for cover bolts:

Size	67	87	106	130	151	178	213	235	263	286	316	372	394	432	480	530	594
T_{an} [Nm]	-	-	4	8	8	8	8	13	13	33	33	33	65	65	65	112	112
Thread M M	-	-	4	5	5	5	5	6	6	8	8	8	10	10	10	12	12
Wrench size	-	-	3	4	4	4	4	5	5	6	6	6	8	8	8	10	10

Table 3 Tightening torques M_A for hexagon nuts:

Size	67	87	106	130	151	178	213	235	263	286	316	372	394	432	480	530	594
M_A [Nm]	33,5	66	112	277	277	537	537	537	537	537	795	795	1855	1855	1855	1855	1855
z x Thread M	6 x M8	8 x M10	6 x M12	6 x M16	8 x M16	8 x M20	8 x M20	10 x M20	10 x M20	14 x M20	14 x M24	16 x M24	14 x M30	18 x M30	24 x M30	28 x M30	30 x M30
Wrench size	10	12	14	19	19	24	24	24	24	24	30	30	46	46	46	46	46
Tool size	1/4“	3/8“	3/8“	1/2“	1/2“	1/2“	1/2“	1/2“	1/2“	1/2“	1“	1“	1“	1“	1”	1”	1”

7 Coupling Alignment

- **Danger of injuries!**

- **Disconnect the drive before carrying out any work on the coupling.**
- **Secure the drive against unintentional re-start and rotating!**
- **Always make sure that the environment is not polluted by escaping lubricants while carrying out assembly and maintenance operations.**

- **Note:**
- **The precise alignment of the coupling increases its lifetime and reduces dangers when it is used.**
- **It is of utmost importance to observe the recommended alignment values. Exceeding the permissible misalignment values results in coupling damages and failures!**

Carefully align the shaft ends. The maximum permissible misalignment of the coupling depends on the operation speed.

Attention: Do not align to 'zero'. A slight offset is necessary in order to ensure the lubrication of the gear teeth.
When aligning the cold equipment take into account the expected thermal growth of the components, so that the permissible misalignment values for the coupling are not exceeded in operation.

7.1 Axial Misalignment ΔK_a

- Before mounting the spacer, measure the actual length dimension 'L_7' across the hubs of the spacer acc. to Fig. 2.
- Before aligning couplings with end float limitation, the 'zero position' of the shaft (the 'magnetic center' of the rotor in the case of el. motors) of the machine that is not equipped with an axial bearing must first be determined and adjusted.
- Adjust the **Distance 'L_F'** between the flange hubs to **'$L_7 + E_2$'** (E2 according to table 1) Fig. 6.

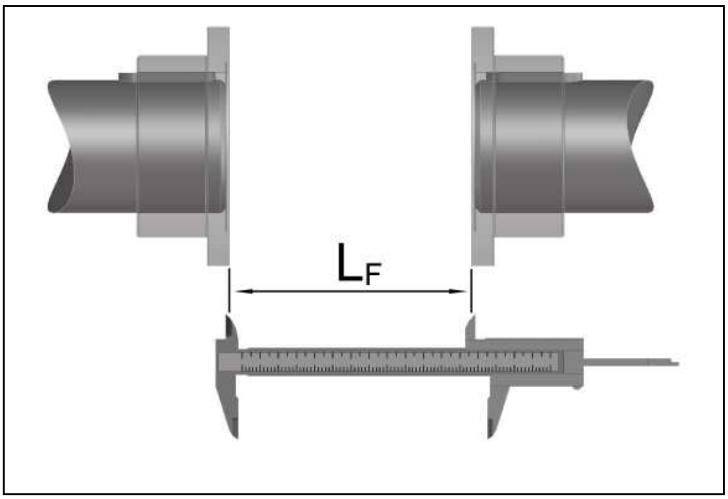


Bild / Fig. 6 Flange distance L_F

7.2 Angular Misalignment ΔK_w

- Measure one complete revolution on the face of the outer diameter from one flange hub. To this purpose, turn the dial gauge by 360°. Determine the largest deviation (Fig. 7)

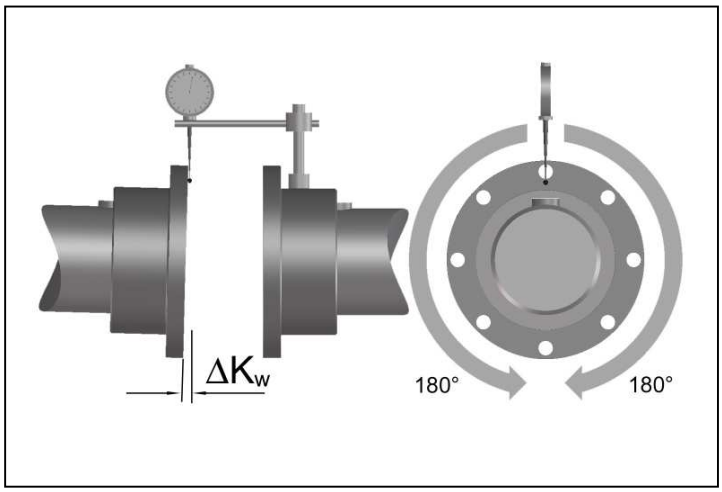


Bild / Fig. 7 Angular Misalignment ΔK_w measure

Table 4 Factor K_w Angular Misalignment:

Size	67	87	106	130	151	178	213	235	263	286	316	372	394	432	480	530	594
K_w	2,34	3,04	3,71	4,54	5,28	6,22	7,55	8,20	9,18	9,98	11,04	12,98	13,76	15,08	16,76	18,5	20,74

7.3 Radial Misalignment ΔK_r

- Measure one complete revolution on the outer diameter. To this purpose, turn the dial gauge by 360°. Determine the largest deviation (Fig. 8)

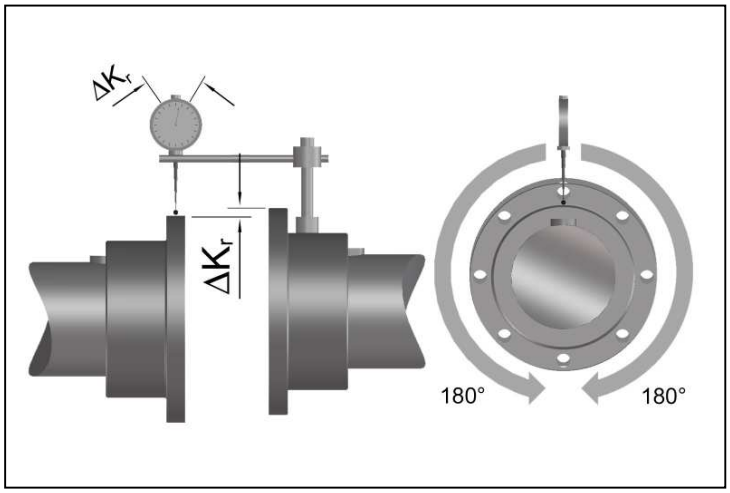


Bild / Fig. 8 Radial Misalignment ΔK_r measure

Table 5 Factor K_r Radial Misalignment:

Size	67	87	106	130	151	178	213	235	263	286	316	372	394	432	480	530	594
K_r	1,92	2,06	2,76	3,25	3,80	4,47	5,03	5,72	6,35	7,47	8,24	9,18	10,82	11,34	12,32	13,37	14,35

The combined angular and radial offset must correspond with the following formulae:

$$0.1° \leq \frac{\Delta K_w}{K_w} + \frac{\Delta K_r}{K_r} \leq 0.75 \cdot \Delta K_{wmax}$$

In case of deviations, the alignment must be corrected as necessary.

ΔK_{wmax} is dependent on the torque and the speed, and has to be determined according to diagram 1 in the POSIFLEX® catalog when selecting the coupling size.

8 Operation

When operating the coupling, its specific technical data have to be carefully observed (see chapter 5 'Technical Data'). These values must never be exceeded without the prior written approval by TSCHAN GmbH.
In order to ensure trouble-free and reliable performance of the coupling, the coupling has to be designed according to the selection specifications in the catalogue POSIFLEX® using a service factor that is appropriate to the operation conditions.

Any change in the service conditions or service parameters always necessitates the verification of the coupling design.

When putting the coupling into service, pay attention to the following:

- **Danger of injuries!**
- **Disconnect the drive before carrying out any work on the coupling!**
- **Secure the drive against unintentional re-start and rotation!**
- **Improperly tightened screws may cause parts to fly off and lead to most serious personal injuries and property damage!**
- **Before putting the coupling into operation, check the alignment and all screwed connections for correct tightening torque and firm fit!**
- **Before operating the coupling make sure that a sufficient quantity of a lubricant appropriate to the specific requirements of the coupling has been filled into the coupling.**
- **The coupling must be clean and tight.**
- **Before starting up the equipment, install all protective guards in order to avoid contact with freely moving or rotating parts.**
- **The covers have to comply with protection type IP2X as a minimum. The guard is to protect the surrounding area against flying objects (the screw plug has a diameter of 6 mm) and the coupling against falling objects.**
- **The guard shall be designed to prevent dust from depositing on the coupling parts.**
- **The guard must not contact the coupling, minimum distance 10 mm, nor impair its operation.**

When starting up and operating the coupling, pay attention to the following:

- Changes in operating noises
- Vibrations
- Leaks
- Other unusual phenomena

Attention!

- **Should you observe any unusual phenomena or problems when starting or operating the coupling, disconnect the driving equipment immediately!**
- Identify the cause for the problem using table 6 below “Operation Faults and Possible Causes“ and correct the fault.
  The listed problems are some examples to assist you in troubleshooting.
- **All the machinery components and operation modes have to be considered for the determination and correction of mechanical problems!**

Table 6 Operation Faults and Possible Causes:

Trouble	Cause	Risk Warning	Correction
Running noises/ vibrations	Alignment fault	Increased restoring forces on shafts and bearings of the connected machines.	- Disconnect drive - Check coupling components for damages and replace parts, if necessary - Check alignment - Check lubricant and quantity of lubricant
	Wrong lubricant or lack of lubricant	Higher reaction forces. Wear increases.	- Disconnect drive - Check coupling components for damages and replace parts, if necessary - Check alignment - Check correct type and quantity of lubricant, see chapter 9 ‘Maintenance’
	Worn out teeth	Higher reaction forces. Coupling fails.	- Disconnect drive - Check coupling components for damages and replace parts, if necessary - Check alignment - Check correct type and quantity of lubricant, see chapter 9 ‘Maintenance’
	Unbalance	Vibrations.	- Disconnect drive - Verify balance state of plant components and correct it, if necessary - Check O-rings and toothed parts for damages, and replace them, if necessary
Coupling teeth damages	Loose screw connections	Flying off screws, the spacer may fly out.	- Disconnect drive - Check coupling components for damages and replace parts, if necessary - Verify coupling alignment - Tighten the screws to the specified torque, and secure them against working loose, if necessary
	Alignment faults	Increased restoring forces on shafts and bearings of the connected machines.	- Disconnect drive - Remove cause for alignment fault - Replace coupling halves - Re-align coupling
	Overload due to very high torque	Tooth fracture! Coupling fails.	- Disconnect drive - Verify coupling design in cooperation with TSCHAN GmbH - Install larger coupling, if necessary - Replace coupling

Trouble	Cause	Risk Warning	Correction
	Wrong lubricant, lack of lubricant	Higher reaction forces and wear.	- Disconnect drive - Replace coupling halves - Verify coupling alignment - Use appropriate lubricant
	Torsional vibrations in the drive line	Tooth fracture!	- Disconnect drive - Analyze and eliminate cause for torsional vibrations - Check coupling components for damages and replace parts, if necessary - Verify coupling alignment

9 Maintenance

The torsionally stiff gear coupling POSIFLEX® has to be inspected and lubricated at regular intervals.

On the occasion of routine inspections or maintenance of the equipment, check:

- Lubricant quantity in the coupling
- tightness of the coupling
- alignment of coupling
- firm fit of all fastening elements
- remove dust deposits from coupling parts

9.1 Inspection and Maintenance

- **Danger of injuries!**
- **Disconnect the drive before carrying out any work on the coupling!**
- **Secure the drive against unintentional re-start and rotating!**
- **While carrying out assembly or maintenance operations on the coupling, avoid the pollution of the environment by lubricants that may escape.**

Check the alignment and tightness of the coupling after 4000 operation hours after the first start-up of the coupling, or after 12 months at latest. Check whether the coupling housing can be freely moved by the dimension E_0 relative to the hubs. Check that all the coupling parts are still in place. Fill up lubricant acc. to chapter 9.2. Make sure that the coupling is operating smoothly and without vibrations.

Every 8000 operation hours, however, at least every 2 years, the coupling must be opened in order to check the gear teeth and seals for damages or wear. Check the alignment, too. Before opening the coupling, mark the position of the hub relative to the sleeve. Upon completion of the inspection, re-assemble the geared parts in their original position. Make sure that the same teeth are in mesh. In doing so it is advisable to replace sealings, bolts and nuts.

Disconnect the drive immediately, if

- changes in operating noises
- vibrations
- leaks
- or other unusual phenomena occur while the coupling is operating.

9.2 Lubrication

- **Danger of injuries!**
- **Disconnect the drive before carrying out any work on the coupling!**
- **Secure the drive against unintentional re-start and rotating!**

- Remove the screw plugs from both housing halves (Fig. 9).
- Bring the opposing hole openings in the horizontal line and fill in lubricant **in each coupling half**, e.g. by using a grease gun, until it comes out at the opposed bore (Fig. 9). See tables 7 and 8 regarding lubricant type and quantity.
- After having filled in lubricant, remount all the screw plugs and tighten them with the torque indicated in table 9.
- Only use such lubricants that are suitable for the particular requirements of the gear coupling.

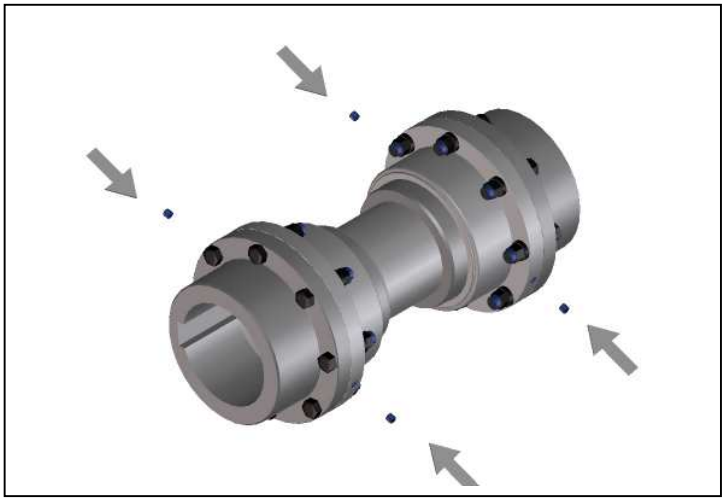


Bild / Fig. 9

- **Normal roller bearing grease is not suitable for use in gear couplings!**
- While working on the coupling make sure not to pollute the environment by lubricants that may escape.

Table 7 Recommended Lubricants:

Normal speed and duty		**High speed and heavy duty**	
Producer	**Brand**	**Producer**	**Brand**
Agip	Agip GR MU/EP 1		
Caltex	Coupling grease	Caltex	Coupling grease
Castrol	Impervia MDX		
Chevron	Polyurea grease EP 0		
Esso	Fibrax 370		
Fina	Marson EPL 1 Lical EPL 1		
Gulf	Gulfcrown EP 0		
Klüber	Klüberplex GE 11-680 Grafloscon C-SG 500 Plus	Klüber	Klüberplex GE 11-680
Mobil	Mobilgrease XTC	Mobil	Mobilgrease XTC
Pennzoil	Multi-Purpose 705		
Shell	Alvania grease EP R-0 / EP 1	Shell	Albida GC1
Texaco	Coupling grease	Texaco	Coupling grease
Total	Specis EPG		

Table 8 Lubricant Quantity for complete coupling:

Size	67	87	106	130	151	178	213	235	263	286	316	372	394	432	480	530	594
dm^3	2 x 0,025	2 x 0,037	2 x 0,065	2 x 0,105	2 x 0,18	2 x 0,26	2 x 0,4	2 x 0,49	2 x 0,76	2 x 1,01	2 x 1,21	2 x 1,64	2 x 3,22	2 x 3,8	2 x 5,5	2 x 6,0	2 x 8,0

Table 9 Tightening torques for screw plugs:

Size	67	87	106	130	151	178	213	235	263	286	316	372	394	432	480	530	594
T_{an} [Nm]	7	10	10	10	10	10	10	10	10	29	29	29	29	29	29	29	29

Warning!

- **Before putting the equipment into service, all safety guards must be installed to prevent unintentional contact with freely rotating parts.**
- **The covers have to fulfil the requirements of protection type IP2X as a minimum.**
- **The covers have to be designed to prevent dust from depositing on the coupling parts.**
- **The cover must not touch the coupling and impair the proper operation of the coupling, distance min 10mm.**

We do not assume any responsibility or warranty for any damages resulting from the use of accessories or spare parts, which have not originally been manufactured by TSCHAN GmbH.

10 Disposal

Disposal of the parts must be arranged in accordance with the regulations and laws of the country where the equipment is installed