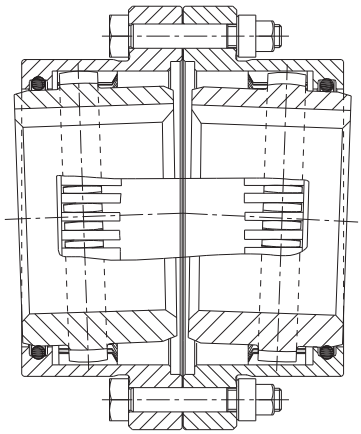
GEAREX Gear couplings

made from steel with grease lubrication

Operating description

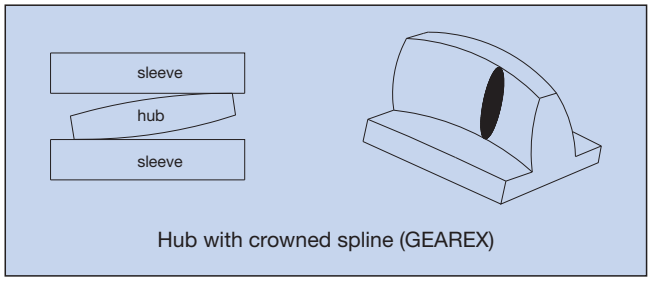


GEAREX couplings made from steel with grease lubrication and toroidal sealing ring correspond to the international standard. Being flexible shaft connections they are suitable for a positive torque transmission. In addition, they ensure to compensate for axial, radial and angular shaft displacements.

GEAREX couplings are used in every range of general engineering requesting for high operating safety and a long service life resulting from the reliable grease lubrication of the crowned spline. The couplings are suitable for horizontal assembly. As special solutions they are suitable for vertical assembly, too.

Numerous coupling sizes for a torque transmission from 930 Nm to 135.000 Nm with shaft dimensions up to a maximum of Ø 276 mm are available. The coupling torques may be increased by using special materials.

GEAREX couplings are in correspondence with the AGMA standard (**A**merican **G**ear **M**anufacturer **A**ssociation).
Small dimensions and a low weight along with a small mass moment of inertia result in a wide range of applications of GEAREX couplings.



Hub with crowned spline (GEAREX)

According to the operating principle of the well-known crowned gear edge pressure in the spline is avoided in case of angular and radial displacements. Moreover, permanent grease lubrication produces a better friction ratio of the spline with an operation almost free from wear along with a long service life of the coupling.

In order to ensure a regular and verified lubrication in assembled condition, two connections for hydraulics are arranged opposite to each other radially on each coupling sleeve. As a result a complete GEAREX coupling has four connections being offset to each other by 90°.
The interior of the coupling is sealed by means of toroidal sealing rings (NBR 70 ShA).
The feather keys have to be sealed against escape of lubricants during the assembly.

GEAREX Gear couplings

made from steel with grease lubrication

Coupling selection for shaft couplings

The coupling has to be dimensioned in a way that the permissible coupling load is not exceeded during any operating condition. For that purpose the loads that are produced have to be compared to the permissible characteristic figures of the coupling.

1 **Coupling selection**

The coupling is selected according to the rated torque (T_{KN}). For that purpose the corresponding operating factors of the driving machine have to be taken into account, see starting factor S_Z and operating factor S_B.

2 **Load of the coupling**

$$T_{KN} \geq T_{NS}$$

$$T_{NS} = T_N \cdot S_Z \cdot S_B$$

$$T_N\,[Nm] = 9550 \cdot \frac{P_{AN/LN}\,[kW]}{n\,[1/min]}$$

T_{KN} = rated torque of the coupling
T_N = driving torque
T_{NS} = driving torque including operating factors
S_Z = starting factor
S_B = operating factor

3 **Starting torque**

The permissible starting torque of the machine should not exceed two times the rated torque of the coupling.

4 **Permissible load on the feather key of the coupling**

The shaft-hub-connection should be verified by the customer. Permissible surface pressure according to DIN 6892 (method C).

5 **Permissible temperature range**

The coupling can be used in a temperature range from -20 °C to +80 °C.

6 **Example of selection**

Electric motor:	30 kW
Application:	textile machine
Shaft-Ø:	70/65 mm
Speed:	250 1/min
Starts:	< 10/h
Starting torque:	2865 Nm

Result:

$$T_N = 9550 \cdot \frac{30\ kW}{250\ 1/min}$$

$T_N = 1146$ Nm

$T_{NS} = 1146\ Nm \cdot 1 \cdot 1{,}25$

$T_{NS} = 1432{,}5$ Nm

Coupling selected:

GEAREX 15 ($T_{KN} = 2000$ Nm)
The starting torque of the machine is 2,5 times the starting torque (2865 Nm).
(permissible $2 \cdot T_{KN} = 4000$ Nm)

Service factor S_Z for starting frequency

starting frequency/h	10	25	50
S_Z	1,0	1,2	1,4

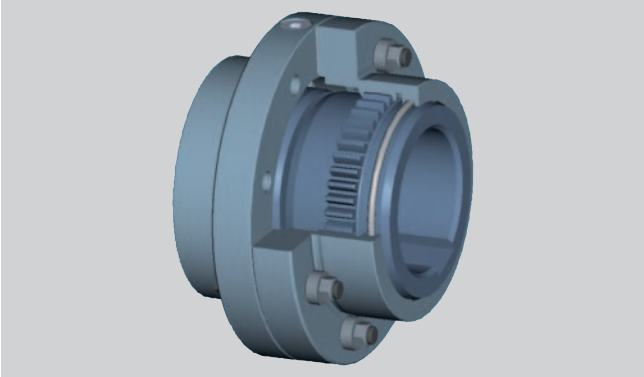
Operating factor S_B

Kind of load	Operating features	Machines	Operating factor
Smooth/ smoothly	Permanent operation without overload or shock load. Low connecting frequency.	• Electric generators • Radial pumps • Light-weight fans	1,00
Light-weight	Permanent operation with small overload and short-term and rare shock load.	• Multistage radial compressors • Piston pumps • Large fans (heavy load operation) • Mixers for liquids • Mixers for solid matters • Textile machines • Machine tools • Belt conveyor • Elevators	1,25
Average	Interrupted operation with low shock load and short-term average overload.	• Piston compressor, cranes (running or drawing operation) • Winding engine, calenders for rubber and nylon • Calenders • Rolling mill drives • Non-reversing cold rolling mill	1,50
Heavy	Operation with heavy and frequent shock load. Frequent load reversion. High degree of safety.	• Bridge cranes for steel industry • Mixers for rubber and nylon • Cranes (heavy load operation) • Wood grinders, marine drives • Equipment for transport of persons • Mine fans • Roller tables • Non-reversing cold rolling mills • Reversing cold rolling mills • Hot-rolling mill	2,00
Very heavy	Extreme and overload with frequent and sudden load revolution.	• Reversing rolling mill drives • Heavy load operation in steel industry • Slitting machines • Grinding machines • Scissors and cutters • Crushers	2,50

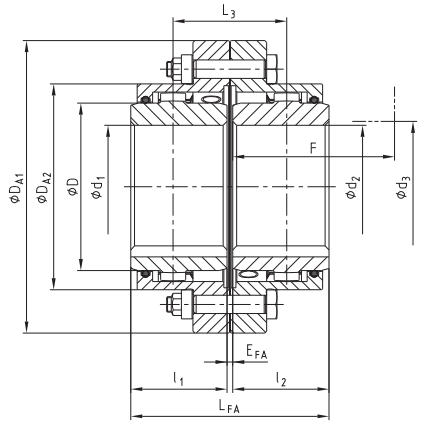
GEAREX Gear couplings

made from steel with grease lubrication

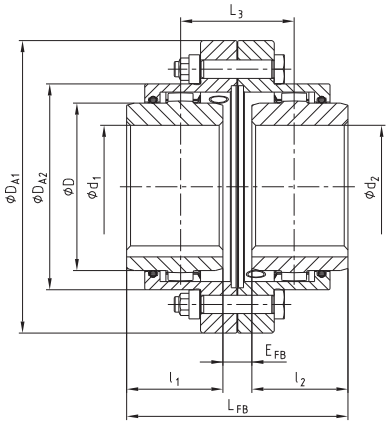
Type FA, FB and FAB



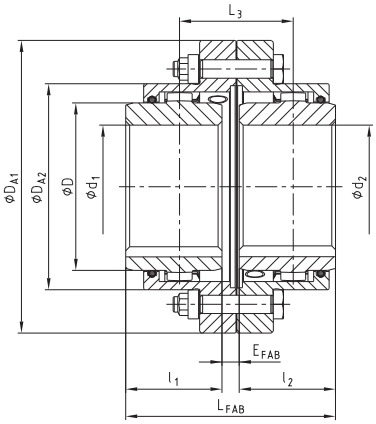
- Double-cardanic crowned gear coupling
- To be used on all applications in general engineering
- Compensating for shaft misalignment axial – radial – angular
- Available with finish bore to ISO, feather key according to DIN 6885 sheet 1, taper and inch bores
- For horizontal assembly
- Higher torques to be realized by special materials



Type FA



Type FB



Type FAB

Size	Max. finish bore	Dimensions [mm]													Fat [2] feeding [dm³]
	d_1, d_2	l_1, l_2	E_{FA}	E_{FB}	E_{FAB}	L_{FA}	L_{FB}	L_{FAB}	L_3	D	D_{A1}	D_{A2}	F [1]	d_3 [1]	
10	50	43	3	21	12	89	107	98	55	67	111	83	74	52	0,02
15	64	50	3	15	9	103	115	109	59	87	152	107	84	68	0,04
20	80	62	3	31	17	127	155	141	79	108	178	129,5	104	85	0,08
25	98	76	5	29	17	157	181	169	93	130	213	156	123	110	0,12
30	112	90	5	33	19	185	213	199	109	153	240	181	148	130	0,18
35	133	105	6	40	21,5	216	250	233	128	180	280	211	172	150	0,22
40	158	120	6	42	24	246	282	264	144	214	318	249,5	192	175	0,35
45	172	135	8	50	29	278	320	299	164	233	347	274	216	190	0,45
50	192	150	8	56	32	308	356	332	182	260	390	307	241	220	0,70
55	210	175	8	70	39	358	420	389	214	283	425,5	332,5	275	250	0,90
60	232	190	8	84	46	388	464	426	236	312	457	364	316	265	1,15
70	276	220	10	76	43	450	516	483	263	371	527	423,5	360	300	1,50

1) Required space to align the coupling or replace the sealing ring, respectively.

2) Fat feeding for each coupling half

Size	Torque [Nm]		Max. speed [1/min]	Weight with max. bore-Ø [kg]			Massmoment of inertia J with max. bore-Ø [kgm²]	Dowel screws (10.9)		
	T_{KN}	$T_{Kmax.}$		Sleeve	Hub	Total		z	M	T_A [Nm]
10	930	1860	8500	0,748	0,553	2,73	0,00436	6	M6	15
15	2000	4000	7700	1,878	1,119	6,38	0,01894	8	M8	36
20	3500	7000	6900	2,602	2,089	9,94	0,04000	6	M10	72
25	6500	13000	6200	4,432	3,564	16,83	0,09749	6	M12	125
30	10000	20000	5800	5,829	6,184	25,21	0,18080	8	M12	125
35	17000	34000	5100	9,705	9,868	41,25	0,41419	8	M14	200
40	28500	57000	4500	11,883	16,065	58,14	0,75535	8	M14	200
45	37000	74000	4000	15,724	21,419	77,08	1,17590	10	M14	200
50	51000	102000	3750	25,661	29,594	114,40	2,24991	8	M18	430
55	65000	130000	3550	31,522	40,304	150,41	3,45102	14	M18	430
60	85000	170000	3400	32,822	52,960	177,44	4,16734	14	M18	430
70	135000	270000	3200	43,521	85,768	268,20	9,32429	16	M20	610

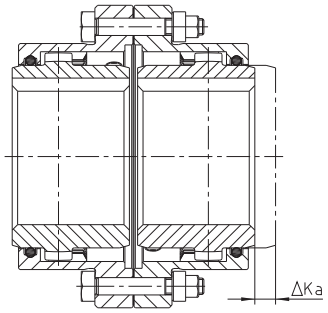
Order form:

GEAREX FA-10	d_1 Ø 50	d_2 Ø 50
Size and type of coupling	Finish bore keyway DIN 6885 sheet 1	Finish bore keyway DIN 6885 sheet 1

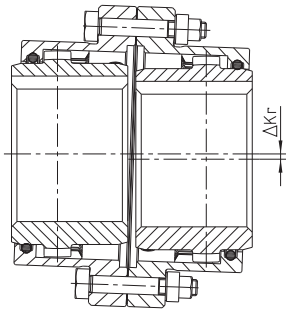
GEAREX Gear couplings

made from steel with grease lubrication

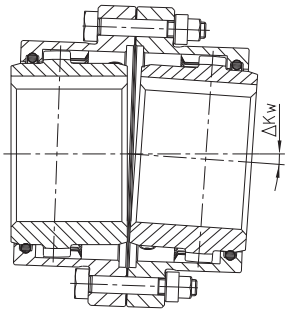
Displacements



Axial displacement



Radial displacement



Angular displacement

Size	Max. axial displacement ΔKa [mm]	Max. permissible displacements [1]	
		ΔKr [mm]	ΔKw [°]
10		0,4	
15		0,5	
20		0,6	
25	± 1,0	0,8	
30		1,0	
35		1,0	0,5° each hub
40		1,2	
45		1,4	
50		1,6	
55	± 1,5	1,8	
60		2,0	
70		2,2	

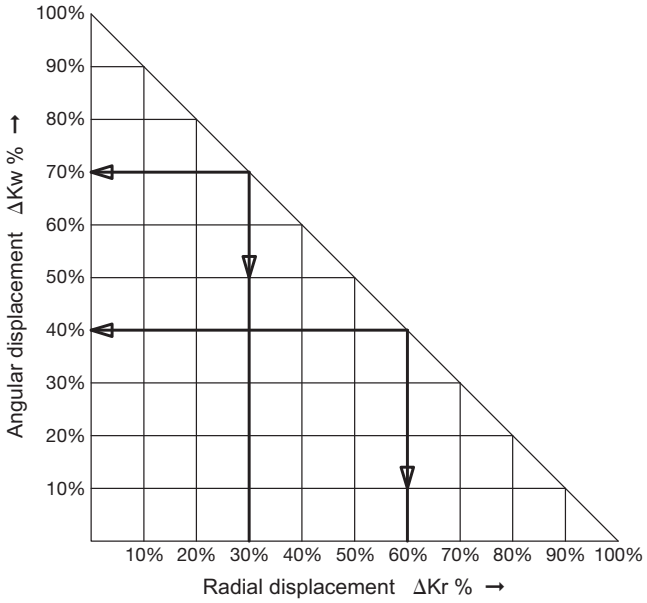
1) The displacement figures are maximum figures which must not arise at the same tine. If both radial and angular displacement arise at the same time, these figures have to be reduced (see examples of calculation and diagramme).

Example 1:

ΔKr = 30%
ΔKw = 70%

Example 2:

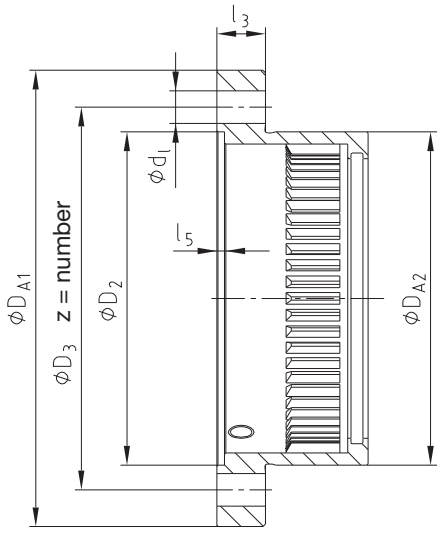
ΔKr = 60%
ΔKw = 40%



GEAREX Gear couplings

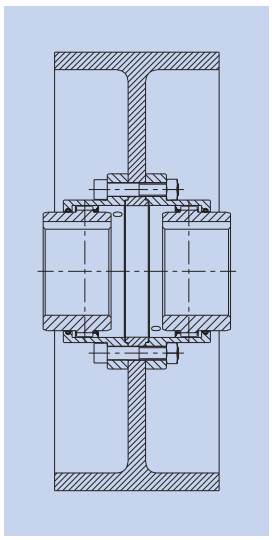
made from steel with grease lubrication

Flange dimensions – other designs

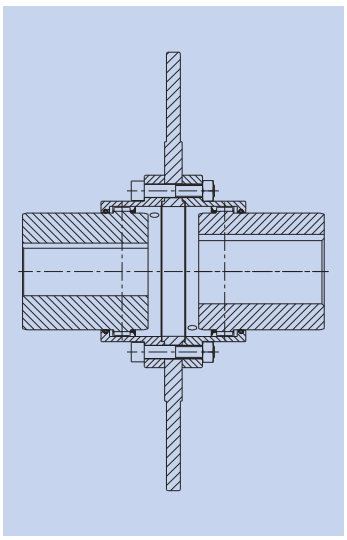


Size	Dimensions [mm]							
	D_{A1}	D_{A2}	D_2	D_3	d_l	Number z	l_3	l_5
10	111	83	82	95,25	6,35	6	14	3
15	152	107	105	122,24	9,52	8	19	3
20	178	130	130	149,23	12,70	6	19	3
25	213	158	153	180,97	15,87	6	22	4
30	240	182	178	206,38	15,87	8	22	4
35	280	214	205	241,30	19,05	8	28,5	5
40	318	250	243	279,40	19,05	8	28,5	4
45	347	274	265	304,80	19,05	10	28,5	5,5
50	390	309	302	342,90	22,22	8	38	6
55	424,5	334	320	368,30	22,22	14	38	6
60	457	365,5	353	400,05	22,22	14	26	6
70	527	425	412	463,55	25,40	16	28,5	8

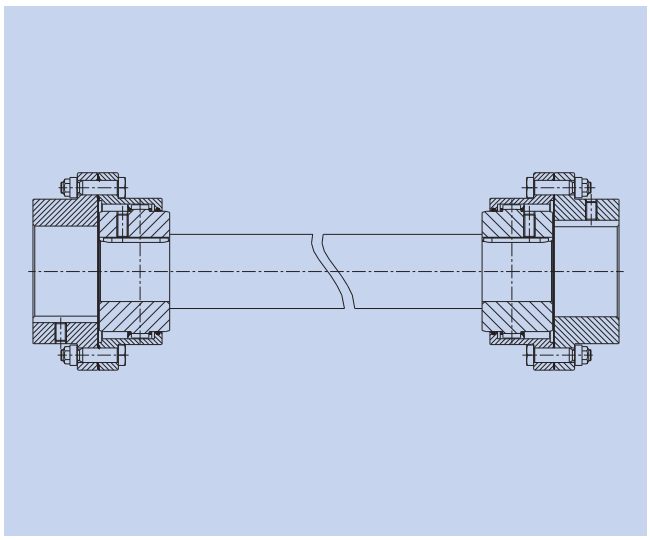
Other designs:



Design with brake drum



Design with brake disk



Design with spacer