





BACKLASH-FREE JAW COUPLINGS TYPES AND OPERATING DESCRIPTION



Properties of backlash-free couplings

				
Product	ROTEX® GS	TOOLFLEX®	RADEX®-NC	COUNTEX®
Type	Jaw coupling	Metal bellow-type coupling	Servo lamina coupling	Shaft encoder coupling
Properties				
Backlash-free	●	●	●	●
Torsionally rigid		●	●	●
Damping vibrations	●			
Maintenance-free	●	●	●	●
Axial plug-in	●	Optionally		●
Compensating for misalignment	●	●	●	●
Electric insulation	●			●
Fail-safe	●			
Shear type		●		
Special features				
Applications	Backlash-free drives			
Core industries	Machine tools, automation technology, drive technology, medical technology, packaging technology	Drive technology, automation technology, medical technology, packaging technology, machine tools	Automation technology, drive technology, packaging technology, machine tools, medical technology	Automation technology, drive technology, medical technology
Applications	Main spindles Control & positioning technology (screw drives with incline $s < 40$, otherwise review by KTR) Gearboxes (for average to high transmission $i \geq 7$) Measuring and testing technology Miniature drives	Gearboxes (transmissions $i < 7$) Miniature drives Control & positioning technology (screw drives with incline $s \geq 40$)	Gearboxes (transmissions $i < 7$) Measuring & testing technology Miniature drives Control & positioning technology (screw drives with incline $s \geq 40$)	Measuring & control technology Miniature drives
Variation of components	very high	average	low	low
Torque range T_{KN} [Nm]				
Min.	0.2	0.1	2.5	0.3
Max.	5,850	600	2000	1.0
Max. circumferential speed v [m/s]				
Steel	depending on hub type up to 40	depending on hub type up to 40	35	-
	80 (type P)			
	175 (type HP)			
Aluminium	depending on hub type up to 50		depending on hub type up to 75	40
Torsion spring stiffness C_T [Nm/rad]				
Up to	1,308,850	322,740	240,000	235
Radial spring stiffness C_R [N/mm]				
Up to	20,290	1,365		70
Spiders / bellow / laminas / spacer				
Material	Polyurethane, Hytrel	Stainless steel	Stainless steel	PEEK
Elastomer hardness	flexible to torsionally rigid	-	-	torsionally rigid
Temperature range [°C] min./max.	-50/+120	-30/+100 (bonded)	-30/+200	-40/+160
		-30/+200 (flanged/welded)		
Geometries				
Design	compact	compact, short	compact, short	short
Mass moment of inertia	low	low	low	low
Shaft distance dimension	average	average	average	low
Shaft-hub-connection				
Positive-locking	●	Optionally	Optionally	Optionally
Non-positive (frictionally engaged)	●	●	●	●

● ≈ Standard

BACKLASH-FREE JAW COUPLINGS TYPES AND OPERATING DESCRIPTION

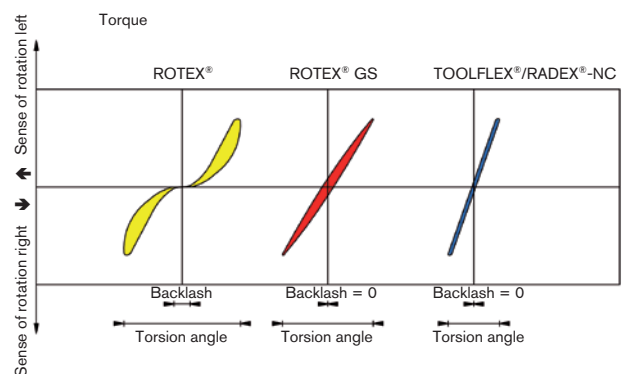
Product finder of backlash-free couplings

Product	ROTEX® GS	TOOLFLEX®	RADEX®-NC	COUNTEX®
Type	Jaw coupling	Metal bellow-type coupling	Servo lamina coupling	Shaft encoder coupling
Types (extract)				
Elastomers can be radially disassembled » with no need of displacing driving/driven side	A-H	-	-	-
Intermediate shaft type » bridging larger shaft distances	ZR1, ZR2, ZR3	-	-	-
Shaft-to-shaft connection	standard	standard	standard	standard
Flange-to-shaft connection	CFN, DFN, CF-DKM	CF	-	-
Flange-to-flange connection » particularly short mounting lengths	Optionally	Optionally	-	-
Single-cardanic	standard	-	EK	-
Double-cardanic » compensating for big displacements » lower restoring forces	DKM	standard	DK	standard
Certifications				
ATEX		●	●	●
Clean room		●	●	

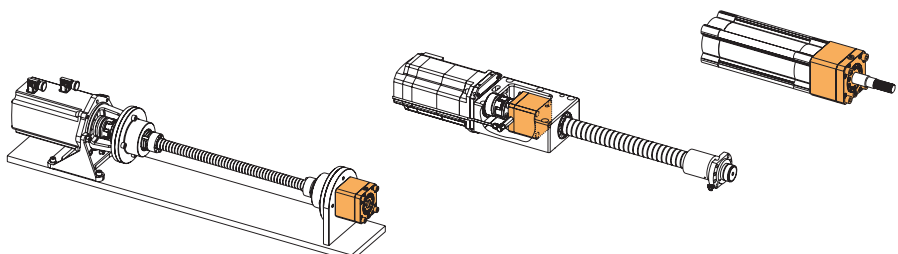
● = Standard

Torsion angle

The diagramme alongside this text explains the influence of ROTEX®, ROTEX® GS, RADEX®-NC and TOOLFLEX® couplings on backlash and torsion angle. Due to the high torsion spring stiffness of RADEX®-NC and TOOLFLEX® the torsion angle is very low under torque. However, contrary to the flexible ROTEX® and the backlash-free ROTEX® GS damping of torsional vibrations etc. is not possible.



The KTR-STOP® NC series is a passive clamping and braking system. It serves for generating a clamping/braking force respectively a clamping/braking torque on a cylindrical piston rod or shaft. This results in a delay of the rotary motion respectively keeping at standstill. For further details please refer to page 146/147.



ROTEX® GS

Backlash-free jaw couplings

Technical description

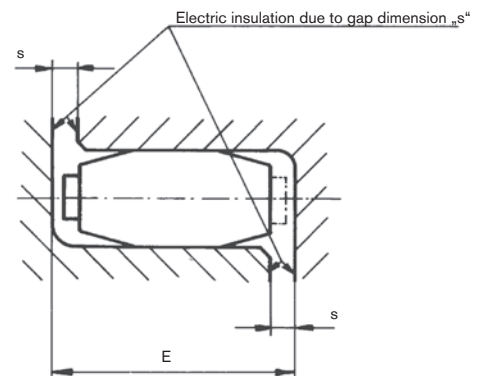
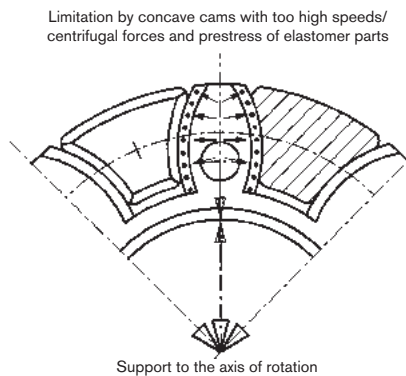


ROTEX® GS is a three-part, axial plug-in coupling backlash-free under prestress. It is convincing even with critical applications by its backlash-free power transmission, its stiffness which is each adapted to the application and its optimum damping of vibrations. This principle of installation offers significant options of assembly optimizing the assembly times in production.

The straight spline of the spider mounted under prestress results in a lower surface pressure and consequently higher stiffness of the coupling system. The flexible teeth compensating for misalignment are radially supported in the internal diameter by means of a web. This avoids too high internal or external deformation with high acceleration or high speeds. This is vital for a smooth operation and long service life of the coupling.

The pegs on the spider arranged reciprocally prevent a contact of the spider on the hubs over the full surface. Observing the distance dimension E ensures the ability of the coupling to compensate for displacements.

By observing the gap dimension „s“ the electrical insulation is ensured, as well as a high service life of the coupling. This fact is gaining more and more importance, due to the increasing precision of shaft encoders and the existing demand for electromagnetic compatibility.



Notes

- Feather keyways available from a bore $\geq \varnothing 6$. Feather keyways according to DIN 6885 sheet 1, tolerance JS9.
- Finish bore tolerance H7 (except for clamping hubs), from $\varnothing 55$ G7 with clamping ring hubs
- Finish bore tolerance H6 for ROTEX® GS P and ROTEX® GS HP
- Recommended insertion dimension of shafts into coupling hubs: l_1/l_2 ; for clamping ring hubs the minimum insertion dimension l_3 applies
- Spider with bore available on request. Please specify in the order as shown in the example on page 126.

Use in potentially explosive atmospheres

ROTEX® GS couplings are suitable for power transmission in drives in potentially explosive atmospheres. The couplings are assessed and approved according to EU directive 2014/34/EU as units of category 2G/2D and thus suitable for the use in potentially explosive atmospheres of zone 1, 2, 21 and 22. Please read through our information included in the respective Type Examination Certificate and the operating and assembly instructions at www.ktr.com.

Selection: If used in potentially explosive atmospheres the clamping ring hubs (clamping hubs without feather keyway only for use in category 3) must be selected in a way that there is a minimum safety factor of $s = 2$ between the peak torque of the machine including all operating parameters and the nominal torque and frictional locking torque of the coupling.









ROTEX® GS

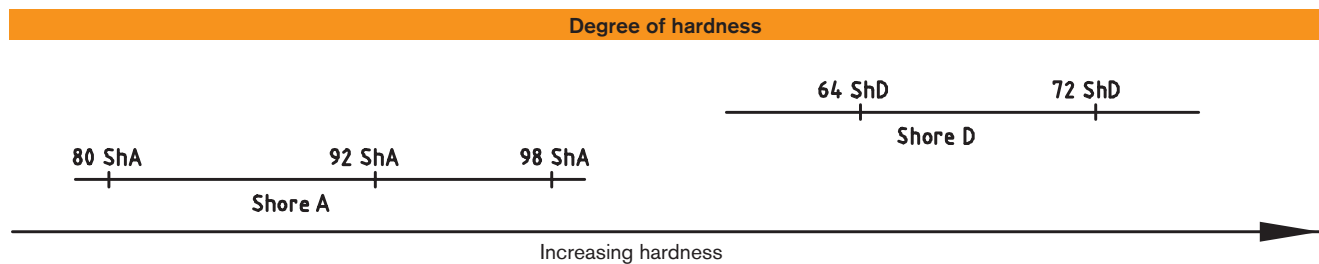
Backlash-free jaw couplings

Spiders

The flexible spiders for the GS series are available in five different kinds of Shore hardness, injected in different colours, either as a torsionally soft or hard material. These five spiders with different kinds of Shore hardness allow to easily adjust the ROTEX® GS with regard to torsional stiffness and the vibration behaviour to the individual conditions of an application. The flexible prestress varies depending on the coupling size, the spiders/material and the production tolerances. Resulting from it is the axial plug-in force starting from low as a close sliding fit or with torsionally soft spider to heavy with big prestress or torsionally rigid spider (see mounting instruction KTR-N 45510 at www.ktr.com).

Along with an increasing hardness of the spider the torques to be transmitted and the stiffness of the spider increase, too. Along with reduced hardness of the spider the ability of compensating for displacements and damping the spider is increased.

Properties						
Description of spider Hardness [Shore]	Marking Colour	Material	Perm. temperature range [°C]		Available for coupling size	Typical applications
			Permanent temperature	Max. temperature (short-time)		
80 ShA-GS		Polyurethane	-50 to +80	-60 to +120	Size 5 to 24	- drives of electric measuring systems
92 ShA-GS		Polyurethane	-40 to +90	-50 to +120	Size 5 to 55	- drives of electric measuring and control systems - main spindle drives
98 ShA-GS		Polyurethane	-30 to +90	-40 to +120	Size 5 to 90	- positioning drives - main spindle drives - high load
98 ShA-GS		Polyurethane	-30 to +90	-40 to +120	Size 24 to 55 (for ROTEX® GS HP only)	- HSC main spindle drives - test benches with severely high speeds
64 ShD-H-GS		Hytrel	-50 to +120	-60 to +150	Size 7 to 38	- planetary gears/backlash-free gears - higher torsion spring stiffness/high ambient temperatures
64 ShD-GS		Polyurethane	-20 to +110	-30 to +120	Size 42 to 90	- higher load - higher torsion spring stiffness
72 ShD-H-GS		Hytrel	-50 to +120	-60 to +150	Size 24 to 38	- very high torsion spring stiffness/high ambient temperature - very high load
72 ShD-GS		Polyurethane	-20 to +110	-30 to +120	Size 42 to 90	- very high torsion spring stiffness - very high load



Spider material	Polyurethane			Hytrel
Degree of hardness	92 Shore A	98 Shore A	64 Shore D	64 Shore D
Relative damping ψ [-] ¹⁾	0.80	0.80	0.75	0.60
Resonance factor V_R [-] ¹⁾	7.90	7.90	8.50	10.5

¹⁾For ROTEX® GS HP separate figures apply, please contact our KTR engineering department.

ROTEX® GS

Backlash-free jaw couplings

Technical data

Size	Spider GS Shore hardness	Shore scale	Max. speed [rpm] for type					DKM	Torque [Nm]		Static torsion spring stiffness ¹⁾ [Nm/rad]	Dynamic torsion spring stiffness ¹⁾ [Nm/rad]	Radial spring stiffness C _r [N/mm]	Weight [kg]		Mass moment of inertia J [kgm ²]	
			2.0 / 2.1 2.5 / 2.6	2.8 2.9	1.0 1.1	6.0 light ²⁾	6.0 P ²⁾		T _{KN}	T _{K max}				Each Hub ⁵⁾	Spider	Each Hub ⁵⁾	Spider
5	70	A	38000	38000	47700			57300	0.2	0.3	1.78	5	43	0.001	0.2 x 10 ⁻³	0.015 x 10 ⁻⁶	0.002 x 10 ⁻⁶
	80	A							0.3	0.6	3.15	10	82				
	92	A							0.5	1.0	5.16	16	154				
	98	A							0.9	1.7	8.3	25	296				
7	80	A	27000	27000	34100			40900	0.7	1.4	8.6	26	114	0.003	0.7 x 10 ⁻³	0.085 x 10 ⁻⁶	0.01 x 10 ⁻⁶
	92	A							1.2	2.4	14.3	43	219				
	98	A							2.0	4.0	22.9	69	421				
	64	D							2.4	4.8	34.3	103	630				
8	80	A	23800						0.7	1.4	8.8	27	117	0.003	0.5 x 10 ⁻³	0.117 x 10 ⁻⁶	0.0124 x 10 ⁻⁶
	98	A							2.0	4.0	23.5	71	433				
	64	D							2.4	4.8	35.3	106	648				
9	80	A	19000	19000	23800			28600	1.8	3.6	17.2	52	125	0.01	1.7 x 10 ⁻³	0.48 x 10 ⁻⁶	0.085 x 10 ⁻⁶
	92	A							3.0	6.0	31.5	95	262				
	98	A							5.0	10.0	51.6	155	518				
	64	D							6.0	12.0	74.6	224	739				
12	80	A	15200	15200	19100			22900	3.0	6.0	84.3	252	274	0.02	2.3 x 10 ⁻³	1.5 x 10 ⁻⁶	0.139 x 10 ⁻⁶
	92	A							5.0	10.0	160.4	482	470				
	98	A							9.0	18.0	240.7	718	846				
	64	D							12.0	24.0	327.9	982	1198				
13	80	A	12700						3.6	7.2	111	330	359	0.01	2.0 x 10 ⁻³	1.1 x 10 ⁻⁶	0.155 x 10 ⁻⁶
	98	A							11.0	22.0	316	941	1109				
	64	D							14.5	29.0	430	1287	1570				
14	80	A	12700	12700	15900	32000	47700	19100	4.0	8.0	60.2	180	153	0.02	4.7 x 10 ⁻³	2.8 x 10 ⁻⁶	0.509 x 10 ⁻⁶
	92	A							7.5	15.0	114.6	344	336				
	98	A							12.5	25.0	171.9	513	654				
	64	D							16.0	32.0	234.2	702	856				
16	80	A	12000						5.0	10.0	157	471	400	0.02	3.6 x 10 ⁻³	2.8 x 10 ⁻⁶	0.435 x 10 ⁻⁶
	98	A							15.0	30.0	450	1341	1710				
	64	D							19.0	38.0	612	1835	2238				
	80	A							6.0	12.0	618	1065	582				
19	92	A	9550	9550	11900	24000	35800	14300	12.0	24.0	1090	1815	1120	0.09	7.6 x 10 ⁻³	19.5 x 10 ⁻⁶	1.35 x 10 ⁻⁶
	98	A							21.0	42.0	1512	2540	2010				
	64	D							26.0	52.0	2560	3810	2930				
	80	A							35	70	2280	4010	1480				
24	98	A	6950	10400	8650	17000	26000	10400	60	120	3640	5980	2560	0.2	0.02	81.9 x 10 ⁻⁶	6.7 x 10 ⁻⁶
	64	D							75	150	5030	10896	3696				
	72 ³⁾	D							97	194	9944	17095	5799				
	92	A							95	190	4080	6745	1780				
28	98	A	5850	8800	7350	15000	22000	8800	160	320	6410	9920	3200	0.3	0.03	184.2 x 10 ⁻⁶	14.85 x 10 ⁻⁶
	64	D							200	400	10260	20177	4348				
	72 ³⁾	D							260	520	21526	36547	7876				
	92	A							190	380	6525	11050	2350				
38	98	A	4750	7150	5950	12000	17900	7150	325	650	11800	17160	4400	0.6	0.05	542.7 x 10 ⁻⁶	39.4 x 10 ⁻⁶
	64	D							405	810	26300	40335	6474				
	72 ³⁾	D							525	1050	44584	71180	11425				
	92	A							265	530	10870	15680	2430				
42	98	A	4000		5000	10000 8050 ⁴⁾	15000	6000	450	900	21594	37692	5570	2.4	0.08	2802 x 10 ⁻⁶	85 x 10 ⁻⁶
	64	D							560	1120	36860	69825	7270				
	72 ³⁾	D							728	1456	58600	93800	9766				
	92	A							310	620	12968	18400	2580				
48	98	A	3600		4550	9100 7200 ⁴⁾	13600	5450	525	1050	25759	45620	5930	3.3	0.09	4709 x 10 ⁻⁶	135 x 10 ⁻⁶
	64	D							655	1310	57630	99750	8274				
	72 ³⁾	D							852	1704	80000	136948	11359				
	92	A							410	820	15482	21375	2980				
55	98	A	3150		3950	6350 ⁴⁾	11900	4750	685	1370	42117	61550	6686	5.1	0.12	9460 x 10 ⁻⁶	229 x 10 ⁻⁶
	64	D							825	1650	105730	130200	9248				
	72 ³⁾	D							1072	2144	150000	209530	12762				
	98	A							940	1880	48520	71660	6418				
65	64	D	2800		3500	5650 ⁴⁾	11000		1175	2350	118510	189189	8870	6.7	0.2	15143 x 10 ⁻⁶	437 x 10 ⁻⁶
	72 ³⁾	D							1527	3054	160000	310000	11826				
	98	A							1920	3840	79150	150450	8650				
75	64	D	2350		2950	4750 ⁴⁾	8950		2400	4800	182320	316377	11923	10.5	0.3	32750 x 10 ⁻⁶	1179 x 10 ⁻⁶
	72 ³⁾	D							3120	6240	360540	586429	16454				
	98	A							3600	7200	204500	302900	10700				
90	64	D	1900		2380	3800 ⁴⁾	7150		4500	9000	429450	908700	14700	18.2	0.6	87099 x 10 ⁻⁶	3362 x 10 ⁻⁶
	72 ³⁾	D							5850	11700	847440	1308852	20290				

¹⁾ Static and dynamic torsion spring stiffness with 0.5 x T_{KN}

²⁾ Higher speed see ROTEX® GS HP

³⁾ When using the spider 72 ShD, we recommend to use hubs made of steel

⁴⁾ Clamping ring hubs 6.0 made of steel

⁵⁾ Hubs with an average bore type 1.0

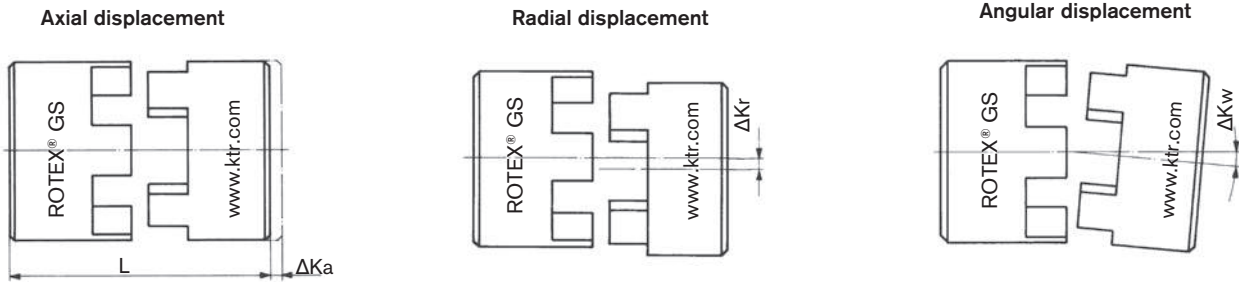
The coupling has to be dimensioned in a way that the permissible coupling load is not exceeded during any operating condition (see coupling selection on page 18 et seq.).

The torques specified T_{KN}/T_{K max} refer to the spider. The shaft-hub-connection needs to be inspected by the customer.

ROTEX® GS

Backlash-free jaw couplings

Notes for displacements



Due to its design the ROTEX® GS is able to absorb axial, angular and radial displacement, without causing any wear or premature failure of the coupling. As the spider is only stressed under pressure it is ensured that the coupling will remain backlash-free even after a longer operation period.

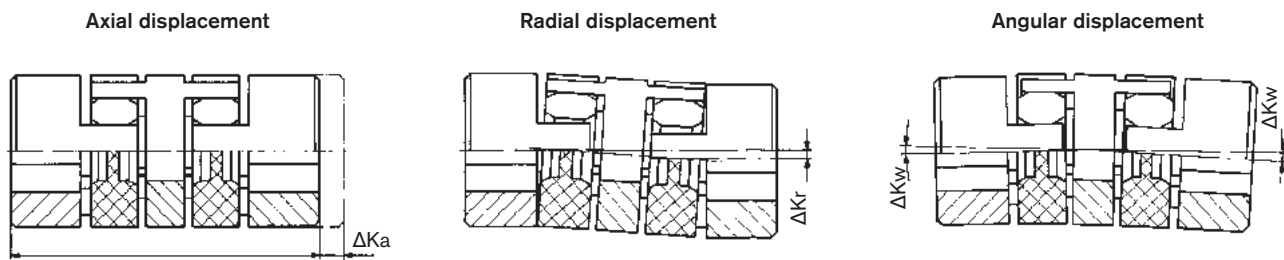
As an example, axial displacement may be generated by different tolerances of the connecting elements with assembly or by alteration of the shaft length if fluctuation of temperature occurs. As the shaft bearings usually cannot be axially stressed to a big extent, it is the task of the coupling to compensate for this axial displacement and to keep the reaction forces low.

In case of pure angular displacement the imaginary bisecting lines of the shafts intersect in the center of the coupling. Within a permissible range this displacement can be absorbed by the coupling without extensive restoring forces being generated.

Radial displacement results from parallel displacement of the shafts towards each other, caused by different tolerances on the centerings or by mounting the power packs on different levels. Due to the kind of displacement the largest restoring forces are generated here, consequently causing the highest stresses on adjacent components.

In case of larger displacements (especially radial displacements) the ROTEX® GS type DKM should be used in order to avoid excessive restoring forces.

The permissible displacement figures of the flexible ROTEX® GS couplings specified are general standard values taking into account the load of the coupling up to the rated torque TKN of the coupling and an ambient temperature of +30 °C. The displacement figures may only be used one by one, if they appear simultaneously, they must be limited in proportion. The ROTEX® GS couplings are able to compensate for axial, radial and angular displacements. Careful and accurate alignment of the shafts increases the service life of the coupling.



Shaft misalignment of ROTEX® GS type DKM

This design reduces the restoring forces arising with radial displacement to a minimum, due to the double-jointed operation, additionally the coupling is able to compensate for higher axial and angular misalignment.

ROTEX® GS

Backlash-free jaw couplings

Displacements

Displacements							
Size	Spider GS	Displacements standard			Displacements DKM		
		Axial $\Delta K_a^{1)}$ [mm]	Radial ΔK_r [mm]	Angular ΔK_w [degree]	Axial $\Delta K_a^{1)}$ [mm]	Radial ΔK_r [mm]	Angular ΔK_w [degree]
5	70 ShA		0.14	1.2°		0.17	1.2°
	80 ShA	+0.4	0.12	1.1°	+0.4	0.15	1.1°
	92 ShA	-0.2	0.06	1.0°	-0.4	0.14	1.0°
	98 ShA		0.04	0.9°		0.13	0.9°
7	80 ShA		0.15	1.1°		0.23	1.1°
	92 ShA	+0.6	0.10	1.0°	+0.6	0.21	1.0°
	98 ShA	-0.3	0.06	0.9°	-0.6	0.19	0.9°
	64 ShD		0.04	0.8°		0.17	0.8°
8	80 ShA		0.15	1.1°			
	98 ShA	+0.6	0.08	0.9°	—	—	—
	64 ShD	-0.5	0.06	0.8°			
	80 ShA		0.19	1.1°		0.29	1.1°
9	92 ShA	+0.8	0.13	1.0°	+0.8	0.26	1.0°
	98 ShA	-0.4	0.08	0.9°	-0.8	0.24	0.9°
	64 ShD		0.05	0.8°		0.21	0.8°
	80 ShA		0.20	1.1°		0.35	1.1°
12	92 ShA	+0.9	0.14	1.0°	+0.9	0.32	1.0°
	98 ShA	-0.4	0.08	0.9°	-0.9	0.29	0.9°
	64 ShD		0.05	0.8°		0.25	0.8°
	80 ShA		0.20	1.1°			
13	80 ShA		0.20	1.1°			
	98 ShA	+0.9	0.08	0.9°	—	—	—
	64 ShD	-0.8	0.05	0.8°			
	80 ShA		0.21	1.1°		0.40	1.1°
14	92 ShA	+1.0	0.15	1.0°	+1.0	0.37	1.0°
	98 ShA	-0.5	0.09	0.9°	-1.0	0.33	0.9°
	64 ShD		0.06	0.8°		0.29	0.8°
	80 ShA		0.21	1.1°			
16	98 ShA	+1.0	0.10	0.9°	—	—	—
	64 ShD	-0.8	0.08	0.8°			
	80 ShA		0.15	1.1°		0.49	1.1°
	92 ShA	+1.2	0.10	1.0°	+1.2	0.45	1.0°
19	98 ShA	-0.5	0.06	0.9°	-1.0	0.41	0.9°
	64 ShD		0.04	0.8°		0.36	0.8°
	92 ShA		0.14	1.0°		0.59	1.0°
	98 ShA	+1.4	0.10	0.9°	+1.4	0.53	0.9°
24	64 ShD	-0.5	0.07	0.8°	-1.0	0.47	0.8°
	72 ShD		0.04	0.7°		0.42	0.7°
	92 ShA		0.15	1.0°		0.66	1.0°
	98 ShA	+1.5	0.11	0.9°	+1.5	0.60	0.9°
28	64 ShD	-0.7	0.08	0.8°	-1.4	0.53	0.8°
	72 ShD		0.05	0.7°		0.46	0.7°
	92 ShA		0.17	1.0°		0.77	1.0°
	98 ShA	+1.8	0.12	0.9°	+1.8	0.69	0.9°
38	64 ShD	-0.7	0.09	0.8°	-1.4	0.61	0.8°
	72 ShD		0.06	0.7°		0.54	0.7°
	92 ShA		0.19	1.0°		0.84	1.0°
	98 ShA	+2.0	0.14	0.9°	+2.0	0.75	0.9°
42	64 ShD	-1.0	0.10	0.8°	-2.0	0.67	0.8°
	72 ShD		0.07	0.7°		0.59	0.7°
	92 ShA		0.23	1.0°		0.91	1.0°
	98 ShA	+2.1	0.16	0.9°	+2.1	0.82	0.9°
48	64 ShD	-1.0	0.11	0.8°	-2.0	0.73	0.8°
	72 ShD		0.08	0.7°		0.64	0.7°
	92 ShA		0.24	1.0°		1.01	1.0°
	98 ShA	+2.2	0.17	0.9°	+2.2	0.91	0.9°
55	64 ShD	-1.0	0.12	0.8°	-2.0	0.81	0.8°
	72 ShD		0.09	0.7°		0.71	0.7°
	98 ShA		0.18	0.9°			
	64 ShD	+2.6	0.13	0.8°	—	—	—
65	72 ShD	-1.0	0.10	0.7°			
	98 ShA		0.21	0.9°			
	64 ShD	+3.0	0.15	0.8°	—	—	—
	72 ShD	-1.5	0.11	0.7°			
75	98 ShA		0.23	0.9°			
	64 ShD	+3.4	0.17	0.8°	—	—	—
	72 ShD	-1.5	0.13	0.7°			
	98 ShA		0.13	0.7°			

¹⁾ The Ka figures specified above have to be added to the length of the respective coupling type.

The displacement figures may only be used one by one, if they appear simultaneously, they must be limited in proportion. Care should be taken to maintain the distance dimension E accurately in order to allow for axial clearance of the coupling while in operation. Detailed mounting instructions are shown on our homepage www.ktr.com.

ROTEX® GS

Backlash-free jaw couplings

Displacements of intermediate shaft coupling

Displacements of intermediate shaft couplings			
ROTEX® GS size (with 98 ShA-GS)	Axial ΔK_a [mm]	Radial ΔK_r ¹⁾ [mm]	Angular ΔK_w [degree]
14	+1.0	15	0.9°
	-1.0		
19	+1.2	14	0.9°
	-1.0		
24	+1.4	14	0.9°
	-1.0		
28	+1.5	14	0.9°
	-1.4		
38	+1.8	14	0.9°
	-1.4		
42	+2.0	14	0.9°
	-2.0		
48	+2.1	13	0.9°
	-2.0		
55	+2.2	13	0.9°
	-2.0		
65	+2.6	13	0.9°
	-2.0		

¹⁾ Radial displacements based on a coupling length $L_{ZR} = 1000$ mm

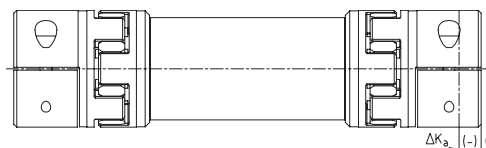
Calculation of overall torsion spring stiffness:

$$C_{tot.} = 2 \cdot \frac{1}{C_1} + \frac{L_{pipe}}{C_2} \quad [\text{Nm/rad}]$$

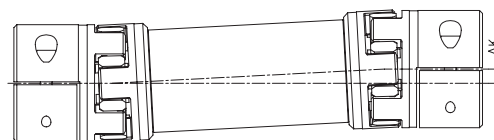
$$\text{with } L_{pipe} = \frac{L_{ZR} - 2 \cdot L}{1000} [\text{m}]$$

C_1 = torsion spring stiffness for spider see page 120
 C_2 = from table on page 142 - 144

Axial displacement

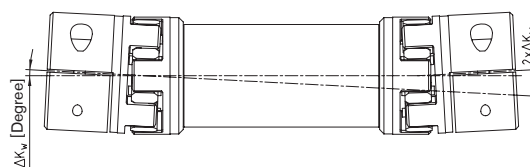


Radial displacement



$$\Delta K_r = (L_{ZR} - 2 \cdot l_1 - E) \cdot \tan \Delta K_w$$

Angular displacement



ROTEX® GS

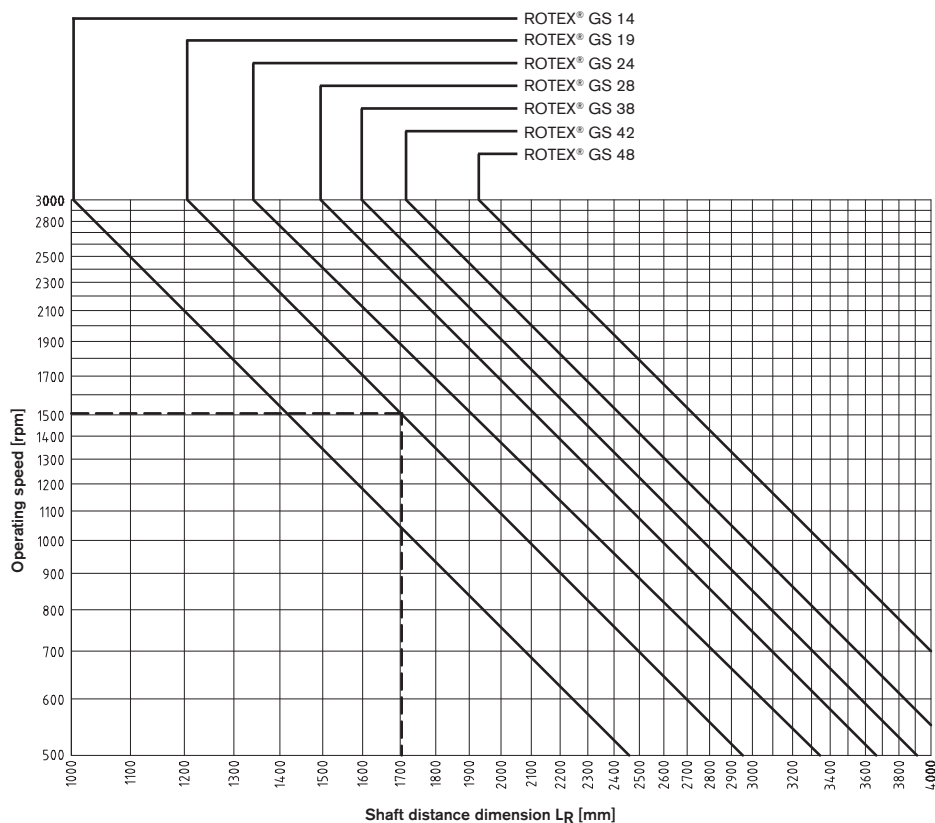
Backlash-free
jaw couplings

TOOLFLEX®

RADEX®-NC

COUNTEX®

Chart of critical bending speeds for type ZR3



Example:
 ROTEX® GS 19
 Operating speed: 1500 rpm
 Max. perm. shaft distance dimension: 1700 mm
 Operating speed = $n_{crit} / 1.4$

ROTEX® GS

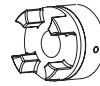
Backlash-free jaw couplings

Types of hubs

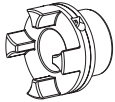
Due to the numerous applications of ROTEX® GS for many different mounting situations, this coupling system is available with various hub types. The different hub types can be combined optionally within one size.



Type 1.0
with feather keyway and setscrew
Positive-locking power transmission, permissible torque depending on the permissible surface pressure. Not suitable for backlash-free power transmission with heavily reversing operation.



Type 1.1
without feather keyway, with setscrew
Non-positive torque transmission. Suitable for backlash-free transmission of very small torques.
(For ATEX category 3 only)



Type 1.5
with hydraulic clamping system
Integrated frictionally engaged shaft-hub-connection for transmitting high torques with easy assembly by means of a screw.



Type 2.0 clamping hub
single slot without feather keyway
Frictionally engaged, backlash-free shaft-hub-connection. Transmittable torques depending on bore diameter. Type 2.0 up to size 14 as standard.
(For ATEX category 3 only)



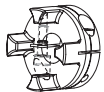
Type 2.1 clamping hub
single slot with feather keyway
Positive-locking power transmission with additional friction fit. The friction fit avoids or reduces reverse backlash. Surface pressure of the keyway connection is reduced. Type 2.1 up to size 14 as standard.



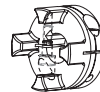
Type 2.5 clamping hub
double slotted, without feather keyway
Frictionally engaged, backlash-free shaft-hub-connection. Transmittable torques depending on bore diameter. Type 2.5 from size 19 as standard.
(For ATEX category 3 only)



Type 2.6 clamping hub
double slotted, with feather keyway
Positive-locking power transmission with additional friction fit. The friction fit avoids or reduces reverse backlash. Surface pressure of the keyway connection is reduced. Type 2.6 from size 19 as standard.



Type 2.8 short-type clamping hub C
with axial slot, without feather keyway
Frictionally engaged, backlash-free shaft-hub-connection, good properties of concentric running. Transmittable torques depending on bore diameter. Type 2.8 from size 24 as standard; size 7 - 19 type 2.8 single slotted.
(For ATEX category 3 only)



Type 2.8 short-type clamping hub C
with axial slot, with feather keyway
Positive-locking power transmission with additional friction fit. Surface pressure of the keyway connection is reduced. Type 2.9 from size 24 as standard; size 7 - 19 type 2.9 single slotted.



Type 6.0 clamping ring hub
Integrated frictionally engaged shaft-hub-connection for the transmission of higher torques. Screwing on elastomer side. For details about torque and dimensions see page 130/131. Suitable for high speeds.



Type 6.0 precision clamping ring hub
Type 6.0 high-precision clamping ring hub
Operating principle equal to type 6.0, but highly accurate machining with slight modifications of design. See page 132/134.



Type 7.5 clamping hub type DH
without feather keyway for double-cardanic connections
Frictionally engaged, backlash-free shaft-hub-connection for radial assembly of coupling. Transmittable torques depending on bore diameter. For torques see page 142.



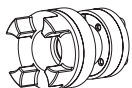
Type 7.6 clamping hub type DH
with feather keyway for double-cardanic connections
Positive shaft-hub-connection with additional friction fit for radial assembly of coupling. The friction fit avoids or reduces reverse backlash. Surface pressure of the keyway connection is reduced.



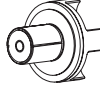
Type 7.8 clamping hub type H
without feather keyway for single-cardanic connection



Type 7.9 clamping hub type H
with feather keyway for single-cardanic connection

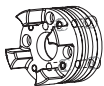


Type 4.2 with CLAMPEX KTR 250
Frictionally engaged shaft-hub-connection to transmit high torques with clamping screws externally.



Type 9.0 expansion hub
Frictionally engaged connection for hollow shaft. Transmittable torques depend on bore diameter and hollow shaft.

Special designs on request of customers



Type 6.5 clamping ring hub
Design equal to 6.0, but only clamping screws externally. As an example for radial disassembly of intermediate pipe (special design).

ROTEX® GS

Backlash-free jaw couplings

Stock programme

		Finish bore [mm] according to ISO fit H7 / feather keyway with thread according to DIN 6885 sheet 1 - JS9																															
Size	Hub design	un/pilot bored	Ø2	Ø3	Ø4	Ø5	Ø6	Ø 6.35	Ø7	Ø8	Ø9	Ø9.5	Ø10	Ø11	Ø12	Ø14	Ø15	Ø16	Ø18	Ø19	Ø20	Ø22	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	
7	1.1	●			●	●	●																										
	2.0	●		●	●	●	●	●																									
	2.8	●		●	●	●	●	●																									
8	2.8	●		●	●	●	●		●	●																							
	1.0	●				●				●	●		●																				
	1.1	●				●				●	●		●																				
9	2.0	●		●	●	●	●	●		●	●		●	●																			
	2.1	●				●				●	●		●																				
	2.8	●				●				●	●		●																				
12	1.0	●												●																			
	2.0	●			●	●	●	●		●	●		●	●	●																		
	2.1	●											●																				
13	2.8	●				●				●	●		●	●	●																		
	1.0	●				●				●	●		●	●	●	●	●	●															
	1.1	●				●				●	●		●	●	●	●	●	●															
14	2.0	●			●	●	●	●		●	●		●	●	●	●	●	●															
	2.1	●								●	●		●	●	●	●	●	●															
	2.8	●								●	●		●	●	●	●	●	●															
16	6.0 light					●				●	●		●	●	●	●	●	●															
	6.0 P												●																				
	2.8	●								●	●		●	●	●	●	●	●	●														
19	1.0	●											●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	2.5	●				■				●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	2.6	●								●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
24	2.8	●								●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	6.0 light												●																				
	6.0 steel													●																			
28	6.0 P 50																																
	6.0 P																																
	1.0	●												●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
38	2.5	●												■																			
	2.6	●																															
	2.8	●																															
42	6.0 light																																
	6.0 steel																																
	1.0	●												●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
48	2.5	●																															
	2.6	●																															
	2.8	●																															
55	6.0 light																																
	6.0 steel																																
	1.0	●																															
65	2.5	●																															
	2.6	●																															
	2.8	●																															
75	6.0 light																																
	6.0 steel																																
	1.0	●																															
90	2.5	●																															
	2.6	●																															
	2.8	●																															
90	6.0 light																																
	6.0 steel																																
	1.0	●																															

Taper bores for Fanuc motors:
 GS 19 1:10 Ø11
 GS 24 1:10 Ø16
¹⁾ Type 2.0/2.1

		Finish bores [mm]														
Size	Hub design	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50	Ø55	Ø60	Ø65	Ø70	Ø80
42	6.0 light	●		●	●	●		●	●		●					
	6.0 steel	●	●	●	●	●	●	●	●	●	●					
48	6.0 light			●	●	●	●	●	●	●	●					
	6.0 steel			●	●	●	●	●	●	●	●	●				
55	6.0 steel					●	●	●	●	●	●	●	●			
65	6.0 steel						●	●	●	●	●	●	●	●	●	
75	6.0 steel							●	●	●	●	●	●	●	●	●
90	6.0 steel										●	●	●	●	●	●

■ = Pilot bored clamping hubs
 ● = Standard bore from stock
 Unbored hubs up to size 65 available from stock
 Other dimensions on request