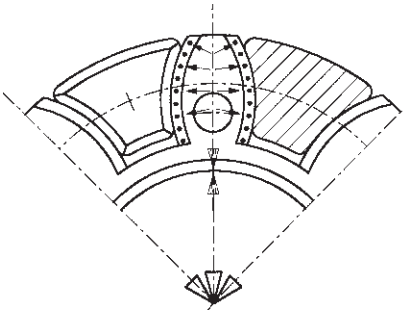
ROTEX® GS
Backlash-free jaw couplings

Technical description

ROTEX® GS is a three-part, axial plug-in coupling backlash-free under prestress. It impresses 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. Using this principle provides for particularly assembly-friendly options optimizing the assembly times in production.

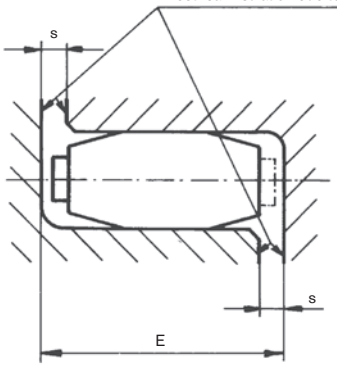
The straight spline of the spider mounted under prestress results in a lower surface pressure and consequently higher stiffness of the coupling system. The flexible teeth compensating for misalignment are radially supported in the internal diameter by a web. This avoids too high internal or external deformation with high acceleration resp. high speeds. This is vital for a smooth operation and long service life of the coupling.
The pegs on the spider arranged reciprocally prevent contact of the spider on the hubs over the full surface. Observing the distance dimension E ensures the coupling's ability to compensate for displacements.
Observing the gap dimension „s“ensures electrical insulation as well as a long service life of the coupling. This is gaining more and more importance, due to the increasing precision of shaft encoders and the existing demand for electromagnetic compatibility (EMC).

Limitation by concave cams with high speed/ centrifugal forces and prestress of elastomer parts



Support to the axis of rotation

Electrical insulation due to gap dimension „s“



Advice

- Feather keyways available from a bore ≥Ø6. Feather keyways according to DIN 6885 sheet 1, tolerance JS9.
- Finish bore tolerance H7 (except for clamping hubs), from Ø55 G7 with clamping ring hubs
- Finish bore tolerance H6 for ROTEX® GS P and ROTEX® GS HP
- Recommended insertion dimension of shafts in the 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 130.

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 as units of category 2G/2D according to EU directive 2014/34/EU 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 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.

Technical description

ROTEX® GS HP is a backlash-free, axial plug-in, flexible jaw coupling developed for high-speed drives.

In contrast to the ROTEX® GS coupling this type has individual elastomers instead of a connected spider.
This allows to design the hubs as a completely enclosed shape so that both the cam section and the pocket part feature higher stiffness against loads in the direction of rotation (torque shocks), but also in tangential direction (centrifugal force). The elastomers are embedded in the pocket part in a way that the high loads resulting from centrifugal forces do not have any negative influence on them and consequently on the overall drive system.

Instead of torques with circumferential speeds of a maximum of 100 m/s for ROTEX® GS P couplings, circumferential speeds up to 175 m/s can be reached with the new ROTEX® GS HP system.

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 to the individual conditions of an application considering the torsional spring stiffness and the vibration characteristics. The flexible prestress varies depending on the coupling size, the spiders/materials and the production tolerances. Resulting from it is the axial plug-in force starting from low as a close sliding fit resp. with torsionally soft spider to heavy with big prestress resp. torsionally rigid spider (see operating/assembly 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 increases.

Properties of ROTEX® GS spiders

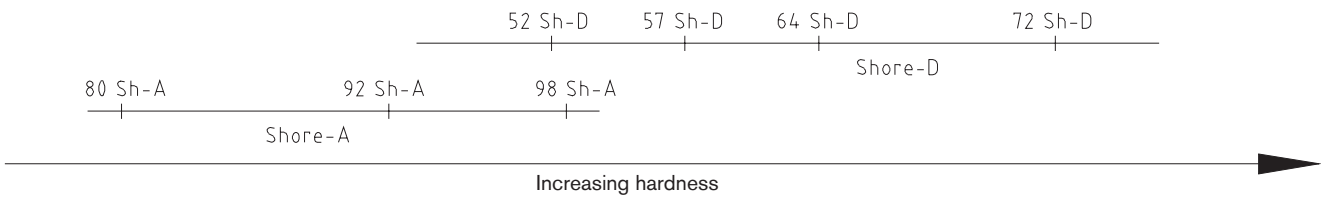
Description of spider hardness [Shore]	Marking of colour	Material	Perm. temperature range [°C]		Available for coupling size	Typical applications
			Permanent temperature [1]	Max. temperature (short-time) [1]		
80 ShA-GS		Polyurethane	-50 to +80	-60 to +120	Size 5 to 19	– drives of electric measuring systems
92 ShA-GS		Polyurethane	-40 to +90	-50 to +120	Size 5 to 38	– 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
52 ShD-S-GS [2]		Polyurethane	-40 to +120	-50 to +150	Size 24 to 42	– positioning drives – backlash-free gears – main spindle drives – high load with increased temperature
57 ShD-GS		Polyurethane	-30 to +90	-40 to +120	Size 19 to 65	– positioning drives – main spindle drives – high load
64 ShD-H-GS 64 ShD-GS		Hytrel	-50 to +120	-60 to +150	Size 7 to 38	– planetary gears/backlash-free gears – higher torsion spring stiffness
		Polyurethane	-20 to +110	-30 to +120	Size 42 to 90	– higher load – higher torsion spring stiffness
72 ShD-H-GS 72 ShD-GS		Hytrel	-50 to +120	-60 to +150	Size 24 to 38	– very high torsion spring stiffness – very high load
		Polyurethane	-20 to +110	-30 to +120	Size 42 to 90	– very high torsion spring stiffness – very high load

Properties of ROTEX® GS HP tooth elements

Description of spider hardness [Shore]	Marking of colour	Material	Perm. temperature range [°C]		Available for coupling size	Typical applications
			Permanent temperature	Max. temperature (short-time)		
98 ShA-GS 52 ShD-GS		Polyurethane	-30 to +90	-40 to +120	Size 24 to 65 (for ROTEX® GS HP only)	– HSC main spindle drives – test benches with severely high speeds
65 ShD-GS		Polyurethane	-30 to +90	-40 to +120	Size 24 to 65 (for ROTEX® GS HP only)	– HSC main spindle drives – test benches with severely high speeds – higher load – higher torsion spring stiffness

[1] The temperature factors specified on page 23 must be considered.
[2] Torques and displacements same as with 98 ShA-GS spider

Degree of hardness



Spider material	Polyurethane					Hytrel
Degree of hardness	92 Shore A	98 Shore A	52 Shore D	57 Shore D	64 Shore D	64 Shore D
Relative damping ψ [-] [1]	0.80	0.80	0.75	0.75	0.75	0.60
Resonance factor V_R [-] [1]	7.90	7.90	8.50	8.50	8.50	10.5

[1] Special figures apply for ROTEX® GS HP, please contact us.

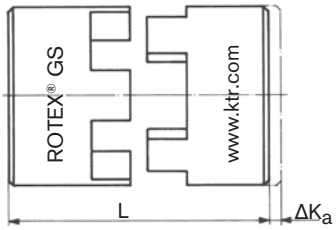
Technical data

Size	Spider GS Shore hardness	Shore scale	Max. speed [rpm] for type						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 [kgm²]	
			2.0/2.1 2.5/2.6	2.8 2.9	1.0 1.1	6.0 light [2]	6.0 P [2]	DKM	T_{KN}	$T_{K\,max}$				Per hub [5]	Spider	Per hub [5]	Spider
	80	A							0.3	0.6	3.15	10	82				
5	92	A	38000	38000	47700			57300	0.5	1.0	5.16	16	154	0.001	0.2 x 10⁻³	0.015 x 10⁻⁶	0.002 x 10⁻⁶
	98	A							0.9	1.7	8.3	25	296				
	80	A							0.7	1.4	8.6	26	114				
7	92	A	27000	27000	34100			40900	1.2	2.4	14.3	43	219	0.003	0.7 x 10⁻³	0.085 x 10⁻⁶	0.01 x 10⁻⁶
	98	A							2.0	4.0	22.9	69	421				
	64	D							2.4	4.8	34.3	103	630				
	80	A							0.7	1.4	8.8	27	117				
8	98	A		23800					2.0	4.0	23.5	71	433	0.003	0.5 x 10⁻³	0.117 x 10⁻⁶	0.0124 x 10⁻⁶
	64	D							2.4	4.8	35.3	106	648				
	80	A							1.8	3.6	17.2	52	125				
	92	A							3.0	6.0	31.5	95	262				
9	98	A	19000	19000	23800			28600	5.0	10.0	51.6	155	518	0.01	1.7 x 10⁻³	0.48 x 10⁻⁶	0.085 x 10⁻⁶
	64	D							6.0	12.0	74.6	224	739				
	80	A							3.0	6.0	84.3	252	274				
	92	A							5.0	10.0	160.4	482	470				
12	98	A	15200	15200	19100			22900	9.0	18.0	240.7	718	846	0.02	2.3 x 10⁻³	1.5 x 10⁻⁶	0.139 x 10⁻⁶
	64	D							12.0	24.0	327.9	982	1198				
	80	A							3.6	7.2	111	330	359				
13	98	A		12700		38200			11.0	22.0	316	941	1109	0.01	2.0 x 10⁻³	1.1 x 10⁻⁶	0.155 x 10⁻⁶
	64	D							14.5	29.0	430	1287	1570				
	80	A							4.0	8.0	60.2	180	153				
	92	A							7.5	15.0	114.6	344	336				
14	98	A	12700	12700	15900	32000	47700	19100	12.5	25.0	171.9	513	654	0.02	4.7 x 10⁻³	2.8 x 10⁻⁶	0.509 x 10⁻⁶
	64	D							16.0	32.0	234.2	702	856				
	80	A							5.0	10.0	157	471	400				
16	98	A		12000					15.0	30.0	450	1341	1710	0.02	3.6 x 10⁻³	2.8 x 10⁻⁶	0.435 x 10⁻⁶
	64	D							19.0	38.0	612	1835	2238				
	80	A							6.0	12.0	618	1065	582				
	92	A							12.0	24.0	1090	1815	1120				
19	98	A	9550	9550	11900	24000 19000 [4]	35800	14300	21.0	42.0	1512	2540	2010	0.09	7.6 x 10⁻³	19.5 x 10⁻⁶	1.35 x 10⁻⁶
	57	D							23.0	46.0	2036	3175	2470				
	64	D							26.0	52.0	2560	3810	2930				
	92	A							35	70	2280	4010	1480				
	98	A							60	120	3640	5980	2560				
	52	D				17000			60	120	3640	5980	2560			81.9	6.7
24	57	D	6950	10400	8650	14000 [4]	26000	10400	68	136	4335	8438	3128	0.2	0.02	x 10⁻⁶	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				
	98	A							160	320	6410	9920	3200				
	52	D				15000			160	320	6410	9920	3200			184.2	14.85
28	57	D	5850	8800	7350	12000 [4]	22000	8800	180	360	8335	15050	3775	0.3	0.03	x 10⁻⁶	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				
	98	A							325	650	11800	17160	4400				
	52	D				12000			325	650	11800	17160	4400			542.7	39.4
38	57	D	4750	7150	5950	9600 [4]	17900	7150	365	730	19050	28745	5437	0.6	0.05	x 10⁻⁶	x 10⁻⁶
	64	D							405	810	26300	40335	6474				
	72 [3]	D							525	1050	44584	71180	11425				
	98	A							450	900	21594	37692	5570				
	52	D							450	900	21594	37692	5570				
42	57	D	4000		5000	10000 8050 [4]	15000	6000	495	990	29225	53760	6420	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				
	98	A							525	1050	25759	45620	5930				
	57	D				9100			590	1180	41695	72685	7102			4709	135
48	64	D	3600		4550	7200 [4]	13600	5450	655	1310	57630	99750	8274	3.3	0.09	x 10⁻⁶	x 10⁻⁶
	72 [3]	D							852	1704	80000	136948	11359				
	98	A							685	1370	42117	61550	6686				
55	57	D							770	1540	68175	98065	8005			9460	229
	64	D	3150		3950	6350 [4]	11900	4750	825	1650	105730	130200	9248	5.1	0.12	x 10⁻⁶	x 10⁻⁶
	72 [3]	D							1072	2144	150000	209530	12762				
	98	A							940	1880	48520	71660	6418				
65	57	D							1055	2110	78535	114175	7685			15143	437
	64	D	2800		3500	5650 [4]	11000		1175	2350	118510	189189	8870	6.7	0.2	x 10⁻⁶	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				

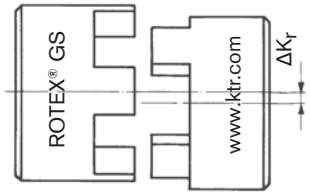
[1] Static and dynamic torsion spring stiffness with 0.5 x T_{KN}
[2] For higher speeds see ROTEX® GS HP
[3] When using the spider 72 ShD, we recommend to use hubs made of steel
[4] Clamping ring hubs 6.0 made of steel
[5] Hubs with an average bore type 1.0
The coupling has to be dimensioned in that the permissible coupling load is not exceeded during any operating condition (see coupling selection on page 22 et seqq.).
The specified torques $T_{KN}/T_{K\,max}$ refer to the spider. The shaft-hub-connection needs to be verified by the customer.

Hints for displacements

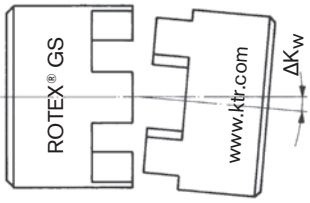
Axial displacement



Radial displacement



Angular displacement



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 remains backlash-free even after a longer operation period.

For instance, axial displacement may be generated by different tolerances of the connecting elements with assembly or by alteration of the shaft lengths if temperature fluctuations occur. 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 keep the reaction forces low.

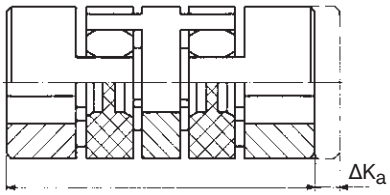
In case of pure angular displacement the imaginary bisecting lines of the shafts intersect in the centre of the coupling. Within a permissible range this displacement can be absorbed by the coupling without extensive restoring forces being generated.

Radial displacement results from parallel displacement of the shafts to one another, 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.

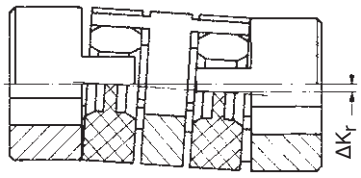
In case of larger displacements (especially radial displacements) the ROTEX® GS type DKM double-cardanic system should be used in order to avoid excessive restoring forces.

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 T_{KN} 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 absorb axial, radial and angular displacements. Careful and accurate alignment of the shafts increases the service life of the coupling.

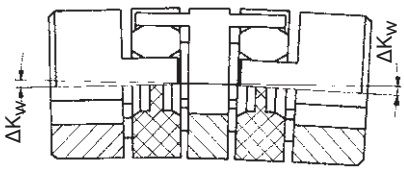
Axial displacement



Radial displacement



Angular displacement



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.

Displacements

Displacements							
Size	Spider GS	Standard displacements			DKM displacements		
		Axial ΔK_a [1] [mm]	Radial ΔK_r [mm]	Angular ΔK_w [degree]	Axial ΔK_a [1] [mm]	Radial ΔK_r [mm]	Angular ΔK_w [degree]
	80 ShA		0.12	1.1°		0.15	1.1°
5	92 ShA	-0.2	0.06	1.0°	-0.4	0.14	1.0°
	98 ShA		0.04	0.9°		0.13	0.9°
	80 ShA		0.15	1.1°		0.23	1.1°
7	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°
	80 ShA		0.15	1.1°			
8	98 ShA	+0.6 -0.5	0.08	0.9°	—	—	—
	64 ShD		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	98 ShA	+0.9 -0.8	0.08	0.9°	—	—	—
	64 ShD		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 -0.8	0.10	0.9°	—	—	—
	64 ShD		0.08	0.8°			
	80 ShA		0.15	1.1°		0.49	1.1°
19	92 ShA		0.10	1.0°		0.45	1.0°
	98 ShA	+1.2 -0.5	0.06	0.9°	+1.2 -1.0	0.41	0.9°
	57 ShD		0.05	0.85°		0.38	0.85°
	64 ShD		0.04	0.8°		0.36	0.8°
	92 ShA		0.14	1.0°		0.59	1.0°
24	98 ShA		0.10	0.9°		0.53	0.9°
	57 ShD	+1.4 -0.5	0.08	0.85	+1.4 -1.0	0.50	0.85
	64 ShD		0.07	0.8°		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		0.11	0.9°		0.60	0.9°
28	57 ShD	+1.5 -0.7	0.09	0.85	+1.5 -1.4	0.56	0.85
	64 ShD		0.08	0.8°		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		0.12	0.9°		0.69	0.9°
38	57 ShD	+1.8 -0.7	0.10	0.85	+1.8 -1.4	0.65	0.85
	64 ShD		0.09	0.8°		0.61	0.8°
	72 ShD		0.06	0.7°		0.54	0.7°
	98 ShA		0.14	0.9°		0.75	0.9°
42	57 ShD	+2.0	0.12	0.85	+2.0	0.71	0.85
	64 ShD	-1.0	0.10	0.8°	-2.0	0.67	0.8°
	72 ShD		0.07	0.7°		0.59	0.7°
	98 ShA		0.16	0.9°		0.82	0.9°
48	57 ShD	+2.1	0.13	0.85	+2.1	0.77	0.85
	64 ShD	-1.0	0.11	0.8°	-2.0	0.73	0.8°
	72 ShD		0.08	0.7°		0.64	0.7°
	98 ShA		0.17	0.9°		0.91	0.9°
55	57 ShD	+2.2	0.14	0.85°	+2.2 -2.0	0.86	0.85°
	64 ShD	-1.0	0.12	0.8°		0.81	0.8°
	72 ShD		0.09	0.7°		0.71	0.7°
	98 ShA		0.18	0.9°			
65	57 ShD	+2.6	0.15	0.85°	—	—	—
	64 ShD	-1.0	0.13	0.8°			
	72 ShD		0.10	0.7°			
	98 ShA		0.21	0.9°			
75	64 ShD	+3.0 -1.5	0.15	0.8°	—	—	—
	72 ShD		0.11	0.7°			
	98 ShA		0.23	0.9°			
90	64 ShD	+3.4 -1.5	0.17	0.8°	—	—	—
	72 ShD		0.13	0.7°			

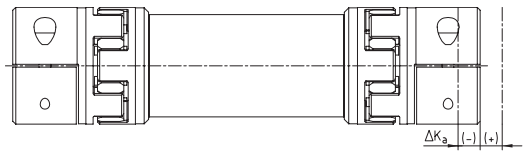
[1] The Ka figures specified have to be added to the length of the respective coupling type.
The displacement figures may only be used one by one, if they appear simultaneously, they must be limited in proportion. Care should be taken to maintain the distance dimension E accurately in order to allow for axial clearance of the coupling while in operation. Detailed mounting instructions are shown on our homepage www.ktr.com.
For technical data of type HP see page 136.

Displacements of intermediate shaft coupling

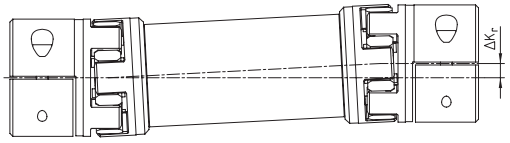
Displacements of intermediate shaft couplings			
ROTEX® GS size (with 98 ShA-GS)	Axial ΔK_a [mm]	Radial ΔKr [1] [mm]	Angular ΔK_w [degree]
14	+1.0 / -1.0	15	0.9°
19	+1.2 / -1.0	14	0.9°
24	+1.4 / -1.0	14	0.9°
28	+1.5 / -1.4	14	0.9°
38	+1.8 / -1.4	14	0.9°
42	+2.0 / -2.0	14	0.9°
48	+2.1 / -2.0	13	0.9°
55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

[1] Radial displacements based on a coupling length L_{ZR} = 1000 mm

Axial displacement

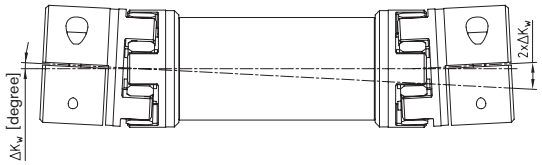


Radial displacement



$$\Delta Kr = (L_{ZR} - 2 \bullet l_1 - E) \cdot \tan \Delta Kw$$

Angular displacement



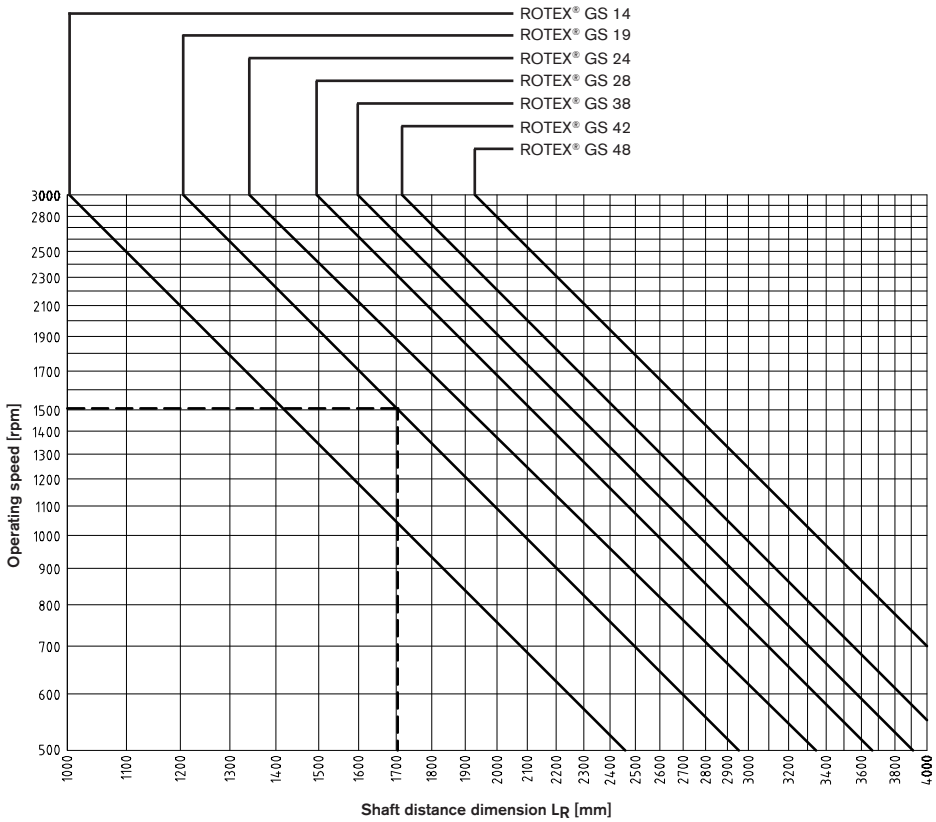
Calculation of overall torsion spring stiffness:

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

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

C_1 = torsion spring stiffness for spider see page 128
C_2 = from table on page 150 - 152

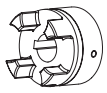
Chart of critical bending speeds for type ZR3



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

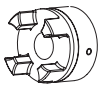
Types of hubs

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 randomly combined 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 low 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 resp. 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 resp. reduces reverse backlash. Surface pressure of the keyway connection is reduced. Type 2.6 from size 19 as standard.

Type 2.8 compact type clamping hub C
with axial slot, without feather keyway

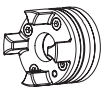
Frictionally engaged, backlash-free shaft-hub-connection, good properties of concentric running. Transmittable torques depending on bore diameter. Type 2.8 from size 24 as standard; size 7 - 19 type 2.8 single slotted.
(For ATEX category 3 only)

Type 2.9 compact 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 132/133 and HP page 136. Suitable for high speeds.



Type 6.0 precision clamping ring hub

Operating principle equal to type 6.0, but highly accurate machining with slight modifications of design. See page 134.

Type 7.5 clamping hub type DH
without feather keyway for double-cardanic connections

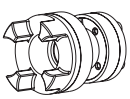
Frictionally engaged, backlash-free shaft-hub-connection for radial assembly of coupling. Transmittable torques depending on bore diameter. For torques see page 142.

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 resp. reduces reverse backlash. Surface pressure of the keyway connection is reduced.

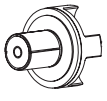
Type 7.8 clamping hub type H
without feather keyway for single-cardanic connection

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. For instance for radial disassembly of intermediate pipe (special design).

Stock programme

Finish bore [mm] according to ISO fit H7 / feather keyway with thread according to DIN 6885 sheet 1 - JS9																																
Size	Hub type	un/pilot bored	Ø2	Ø3	Ø4	Ø5	Ø6	Ø6.35	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
	1.1	●			●	●	●																									
7	2.0	●		●	●	●	●	●	●																							
	2.8	●																														
8	2.8	●		●	●	●	●		●	●																						
	1.0	●					●			●	●		●																			
	1.1	●			●	●	●		●	●			●																			
9	2.0	●		●	●	●	●	●	●	●	●	●	●	●																		
	2.1	●					●			●	●		●	●																		
	2.8	●				●	●			●	●																					
	1.0	●													●																	
	1.1	●																														
12	2.0	●			●	●	●	●		●	●		●	●	●																	
	2.1	●											●		●																	
	2.8	●																														
13	2.8	●					●			●			●	●	●																	
	1.0	●					●			●	●		●	●	●	●	●	●														
	1.1	●					●			●			●	●	●	●																
	2.0	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●														
14	2.1	●								●	●		●	●	●	●	●	●														
	2.8	●								●	●		●	●	●	●		●														
	6.0 light						●			●	●		●	●	●	●																
	6.0 P															●																
16	2.8	●								●	●		●		●	●		●														
	1.0	●											●	●	●	●	●	●	●	●	●	●	●									
	2.5	●				■				●		●	●	●	●	●	●	●	●	●	●	●1)	●1)									
	2.6	●								●			●	●	●	●	●	●	●	●	●		●1)									
19	2.8	●								●	●		●	●	●	●	●	●	●	●	●		●									
	6.0 light												●	●	●	●	●	●	●	●	●											
	6.0 steel															●		●		●	●											
	6.0 P37.5																	●														
	6.0 P																			●												
	1.0	●													●	●	●	●	●	●	●	●	●	●	●							
	2.5	●								■					●	●	●	●	●	●	●	●	●	●	●							
	2.6	●													●	●		●	●	●	●	●	●	●	●							
24	2.8															●	●	●		●	●		●	●	●	●						
	6.0 light													●		●	●	●	●	●	●	●	●	●	●							
	6.0 steel																					●	●	●	●							
	6.0 P50																						●									
	6.0 P																							●								
	1.0	●																		●	●	●	●	●	●	●	●	●				
	2.5	●											■						●	●	●	●	●	●	●	●	●	●				
	2.6	●																●			●	●	●	●	●	●	●	●				
28	2.8																			●		●	●	●	●	●		●				
	6.0 light																		●	●	●	●	●	●	●	●	●	●				
	6.0 steel																					●	●	●	●	●	●	●				
	6.0 P																					●					●	●	●			
	1.0	●																			●			●	●	●	●	●	●	●		
	2.5	●												■										●			●	●	●	●		
	2.6	●																			●			●	●	●	●	●	●	●		
38	2.8																				●			●	●		●	●		●		
	6.0 light																				●	●	●	●	●	●	●	●	●	●	●	●
	6.0 steel																							●	●	●	●	●	●	●		●
	6.0 P																										●	●	●	●		

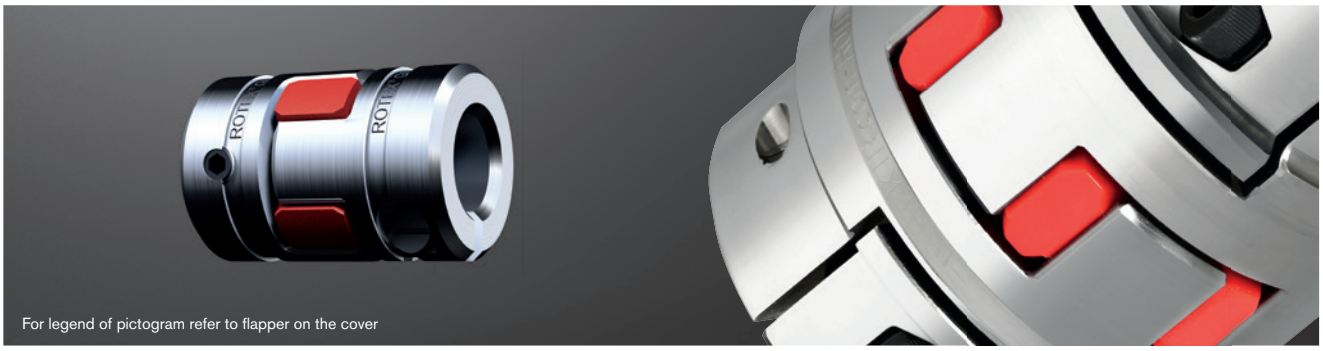
Taper bores for Fanuc motors:
GS 19 1:10 Ø11
GS 24 1:10 Ø16
1) Type 2.0/2.1

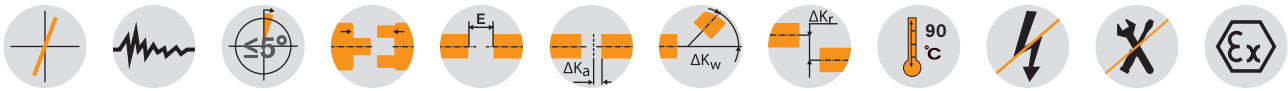
Finish bores [mm]																	
Size	Hub type	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50	Ø55	Ø60	Ø65	Ø70	Ø80
42	6.0 light	●		●	●	●		●	●		●					
	6.0 steel	●	●	●	●	●	●	●	●	●	●					
48	6.0 light			●			●		●	●		●				
	6.0 steel			●	●	●	●	●	●	●	●	●				
55	6.0 steel					●	●	●	●	●	●	●	●			
65	6.0 steel				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

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

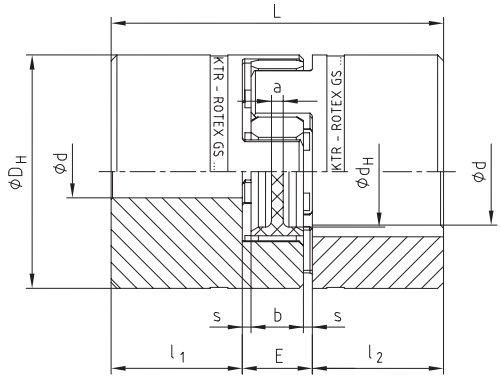
ROTEX® GS
Backlash-free jaw couplings

Standard types

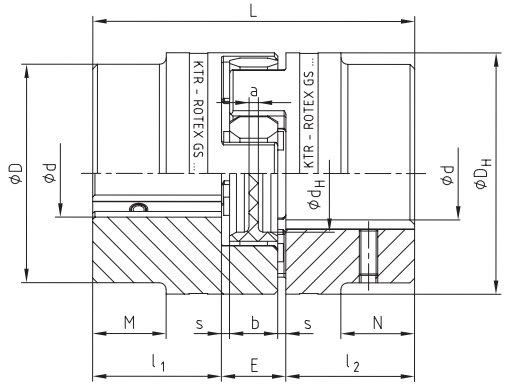




ROTEX® GS 5 - 38

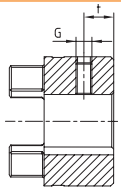


ROTEX® GS 42 - 90



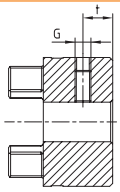
Types of hubs:

Type 1.0



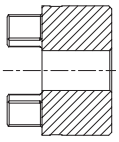
with feather keyway and setscrew

Type 1.1



without feather keyway, with setscrew

Type 1.2



without feather keyway and without setscrew

ROTEX® GS standard types - For size 5 to 38 hub material aluminium/for size 42 to 90 hub material steel

Size	Spider GS [1] torque T_{KN} [Nm] for 98 ShA	$d_{max.}$ for hub type			Dimensions [mm]										Setscrew DIN EN ISO 4029		
		1.0	1.1	1.2	D	D_H	d_H	L	l_1, l_2	M, N	E	b	s	a	G	t	T_A [Nm]
5	0.9	-	6	5	–	10	–	15	5	–	5	4	0.5	4.0	M2	2.5	0.35
7	2.0	7	7	7	–	14	–	22	7	–	8	6	1.0	6.0	M3	3.5	0.6
9	5.0	10	11	11	–	20	7.2	30	10	–	10	8	1.0	1.5	M4	5.0	1.5
12	9.0	12	12	12	–	25	8.5	34	11	–	12	10	1.0	3.5	M4	5.0	1.5
14	12.5	16	16	16	–	30	10.5	35	11	–	13	10	1.5	2.0	M4	5.0	1.5
19	21	24	-	–	–	40	18	66	25	–	16	12	2.0	3.0	M5	10	2.0
24	60	32	–	–	–	55	27	78	30	–	18	14	2.0	3.0	M5	10	2.0
28	160	38	–	–	–	65	30	90	35	–	20	15	2.5	4.0	M8	15	10
38	325	45	–	–	–	80	38	114	45	–	24	18	3.0	4.0	M8	15	10
42	450	55	–	–	85	95	46	126	50	28	26	20	3.0	4.0	M8	20	10
48	525	62	–	-	95	105	51	140	56	32	28	21	3.5	4.0	M8	20	10
55	685	74	–	–	110	120	60	160	65	37	30	22	4.0	4.5	M10	20	17
65	940	80	–	–	115	135	68	185	75	47	35	26	4.5	4.5	M10	20	17
75	1920	95	–	–	135	160	80	210	85	53	40	30	5.0	5.0	M10	25	17
90	3600	110	–	–	160	200	104	245	100	62	45	34	5.5	6.5	M12	30	40

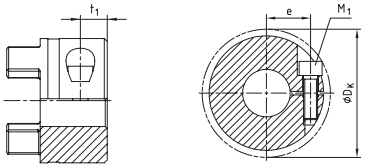
[1] For selections see page 22 et seqq./other spiders see page 127.

Ordering example:

ROTEX® GS 24	98 ShA-GS	d 20	2.5 - Ø24		1.0 - Ø20	
Coupling size	Spider hardness	**Optional:** Bore in spider	Hub type	Finish bore	Hub type	Finish bore

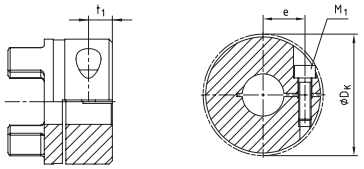
Types of hubs:

Type 2.0
Type 2.1



Size 5 to 14
Type 2.0: single slotted clamping hub **without** feather keyway (only for ATEX cat. 3), torque depending on bore Ø
Type 2.1: single slotted clamping hub **with** feather keyway

Type 2.5
Type 2.6



from size 19
Type 2.5: double slotted clamping hub **without** feather keyway (only for ATEX cat. 3), torque depending on bore Ø
Type 2.6: double slotted clamping hub **with** feather keyway

ROTEX® GS standard types - For size 5 to 38 hub material aluminium/for size 42 to 90 hub material steel

Size	Spider GS [1] torque T_{KN} [Nm] for 98 ShA	$d_{max.}$ for hub type				Dimensions [mm]										Clamping screws DIN EN ISO 4762 (ROTEX® GS 5 - DIN EN ISO 1207)				
		2.0	2.1	2.5	2.6	D	D_H	d_H	L	l_1, l_2	M, N	E	b	s	a	M_1	t_1	e	DK	T_A [Nm]
5	0.9	5	–	–	–	–	10	—	15	5	–	5	4	0.5	4.0	M1.2	2.5	3.5	11.4	– [2]
7	2.0	7	7	–	–	–	14	—	22	7	–	8	6	1.0	6.0	M2	3.5	5.0	16.5	0.37
9	5.0	11	11	–	–	–	20	7.2	30	10	–	10	8	1.0	1.5	M2.5	5.0	7.5	23.4	0.76
12	9.0	12	12	–	–	–	25	8.5	34	11	–	12	10	1.0	3.5	M3	5.0	9.0	27.5	1.34
14	12.5	16	16	–	–	–	30	10.5	35	11	–	13	10	1.5	2.0	M3	5.0	11.5	32.2	1.34
19	21	–	–	24	24	–	40	18	66	25	–	16	12	2.0	3.0	M6	11.0	14.5	46	10
24	60	–	–	28	28	–	55	27	78	30	–	18	14	2.0	3.0	M6	10.5	20.0	57.5	10
28	160	–	–	38	38	–	65	30	90	35	–	20	15	2.5	4.0	M8	11.5	25.0	73	25
38	325	–	–	45	45	–	80	38	114	45	–	24	18	3.0	4.0	M8	15.5	30.0	83.5	25
42	450	–	–	50	45	85	95	46	126	50	28	26	20	3.0	4.0	M10	18	32.0	93.5	69
48	525	–	–	55	55	95	105	51	140	56	32	28	21	3.5	4.0	M12	21	36.0	105	120
55	685	–	–	68	68 [3]	110	120	60	160	65	37	30	22	4.0	4.5	M12	26	42.5	119.5	120
65	940	–	–	70	70 [3]	115	135	68	185	75	47	35	26	4.5	4.5	M12	33	45.0	124	120
75	1920	–	–	80	80	135	160	80	210	85	53	40	30	5.0	5.0	M16	36	51.0	147.5	295
90	3600	–	–	90	90	160	200	104	245	100	62	45	34	5.5	6.5	M20	40	60.0	176	580

[1] For selections see page 22 et seqq./other spiders see page 121.
[2] No T_A defined (slotted screw)
[3] From Ø60 keyway opposite the clamping screw

Review of shaft-hub-connection: Friction torques T_R [Nm] for hub type 2.0

Size	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø9	Ø10	Ø11	Ø12	Ø13	Ø14	Ø15	Ø16
7	0.7	0.9	1.1	1.2	1.4									
9		1.6	1.9	2.2	2.6	2.9	3.2	3.5	3.8					
12		2.4	2.9	3.4	3.9	4.4	4.9	5.4	5.8	6.3				
14			3.1	3.6	4.2	4.7	5.2	5.7	6.2	6.7	7.1	7.6	8.0	8.5

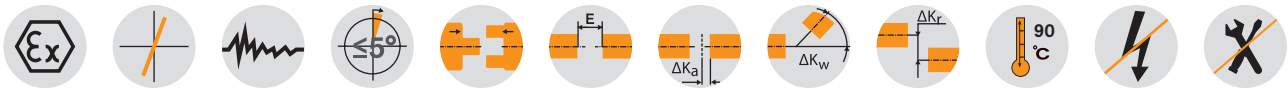
Review of shaft-hub-connection: Friction torques T_R [Nm] for hub type 2.5

Size	Ø8	Ø10	Ø11	Ø14	Ø15	Ø16	Ø18	Ø19	Ø20	Ø22	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50	Ø55	Ø60	Ø65	Ø70	Ø75	Ø80	Ø85	Ø90
19	19	23	25	31	33	35	39	41	42	46 [4]	49 [4]																			
24		24	26	33	35	37	41	43	45	48	52	54	59																	
28				63	67	71	79	82	86	94	101	105	115	122	129	139	148													
38					67	71	79	83	87	95	102	106	117	124	131	142	152	158	165	175										
42								188	197	214	231	240	264	281	297	320	343	358	373	395	417	431								
48												356	394	418	442	478	513	536	558	592	624	646	699							
55															456	493	529	553	577	611	646	668	724	778	830	882				
65																499	536	560	584	620	655	677	734	789	842	895	946			
75																			1107	1175	1242	1287	1396	1503	1607	1709	1810	1908	2005	
90																			1764	1876	1985	2057	2235	2409	2579	2746	2911	3072	3231	3387

[4] Clamping hub single slotted with 2-off clamping screws M4 and dimension e = 15, T_A = 2.9 Nm

ROTEX® GS Compact
Backlash-free jaw couplings

Compact design



ROTEX® GS Compact - Hub material aluminium																	
Size	Spider GS [1] torque T_{KN} [Nm]				Dimensions [mm]									Clamping screws DIN EN ISO 4762			
	80 ShA	92 ShA	98 ShA	64 ShD	$d_{max.}$	D_H	DK	L	l_1, l_2	E	b	s	d_H	t	e	M	T_A [Nm]
Single slotted hub type 2.8/2.9																	
7	0.7	1.2	2.0	2.4	7	14	16.6	18	5	8	6	1	–	2.5	5	M2	0.37
8	0.5	–	2.0	2.4	8	15	17.3	20	7	6	5	0.5	6.2	4	5.4	M2	0.52
9	1.8	3.0	5.0	6	9	20	21.3	24	7	10	8	1	–	3.5	6.7	M2.5	0.76
12	3.0	5.0	9.0	12	12	25	26.2	26	7	12	10	1	–	3.5	8.3	M3	1.34
13	3.6	–	11	14.5	12.7	25	25.7	26	8	10	8	1	10	4	8	M3	1.9
14	4.0	7.5	12.5	16	16 [2]	30	31.6	32	9.5	13	10	1.5	–	4.5	10	M4	2.9
16	5.0	–	15	19	16	30	32.5	32	10.3	11.4	9.4	1	14	5.3	10.5	M4	4.1
19	6.0	12.0	21.0	26.0	24 [2]	40	45.5	50	17	16	12	2	–	9	14.0	M6	10
Axially slotted hub type 2.8/2.9																	
24	–	35	60	75	32	55	57.5	54	18	18	14	2	–	11	20.0	M6	10
28	–	95	160	200	35	65	69.0	62	21	20	15	2.5	–	12	23.8	M8	25
38	–	190	325	405	45	80	86.0	76	26	24	18	3	–	15	29.5	M10	49

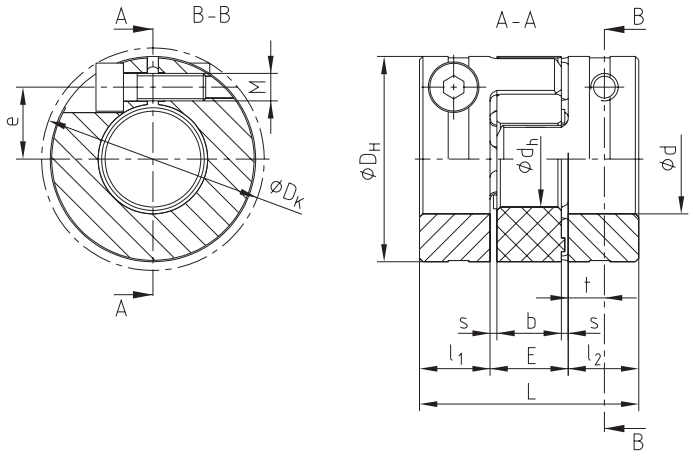
Review of shaft-hub-connection: Friction torques T_R [Nm] for hub type 2.8																										
Size	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø9	Ø10	Ø11	Ø12	Ø14	Ø15	Ø16	Ø18	Ø19	Ø20	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45
Single slotted hub type 2.8																										
7	0.7	0.9	1.1	1.2	1.4																					
8	1.0	1.2	1.5	1.8	2.0	2.3																				
9		1.5	1.8	2.1	2.4	2.7	3.0																			
12		2.3	2.8	3.3	3.8	4.3	4.7	5.2	5.6	6.0																
13		3.1	3.9	4.6	5.2	5.9	6.5	7.1	7.8	8.4																
14			5.0	5.9	6.8	7.7	8.5	9.4	10.2	11.0	7.2 [2]	7.7 [2]	8.1 [2]													
16			7.2	8.5	9.8	11.0	12.2	13.4	14.6	15.7	17.9	19.0	20.0													
19						18.7	20.8	22.9	24.9	26.9	30.8	32.7	34.6	38.2	40.0	41.8	36.0 [2]									
Axially slotted hub type 2.8																										
24								34	37	41	48	51	54	61	64	68	81	85	95	102	109					
28											87	93	100	112	118	124	149	156	174	187	199	218				
38												148	158	178	188	198	237	247	277	296	316	346	375	395	415	444

[1] For selections see page 22 et seqq./other spiders see page 121.
[2] Size 14 with screw M3 and dimension e = 10.4/D_K = 30.5/T_A = 1.34 Nm; size 19 with screw M5 and dimension e = 15.5/D_K = 47mm/T_A = 6 Nm

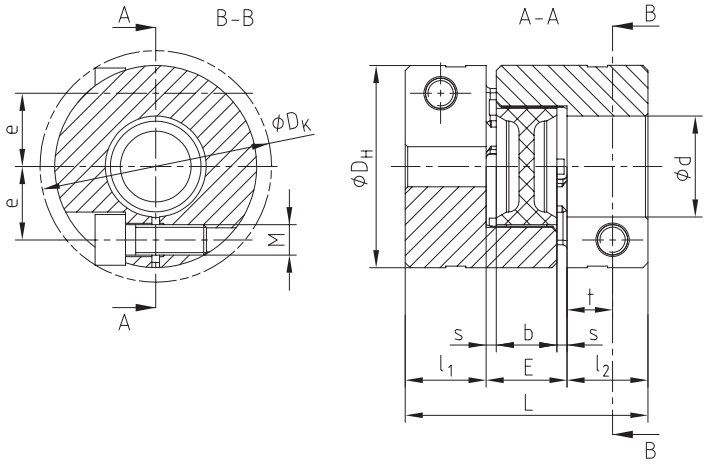
Ordering example:

ROTEX® GS 38	Compact	98 ShA-GS	d 28	2.8 - Ø28		2.8 - Ø45	
Coupling size	Type	Spider hardness	**Optional:** Bore in spider	Hub type	Finish bore	Hub type	Finish bore

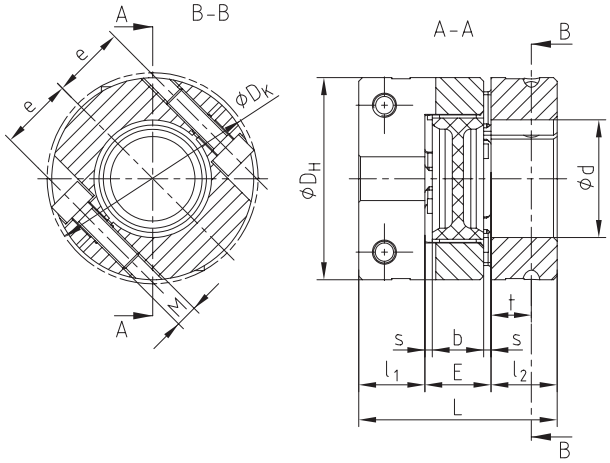
ROTEX® GS 8, 13, 16
Compact
single slotted type 2.8



ROTEX® GS 7, 9, 12, 14, 19
Compact
single slotted type 2.8

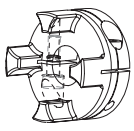


ROTEX® GS 24 - 38
Compact
axially slotted type 2.8



Types of hubs

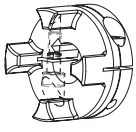
Type 2.8



Compact type clamping hub C with axial slot, without feather keyway

Type 2.8 from size 24 as standard, size 7 - 19 type 2.8 single slotted

Type 2.9

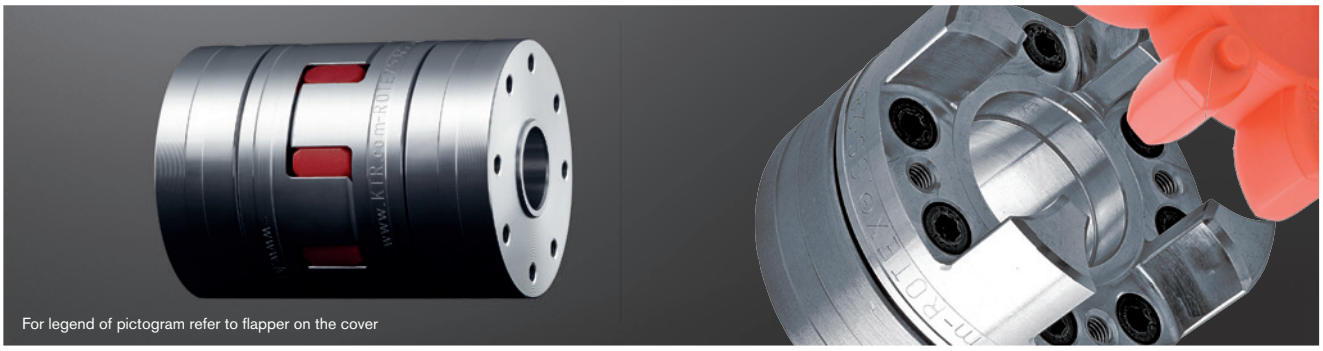


Compact type clamping hub C with axial slot, with feather keyway

Type 2.9 from size 24 as standard, size 7 - 19 type 2.9 single slotted

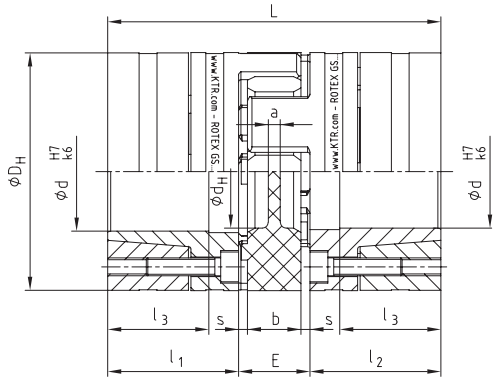
ROTEX® GS Clamping ring hubs light
Backlash-free jaw couplings

Integrated clamping system made of aluminium



Extraction thread M_1 between clamping screws

Clamping ring hub light with block mounting
(hub and clamping ring mounted as a block)



ROTEX® GS clamping ring hubs light

Size	Spider GS [1] torque T_{KN} [Nm]			Dimensions [mm]										Clamping screws DIN EN ISO 4762				Weight per hub with max. bore [kg]	Mass moment of inertia per hub with max. bore [kgm²]
	92 ShA	98 ShA	64 ShD	$d_{max.}$	D_H [2]	d_H	L	l_1, l_2	l_3	E	b	s	a	M	z = number	T_A [Nm]	M_1		
13	-	11	14.5	13	25	10	34	12	9	10	8	1	-	M2	6	0.37	M2	0.014	1.39×10^{-6}
14	7.5	12.5	16.0	14	30	10.5	50	18.5	13.5	13	10	1.5	2.0	M3	4	1.34	M3	0.032	0.04×10^{-4}
19	12	21	26	20	40	18	66	25	18	16	12	2.0	3.0	M4	6	3	M4	0.077	0.19×10^{-4}
24	35	60	75	32	55	27	78	30	22	18	14	2.0	3.0	M5	4	6	M5	0.162	0.78×10^{-4}
28	95	160	200	38	65	30	90	35	27	20	15	2.5	4.0	M5	8	6	M5	0.240	1.70×10^{-4}
38	190	325	405	48	80	38	114	45	35	24	18	3.0	4.0	M6	8	10	M6	0.490	5.17×10^{-4}
42	265	450	560	51	95	46	126	50	35	26	20	3.0	4.0	M8	4	25	M8	0.772	11.17×10^{-4}
48	310	525	655	55	105	51	140	56	41	28	21	3.5	4.0	M10	4	49	M10	1.066	18.81×10^{-4}

[1] For selections see page 22 et seqq./other spiders see page 121.
[2] $\varnothing D_H$ + 2 mm with high speeds for expansion of spider

Review of shaft-hub-connection: Friction torques T_R [Nm] for hub type 6.0 light

Size		Ø3	Ø4	Ø5	Ø6	Ø8	Ø9	Ø10	Ø11	Ø14	Ø15	Ø16	Ø19	Ø20	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50	Ø55*
13	H7/k6	1.3 [3]	2.3 [3]	4.3 [3]	5.4 [3]	10 [3]	6.3	8.9	10.6																		
	H7/h6						2.4	4.8	5.4																		
14	H7/k6				8.2	13.1	18.7	20.5	25.9	36.2																	
	H7/h6				5.8	9.5	15.7	16.6	21.6	24.7																	
19	H7/k6							33	41	59	71	51	80	92													
	H7/h6							27	35	52	65	39	68	81													
24	H7/k6									84	99	93	139	157	160	177	232	177 [4]									
	H7/h6									75	92	79	125	145	119	136	190	147 [4]									
28	H7/k6											140	207	188	289	316	355	414	324	404	422						
	H7/h6											121	187	157	263	293	318	381	245	324	343						
38	H7/k6													290	439	480	567	656	617	759	733	825	922	808	937		
	H7/h6													247	403	447	530	626	499	636	606	696	792	678	809		
42	H7/k6																651	752	747	916	1001	1115	1044	1218	1404	1432	
	H7/h6																574	681	613	774	881	1001	888	1058	1241	1295	
48	H7/k6																765	822	927	1121	1220	1357	1318	1536	1768	1535	1823
	H7/h6																678	760	837	1047	1085	1231	1128	1339	1566	1331	1475

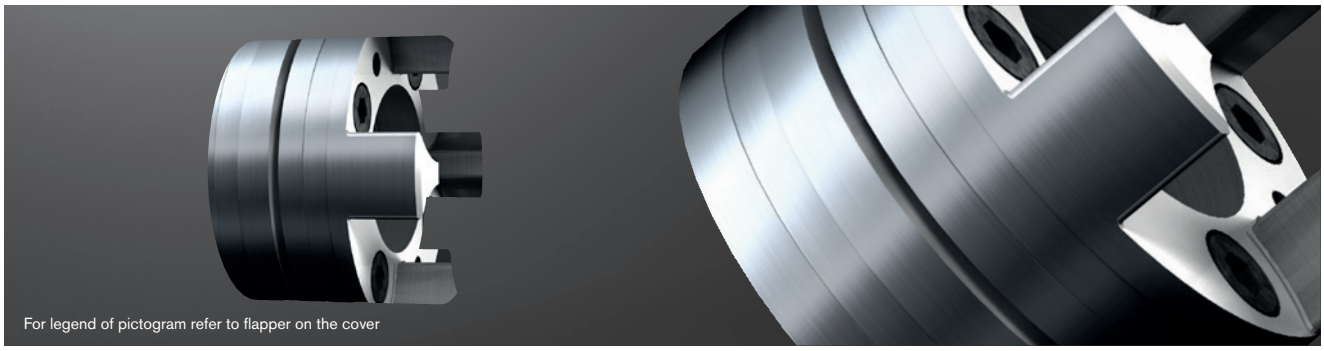
* Standard bore tolerance H7, special tolerances on request * From Ø55 tolerance G7/m6
The friction torque is reduced with bigger clearance.. Steel or nodular iron with a yield strength of approx. 250 N/mm² or more can be used as shaft material. For strength calculation of shaft/hollow shaft see KTR standard 45510 on our homepage www.ktr.com.
[3] Taper of hub with slot
[4] Clamping ring hub with screws M4, z = 8 and T_A = 2.9 Nm

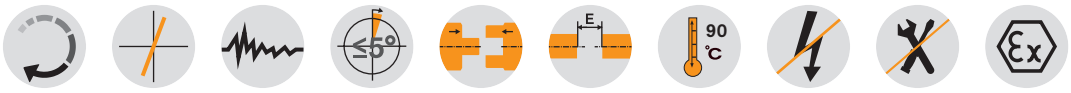
Ordering example:

ROTEX® GS 24	98 ShA-GS	d 20	6.0 light - Ø24		6.0 light - Ø20	
Coupling size	Spider hardness	**Optional:** Bore in spider	Hub type	Finish bore	Hub type	Finish bore

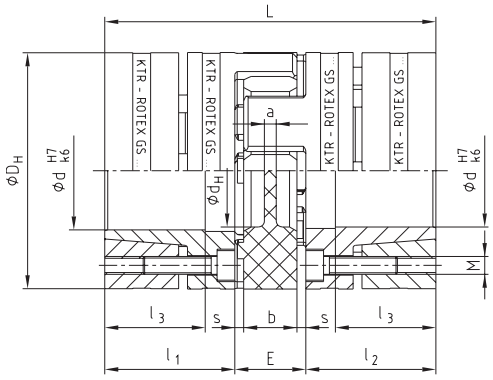
ROTEX® GS Clamping ring hubs made of steel
Backlash-free jaw couplings

Integrated clamping system made of steel





Extraction thread M_1 between clamping screws



ROTEX® GS clamping ring hubs steel

Size	Spider GS [1] torque T_{KN} [Nm]			Dimensions [mm]										Clamping screws DIN EN ISO 4762				Weight per hub with max. bore [kg]	Mass moment of inertia per hub with max. bore [kgm²]
	98 ShA	64 ShD	72 ShD	$d_{max.}$	D_H [2]	d_H	L	l_1, l_2	l_3	E	b	s	a	M	z = number	T_A [Nm]	M_1		
19	21	26	–	20	40	18	66	25	18	16	12	2.0	3.0	M4	6	4.1	M4	0.179	0.44 x 10^{-4}
24	60	75	97	28	55	27	78	30	22	18	14	2.0	3.0	M5	4	8.5	M5	0.399	1.91 x 10^{-4}
28	160	200	260	38	65	30	90	35	27	20	15	2.5	4.0	M5	8	8.5	M5	0.592	4.18 x 10^{-4}
38	325	405	525	48	80	38	114	45	35	24	18	3.0	4.0	M6	8	14	M6	1.225	12.9 x 10^{-4}
42	450	560	728	51	95	46	126	50	35	26	20	3.0	4.0	M8	4	41	M8	2.30	31.7 x 10^{-4}
48	525	655	852	55	105	51	140	56	41	28	21	3.5	4.0	M10	4	69	M10	3.08	52.0 x 10^{-4}
55	685	825	1072	70	120	60	160	65	45	30	22	4.0	4.5	M10	4	69	M10	4.67	103.0 x 10^{-4}
65	940	1175	1527	70	135	68	185	75	55	35	26	4.5	4.5	M12	4	120	M12	6.70	191.0 x 10^{-4}
75	1920	2400	3120	80	160	80	210	85	63	40	30	5.0	5.0	M12	5	120	M12	9.90	396.8 x 10^{-4}
90	3600	4500	5850	105	200	104	245	100	75	45	34	5.5	6.5	M16	5	295	M16	17.7	1136 x 10^{-4}

[1] For selections see page 22 et seqq./other spiders see page 121.
[2] $ØD_H$ + 2 mm with high speeds for expansion of spider

Review of shaft-hub-connection: Friction torques T_R [Nm] for hub type 6.0 steel

Size		Ø10	Ø11	Ø14	Ø15	Ø16	Ø19	Ø20	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50	Ø55*	Ø60*	Ø65*	Ø70*	Ø80*	Ø90*	Ø95*	Ø100*	Ø105*
19	H7/k6	27	32	69	84	57	94	110																					
	H7/h6	15	18	57	74	38	76	94																					
24	H7/k6			70	87	56	97	114	116	133	192																		
	H7/h6			55	74	32	72	93	84	103	173																		
28	H7/k6				108	131	207	148	253	285	315	382	330	433	503														
	H7/h6				74	97	172	94	207	242	267	343	260	377	453														
38	H7/k6							208	353	395	439	531	463	603	593	689	793	776											
	H7/h6							136	290	337	373	476	367	525	491	601	721	677											
42	H7/k6									445	495	595	526	677	671	775	718	872	1043	1061									
	H7/h6									387	429	540	429	600	569	687	599	773	970	978									
48	H7/k6											616	704	899	896	1030	962	1160	1379	1222	1543								
	H7/h6											513	590	806	775	924	822	1042	1290	1073	–								
55	H7/k6													863	856	991	918	1119	1110	1247	1277	1665	1605	2008					
	H7/h6													750	710	863	750	976	934	1089	–	–	–	–					
65	H7/k6															1446	1355	1637	1635	1827	1887	2429	2368	2930					
	H7/h6															1275	1135	1447	1404	1619	–	–	–	–					
75	H7/k6																1710	2053	2059	2294	2384	3040	2983	3664	4293				
	H7/h6																1460	1836	1797	2056	–	–	–	–	–				
90	H7/k6																			3845	4249	4795	5859	5906	7036	8047	9247	9575	10845
	H7/h6																			3445	–	–	–	–	–	–	–	–	–

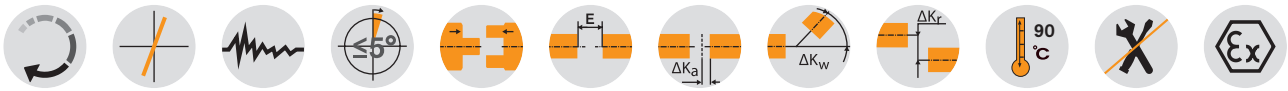
* From Ø55 tolerance G7/m6
The friction torque is reduced with bigger clearance.. For the strength calculation of shaft/hollow shaft see KTR standard 45510 on our homepage www.ktr.com.

Ordering example:

ROTEX® GS 24	98 ShA-GS	d 20	6.0 steel - Ø24		6.0 steel - Ø20	
Coupling size	Spider hardness	**Optional:** Bore in spider	Hub type	Finish bore	Hub type	Finish bore

ROTEX® GS P
Backlash-free jaw couplings

Highly accurate type P according to DIN 69002



ROTEX® GS P - hubs/clamping ring material steel

Size	Spider GS [1] torque T_{KN} [Nm]		Dimensions [mm]											Clamping screws DIN EN ISO 4762				Weight per hub $d_{standard}$ [3] [kg]	Mass moment of inertia per hub with bore $d_{standard}$ [3] [kgm²]
	98 ShA	64 ShD	$d_{max.}$	D_H [2]	d_H	L	l_1, l_2	l_3	E	b	s	a	d_3	M	z = number	T_A [Nm]	M1		
14 P	12.5	16	15	32	10.5	50	18.5	15.5	13	10	1.5	2	—	M3	4	1.89	M3	0.08	0.011 x 10^{-3}
19 P	21	26	20	40	18	66	25	21	16	12	2	3	—	M4	6	3.05	M4	0.19	0.046 x 10^{-3}
24 P	60	75	28	55	27	78	30	25	18	14	2	3	—	M5	4	8.5	M5	0.44	0.201 x 10^{-3}
28 P	160	200	38	65	30	90	35	30	20	15	2.5	4	—	M5	8	8.5	M5	0.64	0.438 x 10^{-3}
38 P	325	405	48	80	38	114	45	40	24	18	3	4	—	M6	8	14	M6	1.32	1.325 x 10^{-3}
42 P	450	560	51	95	46	126	50	45	26	20	3	4	18.5	M8	4	35	M8	2.23	3.003 x 10^{-3}
48 P	525	655	55	105	51	140	56	50	28	21	3.5	4	20.5	M10	4	69	M10	3.09	5.043 x 10^{-3}
55 P	685	825	70	120	60	160	65	58	30	22	4	4.5	22.5	M10	4	69	M10	4.74	10.02 x 10^{-3}
65 P	940	1175	70	135	68	185	75	55	35	26	4.5	4.5	30	M12	4	120	M12	6.70	191.0 x 10^{-4}
75 P	1920	2400	80	160	80	210	85	63	40	30	5.0	5.0	40	M12	5	120	M12	9.90	396.8 x 10^{-4}
90 P	3600	4500	105	200	104	245	100	75	45	34	5.5	6.5	50	M16	5	295	M16	17.7	1136 x 10^{-4}

[1] For selections see page 22 et seqq./other spiders see page 121.
[2] Ø D_H + 2 mm with high speeds for expansion of spider
For the strength calculation of shaft/hollow shaft see KTR standard 45610 on our homepage www.ktr.com.

Review of shaft-hub-connection: Friction torques T_R [Nm] for hub type 6.0 steel

Size		Ø10	Ø11	Ø14	Ø15	Ø16	Ø19	Ø20	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50	Ø55*	Ø60*	Ø65*	Ø70*	Ø80*	Ø90*	Ø95*	Ø100*	Ø105*
14	H6/k6	11	13	29																									
	H6/h6	3	4	23																									
19	H6/k6	34	41	75	90	68	104	119																					
	H6/h6	22	26	64	80	49	85	103																					
24	H6/k6			79	95	70	110	126	134	149	201																		
	H6/h6			64	82	46	85	104	101	119	183																		
28	H6/k6				128	150	225	177	278	307	341	403	366	461	528														
	H6/h6				94	117	191	123	232	265	293	364	295	405	478														
38	H6/k6							247	386	426	475	560	511	641	644	733	828	825	970										
	H6/h6							174	323	368	408	505	415	564	542	645	757	726	897										
42	H6/k6									389	433	512	464	585	586	669	631	753	888	906									
	H6/h6									330	367	457	368	508	485	581	512	654	815	823									
48	H6/k6											672	762	945	957	1082	1033	1219	1423	1296	1606								
	H6/h6											568	647	852	836	977	892	1101	1334	1148	-								
55	H6/k6													920	929	1055	1002	1190	1198	1325	1388	1743	1722	2088					
	H6/h6													807	783	927	834	1047	1022	1168	-	-	-	-					
65	H6/k6															1532	1465	1731	1750	1931	2034	2534	2521	3038					
	H6/h6															1361	1245	1542	1520	1723	-	-	-	-					
75	H6/k6																1835	2161	2190	2413	2551	3161	3158	3789	4421				
	H6/h6																1585	1944	1928	2175	-	-	-	-	-				
90	H6/k6																			4046	4503	5057	6079	6181	7324	8398	9530	9892	11084
	H6/h6																			3645	-	-	-	-	-	-	-	-	-

* From Ø55 tolerance G6/m6.
The friction torque is reduced with bigger clearance.. For the strength calculation of shaft/hollow shaft see KTR standard 45610 on our homepage www.ktr.com.

Assignment for stub spindles according to DIN 69002

Spindle drive	ROTEX® GS P size	Dimensions according to DIN 69002										
		Standard spindle shaft diameter d	d_1	d_2	d_3	D_H	l_1, l_2	L	E	Transmittable torque T_R with d [Nm] [3]	Weight per hub with bore $d_{standard}$ [3] [kg]	Mass moment of inertia with bore $d_{standard}$ [3] [kgm²]
25 x 20	14 P	14	17	17	8.5	32	18.5	50	13	25	0.08	0.011 x 10^{-3}
32k x 25	19 P37.5	16	20	19	9.5	37.5	25	66	16	60	0.16	0.037 x 10^{-3}
32g x 30	19 P	19	23	22	9.5	40	25	66	16	71	0.19	0.046 x 10^{-3}
40 x 35	24 P50	24	28	29	12.5	50	30	78	18	108	0.331	0.136 x 10^{-3}
50 x 45	24 P	25	30	30	12.5	55	30	78	18	170	0.44	0.201 x 10^{-3}
63 x 55	28 P	35	40	40	14.5	65	35	90	20	506	0.64	0.438 x 10^{-3}
80 x 75	38 P	40	46	46	16.5	80	45	114	24	821	1.32	1.325 x 10^{-3}

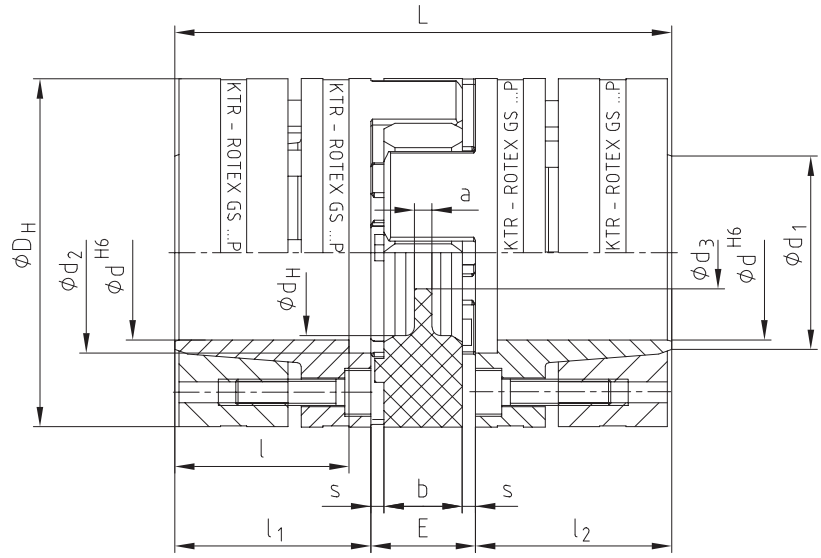
[3] Standard spindle shaft diameter

Ordering example:

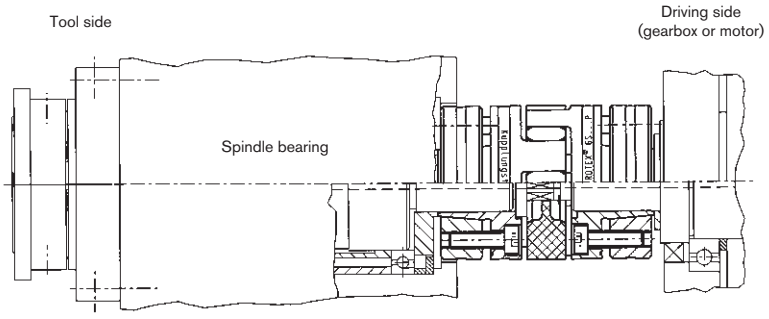
ROTEX® GS 24 P	98 ShA-GS	6.0 - Ø25		6.0 - Ø25	
Coupling size	Spider hardness	Hub type	Finish bore	Hub type	Finish bore

Components

Extraction thread M_1 between clamping screws

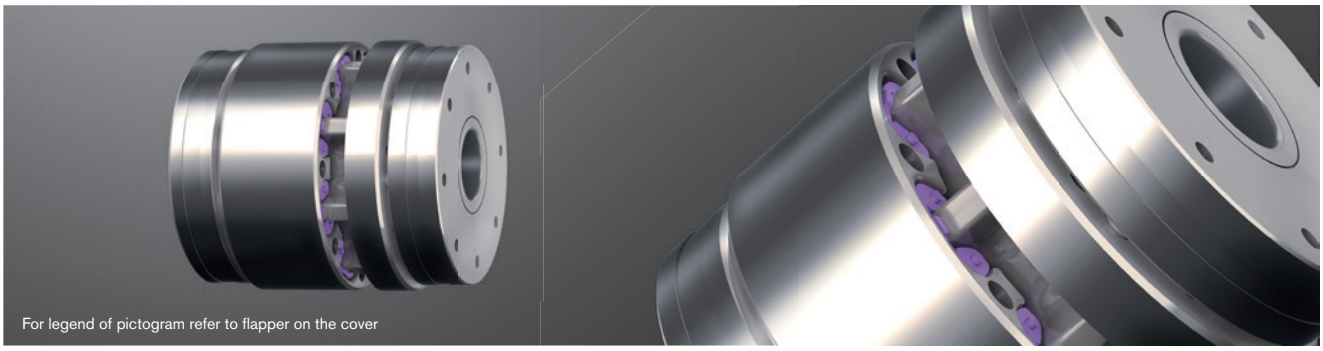


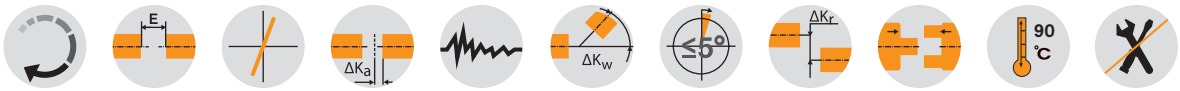
ROTEX® GS P with central coolant supply for stub spindles and multiple spindle heads



ROTEX® GS HP
Backlash-free shaft coupling

Highly accurate closed coupling system





ROTEX® GS HP - clamping ring hubs/clamping ring material steel

Size	Tooth element ROTEX® GS HP [1] torque T_{KN} [Nm]		Max. speed [rpm]	Dimensions [mm]										Clamping screws DIN EN ISO 4762			Weight of coupling with max. bore [kg]	Mass moment of inertia of coupling with max. bore [kgm²]
	52 ShD	65 ShD		Max. d_1, d_2	D_H	D	L	l_1, l_2	l_3, l_4	N	E	b	s	M	z = number	T_A [Nm]		
24	100	125	59,000	25	55	48	73	24.5	18	15	24	20	2	5	5	7.7	0.74	0.000317
28	160	200	47,000	35	66	58	78	27	17	17	24	20	2	5	6	7.7	1.02	0.000653
38	400	500	39,000	45	80	76	82	29	18	18	24	20	2	5	8	7.7	1.54	0.001534
42	475	590	35,000	51	95	82	99	36	24	24	27	22	2.5	6	8	13	2.59	0.003441
48	550	685	30,000	55	105	92	101	37	25	25	27	22	2.5	6	9	13	3.39	0.005481
55	725	905	26,000	60	120	105	103	38	26	26	27	22	2.5	6	10	13	6.84	0.009172
65	1075	1340	22,500	70	139	125	107	40	27	25.3	27	22	2.5	6	12	14	7.00	0.019633

[1] For selections see page 22 et seqq./other spiders see page 121.

Review of shaft-hub-connection: Friction torques T_R [Nm] for hub type 6.0 steel

Size		Ø12	Ø15	Ø18	Ø19	Ø20	Ø22	Ø25	Ø28	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50	Ø55 *	Ø60 *	Ø65 *
24	H6/k6	55	102	165	115	133	172	241												
	H6/h6	34	82	150	81	100	143	222												
28	H6/k6		125	199	226	158	202	280	246	340	432									
	H6/h6		99	177	201	111	157	240	195	292	398									
38	H6/k6					216	274	376	374	508	635	586	666	752	649					
	H6/h6					170	231	339	318	452	592	509	589	674	524					
42	H6/k6									665	830	1015	770	871	1035	1215	1153			
	H6/h6									570	749	953	656	766	948	1150	1076			
48	H6/k6													1128	1321	1530	1211	1477		
	H6/h6													914	1102	1306	985	–		
55	H6/k6													1314	1543	1562	1711	1562	1915	
	H6/h6													1217	1463	1329	1474	–	–	
65	H6/k6														1606	1852	2026	1891	2306	2134
	H6/h6														1349	1584	1751	–	–	–

* From Ø55 G6/m6.
The friction torque depends on the speed.
The friction torque is reduced with bigger clearance.. For the strength calculation of shaft/hollow shaft see KTR standard 45710 on our homepage www.ktr.com.

Technical data

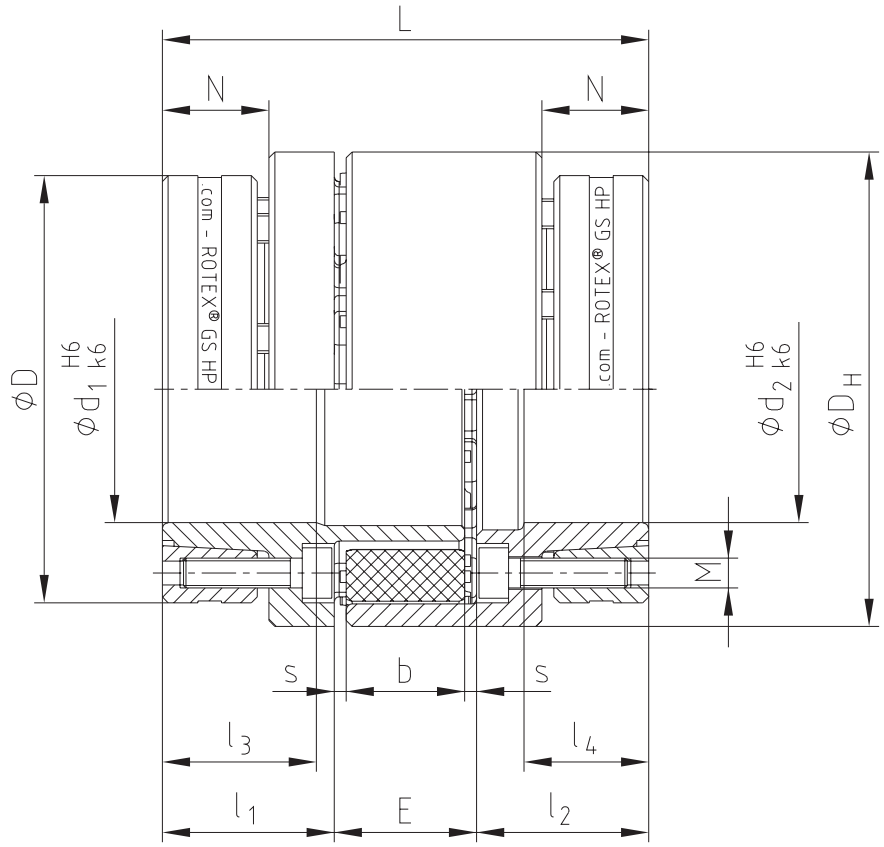
Size	Tooth element ROTEX® GS HP	Displacements			Torsional stiffness [Nm/rad]		Radial spring stiffness [N/mm]	Axial stiffness [N/mm]
		Axial ΔKa [mm]	Radial ΔKr [mm]	Angular ΔKw [degree]	$C_{T\,stat.}$	$C_{T\,dyn.}$	Cr	C_a
24	52 ShD	+1.0/-0.8	0.10	0.9	3,780	10,950	7,210	3,440
	64 ShD		0.07	0.8	6,050	17,520	10,100	4,820
28	52 ShD		0.10	0.9	7,760	23,980	8,380	4,360
	64 ShD		0.07	0.8	12,420	38,370	11,740	6,110
38	52 ShD		0.10	0.9	27,800	69,000	11,190	6,280
	64 ShD		0.07	0.8	44,480	110,400	15,670	8,790
42	52 ShD		0.14	0.9	52,950	101,750	12,490	7,410
	64 ShD		0.10	0.8	84,720	162,800	17,490	10,380
48	52 ShD	+1.4/-1.0	0.14	0.9	64,140	128,530	11,480	8,230
	64 ShD		0.10	0.8	102,620	205,640	16,070	11,520
55	52 ShD		0.14	0.9	87,500	198,940	12,240	9,830
	64 ShD		0.10	0.8	140,000	318,300	17,140	13,770
65	52 ShD		0.14	0.9	110,350	295,200	14,000	14,820
	64 ShD		0.10	0.8	174,930	472,300	19,600	20,750

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.

Ordering example:

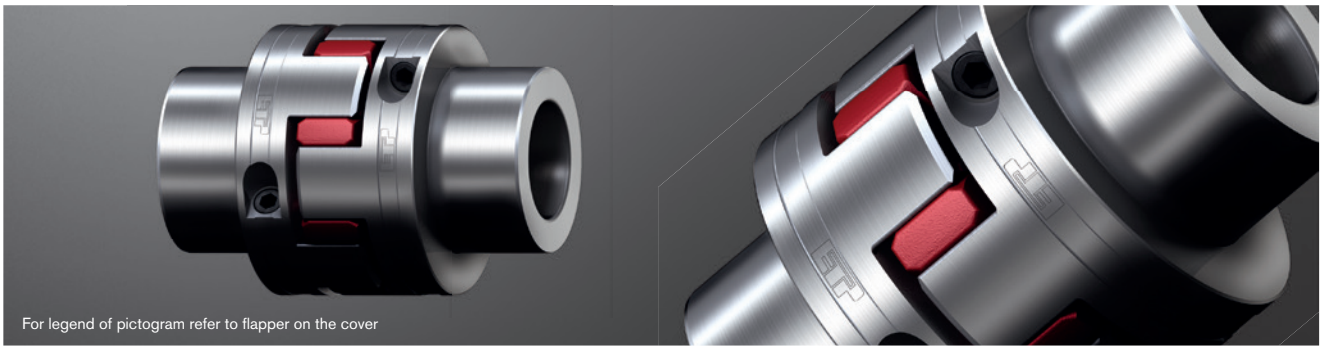
ROTEX® GS 24 HP	98 ShA-GS	d1 6.0 - Ø25		d2 6.0 - Ø25	
Coupling size	Hardness of tooth element	Hub type	Finish bore	Hub type	Finish bore

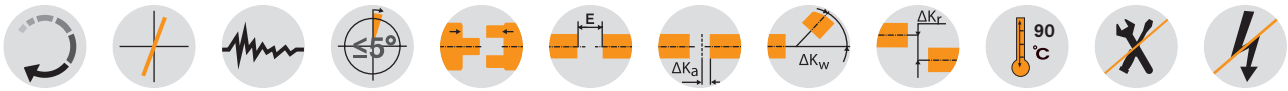
Components

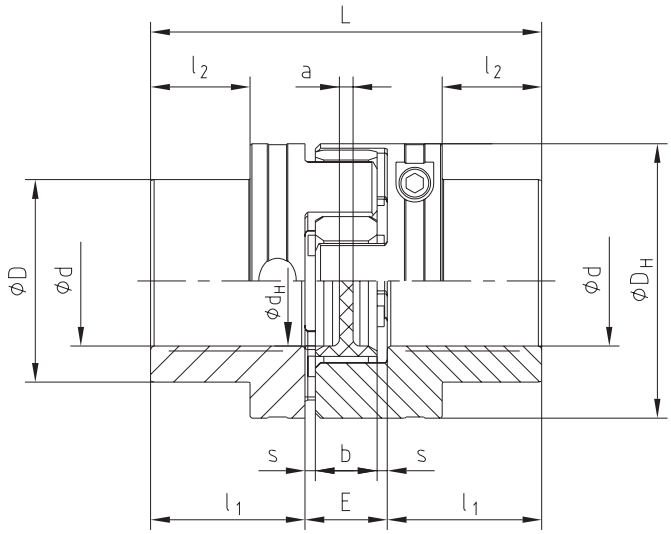

L
N
N
com - ROTEX® GS HP
com - ROTEX® GS HP
ϕD
ϕd1 H6 k6
ϕd2 H6 k6
ϕDH
M
s
b
s
l3
l4
l1
E
l2

ROTEX® GS P ETP®
Backlash-free jaw couplings

Integrated hydraulic clamping system







ROTEX® GS P ETP®																
Size	Spider GS [1] torque T_{KN} [Nm]			Dimensions [mm]										Screw		Weight per hub with max. bore [kg]
	92 ShA	98 ShA	64 ShD	$d_{max.}$	D_H [2]	d_H	L	l_1	l_2	E	b	s	a	M	T_A [Nm]	
24	35	60	75	24	55	27	78	30	16	18	14	2	3	M6	5	0.33
28	95	160	200	32	65	30	90	35	20	20	15	2.5	4	M6	5	0.53
38	190	325	405	40	80	38	114	45	29	24	18	3	4	M6	5	0.98
42	265	450	560	48	95	46	126	50	34	26	20	3.5	4	M6	5	1.51

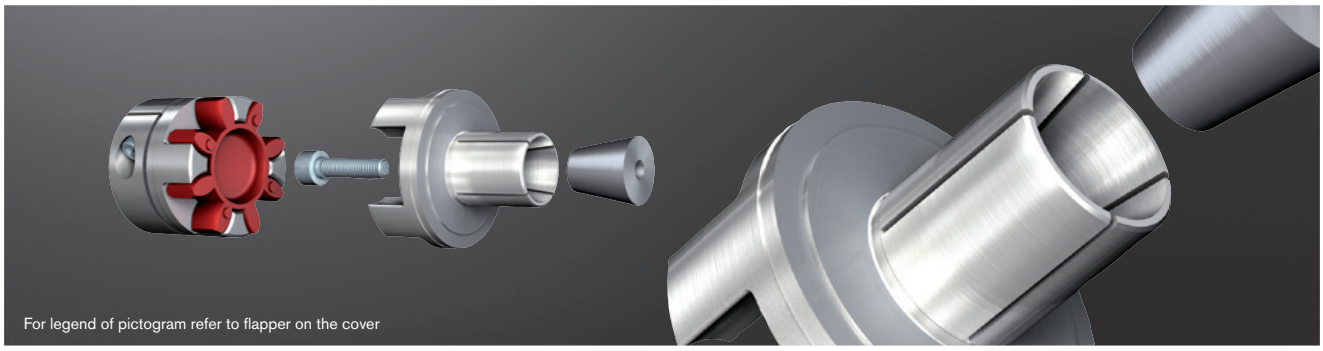
[1] For selections see page 22 et seqq./other spiders see page 121.
[2] $ØD_H$ + 2 mm with high speeds for expansion of spider

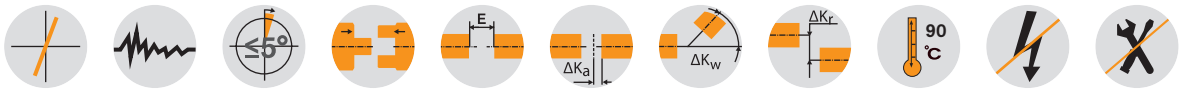
Review of shaft-hub-connection: Friction torques T_R [Nm] for hub type ROTEX® GS P ETP®																
Size	Tolerance fit	Bore diameter d/collar diameter D														
		Ø15/ Ø24	Ø16/ Ø26	Ø19/ Ø30	Ø20/ Ø32	Ø24/ Ø39	Ø25/ Ø40	Ø28/ Ø44	Ø30/ Ø47	Ø32/ Ø50	Ø35/ Ø55	Ø38/ Ø59	Ø40/ Ø62	Ø42/ Ø65	Ø45/ Ø70	Ø48/ Ø74
24	F6/h6	42	50	70	80	125										
28		50	60	80	95	150	160	210	230	250						
38						220	230	310	350	380	450	570	610			
42							270	360	410	440	540	660	730	820	940	1100

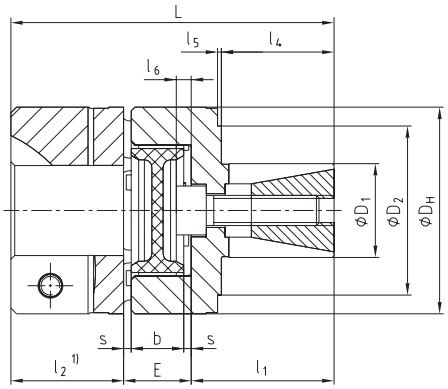
ETP® is a registered trademark by ETP® Transmission AB.

Ordering example:	ROTEX® GS P ETP® 24	98 ShA-GS	d 20	Ø24	Ø20
	Coupling size	Spider hardness	**Optional:** Bore in spider	Finish bore	Finish bore

Clamping system for hollow shaft connection





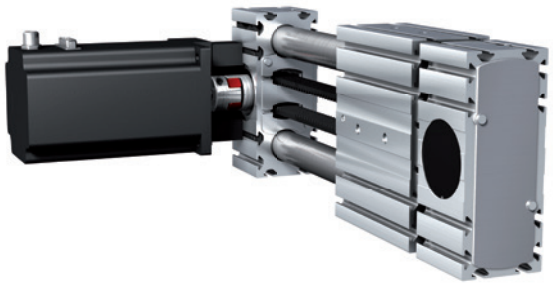


ROTEX® GS expansion hub - Expansion hub material aluminium/clamp pin material stainless steel

Size	Spider GS [2] torque T_{KN} [Nm]					Dimensions [mm]												Friction torque [3] [Nm]
	80 ShA	92 ShA	98 ShA	64 ShD	72 ShD	D_1 [2]	D_2	D_H	l_1 [2]	l_2	l_4 [2]	l_5 [2]	l_6	L	E	b	s	
9	1.8	3.0	5.0	6.0	–	10	–	20	20	10	11	–	0	40	10	8	1.0	6.4
12	3.0	5.0	9.0	12.0	–	10	20	25	19	11	14	1.5	2	42	12	10	1.0	7.7
14	4.0	7.5	12.5	16.0	–	12	24	30	18.5	11	12.5	3	2	42.5	13	10	1.5	7.7
19	6.0	12.0	21.0	26.0	–	20	35	40	28	25	20	1	0	69	16	12	2.0	35.7
24	–	35	60	75	97	25	45	55	38	30	30	1	4	86	18	14	2.0	82.0
28	–	95	160	200	260	35	55	65	44	35	36	1	5	99	20	15	2.5	182.0

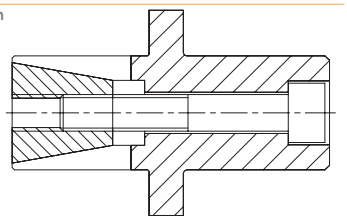
[1] For selections see page 22 et seqq./other spiders see page 121.
[2] Example: Other dimensions on customers' request.
[3] The friction torque applies for the figures D_1, l_1, l_4 and l_5 specified and a hollow shaft material steel.

ROTEX® GS expansion hub for axis of belt

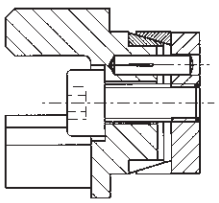


Special types for hollow shaft connections

Shaft extension



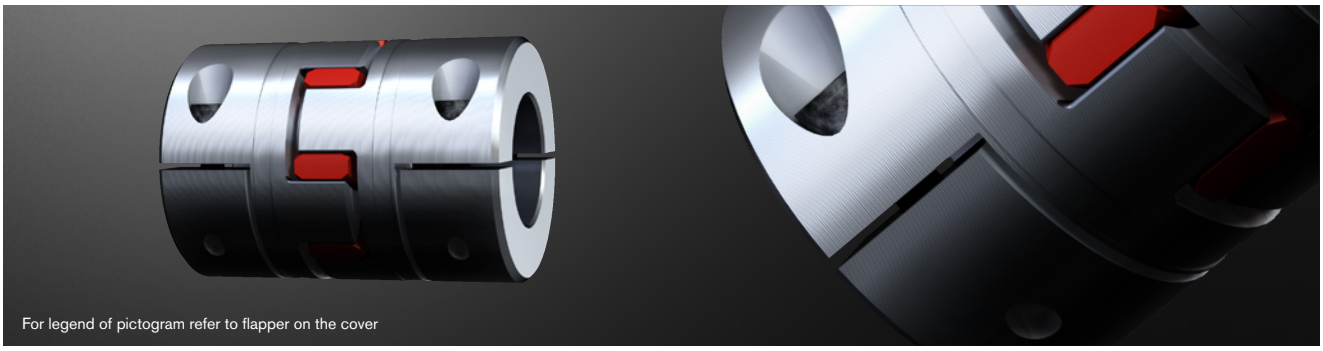
ROTEX® GS hub with CLAMPEX® KTR 150

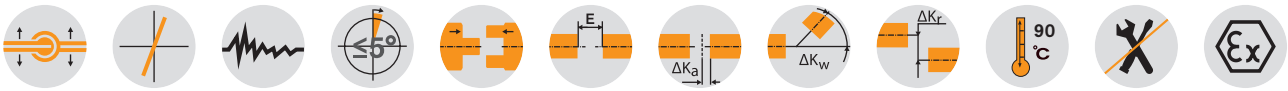


Ordering example:	ROTEX® GS 24	98 ShA-GS	d 20	9.0 – Ø24		2.5 – Ø20	
	Coupling size	Spider hardness	**Optional:** Bore in spider	Hub type	Finish bore	Hub type	Finish bore

ROTEX® GS A-H
Backlash-free jaw couplings

Drop-out center design coupling





ROTEX® GS type A-H - Hub material aluminium												
Size	Dimensions [mm]										Cap screws DIN EN ISO 4762	
	$d_{max.}$	L	l_1, l_2	E	b	s	D_H	DK	x_1, x_2	E_1	M	T_A [Nm]
19	20	66	25	16	12	2.0	40	46	17.5	31	M6	10
24	30	78	30	18	14	2.0	55	57.5	22.0	34	M6	10
28	38	90	35	20	15	2.5	65	73	25.0	40	M8	25
38	45	114	45	24	18	3.0	80	83.5	33.0	48	M8	25
42	50	126	50	26	20	3.0	95	93.5	36.5	48	M10	49

Technical data								
Size	Spider Shore-GS [1]	Shore scale	Max. speed [rpm]	Torque [Nm]		Static torsion spring stiffness [Nm/rad]	Weight per hub with max. bore [kg]	Mass moment of inertia J per hub with max. bore [kgm²]
				T_{KN}	$T_{K\,max}$			
19	80	A	9550	6.0	12.0	618	77 x 10^{-3}	19.6 x 10^{-6}
	92	A		12.0	24.0	1090		
	98	A		21.0	42.0	1512		
	64	D		26.0	52.0	2560		
24	92	A	6950	35	70	2280	161 x 10^{-3}	77.3 x 10^{-6}
	98	A		60	120	3640		
	64	D		75	150	5030		
28	92	A	5850	95	190	4080	240 x 10^{-3}	173 x 10^{-6}
	98	A		160	320	6410		
	64	D		200	400	10260		
38	92	A	4750	190	380	6525	470 x 10^{-3}	496 x 10^{-6}
	98	A		325	650	11800		
	64	D		405	810	26300		
42	92	A	4000	265	530	10870	1770 x 10^{-3}	2409 x 10^{-6}
	98	A		450	900	21594		
	64	D		560	1120	36860		

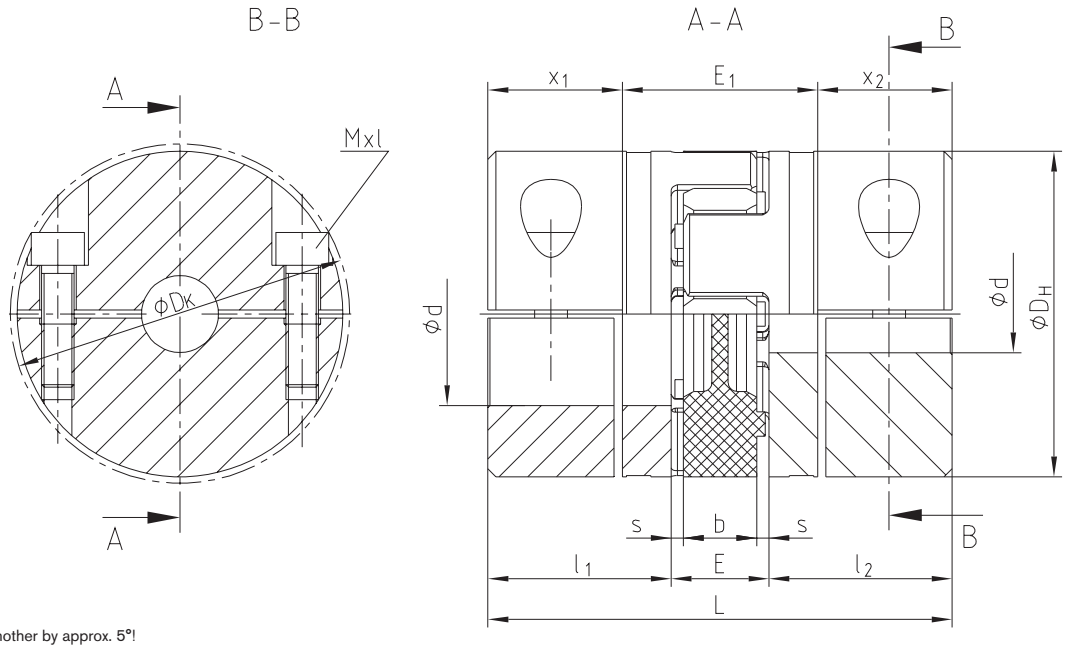
[1] For selections see page 22 et seqq./other spiders see page 121.
[2] Static torsion spring stiffness with 0.5 x T_{KN}
To make sure that the coupling can be radially assembled/disassembled, observe the insertion dimension x1/x2 of the shafts.

Review of shaft-hub-connection: Friction torques T_R [Nm] for hub type 7.8																							
Size	Ø8	Ø10	Ø11	Ø14	Ø15	Ø16	Ø18	Ø19	Ø20	Ø22	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø46	Ø48	Ø50
19	17	21	23	30	32	34	38	40	42														
24		21	23	30	32	34	38	40	42	47	51	53	59	63									
28				54	58	62	70	74	78	86	93	97	109	117	124	136	148						
38							70	74	78	86	93	97	109	117	124	136	148	156	163	175			
42										136	149	155	174	186	198	217	235	248	260	279	285	297	310

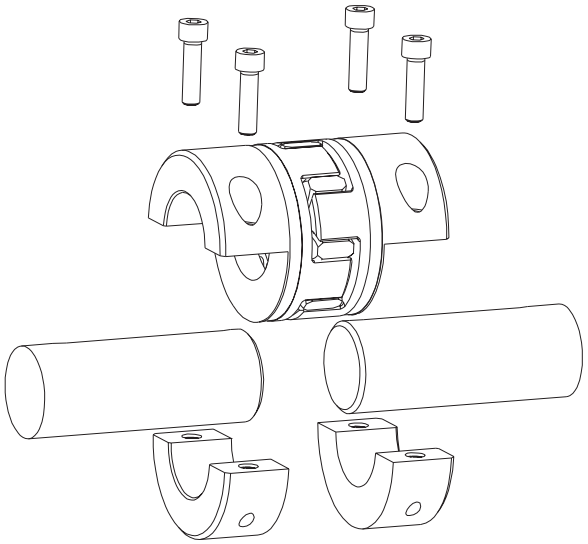
Ordering example:

ROTEX® GS 38	A-H	98 ShA-GS	7.8 – Ø38		7.9 – Ø30	
Coupling size	Type	Spider hardness	Hub type	Finish bore	Hub type	Finish bore

Type A-H

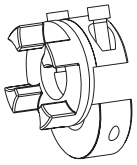


Caution:
Feather keyways are offset to one another by approx. 5°!
Hub material: Al-H



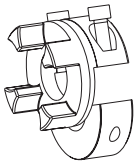
Types of hubs

Type 7.8



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

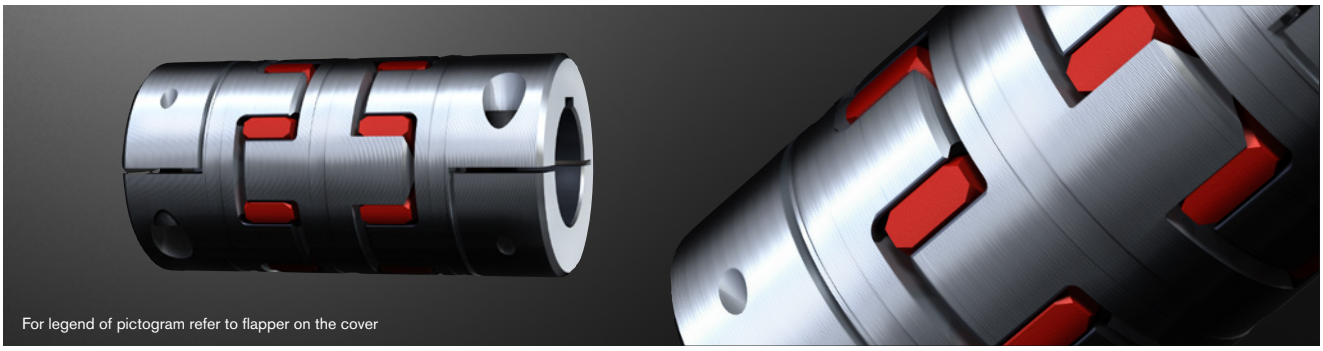
Type 7.9

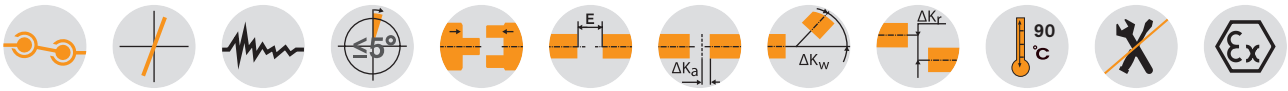


clamping hub type H with feather keyway for single-cardanic connection

ROTEX® GS DKM
Backlash-free jaw couplings

Double-cardanic jaw coupling



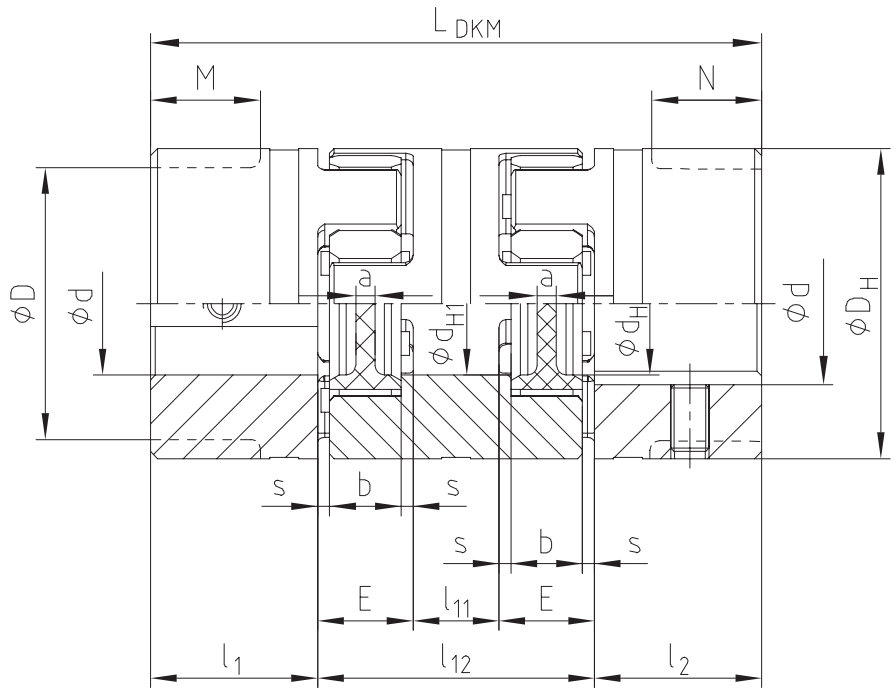


ROTEX® GS DKM - Spacer material aluminium/hub material depends on hub type																
Size	Spider GS [1] torque T_{KN} [Nm]		Dimensions [mm]													
	98 ShA	64 ShD	$d_{max.}$ [2]	D	D_H	d_H	d_{H1}	l_1, l_2	M, N	l_{11}	l_{12}	L_{DKM}	E	b	s	a
5	0.9	—	5	—	10	—	—	5	—	3	13	23	5	4	0.5	4.0
7	2.0	2.4	7	—	14	—	—	7	—	4	20	34	8	6	1.0	6.0
9	5.0	6.0	11	—	20	7.2	—	10	—	5	25	45	10	8	1.0	1.5
12	9.0	12.0	12	—	25	8.5	—	11	—	6	30	52	12	10	1.0	3.5
14	12.5	16.0	16	—	30	10.5	—	11	—	8	34	56	13	10	1.5	2.0
19	21.0	26.0	24	—	40	18.0	18	25	—	10	42	92	16	12	2.0	3.0
24	60	75	30	—	55	27.0	27	30	—	16	52	112	18	14	2.0	3.0
28	160	200	38	—	65	30.0	30	35	—	18	58	128	20	15	2.5	4.0
38	325	405	45	—	80	38.0	38	45	—	20	68	158	24	18	3.0	4.0
42	450	560	55	85	95	46	46	50	28	22	74	174	26	20	3.0	4.0
48	525	655	62	95	105	51	51	56	32	24	80	192	28	21	3.5	4.0
55	685	825	74	110	120	60	60	65	37	28	88	218	30	22	4.0	4.5

[1] For selections see page 22 et seqq./other spiders see page 121.
[2] Dependent on hub type. Hub types can be freely selected, for summary see page 126.

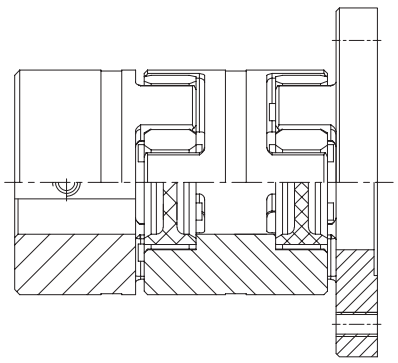
Ordering example:

ROTEX® GS 24	DKM	98 ShA-GS	d 25	1.0 - Ø25		2.5 - Ø25	
Coupling size	Type	Spider hardness	**Optional:** Bore in spider	Hub type	Finish bore	Hub type	Finish bore

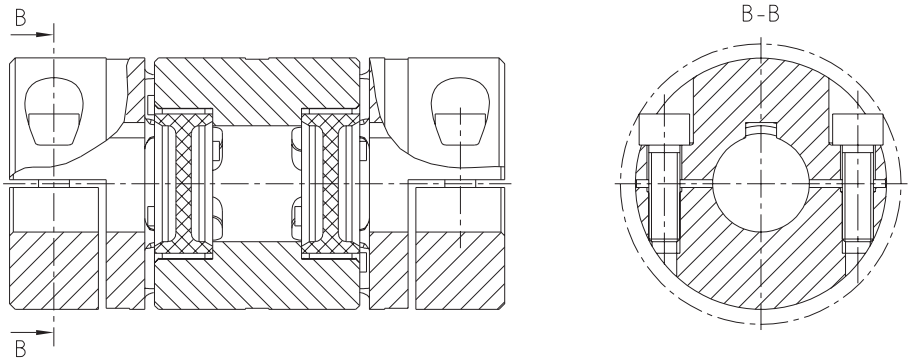


Other types:

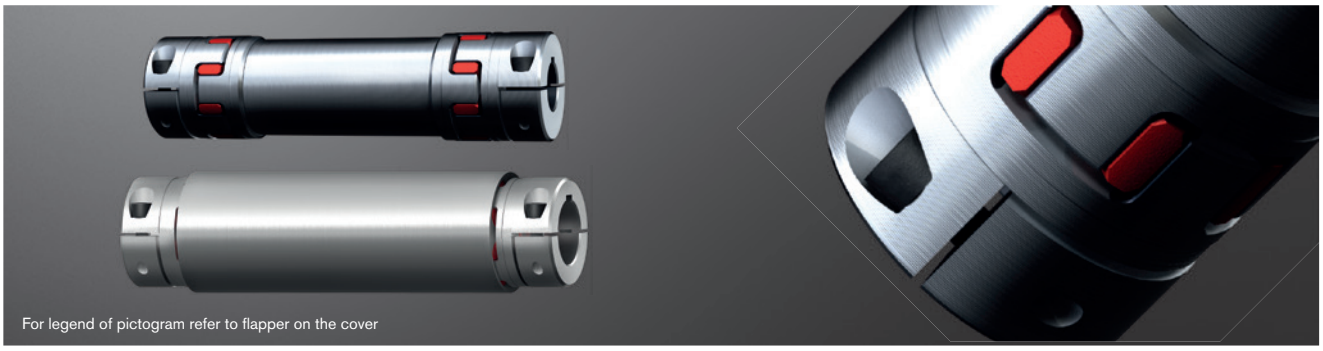
ROTEX® GS - CF - DKM



ROTEX® GS DKM-H



Intermediate shaft coupling with aluminium pipe



ROTEX® GS Type ZR3 - Hub material aluminium/intermediate pipe material aluminium

Size	Dimensions [mm]															
	$d_{max.}$	D_H	l_1	L	l_3	E	L_R		$L_{ZR} = L_R + 2 \bullet l_3$		d_R	DK	t_1	e	Cap screws DIN EN ISO 4762	
							min.	Max.	min.	Max.					M	T_A [Nm]
14	15	30	18.5	36.0	14.5	13	72	2971	101	3000	28	33.3	7.5	10.5	M4	2.9
19	20	40	25	49.0	17.5	16	98	2965	133	3000	40	46	8.0	14.5	M6	10
24	30	55	30	59.0	22.0	18	121	3456	165	3500	50	57.5	10.5	20	M6	10
28	38	65	35	67.0	25.0	20	137	3950	187	4000	60	73	11.5	25	M8	25
38	45	80	45	83.5	33.0	24	169	3934	235	4000	70	83.5	15.5	30	M8	25
42	50	95	50	93.0	36.5	26	180	3927	253	4000	80	93.5	18.0	32	M10	49
48	55	105	56	100.0	39.5	28	202	3921	281	4000	100	105	18.5	36	M12	86

Technical data of type ZR3

Size	Spider GS [1] torque T_{KN} [Nm]		Moment of inertia [10^{-3} kgm²]			Static torsion spring stiffness [3] [Nm/rad]
	98 ShA	64 ShD	Hub [2]	ZR hub	Pipe/meter	ZW C_2
14	12.5	16.0	0.00362	0.00238	0.088	858
19	21.0	26.0	0.02002	0.01304	0.329	3243.6
24	60.0	75.0	0.07625	0.04481	0.673	6631.8
28	160	200	0.17629	0.10950	1.199	11814.1
38	325	405	0.50385	0.2572	2.972	29290.4
42	450	560	1.12166	0.5523	4.560	44929.7
48	525	655	1.87044	1.1834	9.251	91158.2

[1] For selections see page 22 et seqq./other spiders see page 121.
[2] With $d_{max.}$
[3] Torsion spring stiffness with a length of 1 m of intermediate pipe with $L_{pipe} = L_{ZR} - 2 \cdot L$

For inquiries and orders please specify the shaft distance dimension L_R along with the maximum speed to review the critical bending speed. See diagramme on page 125.
The intermediate pipe can be combined with other hub types, but in that case it can no longer be radially disassembled. Please specify the required shaft distance dimension in your order.
Straightness/concentricity of pipes according to DIN EN 755-1.

ROTEX® type ZRS

Size	Dimensions [mm]								Intermediate pipe Torsion spring stiffness C [4]	Cap screws DIN EN ISO 4762		LZRS	min. L_R
	$d_{min.} - d_{max.}$	DH	l_1, l_2	l3	t1	e	DK	DH1	[Nm/rad]	M	Tightening torque T_A [Nm]		
19	0 - 20	40	25	17.5	8.0	14.5	46.0	45	3800	M6	10		33
24	0 - 24	55	30	22.0	15.0	20.0	57.5	60	11100	M6	10		37
28	0 - 38	65	35	25.0	17.5	25.0	73.0	72	23600	M8	25	$L_{ZRS} = L_R + 2 \times l_3$	40
38	24 - 45	80	45	33.0	22.5	30.0	83.5	87	43800	M8	25		49
42	24 - 55	95	50	36.5	25.0	30.0	97.0	103	82600	M10	49		53

[4] Torsion spring stiffness with an intermediate pipe length of 1 m

With vertical application a support washer has to be used (please specify in your order).
Insertion dimension of shaft l_3, to make sure the coupling can be radially assembled/disassembled.

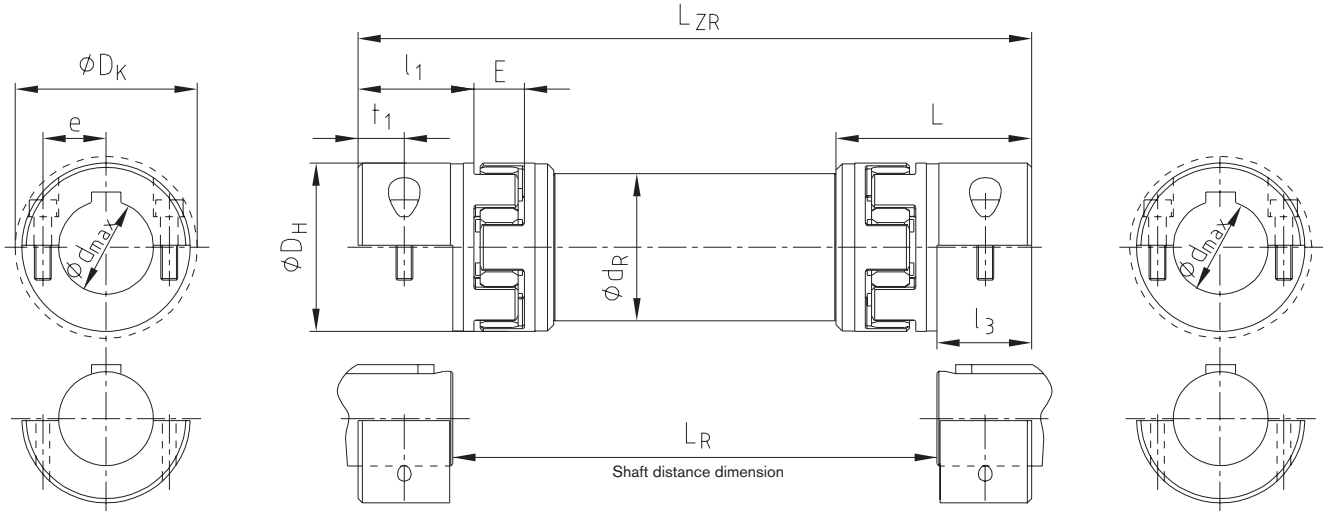
Review of shaft-hub-connection: Friction torques T_R [Nm] for hub type 7.5

Size	Ø6	Ø8	Ø10	Ø11	Ø14	Ø15	Ø16	Ø18	Ø19	Ø20	Ø22	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø46	Ø48	Ø50	Ø55
14	5.5	7.4	9.2	10.1	12.9	13.8																			
19		17	21	23	30	32	34	38	40	42															
24			21	23	30	32	34	38	40	42	47	51	53	59	63										
28					54	58	62	70	74	78	86	93	97	109	117	124	136	148							
38								70	74	78	86	93	97	109	117	124	136	148	156	163	175				
42											136	149	155	174	186	198	217	235	248	260	279	285	297	310	
48											199	217	226	253	271	290	317	344	362	380	407	416	434	452	498

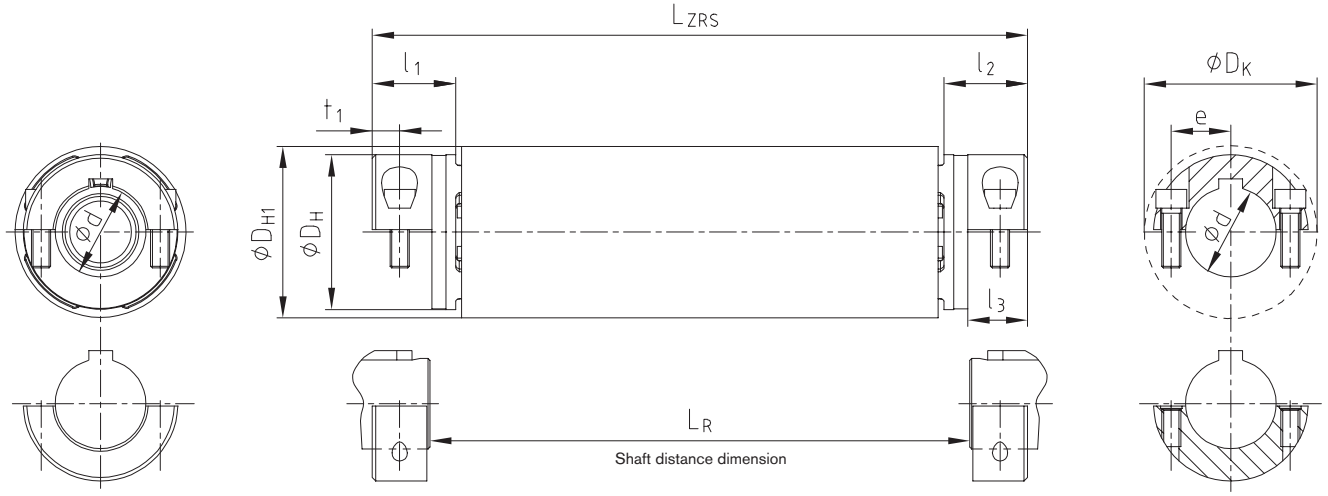
Ordering example:

ROTEX® GS 24	ZR3	1200 mm	98 ShA-GS	7.5 - Ø24		7.5 - Ø24	
Coupling size	Type	Shaft distance dimension (L_R)	Spider hardness	Hub type	Finish bore	Hub type	Finish bore

Type ZR3

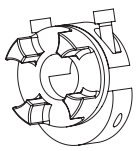


Type ZRS



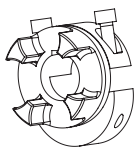
Types of hubs

Type 7.5



Clamping hub type DH without feather keyway for double-cardanic connections

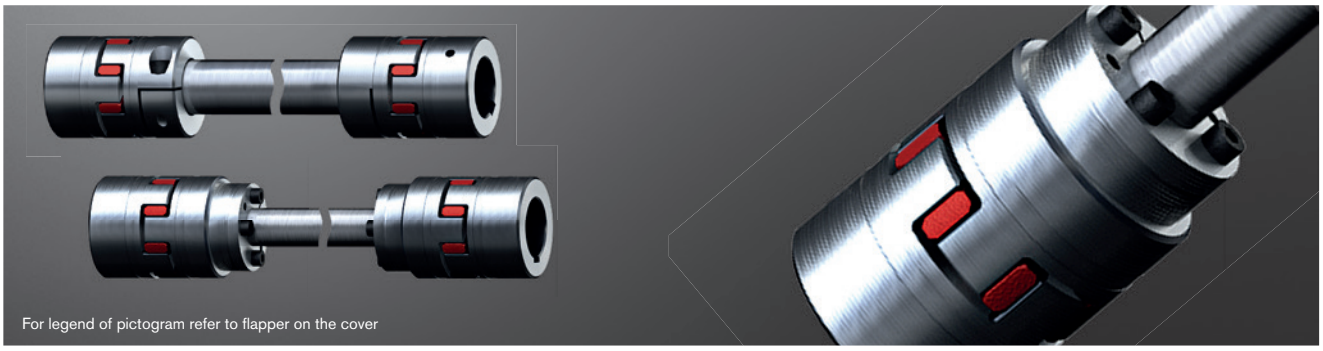
Type 7.6



Clamping hub type DH with feather keyway for double-cardanic connections

ROTEX® GS ZR1 and ZR2
Backlash-free intermediate shaft couplings

Intermediate shaft couplings with steel pipe/steel shaft



ROTEX® GS Type ZR1

Size	Spider GS [1] torque T_{KN} [Nm]		Dimensions [mm]												Cap screws DIN EN ISO 4762		Friction torque T_R [Nm]
	98 ShA	64 ShD	$d_{max.}$ [2]	D_H	l_1, l_2	L	E	b	s	B	L_{R1}	Minimum dimension for L_{R1}	L_{ZR1}	d_R [3]	M	T_A [Nm]	
14 ZR1	12.5	16.0	16	30	11	35	13	10	1.5	11.5	Please specify with inquiries and orders.	71	L_{R1}+22	14x2.5	M3	1.34	6.1
19 ZR1	21.0	26.0	24	40	25	66	16	12	2.0	14.0		110	L_{R1}+50	20x3.0	M6	10.5	34
24 ZR1	60	75	28	55	30	78	18	14	2.0	16.0		128	L_{R1}+60	25x2.5	M6	10.5	45
28 ZR1	160	200	38	65	35	90	20	15	2.5	17.5		145	L_{R1}+70	35x4.0	M8	25	105
38 ZR1	325	405	45	80	45	114	24	18	3.0	21.0		180	L_{R1}+90	40x4.0	M8	25	123

ROTEX® GS Type ZR2

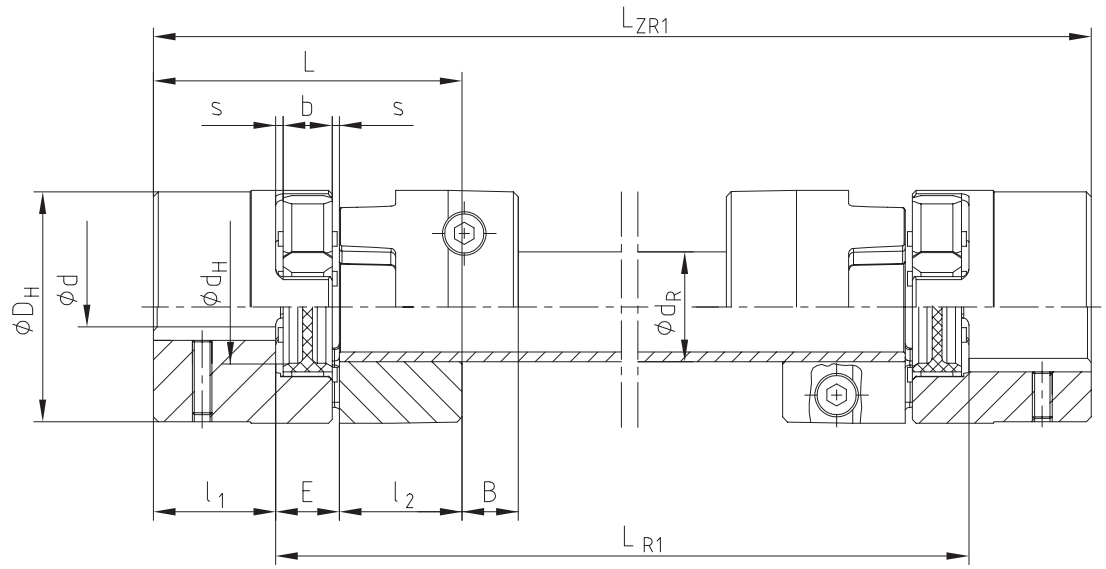
Size	Spider GS [1] torque T_{KN} [Nm]		Dimensions [mm]												Precision tube		Clamping set size KTR 250	Clamping screws DIN EN ISO 4762	Tightening torque T_A [Nm]
	98 ShA	64 ShD	dmax. [2]	D_H	l_1, l_2	l_3	L	E	b	s	B	L_{R2}	Minimum dimension for L_{R2}	L_{ZR2}	d_R [3] [mm]	C_2 [4] [Nm/rad]	dxD	M	
14 ZR2	12.5	16.0	16	30	11	26	50	13	10	1.5	11.5	Please specify with inquiries and orders.	109	L_{R2}+22	10x2.0	68.36	10x16	M4	5.6
19 ZR2	21.0	26.0	24	40	25	26	67	16	12	2.0	14.0		120	L_{R2}+50	12x2.0	130	12x18	M4	5.6
24 ZR2	60	75	28	55	30	38	86	18	14	2.0	16.0		156	L_{R2}+60	20x3.0	954.9	20x28	M6	17.0
28 ZR2	160	200	38	65	35	45	100	20	15	2.5	17.5		177	L_{R2}+70	25x2.5	1811	25x34	M6	17.0
38 ZR2	325	405	45	80	45	45	114	24	18	3.0	21.0		192	L_{R2}+90	32x3.5	5167	32x43	M6	17.0
42 ZR2	450	560	55	95	50	52	128	26	20	3.0	23.0		214	L_{R2}+100	40x4.0	11870	40x53	M6	17.0
48 ZR2	525	655	62	105	56	70	154	28	21	3.5	24.5		261	L_{R2}+112	45x4.0	17486	45x59	M8	41.0
55 ZR2	685	825	74	120	65	80	175	30	22	4.0	26.0		288	L_{R2}+130	55x4.0	33543	55x71	M8	41.0
65 ZR2	940	1175	80	135	75	80	185	35	26	4.5	30.5		387	L_{R2}+150	60x4.0	44362	60x77	M8	41.0

[1] For selections see page 22 et seqq./other spiders see page 121.
[2] Dependent on hub type. Hub types can be freely selected, for summary see page 126.
[3] Has to be remachined, if necessary.
[4] Torsion spring stiffness with a length of 1 m of intermediate pipe.
For inquiries and orders please specify the shaft distance dimension L_{R1}/L_{R2} along with the maximum speed to review the critical bending speed.
With vertical application a support washer has to be used (please specify in your order).
Straightness/concentricity of pipes according to DIN EN 10305-1.

Ordering example:

ROTEX® GS 24	ZR1	1000 mm	98 ShA-GS	1.0 - Ø24		2.5 - Ø24	
Coupling size	Type	Shaft distance dimension (L_{R1}/L_{R2})	Spider hardness	Hub type	Finish bore	Hub type	Finish bore

Type ZR1



Type ZR2