

# Backlash-free servo couplings

Types and operating description 124

## ROTEX® GS

Design and operation	126
Technical data and displacements	128
Types of hubs	132
Basic programme	133
Standard types	134
Type Compact	136
Type clamping ring hubs light	138
Type clamping ring hubs steel	139
Type P according to DIN 69002	140
Type HP	142
Type P with ETP® clamping set	144
Type with expansion hub for hollow shaft connections	145
Type A-H drop-out center design couplings	146
Type DKM (double-cardanic)	148
Intermediate shaft couplings	150
Summary	154

## TOOLFLEX®

Technical description	156
Types of hubs	157
Type S with setscrew	158
Type M with setscrew	159
Type S with clamping hubs	160
Type M with clamping hubs	162
Type PI	164
Type S-H / M-H	166
Type ZR	168

## RADEX®-NC

Technical description	170
Laminae sets and hub types	171
Type DK and EK with clamping hub 2.5/2.6	172
Type DK and EK with clamping hub 3.5/3.6	173
Type DK and EK with clamping ring hub 6.5	174
Type ZR with clamping hub type DH 7.5	176

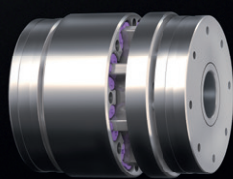
## COUNTEX®

Standard types	178
----------------	-----

ROTEX® GS



ROTEX® GS HP



TOOLFLEX®



RADEX®-NC



COUNTEX®



# BACKLASH-FREE SERVO 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 laminae coupling	Shaft encoder coupling
Properties				
Backlash-free	●	●	●	●
Torsionally stiff		●	●	●
Damping vibrations	●			
Maintenance-free	●	●	●	●
Axial plug-in	●	Optionally		●
Compensating for misalignment	●	●	●	●
Electrical 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 medium 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	medium	medium	low
Torque range $T_{KN}$ [Nm]				
Min.	0.2	0.1	2.5	0.3
Max.	5,850	600	3200	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	1,050,000	235
Radial spring stiffness $C_r$ [N/mm]				
Up to	20,290	1,365		70
Spiders / bellow / laminae / spacer				
Material	Polyurethane, Hytrel	Stainless steel	Stainless steel	PEEK
Elastomer hardness	flexible to torsionally stiff	-	-	Torsionally stiff
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	medium	medium	medium	low
Shaft-hub-connection				
Positive-locking	●	Optionally	Optionally	Optionally
Non-positive (frictionally engaged)	●	●	●	●

● ≈ Standard

# BACKLASH-FREE SERVO COUPLINGS TYPES AND OPERATING DESCRIPTION

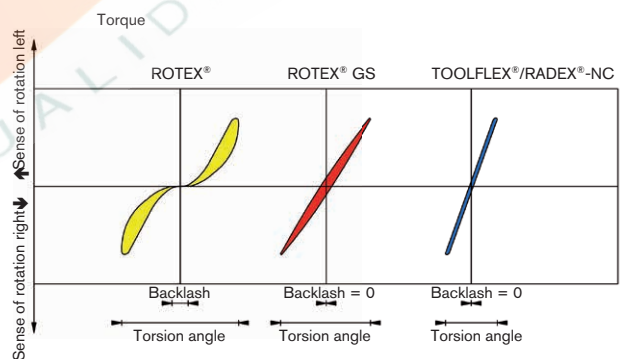
## Product finder of backlash-free couplings

Product	ROTEX® GS	TOOLFLEX®	RADEX®-NC	COUNTEX®
Type	Jaw coupling	Metal bellow-type coupling	Servo laminae coupling	Shaft encoder coupling
<b>Types (extract)</b>				
Elastomers can be radially disassembled » without displacing driving/driven side	A-H	-	-	-
Intermediate shaft types » bridging larger shaft distances	ZR1, ZR2, ZR3	ZR	ZR	-
Shaft-to-shaft connection	Standard	Standard	Standard	Standard
Flange-to-shaft connection	CFN, DFN, CF-DKM	CF	-	-
Flange-to-flange connection » particularly short mounting length	Optionally	Optionally	-	-
Single-cardanic	Standard	-	EK	-
Double-cardanic » compensating for big displacements » lower restoring forces	DKM	Standard	DK	Standard
<b>Certifications</b>				
ATEX		●	●	●

● ≈ Standard

## Torsion angle

The diagramme alongside this text explains the impact 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.



# ROTEX® GS

## Backlash-free jaw couplings

### Technical description

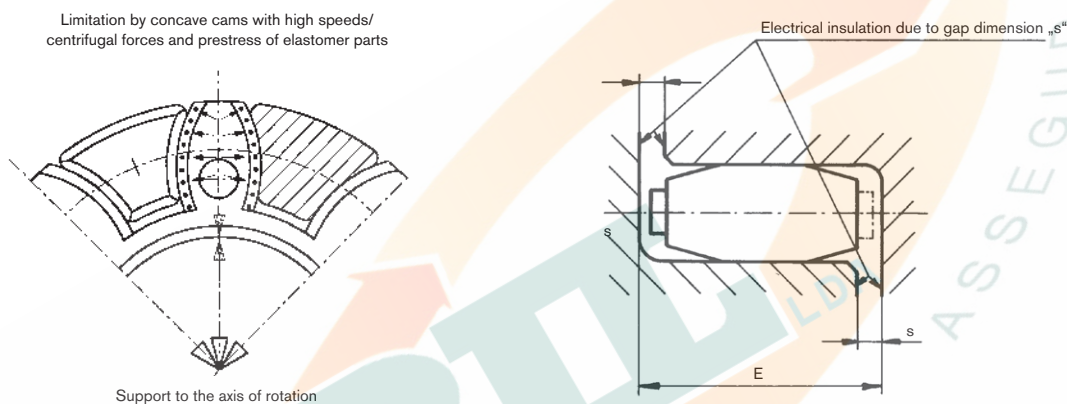


**ROTEX® GS** is a three-part, axial plug-in coupling backlash-free under prestress. It impresses even with critical applications by its backlash-free power transmission, its stiffness which is each adapted to the application and its optimum damping of vibrations. Using this principle provides for particularly 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 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 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).



#### Advice

- 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 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 134.

#### 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](http://www.ktr.com).

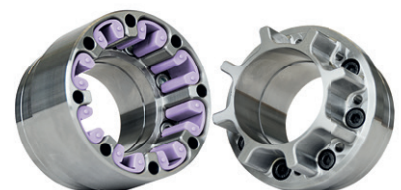
Selection: If used in potentially explosive atmospheres the clamping ring hubs (clamping hubs without feather keyway only for use in category 3) must be selected in that there is a minimum safety factor of  $s = 2$  between the peak torque of the machine including all operating parameters and the nominal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










# 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 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](http://www.ktr.com)).

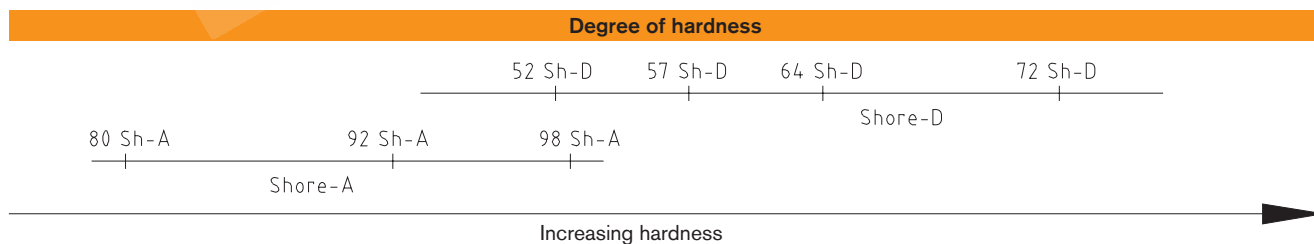
Along with an increasing hardness of the spider the torques to be transmitted and the stiffness of the spider increase, too. Along with reduced hardness of the spider the ability of compensating for displacements and damping the spider is increased.

Properties 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 <sup>1)</sup>	Max. temperature (short-time) <sup>1)</sup>		
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 <sup>2)</sup>		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 48	- 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
64 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

<sup>1)</sup> The temperature factors specified on page 23 must be considered.

<sup>2)</sup> Torques and displacements same as with 98 ShA-GS spider



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 $\psi$ [-] <sup>1)</sup>	0.80	0.80	0.75	0.75	0.75	0.60
Resonance factor $V_R$ [-] <sup>1)</sup>	7.90	7.90	8.50	8.50	8.50	10.5

<sup>1)</sup> Special figures apply for ROTEX® GS HP, please contact us.

# 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 <sup>1)</sup> [Nm/rad]	Dynamic torsion spring stiffness <sup>1)</sup> [Nm/rad]	Radial spring stiffness C <sub>r</sub> [N/mm]	Weight [kg]		Mass moment of inertia J [kgm <sup>2</sup> ]	
			2.0/2.1 2.5/2.6	2.8 2.9	1.0 1.1	6.0 light <sup>2)</sup>	6.0 P <sup>2)</sup>		T <sub>KN</sub>	T <sub>K max</sub>				Per hub <sup>5)</sup>	Spider	Per hub <sup>5)</sup>	Spider
5	80 A	A	38000	38000	47700			57300	0.3	0.6	3.15	10	82	0.001	0.2 x 10 <sup>-3</sup>	0.015 x 10 <sup>-6</sup>	0.002 x 10 <sup>-6</sup>
	92 A	A							0.5	1.0	5.16	16	154				
	98 A	A							0.9	1.7	8.3	25	296				
7	80 A	A	27000	27000	34100			40900	0.7	1.4	8.6	26	114	0.003	0.7 x 10 <sup>-3</sup>	0.085 x 10 <sup>-6</sup>	0.01 x 10 <sup>-6</sup>
	92 A	A							1.2	2.4	14.3	43	219				
	98 A	A							2.0	4.0	22.9	69	421				
	64 D	D							2.4	4.8	34.3	103	630				
8	80 A	A	23800						0.7	1.4	8.8	27	117	0.003	0.5 x 10 <sup>-3</sup>	0.117 x 10 <sup>-6</sup>	0.0124 x 10 <sup>-6</sup>
	98 A	A							2.0	4.0	23.5	71	433				
	64 D	D							2.4	4.8	35.3	106	648				
9	80 A	A	19000	19000	23800			28600	1.8	3.6	17.2	52	125	0.01	1.7 x 10 <sup>-3</sup>	0.48 x 10 <sup>-6</sup>	0.085 x 10 <sup>-6</sup>
	92 A	A							3.0	6.0	31.5	95	262				
	98 A	A							5.0	10.0	51.6	155	518				
	64 D	D							6.0	12.0	74.6	224	739				
12	80 A	A	15200	15200	19100			22900	3.0	6.0	84.3	252	274	0.02	2.3 x 10 <sup>-3</sup>	1.5 x 10 <sup>-6</sup>	0.139 x 10 <sup>-6</sup>
	92 A	A							5.0	10.0	160.4	482	470				
	98 A	A							9.0	18.0	240.7	718	846				
	64 D	D							12.0	24.0	327.9	982	1198				
13	80 A	A	12700		38200				3.6	7.2	111	330	359	0.01	2.0 x 10 <sup>-3</sup>	1.1 x 10 <sup>-6</sup>	0.155 x 10 <sup>-6</sup>
	98 A	A							11.0	22.0	316	941	1109				
	64 D	D							14.5	29.0	430	1287	1570				
14	80 A	A	12700	12700	15900	32000	47700	19100	4.0	8.0	60.2	180	153	0.02	4.7 x 10 <sup>-3</sup>	2.8 x 10 <sup>-6</sup>	0.509 x 10 <sup>-6</sup>
	92 A	A							7.5	15.0	114.6	344	336				
	98 A	A							12.5	25.0	171.9	513	654				
	64 D	D							16.0	32.0	234.2	702	856				
16	80 A	A	12000						5.0	10.0	157	471	400	0.02	3.6 x 10 <sup>-3</sup>	2.8 x 10 <sup>-6</sup>	0.435 x 10 <sup>-6</sup>
	98 A	A							15.0	30.0	450	1341	1710				
	64 D	D							19.0	38.0	612	1835	2238				
19	80 A	A	9550	9550	11900	24000 19000 <sup>4)</sup>	35800	14300	6.0	12.0	618	1065	582	0.09	7.6 x 10 <sup>-3</sup>	19.5 x 10 <sup>-6</sup>	1.35 x 10 <sup>-6</sup>
	92 A	A							12.0	24.0	1090	1815	1120				
	98 A	A							21.0	42.0	1512	2540	2010				
	57 D	D							23.0	46.0	2036	3175	2470				
	64 D	D							26.0	52.0	2560	3810	2930				
	92 A	A							35	70	2280	4010	1480				
24	98 A	A	6950	10400	8650	17000 14000 <sup>4)</sup>	26000	10400	60	120	3640	5980	2560	0.2	0.02	81.9 x 10 <sup>-6</sup>	6.7 x 10 <sup>-6</sup>
	52 D	D							60	120	3640	5980	2560				
	57 D	D							68	136	4335	8438	3128				
	64 D	D							75	150	5030	10896	3696				
	72 <sup>3)</sup>	D							97	194	9944	17095	5799				
	92 A	A							95	190	4080	6745	1780				
28	98 A	A	5850	8800	7350	15000 12000 <sup>4)</sup>	22000	8800	160	320	6410	9920	3200	0.3	0.03	184.2 x 10 <sup>-6</sup>	14.85 x 10 <sup>-6</sup>
	52 D	D							160	320	6410	9920	3200				
	57 D	D							180	360	8335	15050	3775				
	64 D	D							200	400	10260	20177	4348				
	72 <sup>3)</sup>	D							260	520	21526	36547	7876				
	92 A	A							190	380	6525	11050	2350				
38	98 A	A	4750	7150	5950	12000 9600 <sup>4)</sup>	17900	7150	325	650	11800	17160	4400	0.6	0.05	542.7 x 10 <sup>-6</sup>	39.4 x 10 <sup>-6</sup>
	52 D	D							325	650	11800	17160	4400				
	57 D	D							325	650	11800	17160	4400				
	64 D	D							405	810	26300	40335	6474				
	72 <sup>3)</sup>	D							525	1050	44584	71180	11425				
	98 A	A							450	900	21594	37692	5570				
42	52 D	D	4000		5000	10000 8050 <sup>4)</sup>	15000	6000	450	900	21594	37692	5570	2.4	0.08	2802 x 10 <sup>-6</sup>	85 x 10 <sup>-6</sup>
	57 D	D							495	990	29225	53760	6420				
	64 D	D							560	1120	36860	69825	7270				
	72 <sup>3)</sup>	D							728	1456	58600	93800	9766				
	98 A	A							525	1050	25759	45620	5930				
	92 A	A							590	1180	41695	72685	7102				
48	57 D	D	3600		4550	9100 7200 <sup>4)</sup>	13600	5450	655	1310	57630	99750	8274	3.3	0.09	4709 x 10 <sup>-6</sup>	135 x 10 <sup>-6</sup>
	64 D	D							852	1704	80000	136948	11359				
	72 <sup>3)</sup>	D							685	1370	42117	61550	6686				
	98 A	A							825	1650	105730	130200	9248				
55	64 D	D	3150		3950	6350 <sup>4)</sup>	11900	4750	1072	2144	150000	209530	12762	5.1	0.12	9460 x 10 <sup>-6</sup>	229 x 10 <sup>-6</sup>
	72 <sup>3)</sup>	D							940	1880	48520	71660	6418				
	98 A	A							1175	2350	118510	189189	8870				
65	64 D	D	2800		3500	5650 <sup>4)</sup>	11000		1527	3054	160000	310000	11826	6.7	0.2	15143 x 10 <sup>-6</sup>	437 x 10 <sup>-6</sup>
	72 <sup>3)</sup>	D							1920	3840	79150	150450	8650				
	98 A	A							2400	4800	182320	316377	11923				
	72 <sup>3)</sup>	D							3120	6240	360540	586429	16454				
75	98 A	A	2350		2950	4750 <sup>4)</sup>	8950		3600	7200	204500	302900	10700	10.5	0.3	32750 x 10 <sup>-6</sup>	1179 x 10 <sup>-6</sup>
	64 D	D							4500	9000	429450	908700	14700				
	72 <sup>3)</sup>	D							5850	11700	847440	1308852	20290				
90	98 A	A	1900		2380	3800 <sup>4)</sup>	7150		4500	9000	429450	908700	14700	18.2	0.6	87099 x 10 <sup>-6</sup>	3362 x 10 <sup>-6</sup>
	64 D	D							5850	11700	847440	1308852	20290				

<sup>1)</sup> Static and dynamic torsion spring stiffness with 0.5 x T<sub>KN</sub>

<sup>2)</sup> For higher speeds see ROTEX® GS HP

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

<sup>4)</sup> Clamping ring hubs 6.0 made of steel

<sup>5)</sup> Hubs with an average bore type 1.0

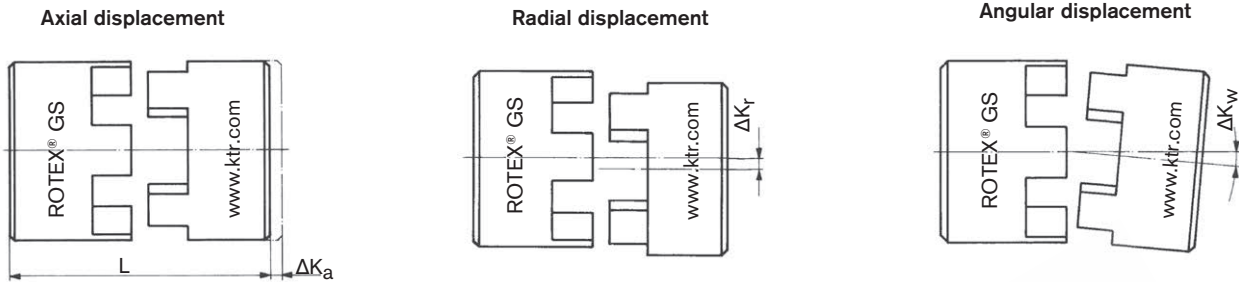
The coupling has to be dimensioned in that the permissible coupling load is not exceeded during any operating condition (see coupling selection on page 22 et seqq.).

The specified torques T<sub>KN</sub>/T<sub>K max</sub> refer to the spider. The shaft-hub-connection needs to be verified 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 remains backlash-free even after a longer operation period.

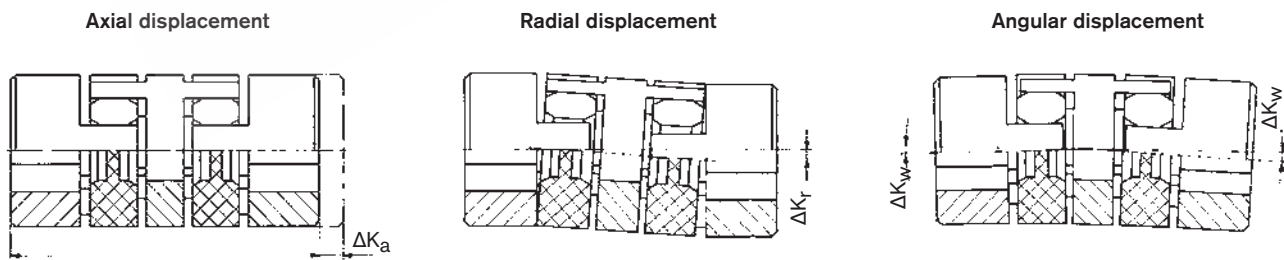
For instance, axial displacement may be generated by different tolerances of the connecting elements with assembly or by alteration of the shaft lengths if temperature fluctuations occur. As the shaft bearings usually cannot be axially stressed to a big extent, it is the task of the coupling to compensate 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 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 absorb 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	Standard displacements			DKM displacements		
		Axial $\Delta K_a^{1)}$ [mm]	Radial $\Delta K_r$ [mm]	Angular $\Delta K_w$ [degree]	Axial $\Delta K_a^{1)}$ [mm]	Radial $\Delta K_r$ [mm]	Angular $\Delta K_w$ [degree]
5	80 ShA		0.12	1.1°		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	+0.6	0.15	1.1°			
	98 ShA		0.08	0.9°	—	—	—
	64 ShD	-0.5	0.06	0.8°			
9	80 ShA		0.19	1.1°		0.29	1.1°
	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°
12	80 ShA		0.20	1.1°		0.35	1.1°
	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°
13	80 ShA	+0.9	0.20	1.1°			
	98 ShA		0.08	0.9°	—	—	—
	64 ShD	-0.8	0.05	0.8°			
14	80 ShA		0.21	1.1°		0.40	1.1°
	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°
16	80 ShA	+1.0	0.21	1.1°			
	98 ShA		0.10	0.9°	—	—	—
	64 ShD	-0.8	0.08	0.8°			
19	80 ShA		0.15	1.1°		0.49	1.1°
	92 ShA		0.10	1.0°		0.45	1.0°
	98 ShA	+1.2	0.06	0.9°	+1.2	0.41	0.9°
	57 ShD	-0.5	0.05	0.85°	-1.0	0.38	0.85°
	64 ShD		0.04	0.8°		0.36	0.8°
24	92 ShA		0.14	1.0°		0.59	1.0°
	98 ShA	+1.4	0.10	0.9°	+1.4	0.53	0.9°
	57 ShD		0.08	0.85		0.50	0.85
	64 ShD	-0.5	0.07	0.8°	-1.0	0.47	0.8°
	72 ShD		0.04	0.7°		0.42	0.7°
28	92 ShA		0.15	1.0°		0.66	1.0°
	98 ShA	+1.5	0.11	0.9°	+1.5	0.60	0.9°
	57 ShD		0.09	0.85		0.56	0.85
	64 ShD	-0.7	0.08	0.8°	-1.4	0.53	0.8°
	72 ShD		0.05	0.7°		0.46	0.7°
38	92 ShA		0.17	1.0°		0.77	1.0°
	98 ShA	+1.8	0.12	0.9°	+1.8	0.69	0.9°
	57 ShD		0.10	0.85		0.65	0.85
	64 ShD	-0.7	0.09	0.8°	-1.4	0.61	0.8°
	72 ShD		0.06	0.7°		0.54	0.7°
42	98 ShA		0.14	0.9°		0.75	0.9°
	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°
48	98 ShA		0.16	0.9°		0.82	0.9°
	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°
55	72 ShD		0.08	0.7°		0.64	0.7°
	98 ShA	+2.2	0.17	0.9°	+2.2	0.91	0.9°
	64 ShD	-1.0	0.12	0.8°	-2.0	0.81	0.8°
65	72 ShD		0.09	0.7°		0.71	0.7°
	98 ShA	+2.6	0.18	0.9°			
	64 ShD	-1.0	0.13	0.8°	—	—	—
75	72 ShD		0.10	0.7°			
	98 ShA	+3.0	0.21	0.9°			
	64 ShD	-1.5	0.15	0.8°	—	—	—
90	72 ShD		0.11	0.7°			
	98 ShA	+3.4	0.23	0.9°			
	64 ShD	-1.5	0.17	0.8°	—	—	—
	72 ShD		0.13	0.7°			

<sup>1)</sup> The  $K_a$  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](http://www.ktr.com). For technical data of type HP see page 142.



# ROTEX® GS

## Backlash-free jaw couplings

### Displacements of intermediate shaft coupling

Displacements of intermediate shaft couplings			
ROTEX® GS size (with 98 ShA-GS)	Axial $\Delta K_a$ [mm]	Radial $\Delta K_r$ <sup>1)</sup> [mm]	Angular $\Delta K_w$ [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		

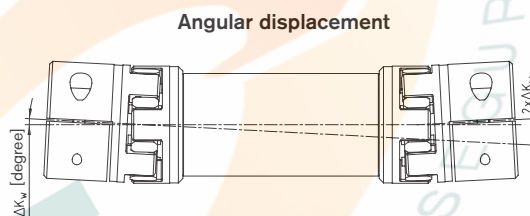
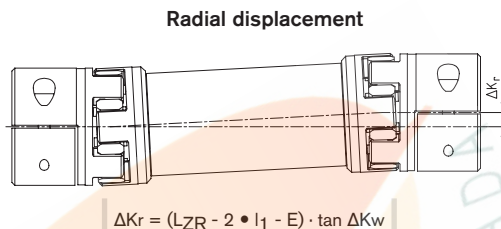
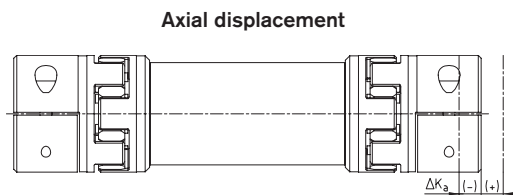
<sup>1)</sup> Radial displacements based on a coupling length  $L_{ZR} = 1000$  mm

Calculation of overall torsion spring stiffness:

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

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

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

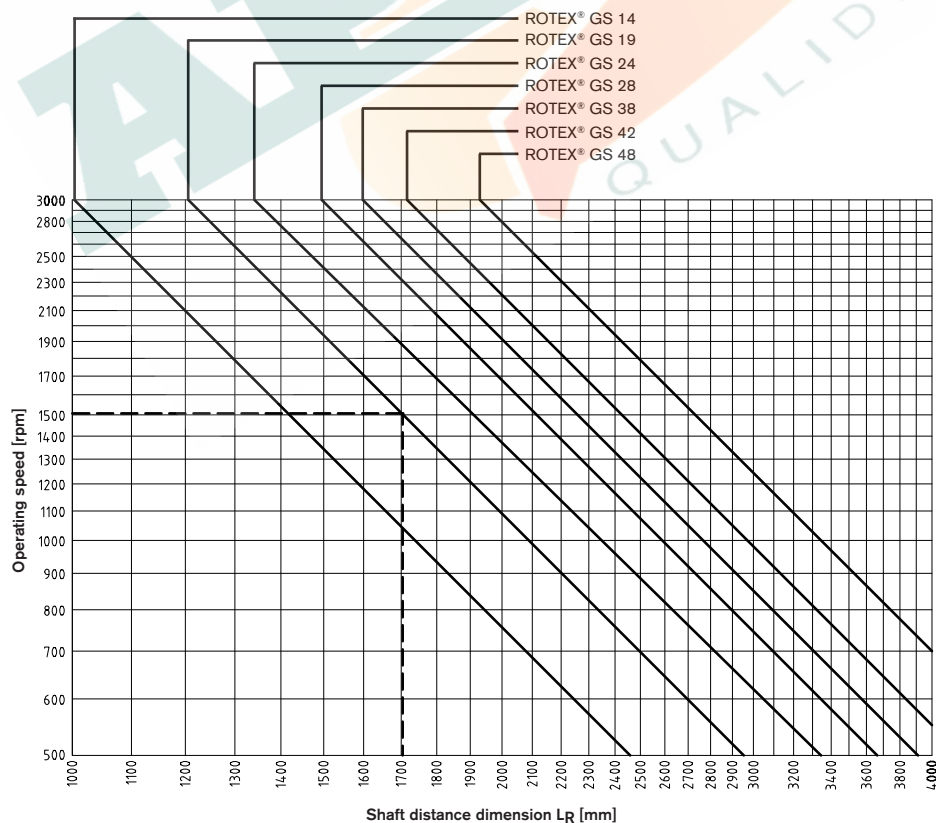


ROTEX® GS

Backlash-free  
servo couplings

TOOLFLEX®

### 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 =  $n_{crit} / 1.4$

RADEX®-NC


















COUNTEX®

# 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 randomly combined within one size.

- |   |   |
|---|---|
|  <p><b>Type 1.0</b><br/>with feather keyway and setscrew</p> <p>Positive-locking power transmission, permissible torque depending on the permissible surface pressure. Not suitable for backlash-free power transmission with heavily reversing operation.</p>   |  <p><b>Type 1.1</b><br/>without feather keyway, with setscrew</p> <p>Non-positive torque transmission. Suitable for backlash-free transmission of very low torques. (For ATEX category 3 only)</p>  |
|  <p><b>Type 1.5</b><br/>with hydraulic clamping system</p> <p>Integrated frictionally engaged shaft-hub-connection for transmitting high torques with easy assembly by means of a screw.</p>   |   |
|  <p><b>Type 2.0</b> clamping hub<br/>single slot without feather keyway</p> <p>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)</p>  |  <p><b>Type 2.1</b> clamping hub<br/>single slot with feather keyway</p> <p>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.</p>                     |
|  <p><b>Type 2.5</b> clamping hub<br/>double slotted, without feather keyway</p> <p>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)</p>   |  <p><b>Type 2.6</b> clamping hub<br/>double slotted, with feather keyway</p> <p>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.</p>                  |
|  <p><b>Type 2.8</b> compact type clamping hub C<br/>with axial slot, without feather keyway</p> <p>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)</p> |  <p><b>Type 2.9</b> compact type clamping hub C<br/>with axial slot, with feather keyway</p> <p>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.</p>                   |
|  <p><b>Type 6.0</b> clamping ring hub</p> <p>Integrated frictionally engaged shaft-hub-connection for the transmission of higher torques. Screwing on elastomer side. For details about torque and dimensions see page 138/139 and HP page 142. Suitable for high speeds.</p>  |  <p><b>Type 6.0</b> precision clamping ring hub</p> <p>Operating principle equal to type 6.0, but highly accurate machining with slight modifications of design. See page 140/141.</p>  |
|  <p><b>Type 7.5</b> clamping hub type DH<br/>without feather keyway for double-cardanic connections</p> <p>Frictionally engaged, backlash-free shaft-hub-connection for radial assembly of coupling. Transmittable torques depending on bore diameter. For torques see page 150.</p>   |  <p><b>Type 7.6</b> clamping hub type DH<br/>with feather keyway for double-cardanic connections</p> <p>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.</p> |
|  <p><b>Type 7.8</b> clamping hub type H<br/>without feather keyway for single-cardanic connection</p>  |  <p><b>Type 7.9</b> clamping hub type H<br/>with feather keyway for single-cardanic connection</p>  |
|  <p><b>Type 4.2</b> with CLAMPEX KTR 250</p> <p>Frictionally engaged shaft-hub-connection to transmit high torques with clamping screws externally.</p>  |  <p><b>Type 9.0</b> expansion hub</p> <p>Frictionally engaged connection for hollow shaft. Transmittable torques depend on bore diameter and hollow shaft.</p>  |

### Special designs on request of customers

- |  |  |
|--|--|
|  <p><b>Type 6.5</b> clamping ring hub</p> <p>Design equal to 6.0, but only clamping screws externally. For instance for radial disassembly of intermediate pipe (special design).</p> |  |
|--|--|

# 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 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
7	1.1	●			●	●	●																									
	2.0	●		●	●	●	●	●	●																							
	2.8	●		●	●	●	●	●	●																							
8	2.8	●		●	●	●	●		●	●																						
	1.0	●				●				●	●		●																			
	1.1	●			●	●	●		●	●		●		●																		
	2.0	●		●	●	●	●	●	●	●		●		●		●																
9	2.1	●				●				●	●		●		●																	
	2.8	●			●	●				●	●		●		●																	
	1.0	●											●																			
	1.1	●				●				●	●		●		●																	
12	2.0	●		●	●	●	●	●	●	●		●		●		●																
	2.1	●				●				●	●		●		●																	
	2.8	●				●				●	●		●		●																	
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	●				■				●	●		●		●		●		●		●		●		●		●		●		●	
	2.8	●				■				●	●		●		●		●		●		●		●		●		●		●		●	
	6.0 light									●	●		●		●																	
24	6.0 steel									●	●		●		●																	
	6.0 P37.5									●	●		●		●																	
	6.0 P									●	●		●		●																	
	1.0	●				●				●	●		●		●		●		●		●		●		●		●		●		●	
	2.5	●				●				●	●		●		●		●		●		●		●		●		●		●		●	
28	2.6	●								●	●		●		●																	
	2.8	●								●	●		●		●																	
	6.0 light									●	●		●		●																	
	6.0 steel									●	●		●		●																	
	6.0 P									●	●		●		●																	
38	1.0	●				●				●	●		●		●		●		●		●		●		●		●		●		●	
	2.5	●				●				●	●		●		●		●		●		●		●		●		●		●		●	
	2.6	●				●				●	●		●		●																	
	2.8	●				●				●	●		●		●																	
	6.0 light									●	●		●		●																	
42	6.0 steel									●	●		●		●																	
	6.0 P									●	●		●		●																	
	6.0 steel									●	●		●		●																	
48	6.0 light									●	●		●		●																	
	6.0 steel									●	●		●		●																	
55	6.0 steel									●	●		●		●																	
	6.0 steel									●	●		●		●																	
65	6.0 steel									●	●		●		●																	
	6.0 steel									●	●		●		●																	
75	6.0 steel									●	●		●		●																	
	6.0 steel									●	●		●		●																	
90	6.0 steel									●	●		●		●																	
	6.0 P									●	●		●		●																	

Taper bores for Fanuc motors:

GS 19 1:10 Ø11

GS 24 1:10 Ø16

<sup>1)</sup> Type 2.0/2.1

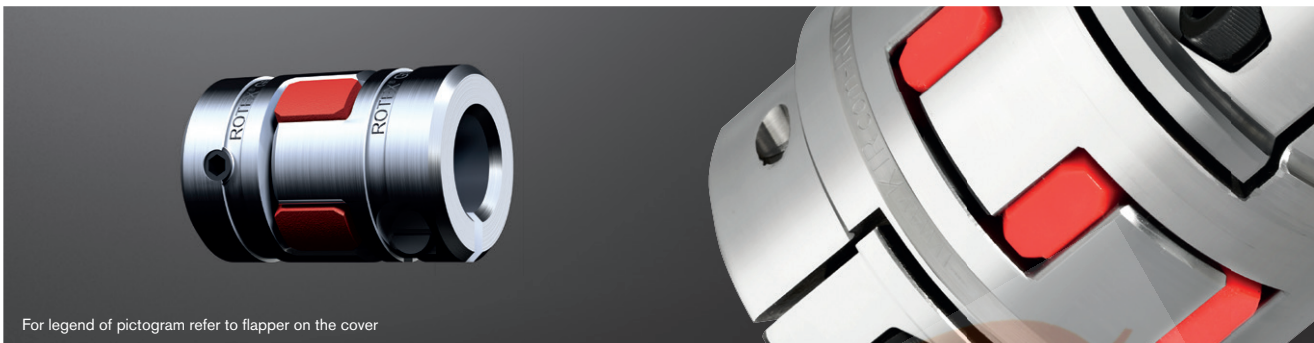
		Finish bores [mm]														
Size	Hub type	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50	Ø55	Ø60	Ø65	Ø70	Ø80
42	6.0 light	●		●	●	●		●	●		●					
	6.0 steel	●	●	●	●	●	●	●	●	●	●					
48	6.0 light			●	●	●	●	●	●	●	●					
	6.0 steel			●	●	●	●	●	●	●	●	●				
55	6.0 steel					●	●	●	●	●	●	●	●			
65	6.0 steel				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

■ = 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

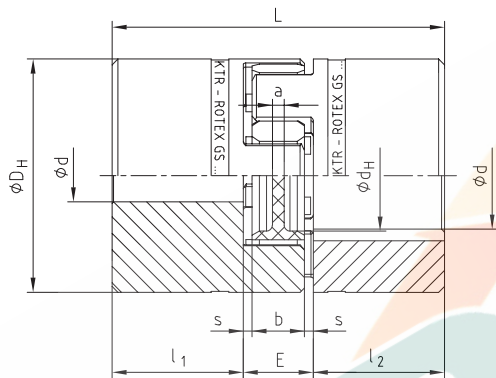
### Standard types



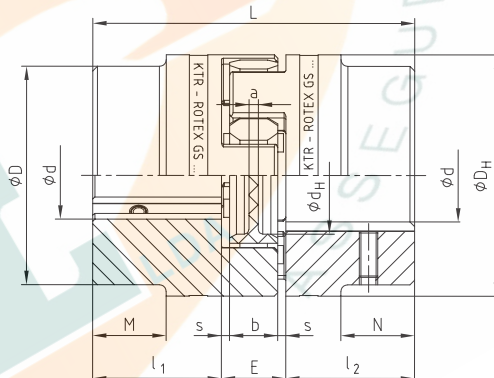
For legend of pictogram refer to flapper on the cover



ROTEX® GS 5 - 38

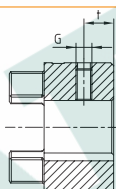


ROTEX® GS 42 - 90



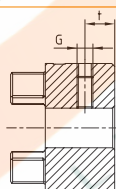
#### Types of hubs:

Type 1.0



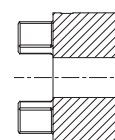
with feather keyway and setscrew

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 <sup>1)</sup> torque T <sub>KN</sub> [Nm] for 98 ShA	d <sub>max.</sub> for hub type			Dimensions [mm]											Setscrew DIN EN ISO 4029		
		1.0	1.1	1.2	D	D <sub>H</sub>	d <sub>H</sub>	L	l <sub>1</sub> , l <sub>2</sub>	M, N	E	b	s	a	G	t	T <sub>A</sub> [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	

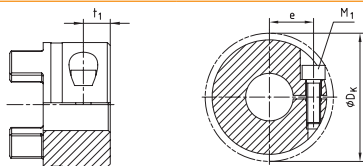
<sup>1)</sup> For selections see page 22 et seqq./other spiders see page 127.

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



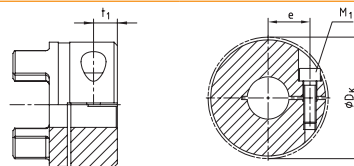
Types of hubs:

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 <sup>1)</sup> torque T <sub>KN</sub> [Nm] for 98 ShA	d <sub>max.</sub> 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 <sub>H</sub>	d <sub>H</sub>	L	l <sub>1</sub> , l <sub>2</sub>	M, N	E	b	s	a	M <sub>1</sub>	t <sub>1</sub>	e	DK	T <sub>A</sub> [Nm]		
5	0.9	5	-	-	-	-	10	-	15	5	-	5	4	0.5	4.0	M1.2	2.5	3.5	11.4	- <sup>2)</sup>		
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	10.5		
24	60	-	-	28	28	-	55	27	78	30	-	18	14	2.0	3.0	M6	10.5	20.0	57.5	10.5		
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 <sup>3)</sup>	110	120	60	160	65	37	30	22	4.0	4.5	M12	26	42.5	119.5	120		
65	940	-	-	70	70 <sup>3)</sup>	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		

<sup>1)</sup> For selections see page 22 et seq./other spiders see page 127.  
<sup>2)</sup> No T<sub>A</sub> defined (slotted screw)  
<sup>3)</sup> From Ø60 keyway opposite the clamping screw

Review of shaft-hub-connection: Friction torques T<sub>R</sub> [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<sub>R</sub> [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 <sup>4)</sup>	49 <sup>4)</sup>																				
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		

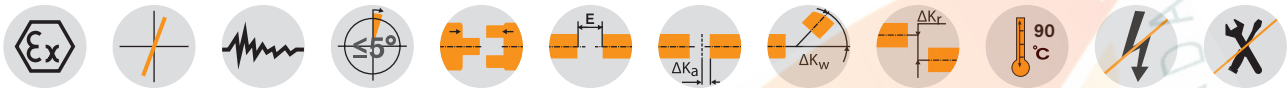
<sup>4)</sup> Clamping hub single slotted with 2-off clamping screws M4 and dimension e = 15, T<sub>A</sub> = 2.9 Nm

# ROTEX® GS Compact Backlash-free jaw couplings

## Compact design



For legend of pictogram refer to flapper on the cover



### ROTEX® GS Compact - Hub material aluminium

Size	Spider GS <sup>1)</sup> torque T <sub>KN</sub> [Nm]				Dimensions [mm]										Clamping screws DIN EN ISO 4762			
	80 ShA	92 ShA	98 ShA	64 ShD	d <sub>max.</sub>	D <sub>H</sub>	DK	L	l <sub>1</sub> , l <sub>2</sub>	E	b	s	d <sub>H</sub>	t	e	M	T <sub>A</sub> [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 <sup>2)</sup>	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 <sup>2)</sup>	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<sub>R</sub> [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 <sup>2)</sup>	7.7 <sup>2)</sup>	8.1 <sup>2)</sup>															
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 <sup>2)</sup>											
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			

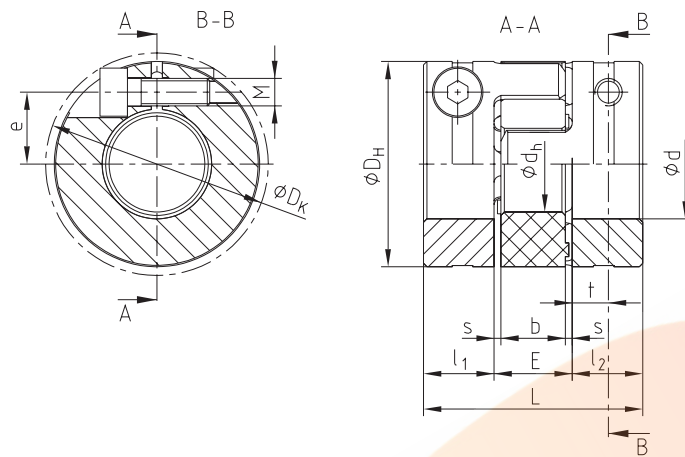
<sup>1)</sup> For selections see page 22 et seqq./other spiders see page 127.

<sup>2)</sup> Size 14 with screw M3 and dimension e = 10.4/D<sub>K</sub> = 30.5/T<sub>A</sub> = 1.34 Nm; size 19 with screw M5 and dimension e = 15.5/D<sub>K</sub> = 47mm/T<sub>A</sub> = 6 Nm

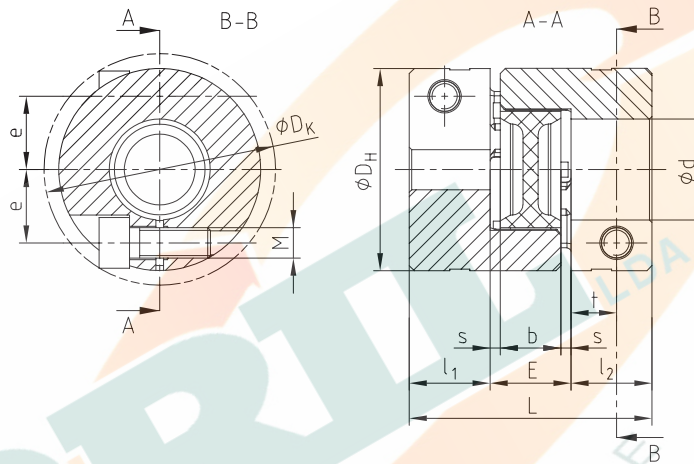
Ordering example:

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

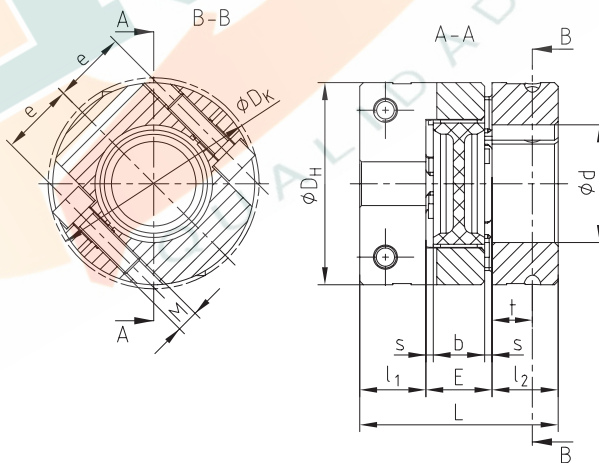
ROTEX® GS 8, 13, 16  
Compact  
single slotted type 2.8



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

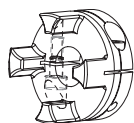


ROTEX® GS 24 - 38  
Compact  
axially slotted type 2.8



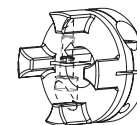
## Types of hubs

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

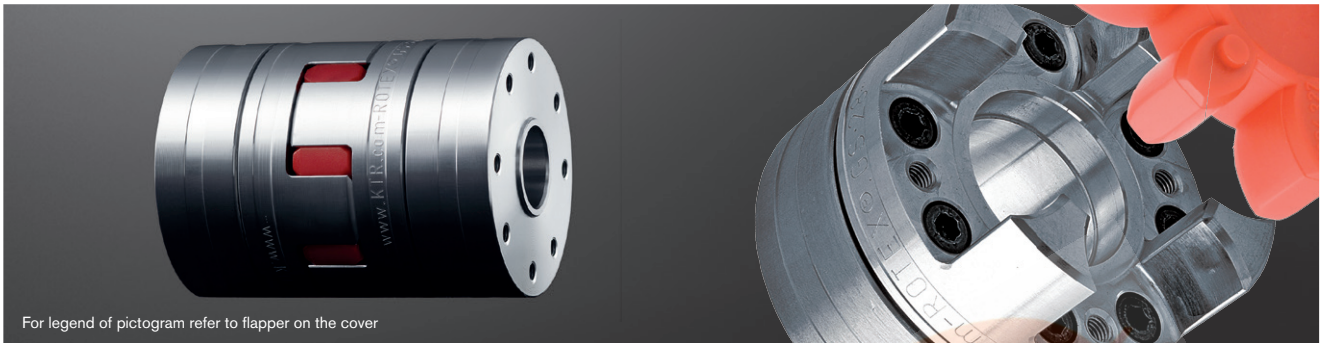
Type 2.9



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

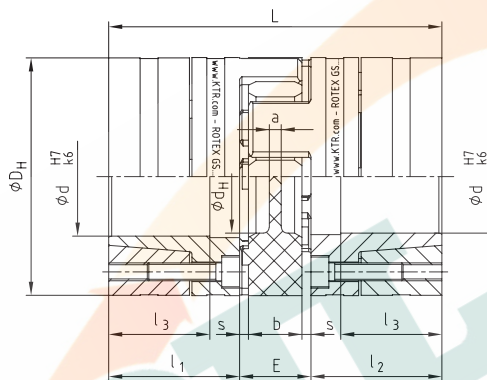


For legend of pictogram refer to flapper on the cover



Extraction thread M<sub>1</sub> 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 <sup>1)</sup> torque T <sub>KN</sub> [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 [kgm <sup>2</sup> ]	
	92 ShA	98 ShA	64 ShD	d <sub>max.</sub>	D <sub>H</sub> <sup>2)</sup>	d <sub>H</sub>	L	l <sub>1,2</sub>	l <sub>3</sub>	E	b	s	a	M	z = number	T <sub>A</sub> [Nm]			M <sub>1</sub>
13	-	11	14.5	13	25	10	34	12	9	10	8	1	-	M2	6	0.37	M2	0.014	1.39 x 10 <sup>-6</sup>
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 x 10 <sup>-4</sup>
19	12	21	26	20	40	18	66	25	18	16	12	2.0	3.0	M4	6	3	M4	0.077	0.19 x 10 <sup>-4</sup>
24	35	60	75	32	55	27	78	30	22	18	14	2.0	3.0	M5	4	6	M5	0.162	0.78 x 10 <sup>-4</sup>
28	95	160	200	38	65	30	90	35	27	20	15	2.5	4.0	M5	8	6	M5	0.240	1.70 x 10 <sup>-4</sup>
38	190	325	405	48	80	38	114	45	35	24	18	3.0	4.0	M6	8	10	M6	0.490	5.17 x 10 <sup>-4</sup>
42	265	450	560	51	95	46	126	50	35	26	20	3.0	4.0	M8	4	25	M8	0.772	11.17 x 10 <sup>-4</sup>
48	310	525	655	55	105	51	140	56	41	28	21	3.5	4.0	M10	4	49	M10	1.066	18.81 x 10 <sup>-4</sup>

<sup>1)</sup> For selections see page 22 et seqq./other spiders see page 127.

<sup>2)</sup> ØD<sub>H</sub> + 2 mm with high speeds for expansion of spider

Review of shaft-hub-connection: Friction torques T <sub>R</sub> [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 <sup>3)</sup>	2.3 <sup>3)</sup>	4.3 <sup>3)</sup>	5.4 <sup>3)</sup>	10 <sup>3)</sup>	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 <sup>4)</sup>										
	H7/h6								75	92	79	125	145	119	136	190	147 <sup>4)</sup>										
28	H7/k6									140	207	188	289	316	355	414	422										
	H7/h6									121	187	157	263	293	318	381	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/mm<sup>2</sup> 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.

<sup>3)</sup> Taper of hub with slot

<sup>4)</sup> Clamping ring hub with screws M3, z = 8 and T<sub>A</sub> = 2.9 Nm

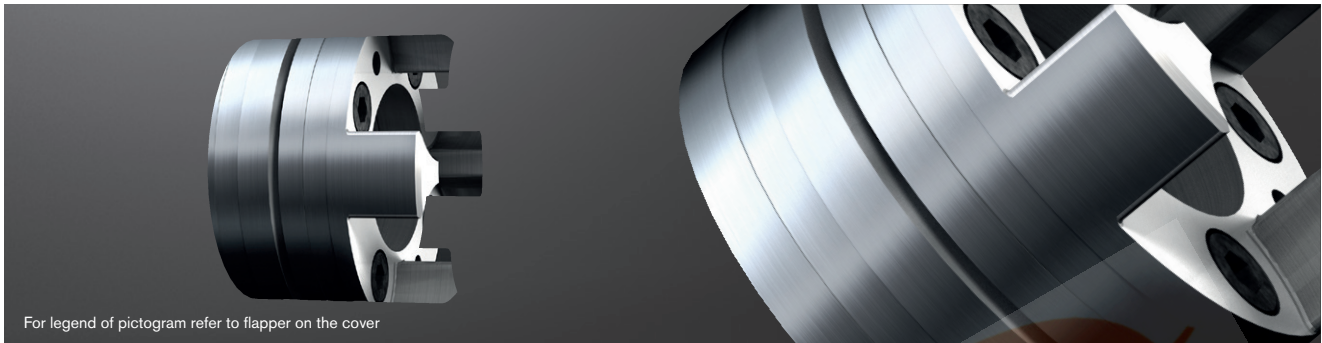
Ordering example:	ROTEX® GS 24	98 ShA-GS	d 20	6.0 light - Ø24		6.0 light - Ø20	
	Coupling size	Spider hardness	Optional: Bore in spider	Hub type	Finish bore	Hub type	Finish bore



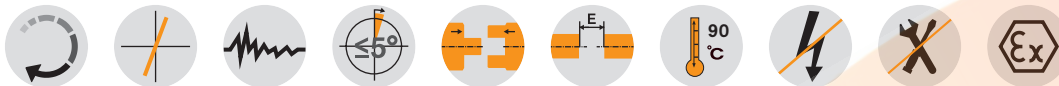
# ROTEX® GS Clamping ring hubs made of steel

## Backlash-free jaw couplings

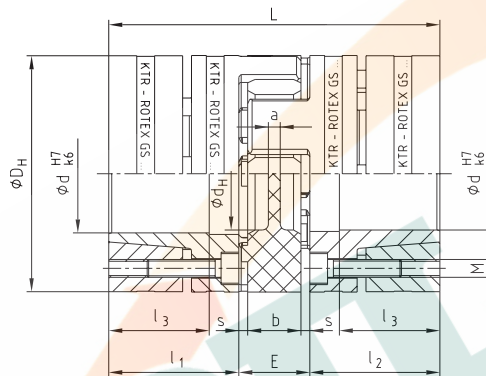
### Integrated clamping system made of steel



For legend of pictogram refer to flapper on the cover



Extraction thread M<sub>1</sub> between clamping screws



ROTEX® GS clamping ring hubs steel

Size	Spider GS <sup>1)</sup> torque T <sub>KN</sub> [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 [kgm <sup>2</sup> ]
	98 ShA	64 ShD	72 ShD	d <sub>max.</sub>	D <sub>H</sub> <sup>2)</sup>	d <sub>H</sub>	L	l <sub>1</sub> , l <sub>2</sub>	l <sub>3</sub>	E	b	s	a	M	z = number	T <sub>A</sub> [Nm]		
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 <sup>-4</sup>
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 <sup>-4</sup>
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 <sup>-4</sup>
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 <sup>-4</sup>
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 <sup>-4</sup>
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 <sup>-4</sup>
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 <sup>-4</sup>
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 <sup>-4</sup>
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 <sup>-4</sup>
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 <sup>-4</sup>

<sup>1)</sup> For selections see page 22 et seq./other spiders see page 127.

<sup>2)</sup> ØD<sub>H</sub> + 2 mm with high speeds for expansion of spider

### Review of shaft-hub-connection: Friction torques T<sub>R</sub> [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

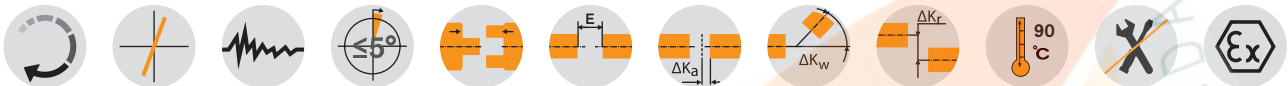
# ROTEX® GS P

## Backlash-free jaw couplings

Highly accurate type P according to DIN 69002



For legend of pictogram refer to flapper on the cover



### ROTEX® GS P - hubs/clamping ring material steel

Size	Spider GS <sup>1)</sup> torque T <sub>KN</sub> [Nm]		Dimensions [mm]										Clamping screws DIN EN ISO 4762			Weight per hub d <sub>standard</sub> <sup>3)</sup> [kg]	Mass moment of inertia per hub with bore d <sub>standard</sub> <sup>3)</sup> [kgm <sup>2</sup> ]		
	98 ShA	64 ShD	d <sub>max</sub>	D <sub>H</sub> <sup>2)</sup>	d <sub>H</sub>	L	l <sub>1</sub> , l <sub>2</sub>	l <sub>3</sub>	E	b	s	a	d <sub>3</sub>	M	z = number			T <sub>A</sub> [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 <sup>-3</sup>
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 <sup>-3</sup>
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 <sup>-3</sup>
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 <sup>-3</sup>
38 P	325	405	48	80	38	114	45	40	24	18	3	4	—	M6	8	14	M6	1.32	1.325 x 10 <sup>-3</sup>
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 <sup>-3</sup>
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 <sup>-3</sup>
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 <sup>-3</sup>
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 <sup>-4</sup>
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 <sup>-4</sup>
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 <sup>-4</sup>

<sup>1)</sup> For selections see page 22 et seqq./other spiders see page 127.

<sup>2)</sup> Ø D<sub>H</sub> + 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<sub>R</sub> [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																														
	H6/h6																	1835	2161	2190	2413	2551	3161	3158	3789	4421					
90	H6/k6																														
	H6/h6																					4046	4503	5057	6079	6181	7324	8398	9530	9892	11084
																						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

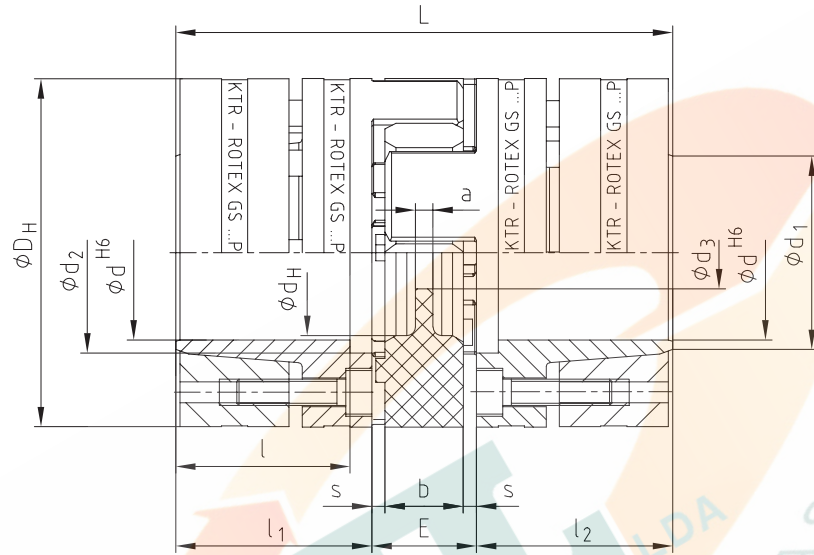
Spindle drive	ROTEX® GS P size	Dimensions according to DIN 69002										Transmittable torque T <sub>R</sub> with d [Nm] <sup>3)</sup>	Weight per hub with bore d <sub>standard</sub> <sup>3)</sup> [kg]	Mass moment of inertia with bore d <sub>standard</sub> <sup>3)</sup> [kgm <sup>2</sup> ]
		Standard spindle shaft diameter d	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	D <sub>H</sub>	l <sub>1</sub> , l <sub>2</sub>	L	E					
25 x 20	14 P	14	17	17	8.5	32	18.5	50	13			25	0.08	0.011 x 10 <sup>-3</sup>
32k x 25	19 P37.5	16	20	19	9.5	37.5	25	66	16			60	0.16	0.037 x 10 <sup>-3</sup>
32g x 30	19 P	19	23	22	9.5	40	25	66	16			71	0.19	0.046 x 10 <sup>-3</sup>
40 x 35	24 P50	24	28	29	12.5	50	30	78	18			108	0.331	0.136 x 10 <sup>-3</sup>
50 x 45	24 P	25	30	30	12.5	55	30	78	18			170	0.44	0.201 x 10 <sup>-3</sup>
63 x 55	28 P	35	40	40	14.5	65	35	90	20			506	0.64	0.438 x 10 <sup>-3</sup>
80 x 75	38 P	40	46	46	16.5	80	45	114	24			821	1.32	1.325 x 10 <sup>-3</sup>

<sup>3)</sup> Standard spindle shaft diameter

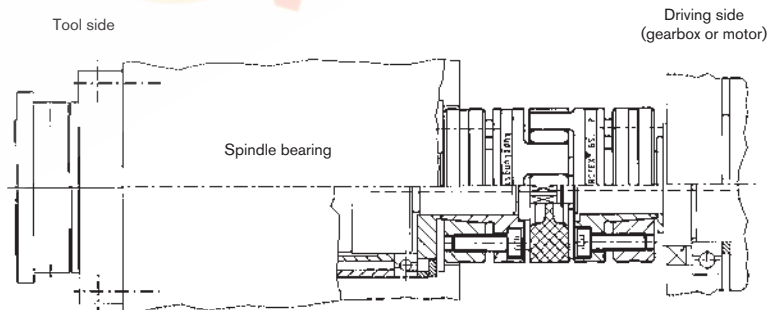
Ordering example:	ROTEX® GS P 24	98 ShA-GS	6.0 - Ø25		6.0 - Ø25	
	Coupling size	Spider hardness	Hub type	Finish bore	Hub type	Finish bore

Components

Extraction thread  $M_1$   
between clamping  
screws



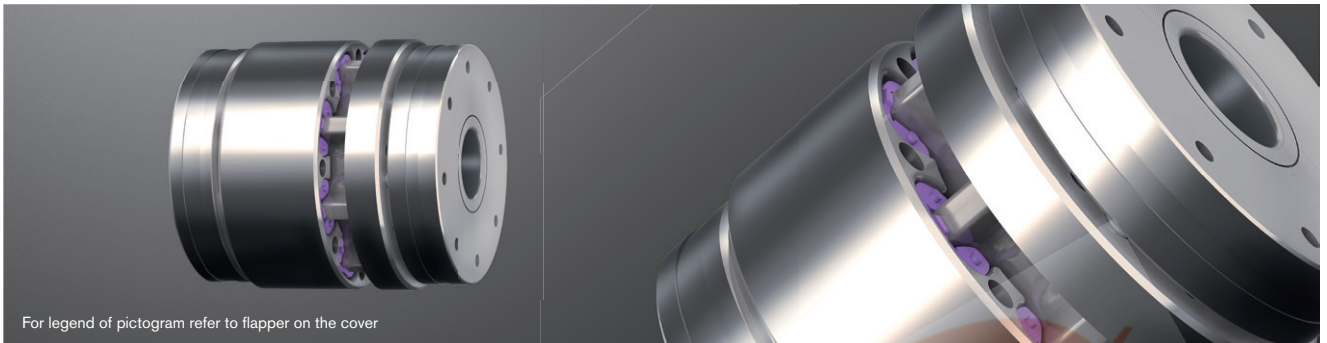
ROTEX® GS P with central coolant supply for stub spindles and multiple spindle heads



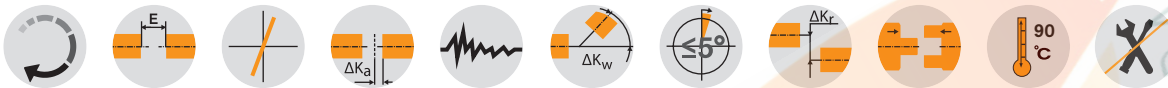
# ROTEX® GS HP

## Backlash-free shaft coupling

### Highly accurate closed coupling system



For legend of pictogram refer to flapper on the cover



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

Size	Tooth element ROTEX® GS HP <sup>1)</sup> torque T <sub>KN</sub> [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 [kgm <sup>2</sup> ]
	52 ShD	64 ShD		Max. d <sub>1</sub> , d <sub>2</sub>	DH	D	L	l <sub>1</sub> , l <sub>2</sub>	l <sub>3</sub> , l <sub>4</sub>	N	E	b	s	M	z = number	T <sub>A</sub> [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

<sup>1)</sup> For selections see page 22 et seqq./other spiders see page 127.

#### Review of shaft-hub-connection: Friction torques T<sub>R</sub> [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](http://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 <sub>T</sub> stat.	C <sub>T</sub> dyn.	C <sub>r</sub>	C <sub>a</sub>
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
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	+1.4/-1.0	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
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
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	+1.4/-1.0	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

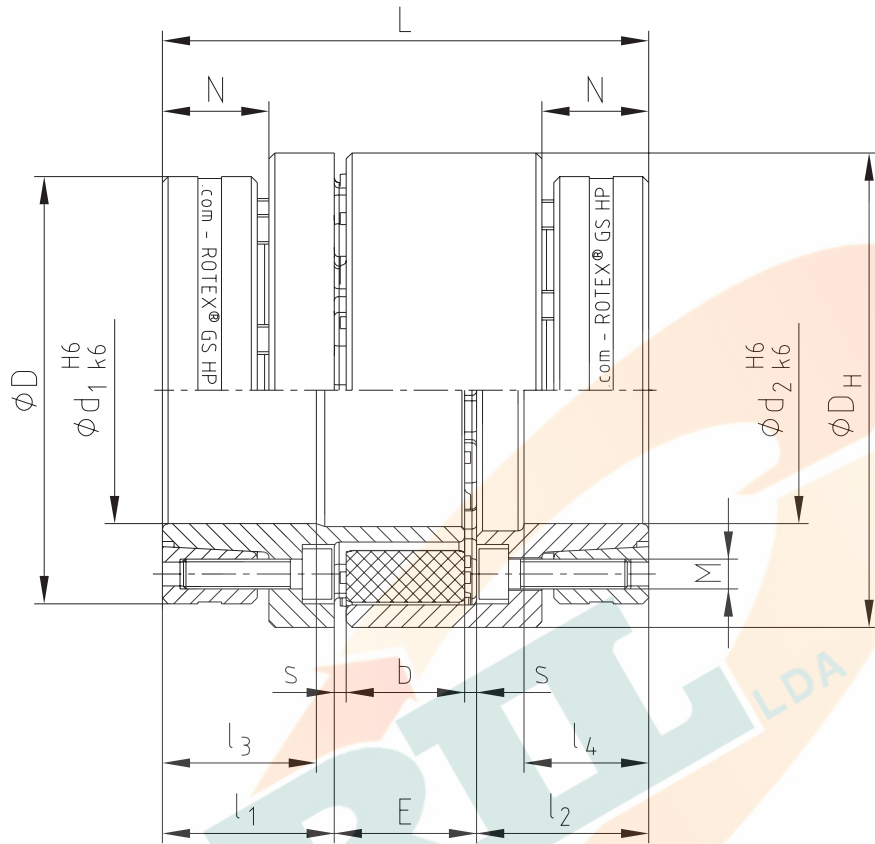
The displacement figures may only be used one by one, if they appear simultaneously, they must be limited in proportion. Care should be taken to maintain the distance dimension E accurately in order to allow for axial clearance of the coupling while in operation. Detailed mounting instructions are shown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



ROTEX® GS

Backlash-free  
servo couplings

TOOLFLEX®

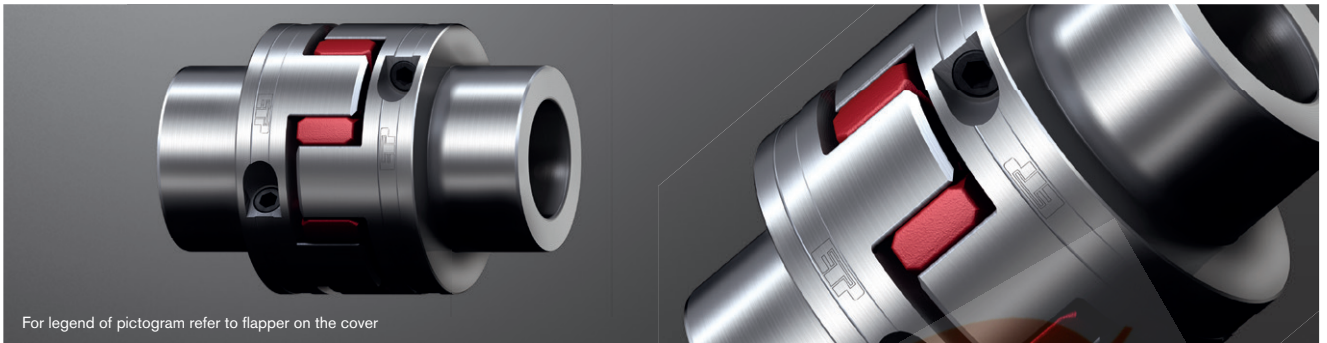
RADEX®-NC

COUNTEX®

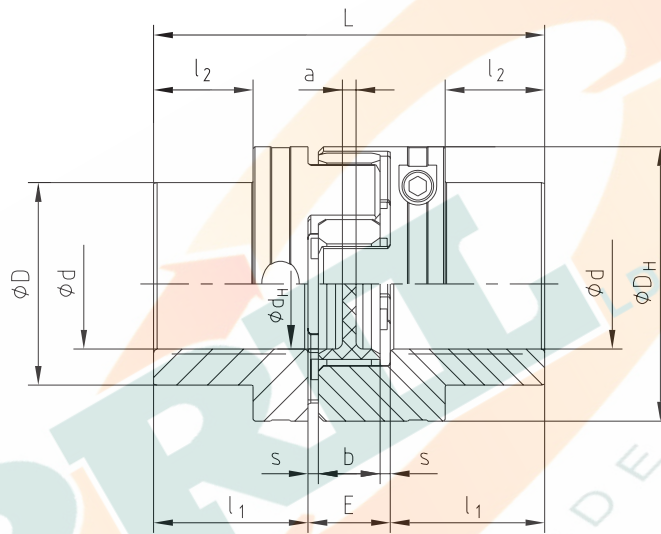
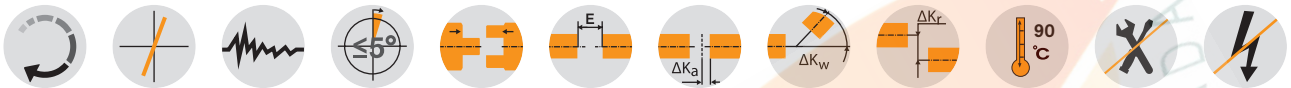
# ROTEX® GS P ETP®

## Backlash-free jaw couplings

### Integrated hydraulic clamping system



For legend of pictogram refer to flapper on the cover



ROTEX® GS P ETP®																	
Size	Spider GS <sup>1)</sup> torque T <sub>KN</sub> [Nm]			Dimensions [mm]											Screw		Weight per hub with max. bore [kg]
	92 ShA	98 ShA	64 ShD	d <sub>max.</sub>	D <sub>H</sub> <sup>2)</sup>	d <sub>H</sub>	L	l <sub>1</sub>	l <sub>2</sub>	E	b	s	a	M	T <sub>A</sub> [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	

<sup>1)</sup> For selections see page 22 et seqq./other spiders see page 127.

<sup>2)</sup> ØD<sub>H</sub> + 2 mm with high speeds for expansion of spider

Review of shaft-hub-connection: Friction torques T <sub>R</sub> [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	

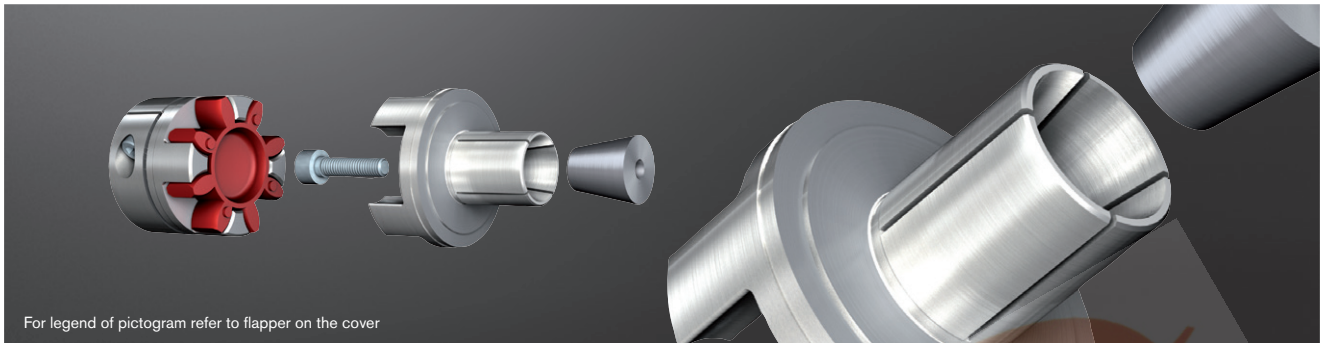
ETP® is a registered trademark by ETP® Transmission AB.

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

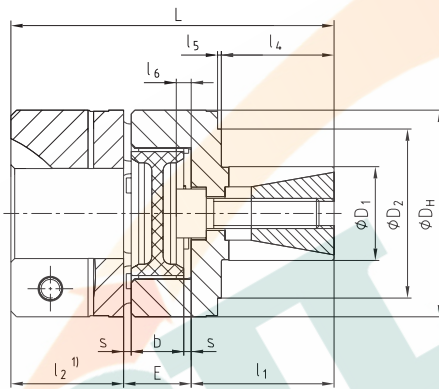
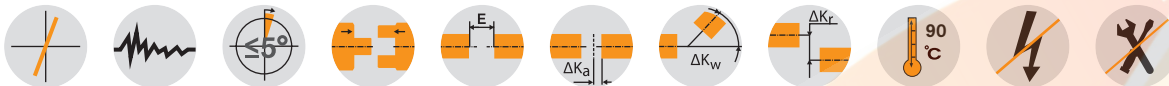
# ROTEX® GS expansion hubs

## Backlash-free jaw couplings

### Clamping system for hollow shaft connection



For legend of pictogram refer to flapper on the cover



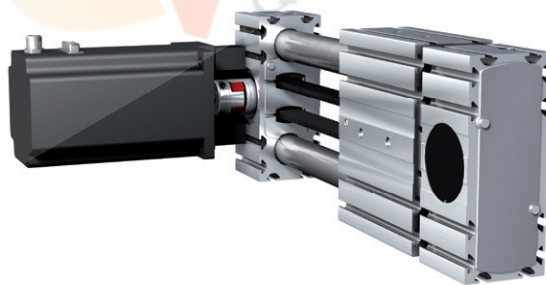
ROTEX® GS expansion hub - Expansion hub material aluminium/clamp pin material stainless steel																			
Size	Spider GS <sup>2)</sup> torque T <sub>KN</sub> [Nm]					Dimensions [mm]													Friction torque <sup>3)</sup> [Nm]
	80 ShA	92 ShA	98 ShA	64 ShD	72 ShD	D1 <sup>2)</sup>	D2	D <sub>H</sub>	l1 <sup>2)</sup>	l2	l4 <sup>2)</sup>	l5 <sup>2)</sup>	l6	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	

<sup>1)</sup> For selections see page 22 et seq./other spiders see page 127.

<sup>2)</sup> Example: Other dimensions on customers' request.

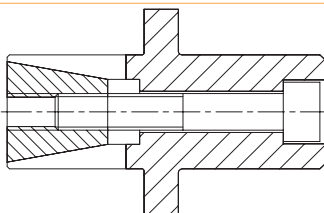
<sup>3)</sup> The friction torque applies for the figures D<sub>1</sub>, l<sub>1</sub>, l<sub>4</sub> and l<sub>5</sub> specified and a hollow shaft material steel.

### ROTEX® GS expansion hub for axis of belt

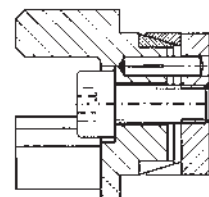


### Special types for hollow shaft connections

Shaft extension



ROTEX® GS hub with CLAMPEX® KTR 150

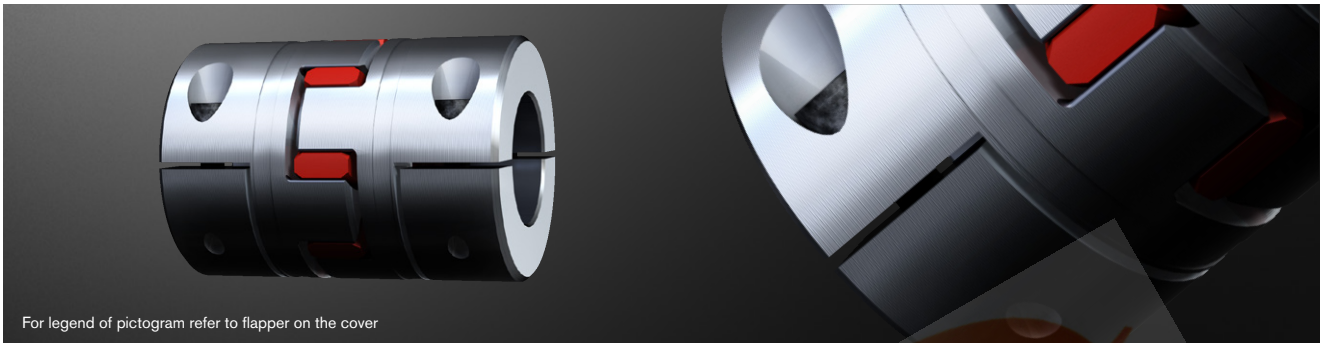


Ordering example:	ROTEX® GS 24	98 ShA-GS	d 20	9.0 - Ø24		2.5 - Ø20	
	Coupling size	Spider hardness	Optional: Bore in spider	Hub type	Finish bore	Hub type	Finish bore

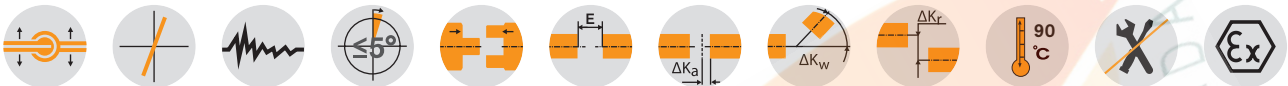
# ROTEX® GS A-H

## Backlash-free jaw couplings

### Drop-out center design coupling



For legend of pictogram refer to flapper on the cover



#### ROTEX® GS type A-H - Hub material aluminium

Size	Dimensions [mm]											Cap screws DIN EN ISO 4762	
	d <sub>max.</sub>	L	l <sub>1, 2</sub>	E	b	s	D <sub>H</sub>	DK	x <sub>1, x2</sub>	E <sub>1</sub>	M	T <sub>A</sub> [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 <sup>1)</sup>	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 [kgm <sup>2</sup> ]
				T <sub>KN</sub>	T <sub>K max</sub>			
19	80	A	9550	6.0	12.0	618	77 x 10 <sup>-3</sup>	19.6 x 10 <sup>-6</sup>
	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 <sup>-3</sup>	77.3 x 10 <sup>-6</sup>
	98	A		60	120	3640		
	64	D		75	150	5030		
28	92	A	5850	95	190	4080	240 x 10 <sup>-3</sup>	173 x 10 <sup>-6</sup>
	98	A		160	320	6410		
	64	D		200	400	10260		
38	92	A	4750	190	380	6525	470 x 10 <sup>-3</sup>	496 x 10 <sup>-6</sup>
	98	A		325	650	11800		
	64	D		405	810	26300		
42	92	A	4000	265	530	10870	1770 x 10 <sup>-3</sup>	2409 x 10 <sup>-6</sup>
	98	A		450	900	21594		
	64	D		560	1120	36860		

<sup>1)</sup> For selections see page 22 et seqq./other spiders see page 127.

<sup>2)</sup> Static torsion spring stiffness with 0.5 x T<sub>KN</sub>

To make sure that the coupling can be assembled/disassembled radially, observe the insertion dimension x1/x2 of the shafts.

#### Review of shaft-hub-connection: Friction torques T<sub>R</sub> [Nm] for hub type 7.8

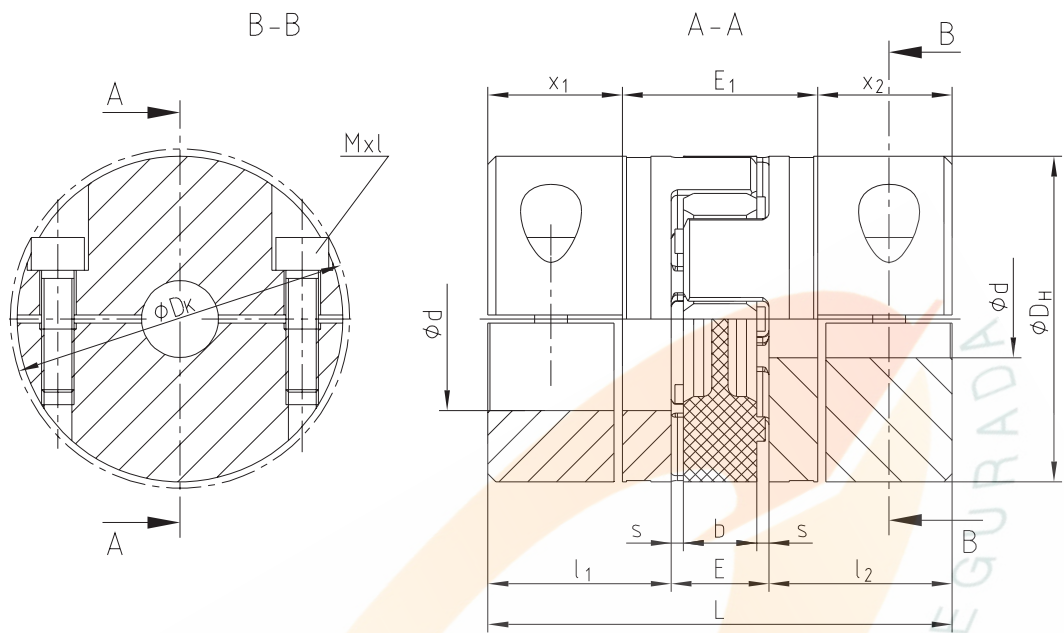
Size	Ø8	Ø10	Ø11	Ø14	Ø15	Ø16	Ø18	Ø19	Ø20	Ø22	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø46	Ø48	Ø50
19	17	21	23	30	32	34	38	40	42														
24		21	23	30	32	34	38	40	42	47	51	53	59	63									
28				54	58	62	70	74	78	86	93	97	109	117	124	136	148						
38							70	74	78	86	93	97	109	117	124	136	148	156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

Ordering example:

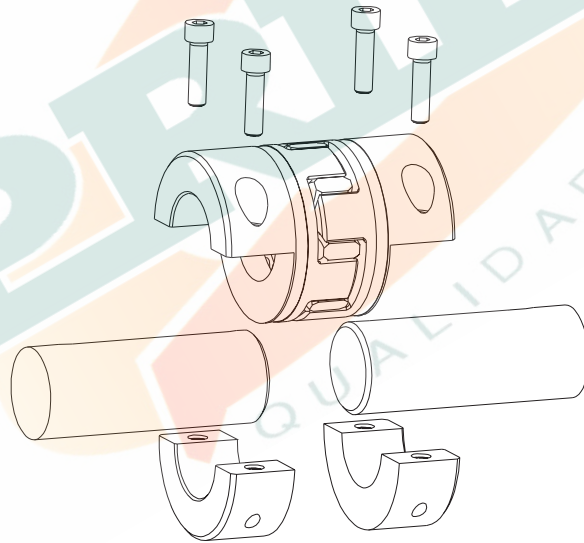
ROTEX® GS 38	A-H	98 ShA-GS	7.8 - Ø38		7.9 - Ø30	
Coupling size	Type	Spider hardness	Hub type	Finish bore	Hub type	Finish bore



Type A-H

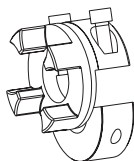


Caution:  
Feather keyways are offset to one another by approx. 5°!  
Hub material: Al-H



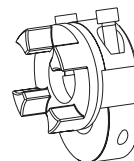
Types of hubs

Type 7.8



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

Type 7.9

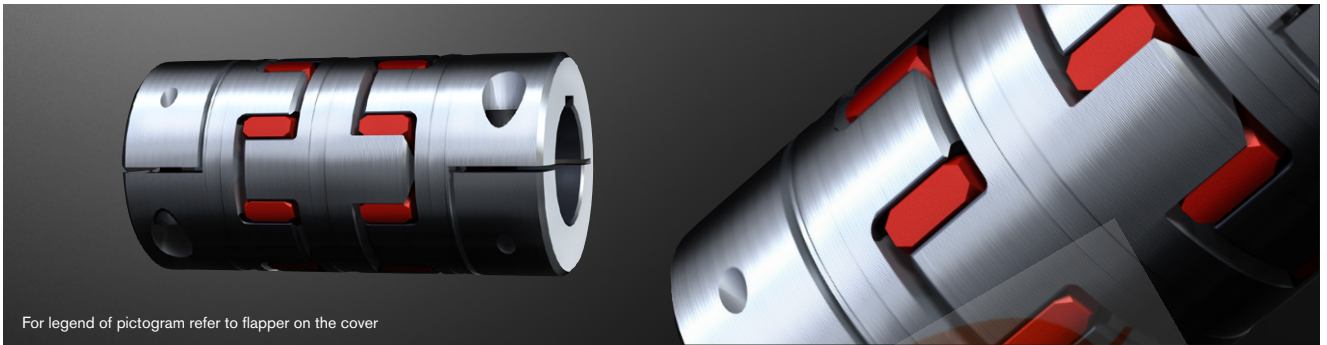


clamping hub type H with feather keyway for single-cardanic connection

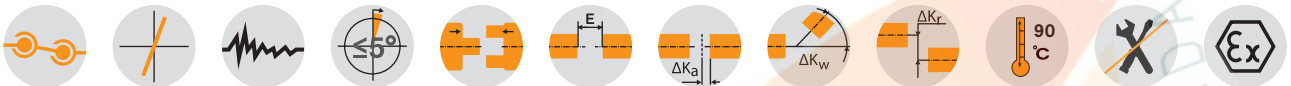
# ROTEX® GS DKM

## Backlash-free jaw couplings

### Double-cardanic jaw coupling



For legend of pictogram refer to flapper on the cover



ROTEX® GS DKM - Spacer material aluminium/hub material depends on hub type

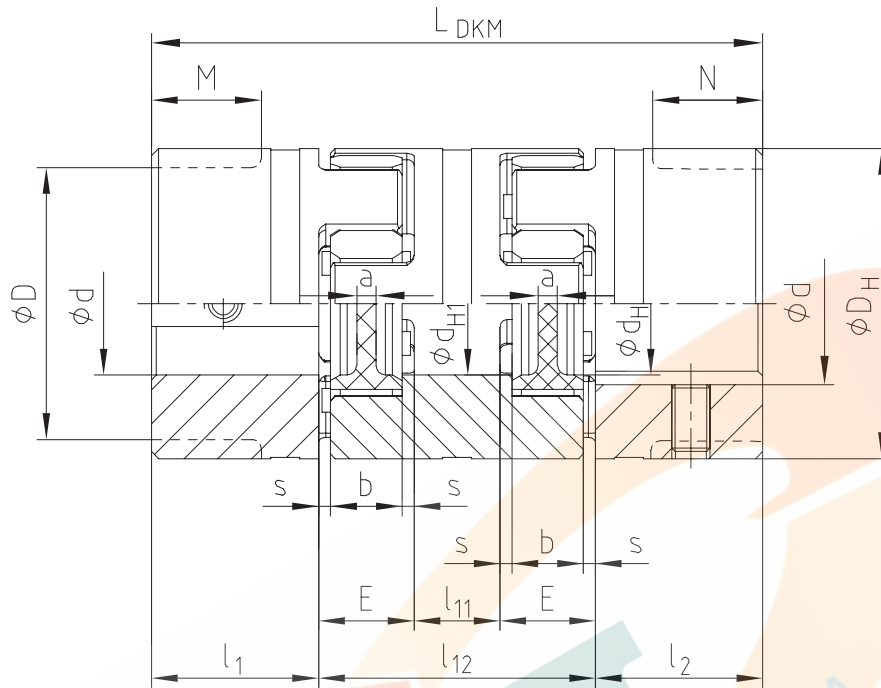
Size	Spider GS <sup>1)</sup> torque T <sub>KN</sub> [Nm]		Dimensions [mm]													
	98 ShA	64 ShD	d <sub>max.</sub> <sup>2)</sup>	D	D <sub>H</sub>	d <sub>H</sub>	d <sub>H1</sub>	l <sub>1</sub> , l <sub>2</sub>	M, N	l <sub>11</sub>	l <sub>12</sub>	LDKM	E	b	s	a
5	0.9	—	5	—	10	—	—	5	—	3	13	23	5	4	0.5	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

<sup>1)</sup> For selections see page 22 et seqq./other spiders see page 127.

<sup>2)</sup> Dependent on hub type. Hub types can be freely selected, for summary see page 132.

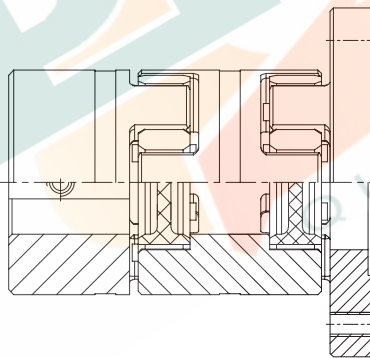
Ordering  
example:

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

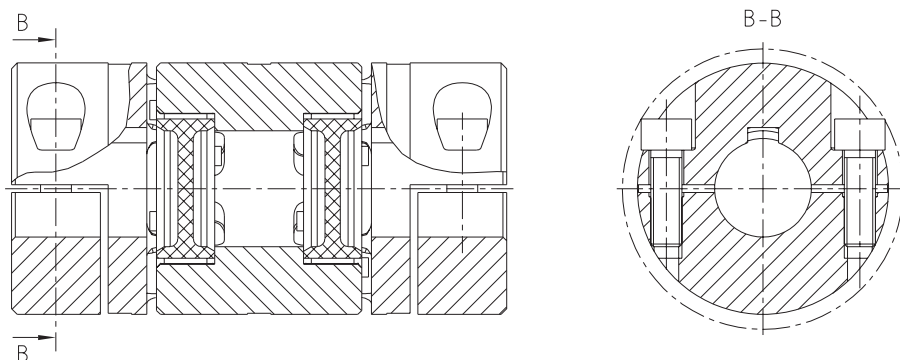


Other types:

ROTEX® GS - CF - DKM



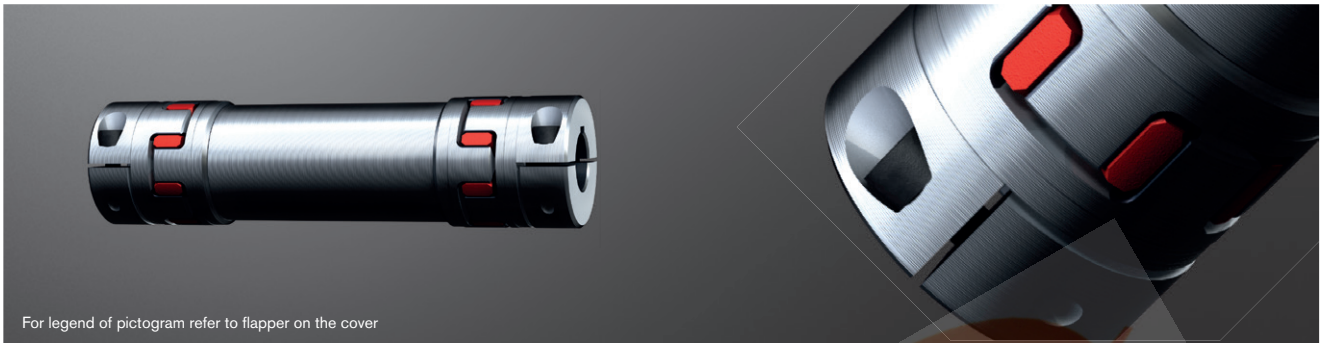
ROTEX® GS DKM-H



# ROTEX® GS ZR3

## Backlash-free intermediate shaft couplings

### Intermediate shaft coupling with aluminium pipe bonded



For legend of pictogram refer to flapper on the cover



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

Size	Dimensions [mm]														Cap screws DIN EN ISO 4762	
	d <sub>max.</sub>	D <sub>H</sub>	l <sub>1</sub>	L	l <sub>3</sub>	E	L <sub>R</sub>		L <sub>ZR</sub> = L <sub>R</sub> + 2 · l <sub>3</sub>		d <sub>R</sub>	DK	t <sub>1</sub>	e	M	T <sub>A</sub> [Nm]
							Min.	Max.	Min.	Max.						
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 <sup>1)</sup> torque T <sub>KN</sub> [Nm]		Moment of inertia [10 <sup>-3</sup> kgm <sup>2</sup> ]			Static torsion spring stiffness [Nm/rad]
	98 ShA	64 ShD	Hub <sup>2)</sup>	ZR hub	Pipe/meter	
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

<sup>1)</sup> For selections see page 22 et seqq./other spiders see page 127.

<sup>2)</sup> With d<sub>max.</sub>

<sup>3)</sup> Torsion spring stiffness with a length of 1 m of intermediate pipe with L<sub>pipe</sub> = L<sub>ZR</sub> - 2 · L

For inquiries and orders please specify the shaft distance dimension L<sub>R</sub> along with the maximum speed to review the critical bending speed. See diagram on page 131.

The intermediate pipe can be combined with other hub types, but in that case it can no longer be disassembled radially. Please specify the required shaft distance dimension in your order.

With vertical application a support washer has to be used (please specify in your order).

Insertion dimension of shaft l<sub>3</sub>, to make sure the coupling can be radially assembled/disassembled.

Straightness/concentricity of pipes according to DIN EN 755-1.

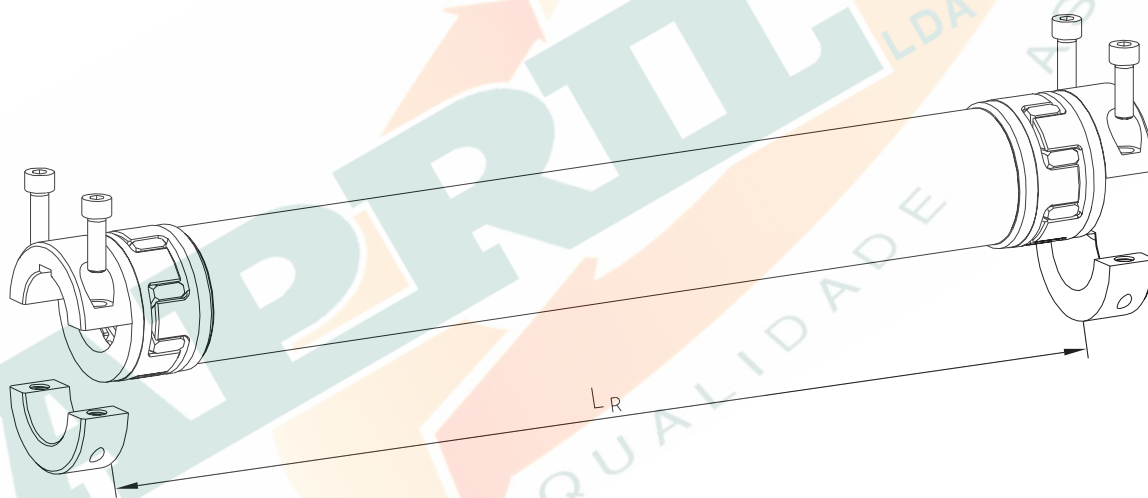
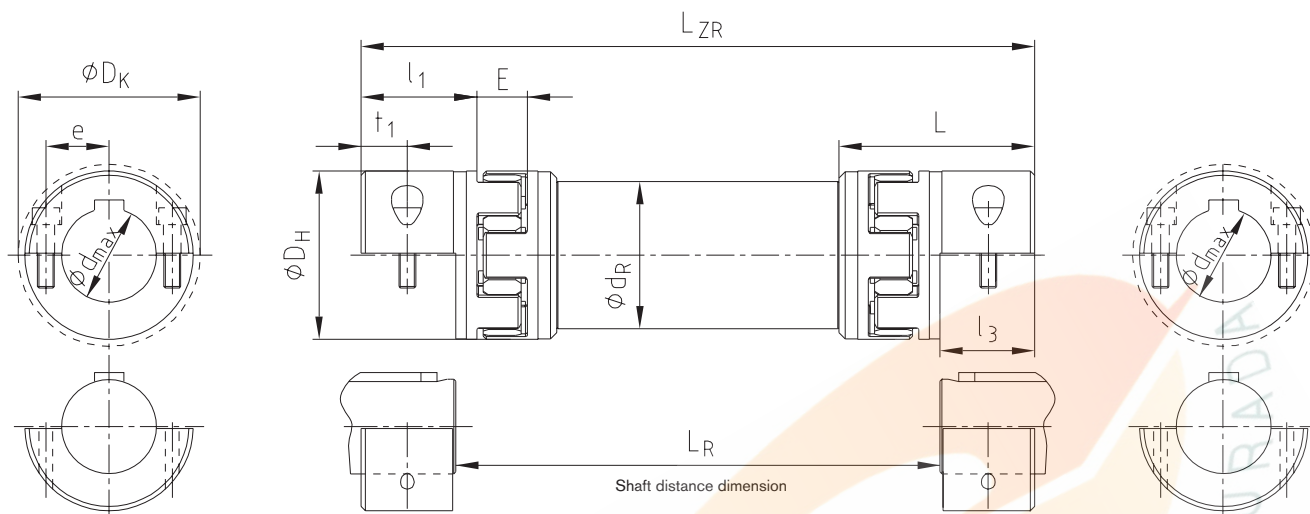
#### Review of shaft-hub-connection: Friction torques T<sub>R</sub> [Nm] for hub type 7.5

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:

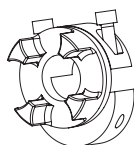
ROTEX® GS 24	ZR3	1200 mm	98 ShA-GS	7.5 - Ø24	7.5 - Ø24
Coupling size	Type	Shaft distance dimension (L <sub>R</sub> )	Spider hardness	Hub type	Finish bore





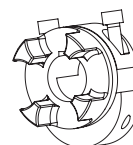
## Types of hubs

Type 7.5



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

Type 7.6

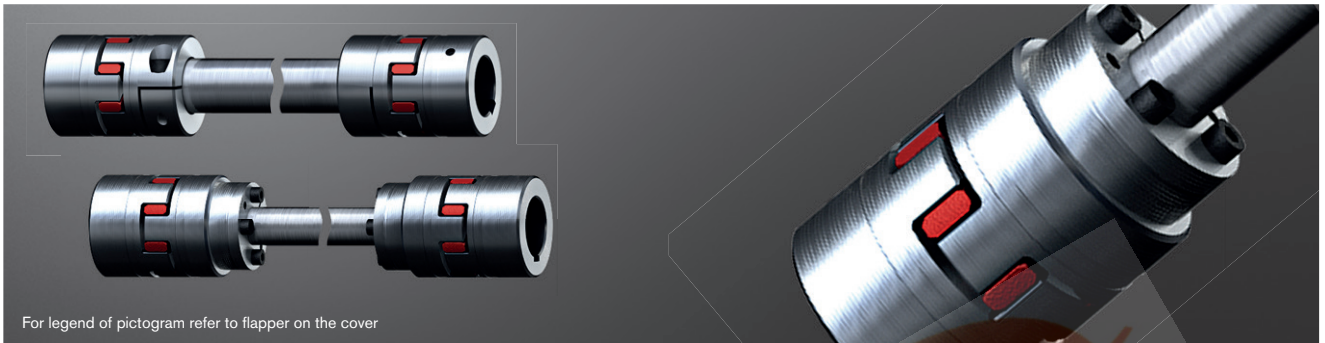


Clamping hub type DH with feather keyway for double-cardanic connections

# ROTEX® GS ZR1 and ZR2

## Backlash-free intermediate shaft couplings

### Intermediate shaft couplings with steel pipe/steel shaft



For legend of pictogram refer to flapper on the cover



ROTEX® GS Type ZR1																	
Size	Spider GS <sup>1)</sup> torque T <sub>KN</sub> [Nm]		Dimensions [mm]											Cap screws DIN EN ISO 4762		Friction torque T <sub>R</sub> [Nm]	
	98 ShA	64 ShD	d <sub>max.</sub> <sup>2)</sup>	D <sub>H</sub>	l <sub>1</sub> , l <sub>2</sub>	L	E	b	s	B	LR1	Minimum dimension for LR1	LZR1	d <sub>R</sub> <sup>3)</sup>	M		T <sub>A</sub> [Nm]
14 ZR1	12.5	16.0	16	30	11	35	13	10	1.5	11.5	Please specify with inquiries and orders.	71	LR1+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	LR1+50	20x3.0	M6	10.5	34
24 ZR1	60	75	28	55	30	78	18	14	2.0	16.0		128	LR1+60	25x2.5	M6	10.5	45
28 ZR1	160	200	38	65	35	90	20	15	2.5	17.5		145	LR1+70	35x4.0	M8	25	105
38 ZR1	325	405	45	80	45	114	24	18	3.0	21.0		180	LR1+90	40x4.0	M8	25	123

ROTEX® GS Type ZR2																			
Size	Spider GS <sup>1)</sup> torque T <sub>KN</sub> [Nm]		Dimensions [mm]											Precision tube		Clamping set size KTR 250	Clamping screws DIN EN ISO 4762	Tightening torque T <sub>A</sub> [Nm]	
	98 ShA	64 ShD	d <sub>max.</sub> <sup>2)</sup>	D <sub>H</sub>	l <sub>1</sub> , l <sub>2</sub>	l <sub>3</sub>	L	E	b	s	B	LR2	Minimum dimension for LR2	LZR2	d <sub>R</sub> <sup>3)</sup> [mm]	C <sub>2</sub> <sup>4)</sup> [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	LR2+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	LR2+50	12x2.0	130	12x18	M4	5.6
24 ZR2	60	75	28	55	30	38	86	18	14	2.0	16.0		156	LR2+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	LR2+70	25x2.5	1811	25x34	M6	17.0
38 ZR2	325	405	45	80	45	45	114	24	18	3.0	21.0		192	LR2+90	32x3.5	5167	32x43	M6	17.0
42 ZR2	450	560	55	95	50	52	128	26	20	3.0	23.0		214	LR2+100	40x4.0	11870	40x53	M6	17.0
48 ZR2	525	655	62	105	56	70	154	28	21	3.5	24.5		261	LR2+112	45x4.0	17486	45x59	M8	41.0
55 ZR2	685	825	74	120	65	80	175	30	22	4.0	26.0		288	LR2+130	55x4.0	33543	55x71	M8	41.0
65 ZR2	940	1175	80	135	75	80	185	35	26	4.5	30.5		387	LR2+150	60x4.0	44362	60x77	M8	41.0

<sup>1)</sup> For selections see page 22 et seqq./other spiders see page 127.

<sup>2)</sup> Dependent on hub type. Hub types can be freely selected, for summary see page 132.

<sup>3)</sup> Has to be remachined, if necessary.

<sup>4)</sup> Torsion spring stiffness with a length of 1 m of intermediate pipe.

For inquiries and orders please specify the shaft distance dimension LR<sub>1</sub>/LR<sub>2</sub> along with the maximum speed to review the critical bending speed.

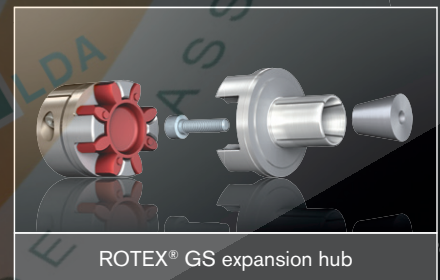
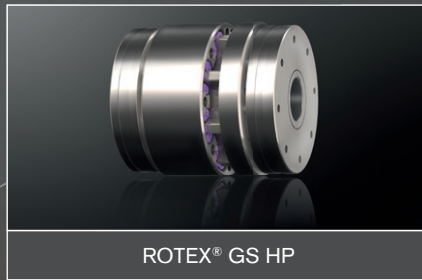
With vertical application a support washer has to be used (please specify in your order).

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 (LR <sub>1</sub> /LR <sub>2</sub> )	Spider hardness	Hub type	Finish bore	Hub type	Finish bore



# Wide range for your application





## Low-cost, backlash-free servo couplings – easy and quick assembly

**ROTEX® GS** is a three-part servo coupling backlash-free under prestress (elastomer coupling). The various hub versions and different Shore hardnesses determine the optimum coupling for each application in automation technology.

This servo coupling is applied wherever drives need to position precisely. In spite of its vibration-damping properties the coupling is torsionally stiff so that you do not have to cut back on precision even with highly dynamic servo drives. The ROTEX® GS backlash-free elastomer couplings allow for simultaneous compensation of radial, axial and angular displacements. The backlash-free servo

coupling ROTEX® GS operates with the construction kit system; it is available in a large number of various hub types that can be combined with each other within one coupling size.

The selection of the hub material depends on the size and it is composed of either aluminium or steel. Both frictionally engaged connections without feather keyway and positive-locking connections with feather keyway are available.

### Applications of the servo coupling ROTEX® GS

Couplings for machine tools, automation technology, drive technology, medical technology, packaging technology.



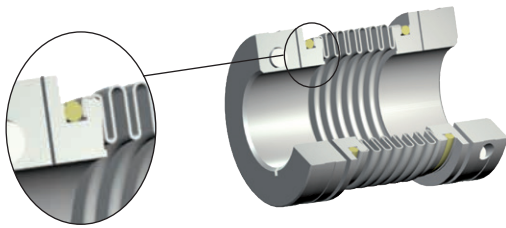


# TOOLFLEX®

## Metal bellow-type couplings

### Technical description

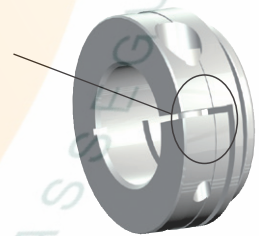
TOOLFLEX® is a metal bellow-type coupling, a coupling system which has proven in the field with numerous applications. The metal bellow compensates optimally for axial, radial and angular displacements. At the same time its geometric shape allows for high torsional stiffness and a low mass moment of inertia. TOOLFLEX® is manufactured in twelve sizes for maximum torques up to 600 Nm. Its main application ranges are both positioning drives, e. g. ball spindles with a high incline, and indexing tables or planetary and worm gears with small gear ratios.



Subject to its proven bonding technique a non-positive, backlash-free connection of the aluminium hubs with the multilayer bellows made of stainless steel is generated. The flanged insert connection for sizes 16 to 55 ensures torque transmission of every single bellow layer. Since TOOLFLEX® is a metal coupling, it remains fatigue-endurable in the high-temperature range up to a maximum of 200 °C. Apart from that it is resistant to the effect of media respectively critical operating conditions.

The renowned shaft-hub-connection made by clamping hubs ensures an easy assembly by a radial clamping screw. Subject to two slots in the hub there is no deformation of the bellow when tightening the clamping screw. For higher friction torques type KN with taper hubs can be used.

Double slotted clamping hub



### Types



Summary											
Size	Type	Bel-low-hub-connection	Torque of bellow [Nm]		Standard types				Special types		
			T <sub>KN</sub> [Nm]	T <sub>K max</sub> [Nm]	Setscrew 1.0 / 1.1	Clamping hubs 2.5 / 2.6	S-H / M-H 7.8 / 7.9	Max. speed [rpm] ZR 7.5 / 7.6	PI	KN 6.5	CF
5	S	Bonded Maximum ambient temperature 100 °C	0.1	0.15	47,700						
	M										
7	S		1	1.5	31,800	31,800					
	M										
9	S		1.5	2.25	23,800	23,800					
	M										
12	S		2	3	19,000	19,100					
	M										
16	S		5	7.5	14,900	14,900					
	M										
20	S		15	22.5	11,900	11,900	9,550	3,000	11,900		
	M										
30	S	Flanged Maximum ambient temperature 200 °C	35	52.5	8,700	6,950	3,000	8,700	15,280	8,700	
	M										
38	S		65	97.5	7,350	5,850	3,000	7,350	12,600	7,350	
	M										
42	S		95	142.5	6,820			6,820	11,580	6,820	
	M										
45	S		170	255	5,750	4,750	3,000	5,750	9,300	5,750	
	M										
55 Al	S		340	510	4,800						
	M										
55	S		340	510	4,800			4,800	7,870		
	M										
65	S	600	900	3,850							
	M										

# TOOLFLEX®

## Metal bellow-type couplings

### Types of hubs

Due to the use of TOOLFLEX® for many different applications and mounting situations, this coupling system is available with various hub types and two different lengths of bellows. A combination of the components forms a type.

TOOLFLEX® is supplied as a complete unit; a supply of individual components is not possible.



**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.



**Type 1.3**  
with spline bore  
Positive-locking power transmission. Spline on request of customers (e. g. for shaft with flattening).



**Type 1.2**  
without feather keyway, without setscrew  
For low torques. Suitable for bonding or pressing of the shaft.



**Type 2.5 clamping hub**  
double slotted, without feather keyway  
Frictionally engaged, backlash-free shaft-hub-connection. Transmittable torques depending on bore diameter.



**Type 2.6 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 7.5 clamping hub type DH**  
without feather keyway for double-cardanic connection  
Frictionally engaged, backlash-free shaft-hub-connection for radial assembly of coupling. Transmittable torques depending on bore diameter.



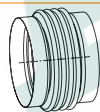
**Type 7.6 clamping hub type DH**  
with feather keyway for double-cardanic connection  
Positive-locking power transmission with additional friction fit for radial assembly of coupling. The friction fit avoids resp. reduces reverse backlash. Surface pressure of the keyway connection is reduced.



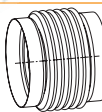
**Type 7.8 clamping hub type H**  
without feather keyway for single-cardanic connection  
Frictionally engaged, backlash-free shaft-hub-connection for radial assembly of coupling. Transmittable torques depending on bore diameter.



**Type 7.9 clamping hub type H**  
with feather keyway for single-cardanic connection  
Positive-locking power transmission 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.

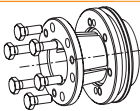


**Bellow type S**  
Bellow with 4 layers made of stainless steel; compact design with high torsion spring stiffness.



**Bellow type M**  
Bellow with 6 layers made of stainless steel; realizing large shaft distance dimensions and displacements.

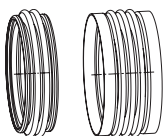
### Special designs on request of customers



**Type 6.5 taper hub KN**  
Integrated frictionally engaged shaft-hub-connection for the transmission of higher torques in the area of the shaft-hub-connection.



**Flange**  
Flange to connect to customer's component.0  
Special dimensions on request.

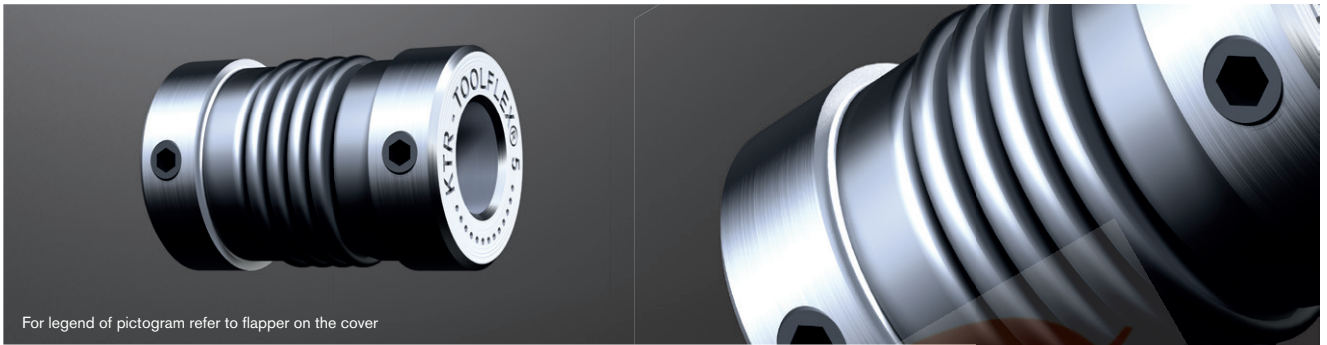


**Special bellows**  
Bellows with 1, 2 or 3 layers available on request.

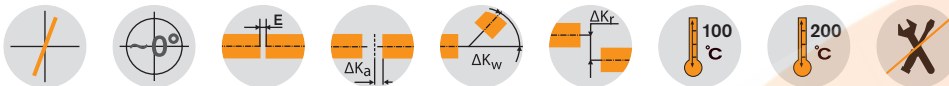
# TOOLFLEX® S

## Metal bellow-type couplings

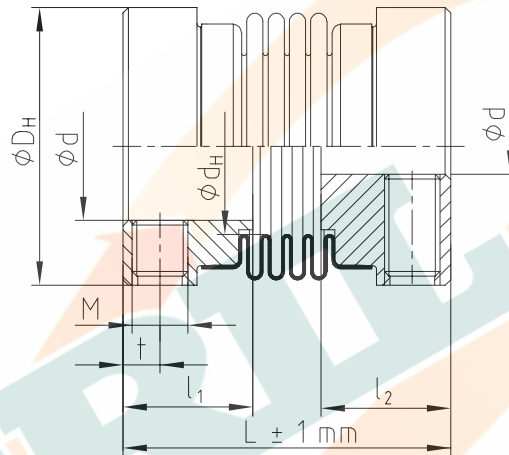
### Type S: Hubs with setscrews



For legend of pictogram refer to flapper on the cover



TOOLFLEX® S type 1.1



TOOLFLEX® S with setscrew (type 1.1) - Hub material aluminium/bellow material stainless steel

Size	Bellow-hub-connection	Torque of bellow $T_{KN}$ <sup>1)</sup> [Nm]	Max. speed [rpm]	Dimensions [mm]									Perm. displacements			Torsion spring stiffness CT [Nm/rad]	Weight <sup>3)</sup> [kg]
				Finish bore d		General				Setscrew			Axial [mm]	Radial [mm]	Angular [degree]		
				Min.	Max.	DH	dH	L	l <sub>1</sub> , l <sub>2</sub>	M	t	z = number <sup>2)</sup>					
5		0.1	47700	2	5	10	6	15	6	M2	1.8	1	±0.30	0.10	0.7	97	0.0027
7	4)	1.0	31800	3	8	15	9	18	7	M3	2.0	1	±0.30	0.10	0.7	390	0.005
9		1.5	23800	3	10	20	12	21	8	M3	2.2	2	±0.35	0.15	1.0	750	0.010
12		2.0	19000	4	14	25	16	27.5	11	M4	2.8	2	±0.40	0.15	1.0	1270	0.017
16	5)	5.0	14900	5	18	32	20	37	13	M5	4	2	±0.30	0.15	1.0	4500	0.046
20		15	11900	6	25	40	27	42	15	M5	5	2	±0.40	0.15	1.0	9600	0.076

<sup>1)</sup> For selection see page 22 et seqq.

<sup>2)</sup> Number per hub; from size 9: 2 x 120° offset.

<sup>3)</sup> Figures refer to the complete coupling with max. bore.

<sup>4)</sup> Bonded

<sup>5)</sup> Flanged

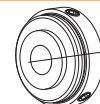
### Types of hubs

Type 1.0



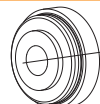
Hub with feather keyway and setscrew

Type 1.1



Hub without feather keyway, with setscrew

Type 1.2



Hub without feather keyway, without setscrew

Type 1.3



Hub with spline bore

Ordering example:

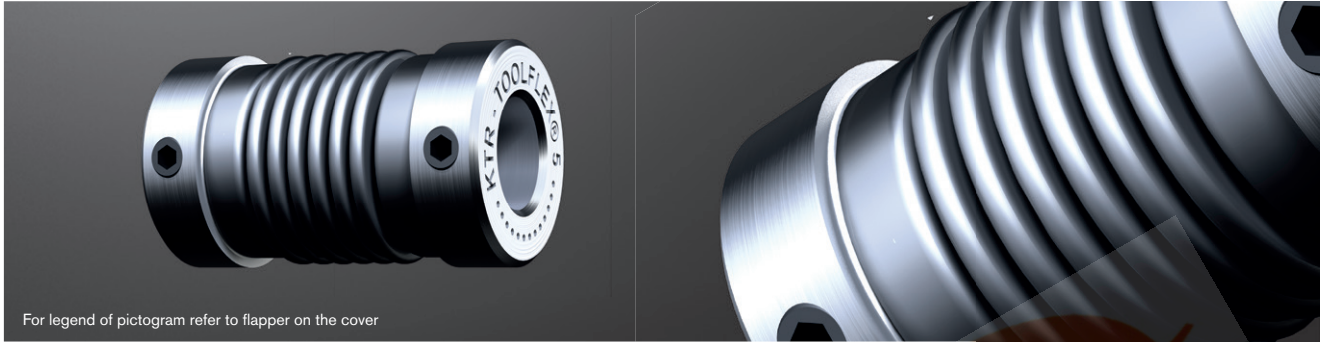
TOOLFLEX® 7 S	1.1 - Ø4		1.1 - Ø6	
Size and type of coupling	Hub type	Finish bore	Hub type	Finish bore



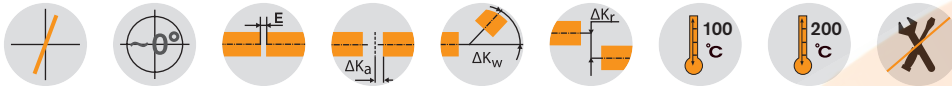
# TOOLFLEX® M

## Metal bellow-type couplings

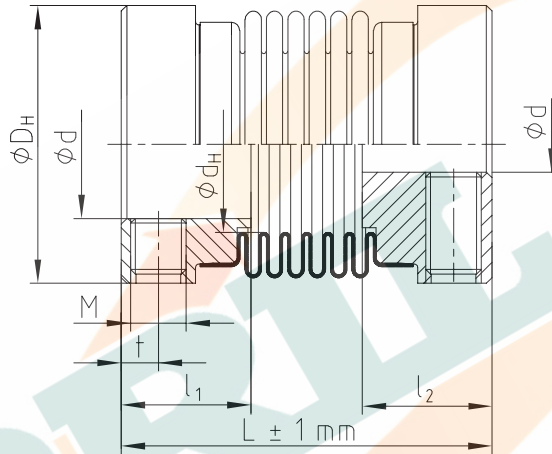
### Type M: Hubs with setscrews



For legend of pictogram refer to flapper on the cover



TOOLFLEX® M type 1.1



TOOLFLEX® M with setscrew (type 1.1) - Hub material aluminium/bellow material stainless steel

Size	Bellow-hub-connection	Torque of bellow $T_{KN}$ <sup>1)</sup> [Nm]	Max. speed [rpm]	Finish bore d		Dimensions [mm]						Perm. displacements			Torsion spring stiffness $C_T$ [Nm/rad]	Weight <sup>3)</sup> [kg]	
				Min.	Max.	General			Setscrew			Axial [mm]	Radial [mm]	Angular [degree]			
5		0.1	47700	2	5	10	6	17	6	M2	1.8	1	±0.40	0.15	1.0	75	0.003
7	4)	1.0	31800	3	8	15	9	20	7	M3	2.0	1	±0.40	0.15	1.0	300	0.006
9		1.5	23800	3	10	20	12	24	8	M3	2.2	2	±0.50	0.20	1.5	580	0.011
12		2.0	19000	4	14	25	16	31	11	M4	2.8	2	±0.60	0.20	1.5	980	0.019
16		5.0	14900	5	18	32	20	41	13	M5	4	2	±0.50	0.20	1.5	3050	0.049
20	5)	15	11900	6	25	40	27	49	15	M5	5	2	±0.60	0.20	1.5	6600	0.082

<sup>1)</sup> For selection see page 22 et seqq.  
<sup>2)</sup> Number per hub; from size 9: 2 x 120° offset.  
<sup>3)</sup> Figures refer to the complete coupling with max. bore.  
<sup>4)</sup> Bonded  
<sup>5)</sup> Flanged

### Types of hubs

Type 1.0



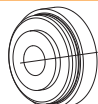
Hub with feather keyway and setscrew

Type 1.1



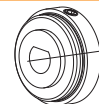
Hub without feather keyway, with setscrew

Type 1.2



Hub without feather keyway, without setscrew

Type 1.3



Hub with spline bore

Ordering example:

TOOLFLEX® 7 M	1.1 - Ø4		1.1 - Ø6	
Size and type of coupling	Hub type	Finish bore	Hub type	Finish bore

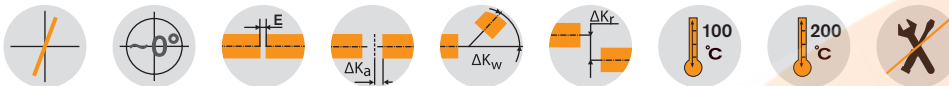
# TOOLFLEX® S

## Metal bellow-type couplings

### Type S: with clamping hubs



For legend of pictogram refer to flapper on the cover



#### TOOLFLEX® Type S with clamping hubs - Hub material aluminium (size 55/65 steel)/bellow material stainless steel

Size	Dimensions [mm]											
	Finish bore d		General					Clamping screws DIN EN ISO 4762				
	Min.	Max.	L	I <sub>1</sub> , I <sub>2</sub>	E	D <sub>H</sub>	d <sub>H</sub>	M <sub>1</sub>	DK	t <sub>1</sub>	e <sub>1</sub>	T <sub>A</sub> [Nm]
7	3	7	24	9	6	15	9	M2	16.5	3.2	5	0.37
9	3	9	29	11	7	20	12	M2.5	21.5	3.5	7.1	0.76
12	4	12	34.5	13	8.5	25	16	M3	26.5	4	8.5	1.34
16	5	16	45	17.0	11	32	20	M4	35.0	5	12.0	2.9
20	8	20	55	21.5	12	40	27	M5	43.5	6	14.5	6
30	10	30	63	23.0	17	55	33	M6	58.0	7	19	10
38	12	38	69	25.5	18	65	42	M8	72.6	9	25	25
42	14	42	84	30.0	24	70	46	M8	76.1	9	27	25
45	14	45	86.5	32.0	22.5	83	58	M10	89.0	11	30	49
55 Al	20	55	111	40.0	31	100	73	M12	106.0	14	37	86
55 <sup>3)</sup>	20	55	111	40.0	31	100	73	M12	106.0	14	37	120
65 <sup>3)</sup>	30	65	126	45.0	36	125	95	M14	127.2	15	45	185

#### Technical data

Size	Bellow-hub-connection	Torque of bellow T <sub>KN</sub> <sup>1)</sup> [Nm]	Max. speed [rpm]	Hub material	Moment of inertia <sup>2)</sup> [x10 <sup>-6</sup> kgm <sup>2</sup> ]	Torsion spring stiffness C <sub>T</sub> [Nm/rad]	Axial stiffness C <sub>a</sub> [N/mm]	Radial stiffness C <sub>r</sub> [N/mm]	Perm. displacements			Weight <sup>2)</sup> [kg]
									Axial [mm]	Radial [mm]	Angular [degree]	
7	Bonded	1	31800	Aluminium	0.26	390	—	—	±0.3	0.10	0.7	0.007
9		1.5	23800	Aluminium	0.97	750	—	—	±0.35	0.15	1.0	0.014
12		2	19100	Aluminium	2.6	1270	—	—	±0.4	0.15	1.0	0.025
16		5	14900	Aluminium	9	4500	43	138	±0.3	0.15	1.0	0.06
20		15	11950	Aluminium	30	9600	63	189	±0.4	0.15	1.0	0.12
30	Flanged	35	8700	Aluminium	114	17800	97	233	±0.5	0.20	1.5	0.24
38		65	7350	Aluminium	245	37400	108	318	±0.6	0.20	1.5	0.35
42		95	6820	Aluminium	396	54700	120	499	±0.6	0.20	1.5	0.49
45		170	5750	Aluminium	931	95800	132	738	±0.9	0.20	1.5	0.82
55 Al		340	4800	Aluminium	1665	144100	160	894	±1.1	0.25	1.5	1.50
55 <sup>3)</sup>		340	4800	Steel	4996	144100	160	894	±1.0	0.25	1.5	3.20
65 <sup>3)</sup>	600	3850	Steel	13318	322740	212	1365	±1.0	0.30	1.5	5.50	

<sup>1)</sup> For selection see page 22 et seqq.

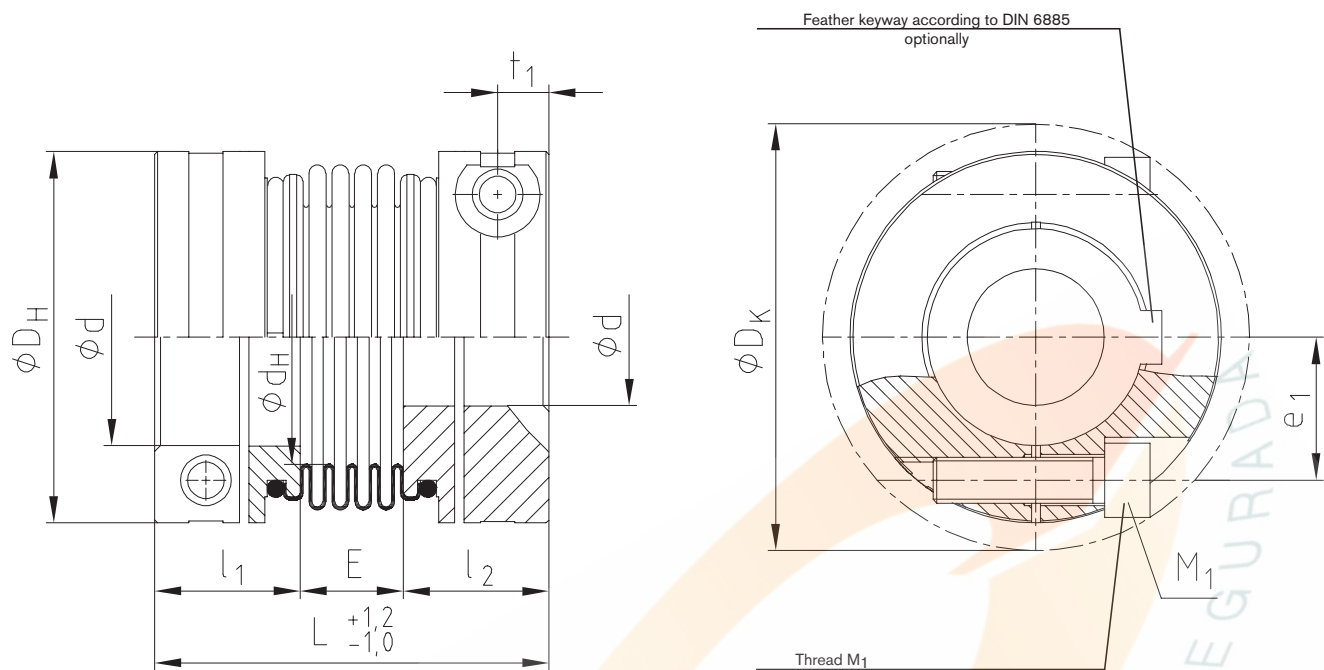
<sup>2)</sup> Figures refer to the complete coupling with max. bore.

<sup>3)</sup> Hub made of steel welded with bellow.

#### Review of shaft-hub-connection: Friction torques T<sub>R</sub> [Nm] for hub type 2.5

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	Ø50	Ø55	Ø60	Ø65	
7	0.84	0.91	0.97	1.04	1.10																										
9	1.87	1.98	2.09	2.20	2.31	2.41	2.52																								
12		3.48	3.65	3.81	3.98	4.14	4.31	4.48	4.64	4.81																					
16			8.5	8.8	9.1	9.4	9.7	9.9	10.2	10.5	11.1	11.4	11.7																		
20						17.6	18.1	18.6	19.1	19.5	20.5	21.0	21.4	22.4	22.9	23.3															
30									33.1	33.8	35.1	35.8	36.5	37.8	38.5	39.2	41.9	42.5	44.6	45.9											
38											79.2	80.4	81.7	84.2	85.4	86.6	91.6	92.8	96.5	99.0	102	105	109								
42											84.2	85.4	86.6	89.1	90.3	91.6	96.5	97.8	102	104	106	110	114	116	119						
45																157	165	167	173	177	181	187	193	197	200	206					
55 Al																270	281	284	293	298	304	313	321	327	333	341	356	371			
55 <sup>3)</sup>																	397	401	413	421	429	442	454	462	470	482	502	523			
65 <sup>3)</sup>																					720	732	750	768	780	792	810	840	870	900	930

Ordering example:	TOOLFLEX® 30 S	2.5	Ø25	2.5	Ø30
	Size and type of coupling	Hub type	Finish bore	Hub type	Finish bore

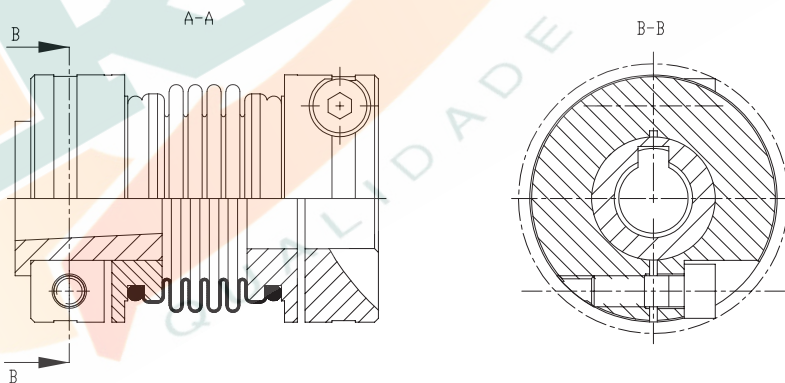


ROTEX® GS

Backlash-free  
servo couplings

TOOLFLEX®

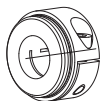
**Other types:**  
Type for FANUC motors



RADEX®-NC

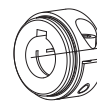
## Types of hubs

Type 2.5



Clamping hub double slot without feather keyway

Type 2.6



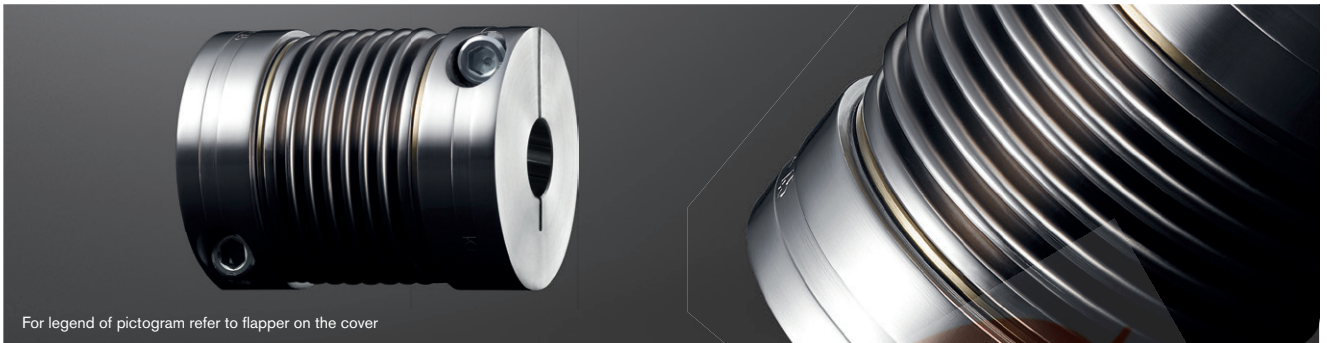
Clamping hub double slot with feather keyway

COUNTEX®

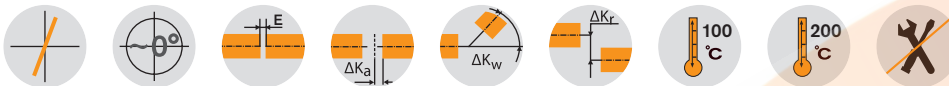
# TOOLFLEX® M

## Metal bellow-type couplings

### Type M: with clamping hubs



For legend of pictogram refer to flapper on the cover



#### TOOLFLEX® Type M with clamping hubs - Hub material aluminium (size 55/65 steel)/bellow material stainless steel

Size	Dimensions [mm]											
	Finish bore d		General					Clamping screws DIN EN ISO 4762				
	Min.	Max.	L	l <sub>1</sub> , l <sub>2</sub>	E	D <sub>H</sub>	d <sub>H</sub>	M <sub>1</sub>	DK	t <sub>1</sub>	e <sub>1</sub>	T <sub>A</sub> [Nm]
7	3	7	26	9	8	15	9	M2	16.5	3.2	5	0.37
9	3	9	32	11	10	20	12	M2.5	21.5	3.5	7.1	0.76
12	4	12	38	13	12	25	16	M3	26.5	4	8.5	1.34
16	5	16	49	17.0	15	32	20	M4	35.0	5	12	2.9
20	8	20	62	21.5	19	40	27	M5	43.5	6	14.5	6
30	10	30	72	23.0	26	55	33	M6	58.0	7	19	10
38	12	38	81	25.5	30	65	42	M8	72.6	9	25	25
42	14	42	95	30.0	35	70	46	M8	76.1	9	27	25
45	14	45	103	32.0	39	83	58	M10	89.0	11	30	49
55 Al	20	55	125	40.0	45	100	73	M11	106.0	14	37	86
55 <sup>3)</sup>	20	55	125	40.0	45	100	73	M12	106.0	14	37	120
65 <sup>3)</sup>	30	65	142	45.0	52	125	95	M14	127.2	15	45	185

#### Technical data

Size	Bellow-hub-connection	Torque of bellow T <sub>K(N)</sub> [Nm] <sup>1)</sup>	Max. speed [rpm]	Hub material	Moment of inertia <sup>2)</sup> [x10 <sup>-8</sup> kgm <sup>2</sup> ]	Torsion spring stiffness C <sub>T</sub> [Nm/rad]	Axial stiffness C <sub>a</sub> [N/mm]	Radial stiffness C <sub>r</sub> [N/mm]	Perm. displacements			Weight <sup>2)</sup> [kg]
									Axial [mm]	Radial [mm]	Angular [degree]	
7	Bonded	1	31800	Aluminium	0.3	300	—	—	±0.4	0.15	1.0	0.008
9		1.5	23800	Aluminium	1.0	580	—	—	±0.5	0.20	1.5	0.015
12		2	19100	Aluminium	2.7	980	—	—	±0.6	0.20	1.5	0.03
16		5	14900	Aluminium	10	3050	29	92	±0.5	0.20	1.5	0.06
20		15	11950	Aluminium	32	6600	42	126	±0.6	0.20	1.5	0.14
30	Flanged	35	8700	Aluminium	123	14800	65	155	±0.8	0.25	2.0	0.31
38		65	7350	Aluminium	262	24900	72	212	±0.8	0.25	2.0	0.45
42		95	6820	Aluminium	427	36500	80	333	±0.8	0.25	2.0	0.52
45		170	5750	Aluminium	1020	64000	88	492	±1.0	0.25	2.0	1.13
55 Al		340	4800	Aluminium	1706	96100	107	598	±1.1	0.30	2.0	2.0
55 <sup>3)</sup>		340	4800	Steel	5118	96100	107	598	±1.0	0.30	2.0	3.3
65 <sup>3)</sup>	600	3850	Steel	13727	226550	135	910	±2.0	0.35	2.0	5.6	

<sup>1)</sup> For selection see page 22 et seqq.

<sup>2)</sup> Figures refer to the complete coupling with max. bore.

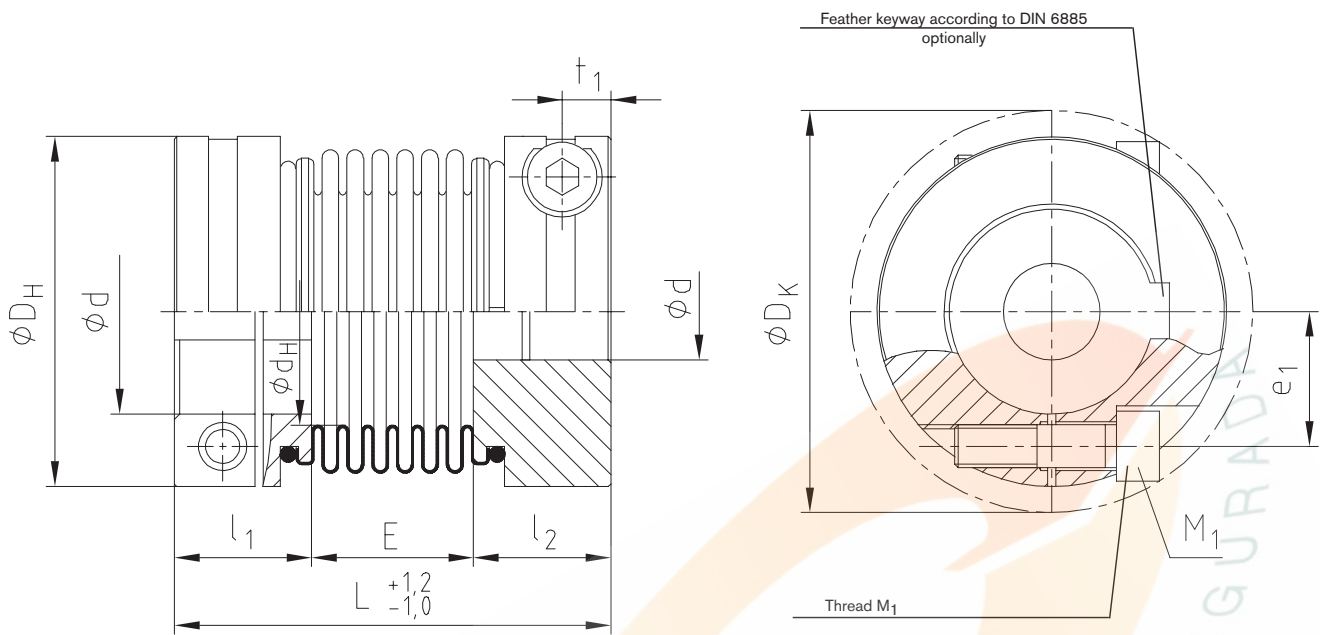
<sup>3)</sup> Hub made of steel welded with bellow.

#### Review of shaft-hub-connection: Friction torques T<sub>R</sub> [Nm] for hub type 2.5

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	Ø50	Ø55	Ø60	Ø65	
7	0.84	0.91	0.97	1.04	1.10																										
9	1.87	1.98	2.09	2.20	2.31	2.41	2.52																								
12		3.48	3.65	3.81	3.98	4.14	4.31	4.48	4.64	4.81																					
16			8.5	8.8	9.1	9.4	9.7	9.9	10.2	10.5	11.1	11.4	11.7																		
20						17.6	18.1	18.6	19.1	19.5	20.5	21.0	21.4	22.4	22.9	23.3															
30									33.1	33.8	35.1	35.8	36.5	37.8	38.5	39.2	41.9	42.5	44.6	45.9											
38											79.2	80.4	81.7	84.2	85.4	86.6	91.6	92.8	96.5	99.0	102	105	109								
42											84.2	85.4	86.6	89.1	90.3	91.6	96.5	97.8	102	104	106	110	114	116	119						
45																157	165	167	173	177	181	187	193	197	200	206					
55 Al																270	281	284	293	298	304	313	321	327	333	341	356	371			
55 <sup>3)</sup>																	397	401	413	421	429	442	454	462	470	482	502	523			
65 <sup>3)</sup>																					720	732	750	768	780	792	810	840	870	900	930

Ordering example:	TOOLFLEX® 30 M	2.5 - Ø25			2.5 - Ø30		
	Size and type of coupling	Hub type	Finish bore	Hub type	Finish bore	Hub type	Finish bore



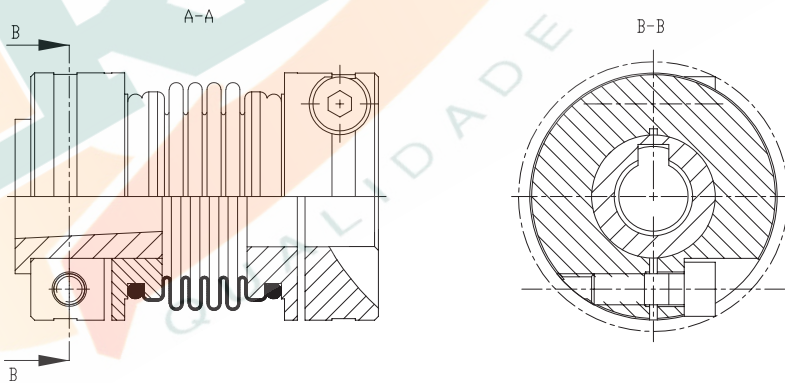


ROTEX® GS

Backlash-free servo couplings

TOOLFLEX®

**Other types:**  
Type for FANUC motors



RADEX®-NC

## Types of hubs

Type 2.5



Clamping hub double slot without feather keyway

Type 2.6



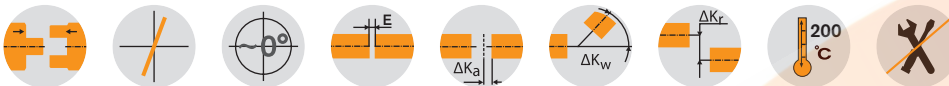
Clamping hub double slot with feather keyway

COUNTEX®

# TOOLFLEX® PI

## Metal bellow-type couplings

### Axial plug-in



#### TOOLFLEX® Type S-PI - Hub material aluminium/bellow material stainless steel

Size	Type	Dimensions [mm]													
		General									Clamping screws DIN EN ISO 4762				
		Min. d <sub>1</sub> , d <sub>2</sub>	Max. d <sub>1</sub>	Max. d <sub>2</sub>	L <sup>1)</sup>	l <sub>1</sub>	l <sub>2</sub>	E	D <sub>H</sub>	H	M <sub>1</sub> , M <sub>2</sub>	DK	e	t <sub>1</sub> , t <sub>2</sub>	T <sub>A</sub> [Nm]
20	S	8	20	20	67.0	21.5	33.5	12.0	40	0.5 - 1	M5	43.5	14.5	6	6
30	S	10	30	28	73.5	23.0	33.5	17.0	55	0.5 - 1	M6	58.0	19.0	7	10
38	S	12	38	32	87.5	25.5	44.0	18.0	65	0.5 - 1.5	M8	72.6	25.0	9	25
42	S	14	42	35	93.0	30	39.0	21.0	70	0.5 - 1.5	M8	76.1	25.0	9	25
45	S	14	45	42	96.0	32.0	41.5	22.5	83	0.5 - 1.5	M10	89.0	30.0	11	49
55 <sup>4)</sup>	S	20	55	55	130.1	40	58.5	31.5	100	0.5 - 1.5	M12	106.0	37	14	120

#### Technical data of TOOLFLEX® S-PI

Size	Type	Torque of bellow T <sub>KN</sub> <sup>2)</sup> [Nm]	Max. speed [rpm]	Moment of inertia <sup>3)</sup> [x10 <sup>-6</sup> kgm <sup>2</sup> ]	Torsion spring stiffness C <sub>T</sub> [Nm/rad]	Axial stiffness C <sub>a</sub> [N/mm]	Radial stiffness C <sub>r</sub> [N/mm]	Perm. displacements		Weight <sup>3)</sup> [kg]
								Radial [mm]	Angular [degree]	
20	S	15	11950	37	6600	63	189	0.15	1.0	0.15
30	S	35	8700	140	11500	97	233	0.20	1.5	0.29
38	S	65	7350	329	21500	108	318	0.20	1.5	0.50
42	S	95	6820	396	31500	120	499	0.20	1.5	0.49
45	S	170	5750	1031	55000	132	738	0.25	1.5	0.93
55 <sup>4)</sup>	S	340	4800	6150	144100	160	894	0.25	1.5	3.80

#### TOOLFLEX® Type M-PI - Hub material aluminium/bellow material stainless steel

Size	Type	Dimensions [mm]													
		General									Clamping screws DIN EN ISO 4762				
		Min. d <sub>1</sub> , d <sub>2</sub>	Max. d <sub>1</sub>	Max. d <sub>2</sub>	L <sup>1)</sup>	l <sub>1</sub>	l <sub>2</sub>	E	D <sub>H</sub>	H	M <sub>1</sub> , M <sub>2</sub>	DK	e	t <sub>1</sub> , t <sub>2</sub>	T <sub>A</sub> [Nm]
20	M	8	20	20	74.0	21.5	33.5	19.0	40	0.5 - 1	M5	43.5	14.5	6	6
30	M	10	30	28	82.5	23.0	33.5	26.0	55	0.5 - 1	M6	58.0	19.0	7	10
38	M	12	38	32	99.5	25.5	44.0	30.0	65	0.5 - 1.5	M8	72.6	25.0	9	25
42	M	14	42	35	104.0	30	39.0	32.0	70	0.5 - 1.5	M8	76.1	25.0	9	25
45	M	14	45	42	112.5	32.0	41.5	39.0	83	0.5 - 1.5	M10	89.0	30.0	11	49
55	M	20	55	55	143.6	40	58.5	45	100	0.5 - 1.5	M12	106.0	37	14	120

#### Technical data of TOOLFLEX® M-PI

Size	Type	Torque of bellow T <sub>KN</sub> <sup>2)</sup> [Nm]	Max. speed [rpm]	Moment of inertia <sup>3)</sup> [x10 <sup>-6</sup> kgm <sup>2</sup> ]	Torsion spring stiffness C <sub>T</sub> [Nm/rad]	Axial stiffness C <sub>a</sub> [N/mm]	Radial stiffness C <sub>r</sub> [N/mm]	Perm. displacements		Weight <sup>3)</sup> [kg]
								Radial [mm]	Angular [degree]	
20	M	15	11950	38	4900	42	126	0.20	1.5	0.16
30	M	35	8700	145	10200	65	155	0.25	2.0	0.31
38	M	65	7350	346	15100	72	212	0.25	2.0	0.52
42	M	95	6820	427	22000	80	333	0.25	2.0	0.52
45	M	170	5750	1127	41000	88	492	0.30	2.0	1.00
55 <sup>4)</sup>	M	340	4800	6270	96100	107	598	0.30	2.0	3.90

<sup>1)</sup> When plugged in

<sup>2)</sup> For selection see page 22 et seqq.

<sup>3)</sup> Figures refer to the complete coupling with max. bore.

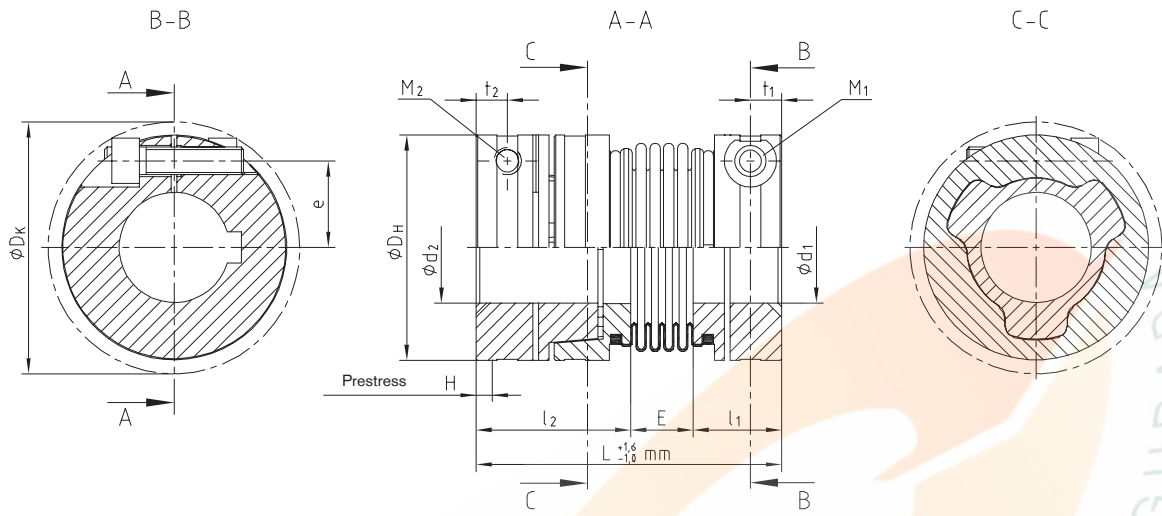
<sup>4)</sup> Hub made of steel welded with bellow.

#### Review of shaft-hub-connection: Friction torques T<sub>R</sub> [Nm] for hub type 2.5 for Ød<sub>1</sub>/Ød<sub>2</sub>

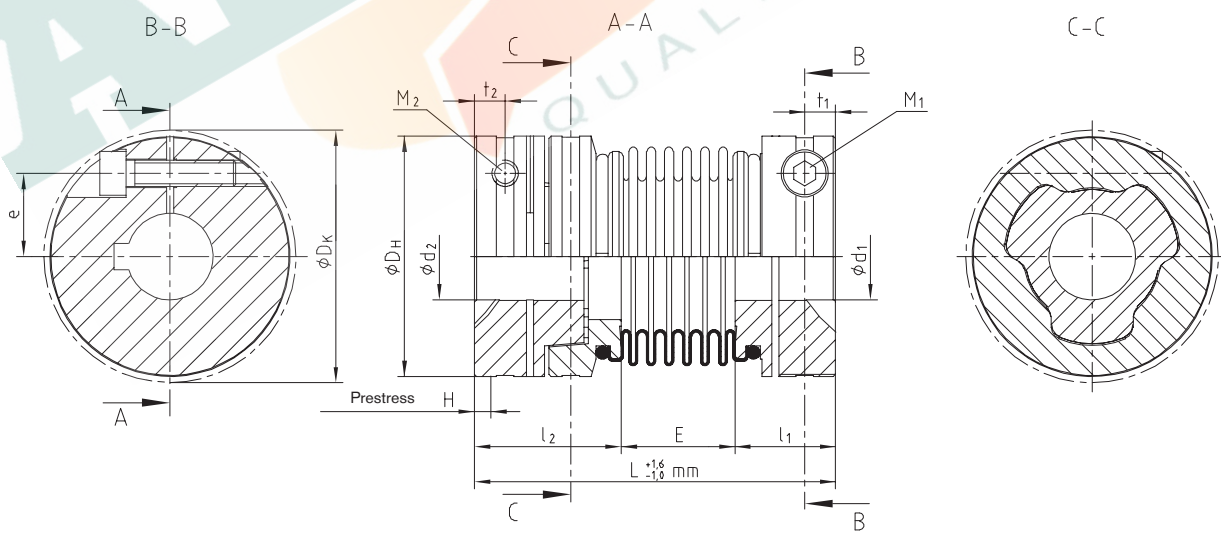
Size	Ø8	Ø9	Ø10	Ø11	Ø12	Ø14	Ø15	Ø16	Ø18	Ø19	Ø20	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42
20	17.6	18.1	18.6		19.1	19.5	20.5	21.0	21.4	22.4	22.9	23.3								
30				33.1	33.8	35.1	35.8	36.5	37.8	38.5	39.2	41.9	42.5	44.6	45.9					
38					79.2	80.4	81.7	84.2	85.4	86.6	91.6	92.8	96.5	99.0	102					
42					79.2	80.4	81.7	84.2	85.4	86.6	91.6	92.8	96.5	99.0	102	105				
45										157	165	167	173	177	181	187	193	197	200	
55											397	401	413	421	429	442	454	462	470	

Ordering example:	TOOLFLEX® 30 S-PI	d <sub>1</sub> - Ø22	d <sub>2</sub> - Ø18
	Size and type of coupling	Finish bore	Finish bore

TOOLFLEX® S-PI



TOOLFLEX® M-PI



ROTEX® GS

Backlash-free  
servo couplings

TOOLFLEX®

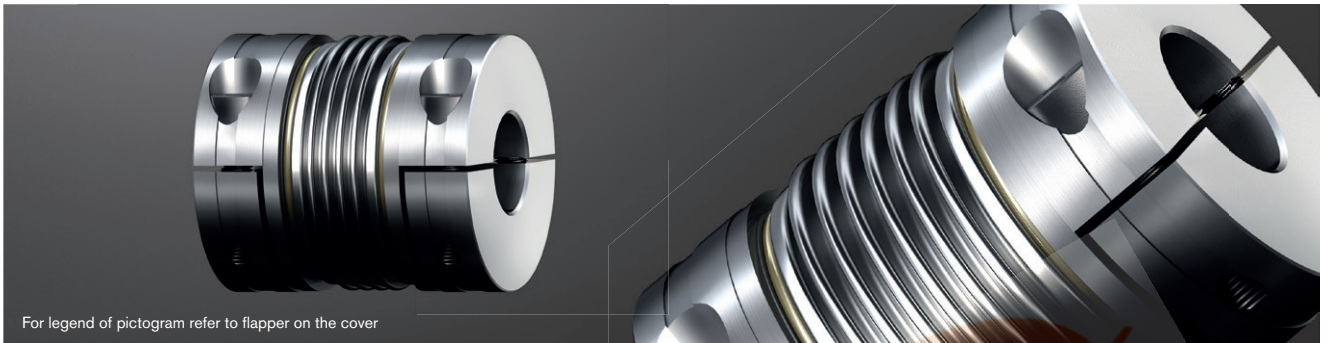
RADEX®-NC

COUNTEX®

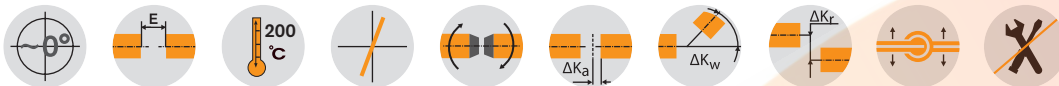
# TOOLFLEX® S-H / M-H

## Metal bellow-type couplings

### Half shell clamping hubs



For legend of pictogram refer to flapper on the cover



#### TOOLFLEX® type S-H / shell clamping hubs - Hub material aluminium/bellow material stainless steel

Size	Finish bore d		Dimensions [mm]												
	Min.	Max.	General								Clamping screws DIN EN ISO 4762				
			L	l <sub>1,2</sub>	E	D <sub>H</sub>	DK	E <sub>1</sub>	t <sub>1</sub>	x <sub>1,2</sub>	e	M	T <sub>A</sub> [Nm]		
20	8	20	51	19.5	12.0	40	41.2	26.0	5.5	12.5	14.5	M4	5.0		
30	10	30	68	25.5	17.0	55	57.7	34.0	7.5	17.0	19.0	M6	15.0		
38	12	38	78	30.0	18.0	65	72.6	36.0	9.5	21.0	25.0	M8	40.0		
45	14	45	94.5	36.0	22.5	83	88.8	46.5	11.0	24.0	30.0	M10	70.0		

#### Technical data of TOOLFLEX® S-H

Size	Bellows-hub-connection	Torque of bellow T <sub>KN</sub> <sup>1)</sup> [Nm]	Max. speed [rpm]	Moment of inertia <sup>2)</sup> [x10 <sup>-6</sup> kgm <sup>2</sup> ]	Torsion spring stiffness C <sub>T</sub> [Nm/rad]	Axial stiffness C <sub>a</sub> [N/mm]	Radial stiffness C <sub>r</sub> [N/mm]	Perm. displacements			Weight <sup>2)</sup> [kg]
								Axial [mm]	Radial [mm]	Angular [degree]	
20	Flanged	15	9550	28	9600	63	189	±0.4	0.15	1.0	0.110
30		35	6950	132	17800	97	233	±0.5	0.20	1.5	0.285
38		65	5850	292	37400	108	318	±0.6	0.20	1.5	0.422
45		170	4750	1003	95800	132	738	±0.9	0.20	1.5	0.897

#### TOOLFLEX® type M-H / half shell clamping hubs - Hub material aluminium/bellow material stainless steel

Size	Finish bore d		Dimensions [mm]												
	Min.	Max.	General								Clamping screws DIN EN ISO 4762				
			L	l <sub>1,2</sub>	E	D <sub>H</sub>	DK	E <sub>1</sub>	t <sub>1</sub>	x <sub>1,2</sub>	e	M	T <sub>A</sub> [Nm]		
20	8	20	58	19.5	19.0	40	41.2	33.0	5.5	12.5	14.5	M4	5.0		
30	10	30	77	25.5	26.0	55	57.7	43.0	7.5	17.0	19.0	M6	15.0		
38	12	38	90	30.0	30.0	65	72.6	48.0	9.5	21.0	25.0	M8	40.0		
45	14	45	111	36.0	39.0	83	88.8	63.0	11.0	24.0	30.0	M10	70.0		

#### Technical data of TOOLFLEX® M-H

Size	Bellows-hub-connection	Torque of bellow T <sub>KN</sub> <sup>1)</sup> [Nm]	Max. speed [rpm]	Moment of inertia <sup>2)</sup> [x10 <sup>-6</sup> kgm <sup>2</sup> ]	Torsion spring stiffness C <sub>T</sub> [Nm/rad]	Axial stiffness C <sub>a</sub> [N/mm]	Radial stiffness C <sub>r</sub> [N/mm]	Perm. displacements			Weight <sup>2)</sup> [kg]
								Axial [mm]	Radial [mm]	Angular [degree]	
20	Flanged	15	9550	29	6600	42	126	±0.6	0.20	1.5	0.115
30		35	6950	138	14800	65	155	±0.8	0.25	2.0	0.304
38		65	5850	310	24900	72	212	±0.8	0.25	2.0	0.445
45		170	4750	1069	64000	88	492	±1.0	0.25	2.0	0.947

<sup>1)</sup> For selection see page 22 et seqq.

<sup>2)</sup> Figures refer to the complete coupling with max. bore.

To make sure that the coupling can be assembled/disassembled radially, observe the insertion dimension x1/x2 of the shafts.

#### Review of shaft-hub-connection: Friction torques T<sub>R</sub> [Nm] for hub type 7.8 for Ød<sub>1</sub>/Ød<sub>2</sub>

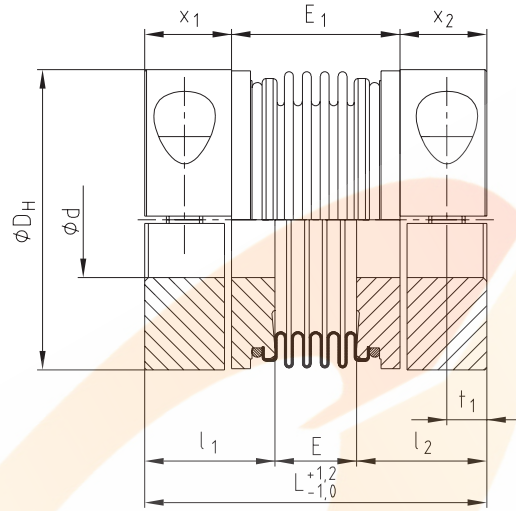
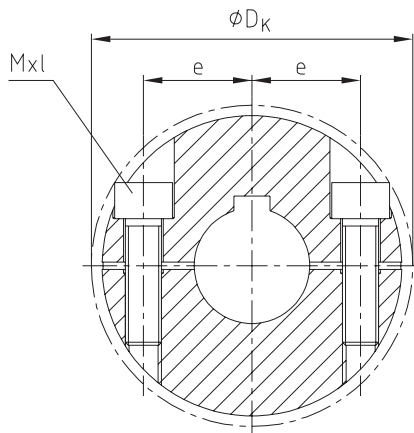
Size	Ø8	Ø9	Ø10	Ø11	Ø12	Ø14	Ø15	Ø16	Ø18	Ø19	Ø20	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	
20	20	23	25	28	30	35	38	40	45	48	50											
30			51	56	61	71	76	81	92	97	102	122	127	143								
38					120	140	150	160	180	190	200	240	250	280	300	320	350	380				
45						197	211	226	254	268	282	338	352	395	423	451	493	536	564	592	634	

Ordering example:

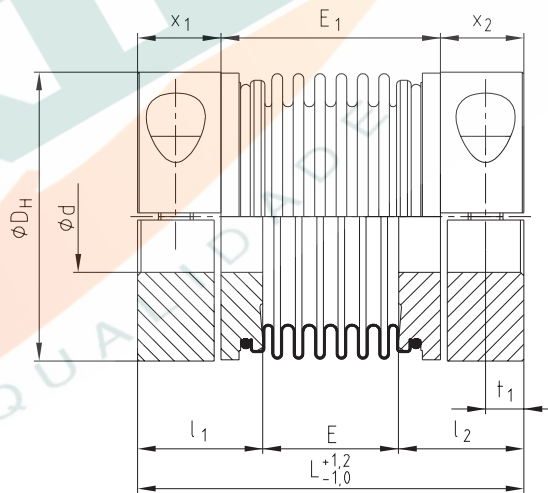
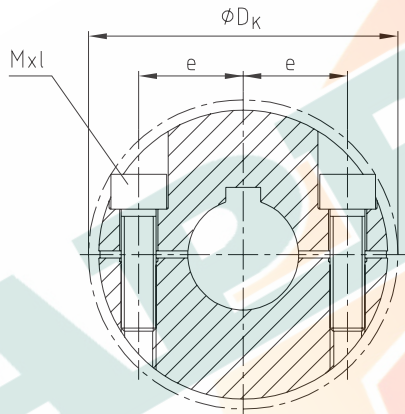
TOOLFLEX® 30 S-H	7.8 - Ø25			7.9 - Ø30		
Size and type of coupling	Hub type	Finish bore	Hub type	Finish bore	Hub type	Finish bore



TOOLFLEX® S-H



TOOLFLEX® M-H



ROTEX® GS

Backlash-free  
servo couplings

TOOLFLEX®

RADEX®-NC

Types of hubs

Type 7.8



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

Type 7.9



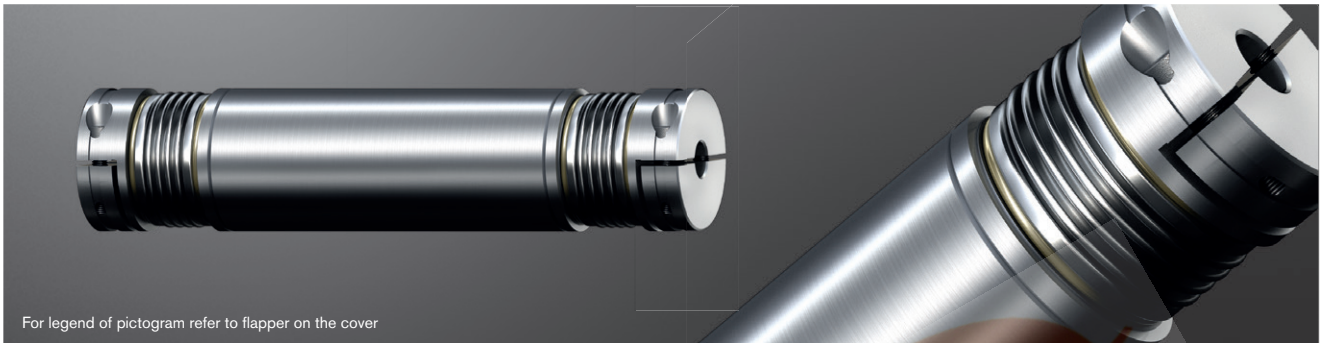
clamping hub type H with feather keyway for single-cardanic connection (on request)

COUNTEX®

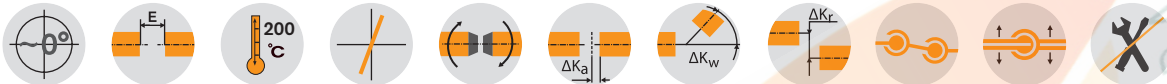
# TOOLFLEX® ZR

## Metal bellow-type couplings

### Intermediate shaft coupling with aluminium pipe bonded



For legend of pictogram refer to flapper on the cover



#### TOOLFLEX® type ZR / half shell clamping hubs - Hub material aluminium/bellow material stainless steel

Size	Finish bore d		Dimensions [mm]											Clamping screws DIN EN ISO 4762	
	Min.	Max.	DH	L	l3	General				dR	DK	t1	e	M	TA [Nm]
						LR		LZR = LR + 2 • l3							
20	8	20	40	40	12.5	Min. 80	Max. 2975	Min. 105	Max. 3000	40	41.2	5.5	14.5	M4	5
30	10	28	55	58.5	17.0	114	3466	148	3500	50	58.0	7.5	19	M6	15
38	12	38	65	61	21.0	129	3958	171	4000	60	72.6	9.5	25	M8	40
45	14	45	83	78.5	25.0	149	3950	199	4000	80	89.0	11.0	30	M10	70

#### Technical data of TOOLFLEX® ZR

Size	Torque of bellow TKN <sup>1)</sup> [Nm]	Moment of inertia [10 <sup>-3</sup> kgm <sup>2</sup> ]		Static torsion spring stiffness [Nm/rad]
		ZR hub <sup>2)</sup>	Pipe/meter	
20	15	0.024378	0.329	1935
30	35	0.121256	0.673	3800
38	65	0.253162	1.199	7240
45	170	0.961451	4.560	23183

<sup>1)</sup> For selection see page 22 et seqq.

<sup>2)</sup> Figures refer to the complete coupling with max. bore.

<sup>3)</sup> Torsion spring stiffness with a length of 1 m of intermediate pipe with  $L_{pipe} = LZR \cdot 2 \cdot L$

For inquiries and orders please specify the shaft distance dimension LR along with the maximum speed to review the critical bending speed. Straightness/concentricity of pipes according to DIN EN 755-1.

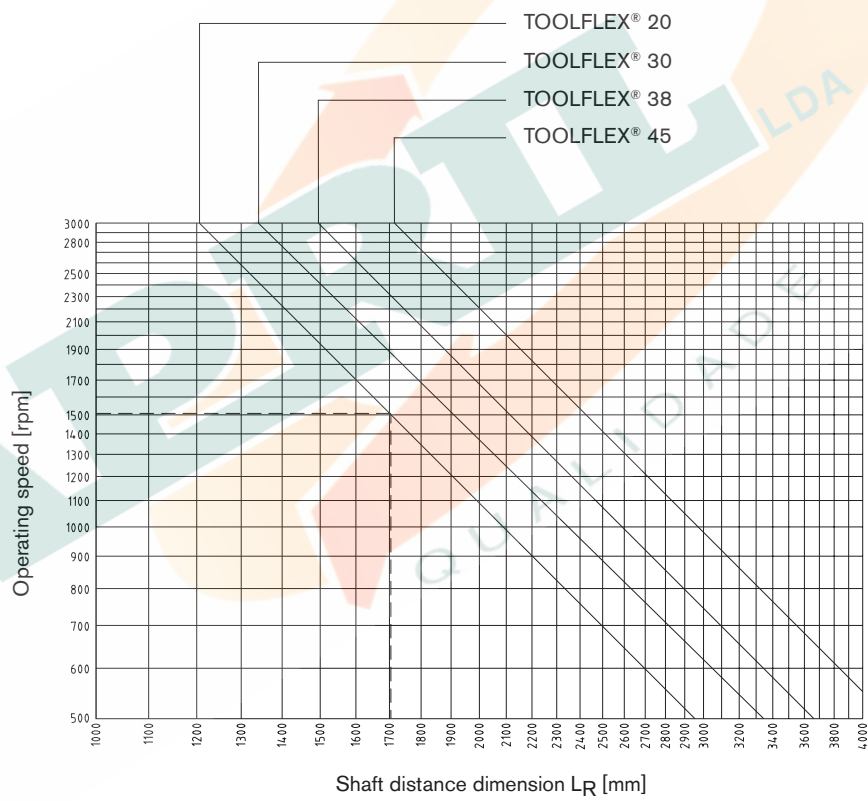
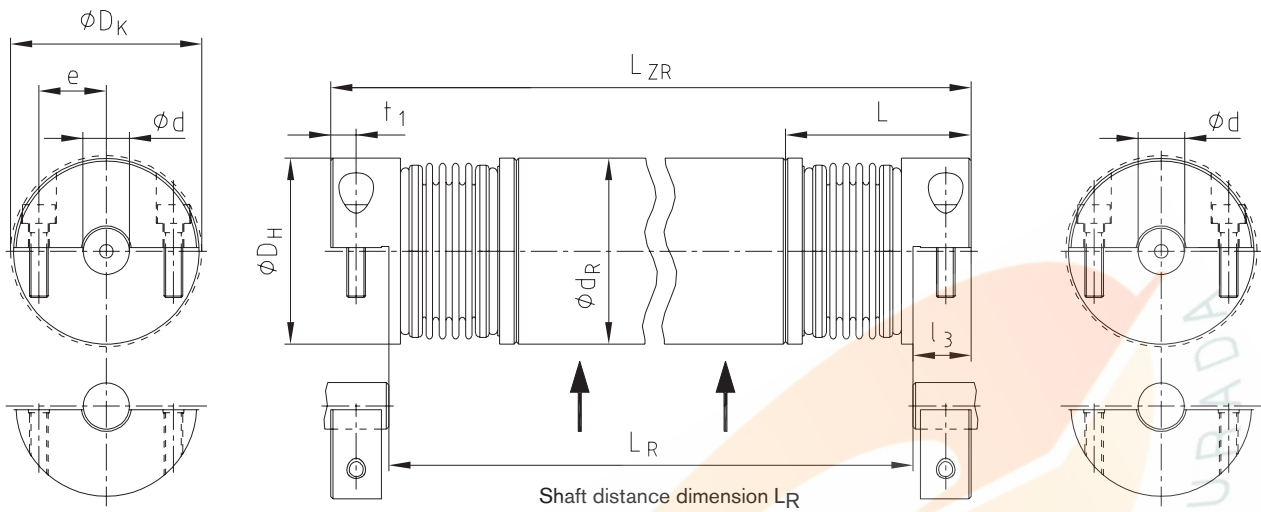
#### Review of shaft-hub-connection: Friction torques $T_R$ [Nm] for hub type 7.5 for $\varnothing d_1/\varnothing d_2$

Size	Ø8	Ø9	Ø10	Ø11	Ø12	Ø14	Ø15	Ø16	Ø18	Ø19	Ø20	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	
20	20	23	25	28	30	35	38	40	45	48	50											
30			51	56	61	71	76	81	92	97	102	122	127	143								
38					120	140	150	160	180	190	200	240	250	280	300	320	350	380				
45						197	211	226	254	268	282	338	352	395	423	451	493	536	564	592	634	

**Ordering example:**

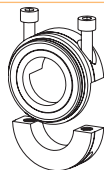
TOOLFLEX® 30	ZR	1200 mm	7.5 - Ø24	7.6 - Ø24
Size and type of coupling	Type	Shaft distance dimension (LR)	Hub type	Finish bore
			Hub type	Finish bore

TOOLFLEX® ZR



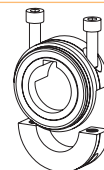
Types of hubs

Type 7.5



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

Type 7.6



Clamping hub type DH with feather keyway for double-cardanic connection (on request)

ROTEX® GS

Backlash-free servo couplings

TOOLFLEX®

RADEX®-NC

COUNTEX®

# RADEX®-NC

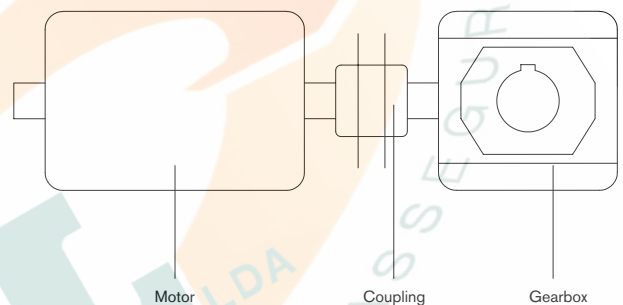
## Servo laminae couplings

### Technical description

RADEX®-NC is a line specifically developed for servo technology. With this coupling a set of torsionally rigid steel laminas that are soft in bending ensure reliable compensation for axial, angular and radial shaft displacements. As an all-metal coupling - the laminas are made of stainless steel - RADEX®-NC can even be used with high temperatures (up to 200 °C) and under aggressive ambient conditions. RADEX®-NC is manufactured in 10 sizes from size 5 to 75 for max. torques up to 4800 Nm. In addition to the two different types (EK = single-cardanic and DK = double-cardanic) it is available in five different hub types.



A typical application of RADEX®-NC are backlash-free worm gear pairs with low gear ratios. For reason of the gear ratio of the gearbox the rigidity of the coupling must be converted from the drive side into the driven side. Here the gear ratio itself has a decisive effect because it is included in the calculation by square. This converted rigidity is added in line with the gearbox stiffness in order to obtain the total rigidity. In case of gear ratios that are smaller than  $i = 8$  we recommend to use RADEX®-NC due to the loss of rigidity of the total system arising with the use of flexible couplings.



### Use in potentially explosive atmospheres

RADEX®-NC 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](http://www.ktr.com).

#### Selection:

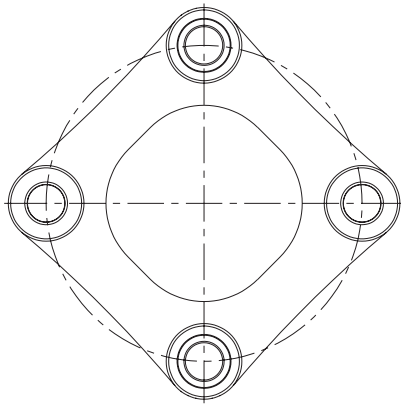
If used in potentially explosive atmospheres, the clamping hubs without feather keyway only for use in category 3 (with feather keyway for cat. 2) must be selected in that there is a minimum safety factor of  $s = 2$  between the peak torque (including all operating parameters) and the nominal torque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



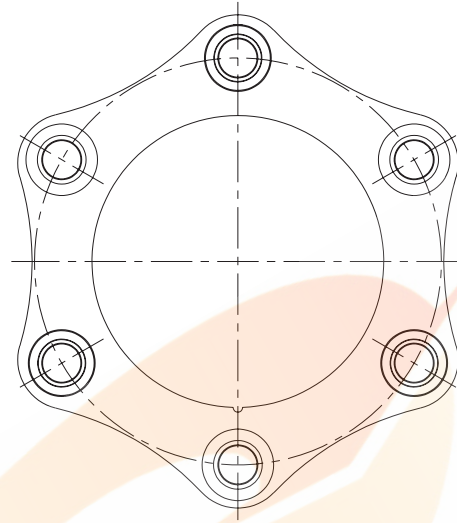


# RADEX®-NC DK and EK Servo laminae couplings

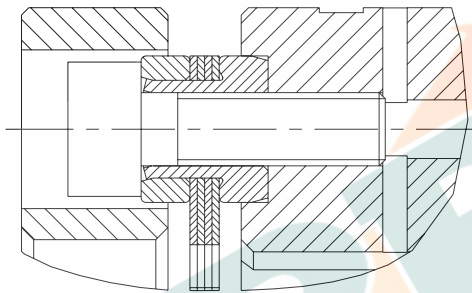
## Laminae sets



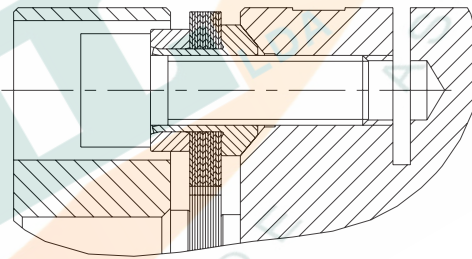
Size 5 to 26  
(lamina with 4 holes)



Size 36 to 75  
(lamina with 6 holes)



Size 5 to 10  
(cylindrical sleeve)



Size 16 to 75  
(taper sleeve)

## Types of hubs



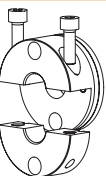
**Type 2.5 clamping hub**  
double slotted, without feather keyway  
Frictionally engaged, backlash-free shaft-hub-connection.  
Transmittable torques depending on bore diameter.



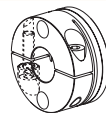
**Type 2.6 clamping hub**  
double slotted, with feather keyway  
Positive-locking power transmission with additional friction fit. The friction fit avoids resp. reduces reverse backlash. Surface pressure of the keyway connection is reduced.



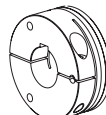
**Type 6.5 clamping ring hub**  
Integrated frictionally engaged shaft-hub-connection for the transmission of higher torques. Suitable for high speeds.



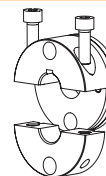
**Type 7.5 clamping hub type DH**  
without feather keyway for double-cardanic connection  
Frictionally engaged, backlash-free shaft-hub-connection for radial assembly of coupling. Transmittable torques depending on bore diameter.



**Type 3.5 clamping hub**  
triple slotted, without feather keyway  
Frictionally engaged, backlash-free shaft-hub-connection, good properties of concentric running and reduced imbalance. Transmittable torques depending on bore diameter. Type 3.5 standard from size 43



**Type 3.6 clamping hub**  
triple 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 3.6 standard from size 43



**Type 7.6 clamping hub type DH**  
with feather keyway for double-cardanic connection  
Positive-locking, backlash-free power transmission 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.

ROTEX® GS

Backlash-free  
servo couplings

TOOLFLEX®

RADEX®-NC

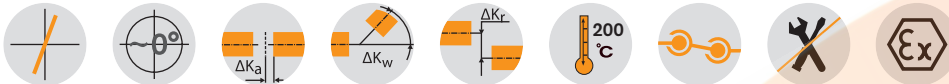
COUNTEX®

# RADEX®-NC DK and EK Servo laminae couplings

## Double- and single-cardanic types



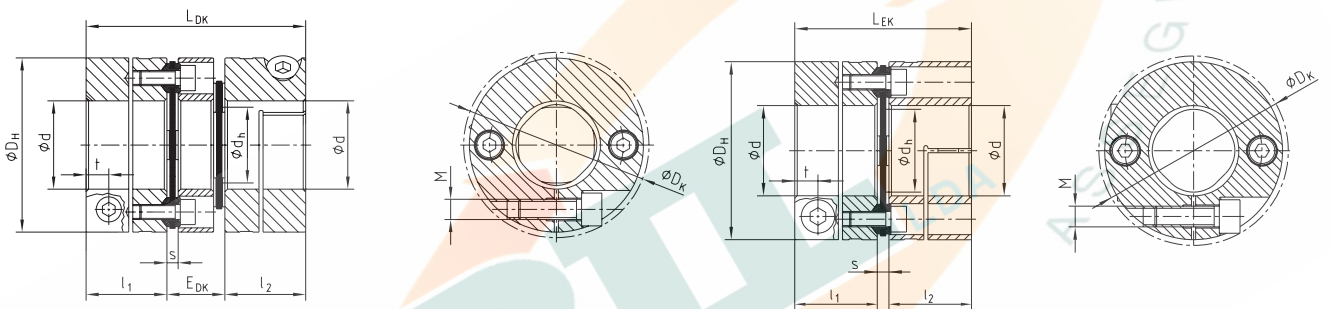
For legend of pictogram refer to flapper on the cover



### Hub type 2.5/2.6

#### Type DK

#### Type EK



### RADEX®-NC Types DK and EK - Hub and spacer material aluminium/laminas made of stainless steel

Size	Dimensions [mm]											Clamping screws DIN EN ISO 4762		Mass moment of inertia [kgm <sup>2</sup> ]	
	d <sub>max.</sub>	DH	DK	l <sub>1</sub> , l <sub>2</sub>	L <sub>DK</sub>	E <sub>DK</sub>	L <sub>EK</sub>	d <sub>h</sub>	s	t	M	T <sub>A</sub> [Nm]	DK	EK	
5	12	26	26	12	34	10	26.5	12	2.5	3.5	M2.5	0.8	0.000004	0.000003	
10	15	35	35	16	44	12	35	14.5	3	5	M4	3	0.000016	0.000012	
16	20	46	49	22	58	14	47	19.5	3	6.8	M6	10	0.000063	0.00005	
21	30	58	59	25	69	19	53.5	24	3.5	6.8	M6	10	0.00018	0.00014	
26	38	69	73	32	88	24	69	30	5	9	M8	25	0.00046	0.00036	
36	45	84	87	35	93.6	23.6	74.8	48	4.8	10.5	M10	49	0.0011	0.00091	

### Technical data

Size	T <sub>KN</sub> <sup>1)</sup> [Nm]	T <sub>K max</sub> <sup>1)</sup> [Nm]	Max. speed [rpm]	Torsion spring stiffness [Nm/rad]			Laminae type	Displacements of type DK			Displacements of type EK		
				EK	DK	4 holes		Radial [mm]	Axial [mm]	Angular per lamina [degree]	Radial [mm]	Axial [mm]	Angular per lamina [degree]
5	2.5	5	18,300	2,400	1,200	4 holes	0.13	± 0.4	1	-	± 0.2	1	
10	7.5	15	13,600	5,600	2,800	4 holes	0.16	± 0.8	1	-	± 0.4	1	
16	35	53	10,500	20,000	10,000	4 holes	0.19	± 1.0	1	-	± 0.5	1	
21	70	105	8,500	40,000	20,000	4 holes	0.27	± 1.2	1	-	± 0.6	1	
26	120	180	7,000	84,000	42,000	4 holes	0.33	± 1.6	1	-	± 0.8	1	
36	340	510	5,700	280,000	140,000	6 holes	0.32	± 2.0	1	-	± 1.0	1	

<sup>1)</sup> For selection see page 22 et seqq.

### Review of shaft-hub-connection: Friction torques T<sub>R</sub> [Nm] for hub type 2.5

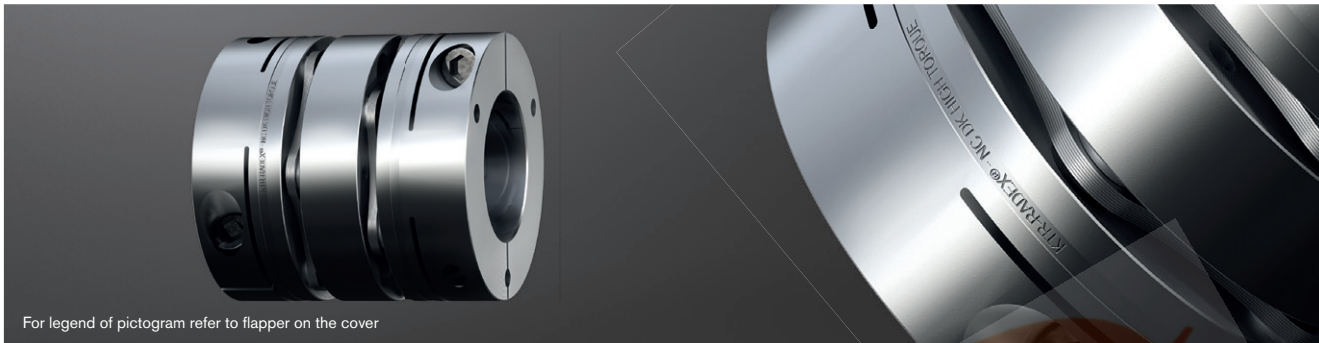
Size	Pilot bored	Ø3	Ø5	Ø8	Ø10	Ø12	Ø14	Ø15	Ø16	Ø19	Ø20	Ø22	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45
5	2.5	1.1	1.8	2.8	3.4	4																
10	4.5		5	7.7	9.5	11.1	12.7	13.5														
16	5.5				23	27	31	33	35	41	43											
21	7.5					28	32	34	36	42	44	48	52	54	59	63						
26	9.5							66	70	81	85	92	100	103	114	121	127	137	147			
36	11.5									129	135	147	159	165	182	194	199	221	237	247	258	273

Ordering  
example:

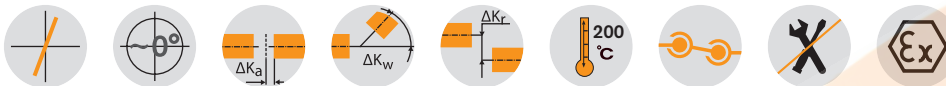
RADEX®-NC 21	DK	2.5 - Ø20		2.5 - Ø25	
Coupling size	Type	Hub type	Finish bore	Hub type	Finish bore

# RADEX®-NC DK and EK Servo laminae couplings

## Double- and single-cardanic types



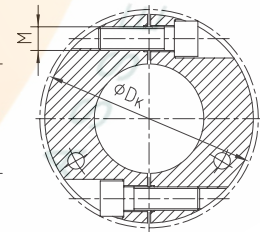
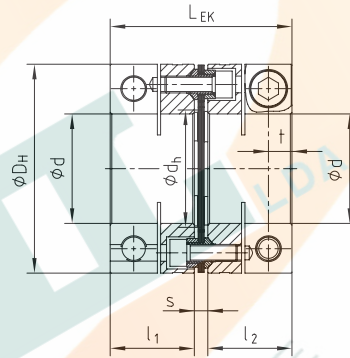
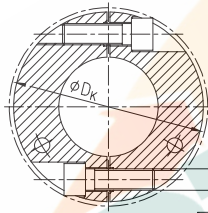
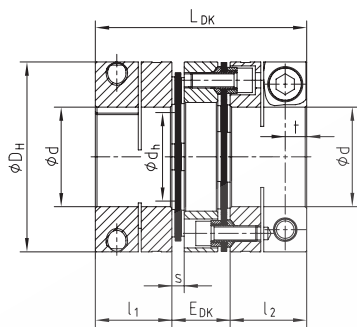
For legend of pictogram refer to flapper on the cover



### Hub type 3.5/3.6

#### Type DK

#### Type EK



### RADEX®-NC Types DK and EK - Hub and spacer material aluminium up to size 61, steel with size 75 / laminas made of stainless steel

Size	Dimensions [mm]										Clamping screws DIN EN ISO 4762		Mass moment of inertia [kgm <sup>2</sup> ]	
	d <sub>max</sub>	D <sub>H</sub>	DK	l <sub>1</sub> , l <sub>2</sub>	L <sub>DK</sub>	E <sub>DK</sub>	L <sub>EK</sub>	d <sub>h</sub>	s	t	M	T <sub>A</sub> [Nm]	DK	EK
43	55	104	104	40.5	115	34	89	61	8	10.5	M10	49	0.0033	0.0025
51	70	124	130	50	138	38	108	73	8	14	M14	135	0.0082	0.006
61	80	144	148.5	54	150	42	118	88	10	16	M16	210	0.016	0.012
75	90	170	181.1	70	189	49	152	104	12	21.5	M20	610	0.099	0.077

### Technical data

Size	T <sub>KN</sub> <sup>1)</sup> [Nm]	T <sub>K max</sub> <sup>1)</sup> [Nm]	Max. speed [rpm]	Torsion spring stiffness [Nm/rad]		Laminae type	Displacements of type DK			Displacements of type EK		
				Type EK	Type DK		Radial [mm]	Axial [mm]	Angular per lamina [degree]	Radial [mm]	Axial [mm]	Angular per lamina [degree]
43	600	900	8,100	510,000	255,000	6 holes	0.45	± 2.20	1	—	± 1.10	1
51	1,300	1,950	6,700	920,000	460,000	6 holes	0.52	± 2.50	1	—	± 1.25	1
61	2,000	3,000	6,100	1,500,000	750,000	6 holes	0.56	± 2.60	1	—	± 1.30	1
75	3,200	4,800	5,100	2,100,000	1,050,000	6 holes	0.64	± 2.90	1	—	± 1.45	1

<sup>1)</sup> For selection see page 22 et seqq.

### Review of shaft-hub-connection: Friction torques T<sub>f</sub> [Nm] for hub type 3.5

Size	Pilot bored	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50	Ø55	Ø58	Ø60	Ø65	Ø70	Ø75	Ø80	Ø85	Ø90	
43	15.0	238	248	258	297	317	347	377	397	416	446	476	496	545									
51	28.0				594	633	693	752	792	831	891	950	990	1089	1148	1188	1286	1385					
61	30.0								1039	1093	1148	1230	1312	1367	1503	1585	1640	1777	1913	2050	2187		
75	35												3129	3192	3630	3755	4068	4381	4694	5006	5319	5632	

#### Ordering example:

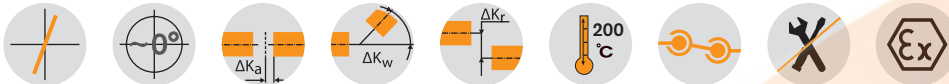
RADEX®-NC 43	DK	3.5 - Ø25			3.5 - Ø35	
Coupling size	Type	Hub type	Finish bore	Hub type	Finish bore	

# RADEX®-NC DK and EK with clamping ring hubs Servo laminae couplings

## Double- and single-cardanic types



For legend of pictogram refer to flapper on the cover



### RADEX®-NC Types DK and EK - Hub and spacer material aluminium/laminas made of stainless steel

Size	Dimensions [mm]											Clamping screws DIN EN ISO 4017			Mass moment of inertia [kgm <sup>2</sup> ]	
	d <sub>max.</sub>	DH	l <sub>1, 2</sub>	l <sub>3</sub>	LDK	LDK1	EDK	LEK	LEK1	d <sub>h</sub>	s	M x l	z = number	T <sub>A</sub> [Nm]	DK	EK
16	20	46	24	18	62	68	14	51	57	19.5	3	M5 x 20	4	6	0.000075	0.000063
21	28	58	28	22	75	81.2	19	59.5	65.7	24	3.5	M6 x 25	4	10	0.000218	0.000177
26	35	69	36	28	96	100.8	24	77	81.8	30	5	M5 x 30	8	6	0.000565	0.000467
36	42	84	43	35	109.6	118.3	23.6	90.8	99.5	48	4.8	M8 x 40	6	25	0.001581	0.001294
43	60	104	46	35	126	135.9	34	100	109.9	61	8	M8 x 40	6	25	0.004051	0.003250
51	70	124	50	38	138	150.5	38	108	120.5	73	8	M10 x 45	6	49	0.008981	0.007096
61	80	144	55	43	152	165.5	42	120	133.5	88	10	M12 x 50	6	85	0.024188	0.020678

### Technical data

Size	T <sub>KN</sub> <sup>1)</sup> [Nm]	T <sub>K max</sub> <sup>1)</sup> [Nm]	Max. speed [rpm]	Torsion spring stiffness [Nm/rad]		Laminae type	Displacements of type DK			Displacements of type EK		
				Type EK	Type DK		Radial [mm]	Axial [mm]	Angular per lamina [degree]	Radial [mm]	Axial [mm]	Angular per lamina [degree]
16	35	53	31,150	20,000	10,000	4 holes	0.19	± 1.00	1.00	—	± 0.50	1
21	70	105	24,700	40,000	20,000	4 holes	0.27	± 1.20	1.00	—	± 0.60	1
26	120	180	20,800	84,000	42,000	4 holes	0.33	± 1.60	1.00	—	± 0.80	1
36	340	510	17,100	280,000	140,000	6 holes	0.32	± 2.00	1.00	—	± 1.00	1
43	600	900	13,800	510,000	255,000	6 holes	0.45	± 2.20	1.00	—	± 1.10	1
51	1300	1950	11,600	920,000	460,000	6 holes	0.52	± 2.50	1.00	—	± 1.25	1
61	2000	3000	10,000	1,500,000	750,000	6 holes	0.56	± 2.60	1.00	—	± 1.30	1

<sup>1)</sup> For selection see page 22 et seqq.

### Review of shaft-hub-connection: Friction torques T<sub>R</sub> [Nm] for hub type 6.5

Size	Tolerance fit	Ø10	Ø12	Ø14	Ø15	Ø16	Ø19	Ø20	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50	Ø55*	Ø60*	Ø65*	Ø70*	Ø75*	Ø80*	
16	H7/h6	29	33	57	70	50	83	97																			
	H7/k6	34	42	64	76	62	96	109																			
21	H7/h6	27	45	75	91	79	125	145	127	144	201																
	H7/k6	36	56	83	99	93	139	157	169	187	245																
26	H7/h6				104	126	194	169	279	311	338	404	273	357													
	H7/k6				124	145	214	200	305	334	382	444	355	441													
36	H7/h6							241	395	438	521	616	523	664	647	741	841										
	H7/k6							284	430	471	558	646	640	779	778	875	974										
43	H7/h6										595	705	647	814	946	1073	980	1163	1360	1200	1072	1372					
	H7/k6										684	789	784	916	1096	1219	1144	1332	1534	1376	1370	1669					
51	H7/h6										750	818	1020	1085	1228	1166	1377	1605	1450	1607	2283	2255	2704				
	H7/k6										822	927	1117	1254	1392	1348	1568	1803	1652	1960	2387	2447	2842				
61	H7/h6													880	1074	1211	1264	1480	1597	1750	1911	2097	2542	2669	2718	3168	
	H7/k6													951	1131	1258	1333	1534	1668	1810	2032	2239	2635	2785	2855	3252	

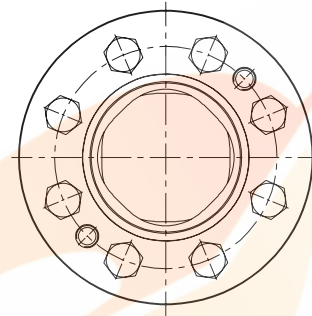
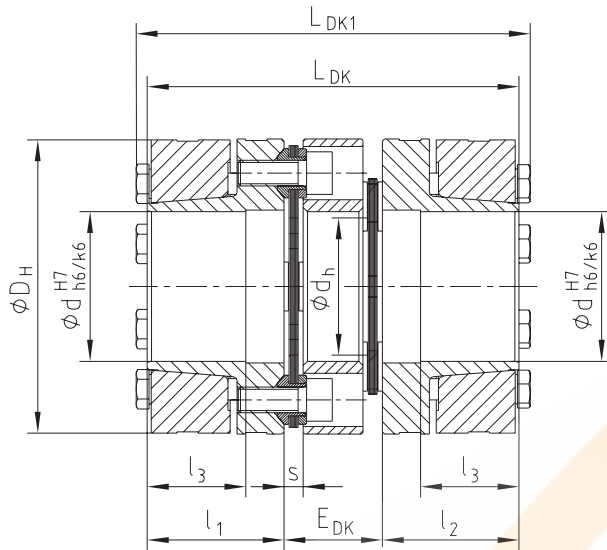
\* From Ø55 tolerance G7/m6

Ordering example:	RADEX®-NC 26	DK	6.5 - Ø24		6.5 - Ø35	
	Coupling size	Type	Hub type	Finish bore	Hub type	Finish bore

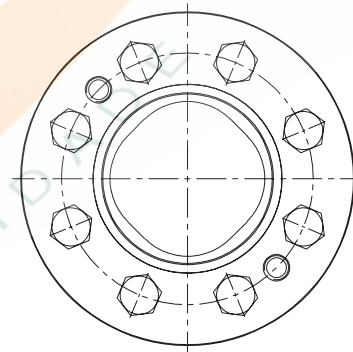
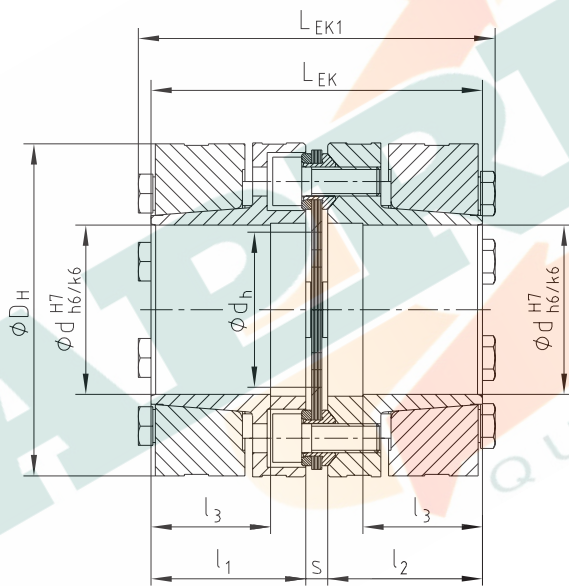


Hub type 6.5

Type DK



Type EK



Types of hubs

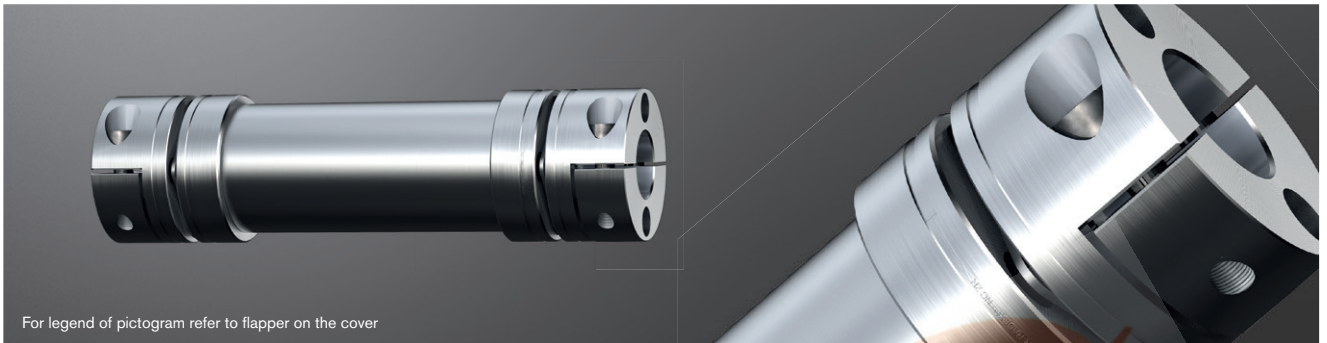


Type 6.5  
Clamping ring hub

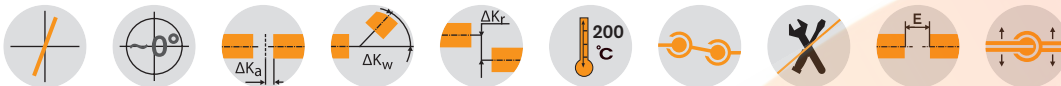
# RADEX®-NC ZR

## Servo laminae couplings

### Double-cardanic type



For legend of pictogram refer to flapper on the cover



#### RADEX®-NC Type ZR - Hub and spacer material aluminium/laminas made of stainless steel

Size	Finish bore d		Dimensions [mm]											Clamping screws DIN EN ISO 4762	
	Min.	Max.	DH	L	l <sub>3</sub>	LR		LZR = LR + 2 • l <sub>3</sub>		dR	DK	t <sub>1</sub>	e	M	T <sub>A</sub> [Nm]
						Min.	Max.	Min.	Max.						
16	6	20	46	42	17.0	75	2966	109	3000	40	48.9	8	16	M6	15.0
21	8	30	58	47.5	17.0	92	3466	126	3500	50	59.2	8	20.5	M6	15.0
26	10	35	69	59	21.5	124	3957	167	4000	60	72.6	9.5	25	M8	40.0
36	12	45	84	62.3	26.5	114	3947	167	4000	80	86.8	12	30	M10	70.0

#### Technical data of RADEX®-NC ZR

Size	TKN <sup>1)</sup> [Nm]	Moment of inertia [10 <sup>-3</sup> kgm <sup>2</sup> ]		Static torsion spring stiffness [Nm/rad]
		ZR hub <sup>2)</sup>	Pipe/meter	
16	35	0.049596	0.329	2449
21	70	0.138744	0.673	4980
26	120	0.348421	1.199	9220
36	340	0.869569	4.560	34014

<sup>1)</sup> For selection see page 22 et seqq.

<sup>2)</sup> Figures refer to the complete coupling with max. bore.

<sup>3)</sup> Torsion spring stiffness with a length of 1 m of intermediate pipe with  $L_{pipe} = LZR - 2 \cdot L$

For inquiries and orders please specify the shaft distance dimension LR along with the maximum speed to review the critical bending speed. Straightness/concentricity of pipes according to DIN EN 755-1.

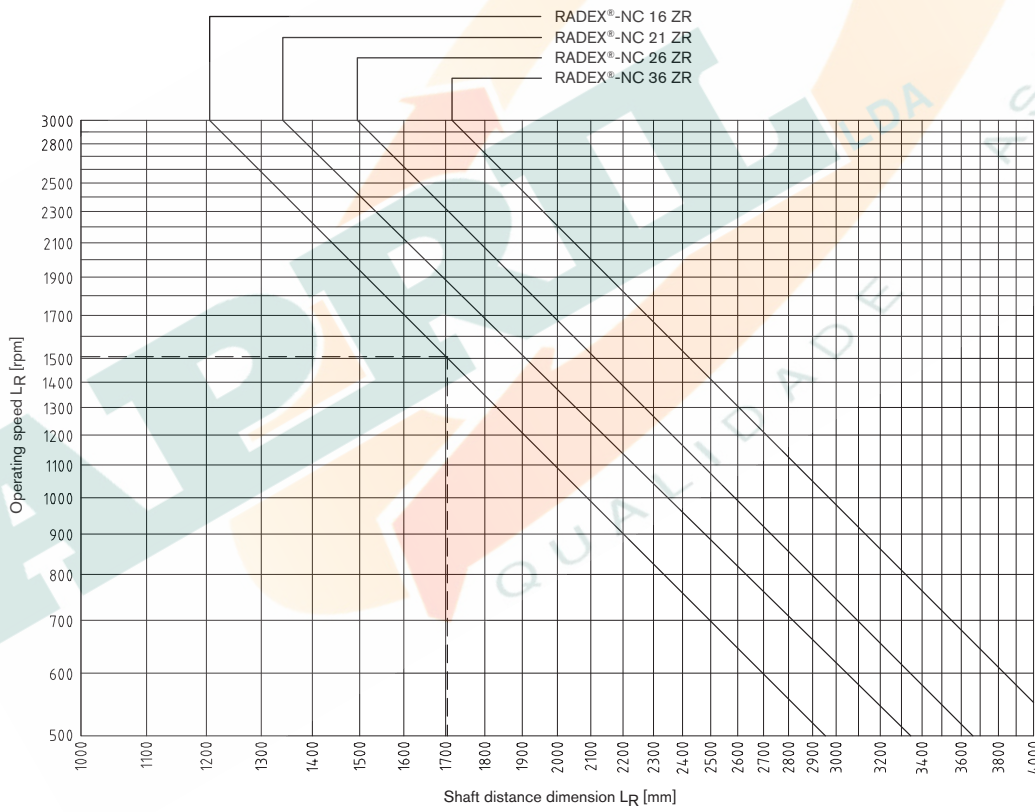
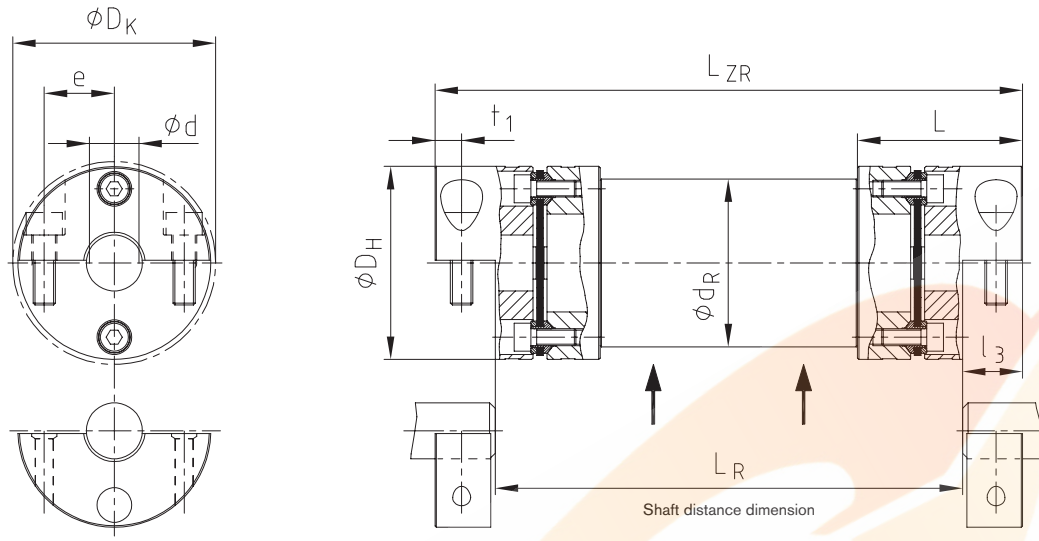
#### Review of shaft-hub-connection: Friction torques T<sub>R</sub> [Nm] for hub type 7.5 for Ød<sub>1</sub>/Ød<sub>2</sub>

Size	Ø8	Ø9	Ø10	Ø11	Ø12	Ø14	Ø15	Ø16	Ø18	Ø19	Ø20	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	
16			51	56	61	71	76	81	92	97	102											
21					61	71	76	81	92	97	102	122	127	143	153							
26							150	160	180	190	200	240	250	280	300							
36										268	282	338	352	395	423	451	493	536	564	592	634	

Ordering example:

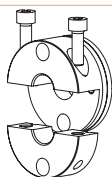
RADEX®-NC 26	ZR	1200 mm	7.5 - Ø24		7.6 - Ø24	
Coupling size	Type	Shaft distance dimension (L <sub>R</sub> )	Hub type	Finish bore	Hub type	Finish bore

## Components



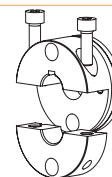
## Types of hubs

Type 7.5



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

Type 7.6



Clamping hub type DH with feather keyway for double-cardanic connection (on request)

# COUNTEX®

## Backlash-free shaft encoder couplings

### Double-cardanic for measuring drives



For legend of pictogram refer to flapper on the cover



COUNTEX® - Hub material aluminium/spacer PEEK

Size	Torque [Nm]		Finish bore d		Dimensions [mm]				Displacements			Torsion spring stiffness $C_T$ [Nm/rad]	Radial stiffness $C_r$ [N/mm]	Axial restoring force $F_A$ [N]
	$T_{KN}$	$T_{K max}$	Min.	Max.	D	$l_1, l_2$	E	L	Radial $\Delta K_r$ [mm]	Axial $\Delta K_a$ [mm]	Angular $\Delta K_w$ [degree]			
6	0.3	0.6	2	6	15	4	4	12	0.05	-0.3/+0.6	0.36	48	26	10
12	0.5	1.0	2	12	22	6	3.5	15.5	0.10	-0.5/+1.0	0.45	120	65	25
14	1.0	2.0	5	14	31	8	4	20	0.12	-0.5/+1.0	0.57	235	70	27

#### General description

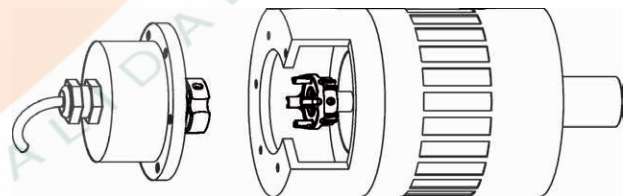
COUNTEX® is a three-part, backlash-free and torsionally stiff coupling specifically developed for the demands in measuring and control technology.

Its axial plug-in ability combined with the geometry of hubs results in a coupling system with compact dimensions, easy to assemble. The material of the spacer is resistant to high temperatures ensuring almost continuous properties of the coupling system even with temperatures up to 160 °C.

#### Applications

The measuring and control technology demands for high torsion spring stiffness of the coupling in order to implement reproducible positioning. At the same time the coupling has to compensate for displacements without any big forces causing stresses on the adjacent filigree components.

With its spacer made of high-temperature resistant nylon our COUNTEX® ensures almost constant torsion spring stiffness even with high temperatures. The double-cardanic principle of COUNTEX® reduces the restoring forces to a minimum. Nevertheless it has very compact dimensions which make it excellently suitable for tight mounting spaces.



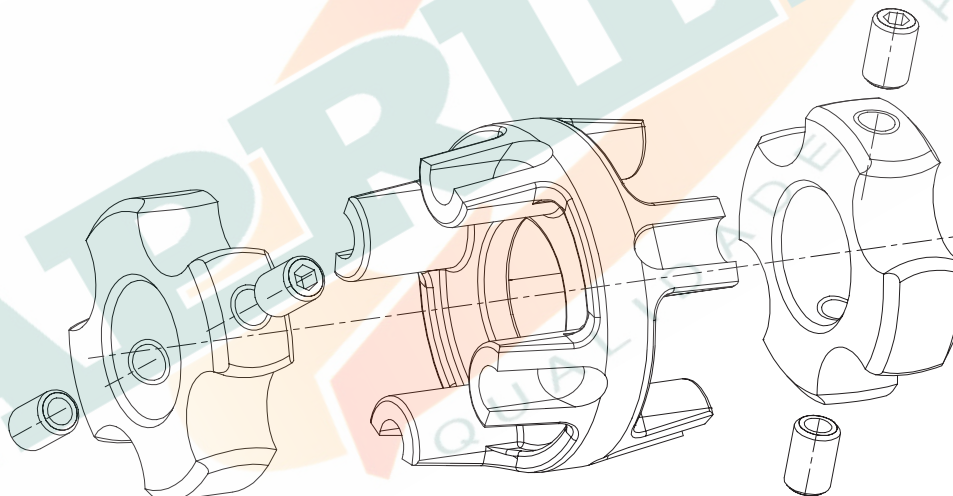
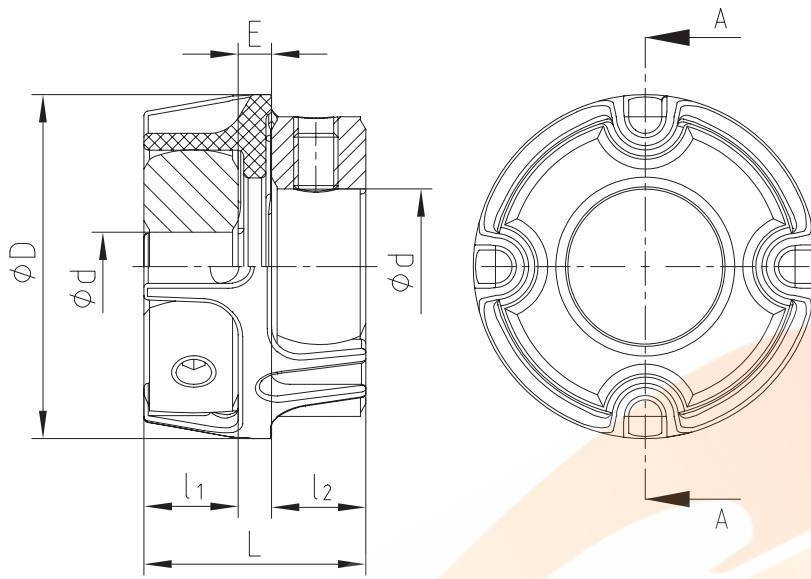
#### Use in potentially explosive atmospheres

COUNTEX® couplings are suitable for positioning transmission in drives used 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](http://www.ktr.com).



Ordering example:	COUNTEX® 14	1.1 - Ø6.35		1.1 - Ø10	
	Coupling size	Hub type	Finish bore d <sub>1</sub>	Hub type	Finish bore d <sub>2</sub>





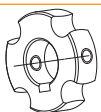
ROTEX® GS

Backlash-free  
servo couplings

TOOLFLEX®

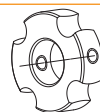
RADEX®-NC

## Types of hubs



**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.  
**Standard**



**Type 1.3**  
with spline bore

Positive-locking power transmission. Spline on request of customers (e. g. for shaft with flattening).



**Type 1.2**  
without feather keyway, without setscrew

For low torques. Suitable for bonding or pressing of the shaft.

COUNTEX®