



# Torque limiters

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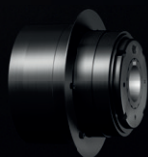
RUFLEX®



KTR-SI



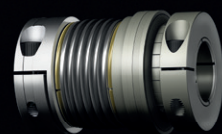
KTR-SI FRA



SYNTEX®



SYNTEX®-NC



KTR-SI Compact



# TORQUE LIMITERS

## TYPES AND OPERATING DESCRIPTION

### Properties of torque limiters

							
Product	RUFLEX®	KTR-SI	KTR-SI FRE	KTR-SI FRA	SYNTEX®	SYNTEX®-NC	KTR-SI Compact
Type	Torque limiter	Overload system	Overload system	Overload system	Backlash-free overload system		
<b>Torque limitation</b>							
Friction (load-retaining)	●						
Ratchet coupling		●	●	●	●	●	●
Synchronous ratcheting SK/SR (load-separating)		●			●	●	●
Ratcheting DK (load-separating)		●			●	●	●
Idle rotation FR/FRE/FRA (load-separating)		●	●	●			
Fail-safe SGR (no mechanical separation)		●					
<b>Properties</b>							
Backlash-free					●	●	●
High repeatability		●	●	●	●	●	●
Quick separation with overload						●	●
Signal by limit switch/sensor		●	●	●	●	●	●
Torque setting possible when in place	●	●	●	●	●	●	●
<b>Torque range <math>T_{KN}</math> [Nm]</b>							
min. - max.	0,5 - 12,000	2,5 - 8,200	1,000 - 60,000 (and above)	5 - 3,000	6 - 400	2 - 550	3 - 3,100
<b>Max. bore [mm]</b>							
	140	100	200 (and above)	80	50	60	80
<b>Shaft-hub-connection</b>							
Positive locking	●	●	●	●	●	●	●
Frictionally engaged			●		●	●	●
<b>Speed <math>n_{max}</math> [rpm]</b>							
	10,000	6,000	3,300	3,600	1,500	3,500	4,000
<b>Special features</b>							
	high power density, low price	hardened surfaces, solid design	modular design, for high torques	re-engagement by reversing the direction of rotation	for tailor-made solutions, low cost, ideally suitable for bigger quantities	high power density, light-weight design	hardened surfaces, solid design
<b>Applications</b>							
	slowly rotating drives such as sprocket or toothed belt drives, conveyors, rotary feeders, ...	rugged drive situations, e. g. crushers, ...	shredders, extruders, steel mills, test benches	shredders, extruders, materials handling, ...	customised design, packaging machines, linear drives, ...	dynamic drives, packaging machines, machine tools, linear drives, ...	packaging machines, special purpose machines, conveyor technology, ...

● ≈ Standard

# TORQUE LIMITERS TYPES AND OPERATING DESCRIPTION

## Product finder of torque limiters

Product	RUFLEX®	KTR-SI	KTR-SI FRE	KTR-SI FRA	SYNTEX®	SYNTEX®-NC	KTR-SI Compact
Type	Torque limiter	Overload system	Overload system	Overload system	Backlash-free overload system		
<b>Types (extract)</b>							
Combined with:							
» Sprocket/toothed belt pulley/flange	●	●	●	●	●	●	●
» ROTEX® torsionally flexible jaw coupling	●	●	●				
» BoWex® torsionally stiff curved-tooth gear coupling®	●						
» TOOLFLEX® torsionally stiff metal bellow-type coupling						●	
» ROTEX® GS backlash-free jaw coupling					●	●	●
» POLY-NORM® torsionally flexible jaw coupling				●			
» RADEX®-N torsionally stiff steel laminae coupling	○	○	○				
» RADEX®-NC torsionally stiff servo laminae coupling						○	
» GEARex® all-steel gear coupling			○				
Integrated ball bearing			●			●	●

● ≈ Standard  
○ ≈ On request

## Information on selection of torque limiters

To make sure that the torque limiter is not released with process-related torque peaks, the switching torque of the coupling should at least be 30 % above the maximum operating torque (see diagramme).

Torque limiters and overload systems that re-engage automatically should be used with reduced speed only after having applied higher release torques. Frequent or continuous slipping or ratcheting increases the wear on the torque limiter.

After the torque limiter separated driving from driven side in case of overload, it may take some time before the drive stops due to large inertias in the drive train. This may generate higher wear on the torque limiter and the overload system re-engaging automatically. That is why we recommend to use the overload system KTR-SI as an idle rotation type (page 288 et seqq.) for drives with larger inertias or higher speeds.

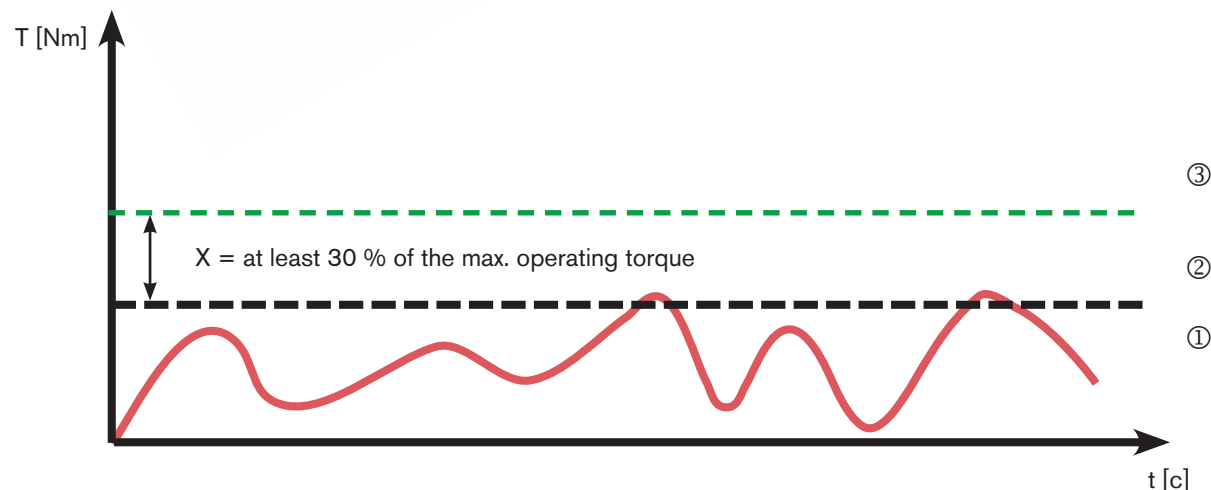
We basically recommend electronic monitoring of the torque limiters to disconnect the drive immediately in case of overload.

We will be pleased to assist you with any technical questions about the selection of torque limiters.

For that purpose we dispose of state-of-the-art simulation and calculation programs. Here the principle applies: The more detailed the data provided, the more accurate the calculation results.

Unless otherwise specified, our feather keyways are designed acc. to DIN 6885 Bl.1 [JS9]. The shaft-hub-connection needs to be verified by the customer.

A smooth operation is only ensured if the overload torque set exceeds the maximum operating torque of the machine (see diagramme).



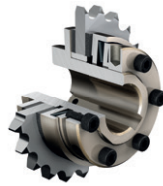
- ① Torque curve of the machine
- ② Max. operating torque arising on the machine
- ③ Torque set on the coupling

# RUFLEX®

## Torque limiters

### Design and operation

- Load-retaining overload protection up to 12.000 Nm (standard)
- Available with various drive components (e. g. sprocket) and combinations (e. g. ROTEX®)
- Asbestos-free and rust-proof friction lining for dry running (ATEX available on request (Ex))
- High wear capacity, long service life
- High-quality plain bush with dry lubricant
- Torque setting possible when in place



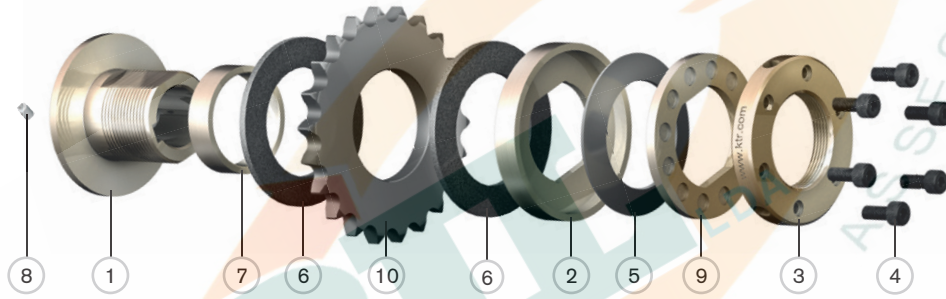
- Protection of the nut by locking in 12 different positions
- Easy assembly and torque setting
- Coupling components made of steel, large safety reserves
- Corrosion protection by zinc-coated and passivated surfaces
- Rust-proof and acid-proof type on request
- High power density due to high-quality disk springs and friction linings

The RUFLEX® modular system provides solutions for your drive, too.

The combination with the proven KTR couplings and the integration of customised drive components (e. g. sprockets) allows for an overload protection optimally adapted to the respective application.

Various disk spring layerings and high-quality friction linings ensure high power density even with only small mounting space.

RUFLEX® consists of the following components:



List of components:

- |                         |                                    |
|-------------------------|------------------------------------|
| ① Hub                   | ⑥ Friction lining                  |
| ② Pressure ring         | ⑦ Plain bush                       |
| ③ Setting nut           | ⑧ Setscrew                         |
| ④ Torque setting screws | ⑨ Lock washer                      |
| ⑤ Disk spring           | ⑩ Drive component (e. g. sprocket) |

Disk spring layerings:

- 1TF
- Small specific load on friction linings
  - For small to medium torques
  - Long service life of friction linings

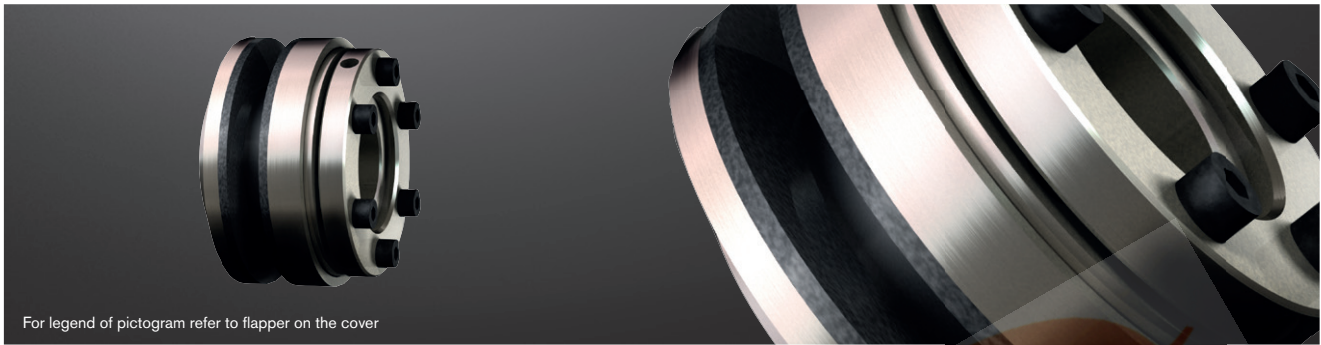
- 1TFD
- Small specific load on friction linings
  - Torques like with type 1TF
  - Only small decrease of torque even with a longer period of friction
  - Precision torque adjustment due to double spring excursion

- 2TF
- Standard specific load on friction linings
  - Medium wear and decrease of torque with longer slipping periods
  - Double torque due to double disk spring layering

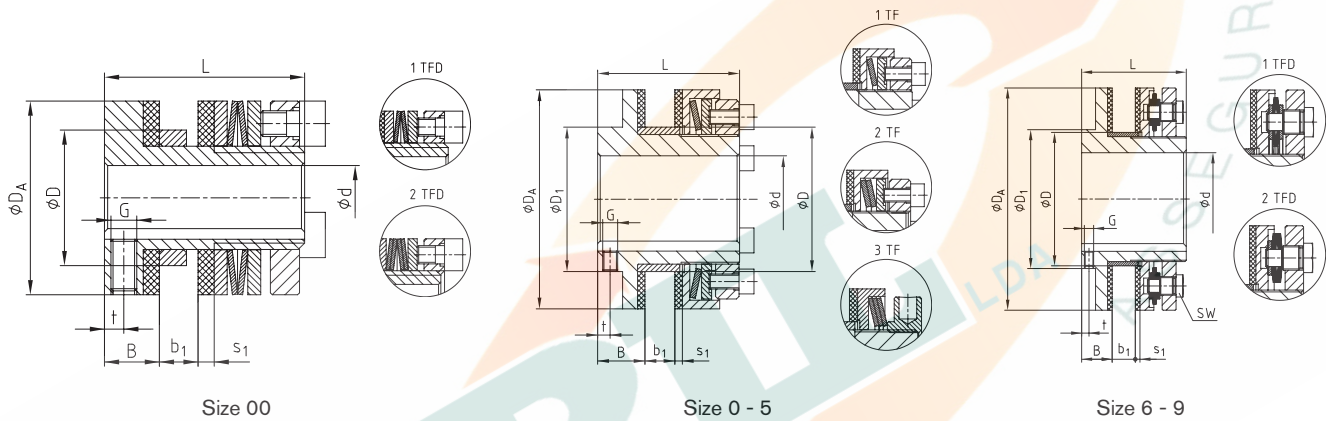
- 2TFD
- Standard specific load on friction linings
  - Torques like with type 2TF
  - Only small decrease of torque even with a longer period of friction
  - Precision torque adjustment due to double spring excursion

- 3TF
- High specific load on friction linings
  - High wear and decrease of torque with longer slipping periods
  - Applicable only in special cases for designs with only limited dimensions

## Standard width of drive component



For legend of pictogram refer to flapper on the cover



Technical data – dimensions																	
Size	Max. speed <sup>4)</sup> [rpm]	Torques [Nm]			Dimensions [mm]												
					Bore d		D <sup>2)</sup>	D <sub>1</sub>	D <sub>A</sub>	B	Drive component		s <sub>1</sub>	L	Setscrew		
		Pilot bore	Max.	Min.	Max.	t					G						
00	10000	(0.5) <sup>5)</sup> 1-3	2-5	–	–	10	21	–	30	8.5	2	6	2.5	31	3	M4	
0	8500	2-10	4-20	–	–	19 (20) <sup>1)</sup>	35	45	45	8.5	2	6	2.5	33	3	M4	
01	6600	5-35	10-70	–	–	22	40	40	58	16	3	8	3	45	4	M5	
1	5600	20-75	40-150	130-200	–	25	44	45	68	17	3	10	3	52	5	M5	
2	4300	25-140	50-280	250-400	–	35	58	58	88	19	4	12	3	57	5	M6	
3	3300	50-300	100-600	550-800	–	45	72	75	115	21	5	15	4	68	5	M6	
4	2700	90-600	180-1200	1100-1600	–	55	85	90	140	23	6	18	4	78	5	M8	
5	2200	400-800	800-1600	1400-2100	–	65	98	102	170	29	8	20	5	92	8	M8	
6	1900	300-1200	600-2400	–	38	80	116	120	200	31	8	23	5	102	8	M8	
7	1600	600-2200	1200-4400	–	45	100	144	150	240	33	8	25	5	113	8	M10	
8	1300	900-3400	1800-6800	–	58	120	170	180	285	35	8	25	5	115	8	M10	
9	1000	2500-6000	6000-12000	–	65	140	237	225	350	53	16	28	6	162	11	M12	

<sup>1)</sup> The figure in brackets specifies the max. bore with keyway to DIN 6885 sheet 3 (low-rise design)

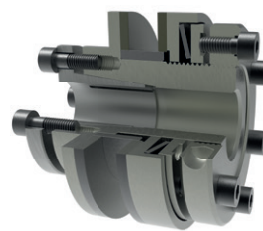
<sup>2)</sup> Bore tolerance (drive component): F8 with size 0 - 4, H8 with size 5 - 9

<sup>3)</sup> With clamping setting nut to be used on types limited in dimensions only

<sup>4)</sup> See comments on page 281

<sup>5)</sup> With special disk spring

On request:



- With clamping setting nut for size 0 - 5 (standard with 3TF)
- For radial torque setting

- With taper sleeve (hub type 4.5)
- Frictionally engaged shaft-hub-connection

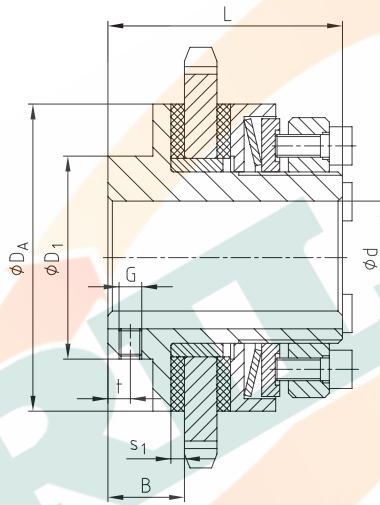
Ordering example:	RUFLEX® 1	2TF	b <sub>1</sub> 10	d Ø20
	Type/size	Disk spring layering	Width of drive component b <sub>1</sub>	Finish bore

# RUFLEX® Torque limiters

## With sprocket



For legend of pictogram refer to flapper on the cover



Technical data – dimensions

Size <sup>4)</sup>	Max. speed <sup>3)</sup> [rpm]	Torques [Nm]			Dimensions [mm]								
					Max. bore		D1	DA	B	s1	L	Setscrew	
		1TF	2TF	3TF <sup>1)</sup>	d	t						G	
01	6600	5-35	10-70	–	22	40	58	16	3	45	4	M5	06 B-1 ( <sup>9</sup> / <sub>8</sub> x <sup>7</sup> / <sub>32</sub> ) z = 23
1	5600	20-75	40-150	130-200	25	45	68	17	3	52	5	M5	08 B-1 ( <sup>1</sup> / <sub>2</sub> x <sup>5</sup> / <sub>16</sub> ) z = 22
2	4300	25-140	50-280	250-400	35	58	88	19	3	57	5	M6	08 B-1 ( <sup>1</sup> / <sub>2</sub> x <sup>5</sup> / <sub>16</sub> ) z = 27
3	3300	50-300	100-600	550-800	45	75	115	21	4	68	5	M6	12 B-1 ( <sup>3</sup> / <sub>4</sub> x <sup>7</sup> / <sub>16</sub> ) z = 22
4	2700	90-600	180-1200	1100-1600	55	90	140	23	4	78	5	M8	16 B-1 (1 x 17,02) z = 21

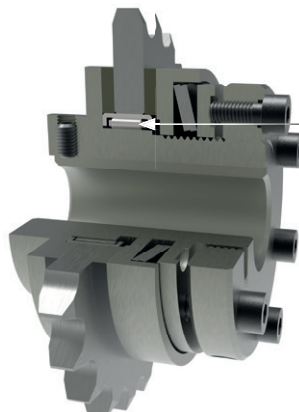
<sup>1)</sup> With clamping setting nut to be used on types limited in dimensions only

<sup>2)</sup> Review minimum number of teeth required / Other sprockets available on request.

<sup>3)</sup> See comments on page 281

<sup>4)</sup> Other sizes on request

### Special type:



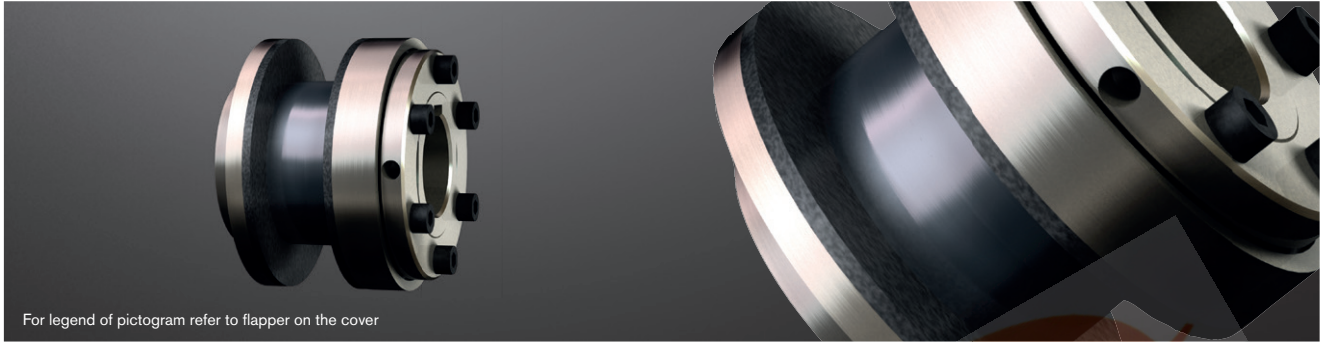
- If requested, available with needle bearing instead of slide bush
- For high radial loads on the sprocket
- With high speeds or long slipping periods

### Ordering example:

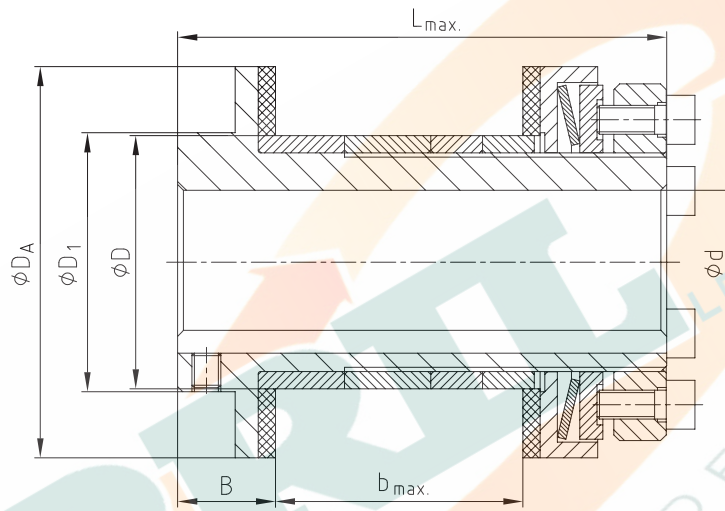
RUFLEX® 1	2TF	d Ø20	08 B -1 ( <sup>1</sup> / <sub>2</sub> x <sup>5</sup> / <sub>16</sub> ), z = 29	100 Nm
Type/size	Disk spring layering	Finish bore	Sprocket	Torque set

# RUFLEX® Torque limiters

## Max. type



For legend of pictogram refer to flapper on the cover



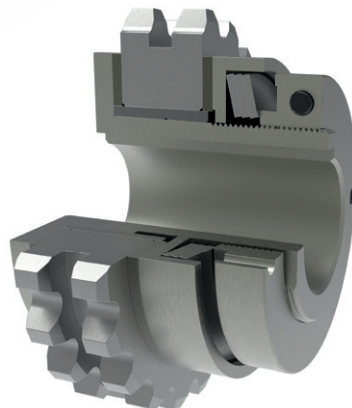
### Technical data – dimensions

Size	Max. speed <sup>3)</sup> [rpm]	Torques [Nm]			Dimensions [mm]						
		1TF	2TF	3TF <sup>2)</sup>	Max. bore d	D <sub>1</sub>	D <sub>A</sub>	B	Max. b	D <sup>1)</sup>	Max. L
01	6600	5-35	10-70	–	22	40	58	16	33	40	70
1	5600	20-75	40-150	130-200	25	45	68	17	43	44	85
2	4300	25-140	50-280	250-400	35	58	88	19	54	58	100
3	3300	50-300	100-600	550-800	45	75	115	21	62	72	115
4	2700	90-600	180-1200	1100-1600	55	90	140	23	91.5	85	154

<sup>1)</sup> Bore tolerance (drive component): F8

<sup>2)</sup> With clamping setting nut to be used on types limited in dimensions only

<sup>3)</sup> See comments on page 281



### Example:

- RUFLEX® max. with sprocket assembled
- Available as a complete subassembly with torque preset

### Ordering example:

RUFLEX® max. 1	2TF	b 35	d Ø20
Type/size	Disk spring layering	Width of drive component b	Finish bore

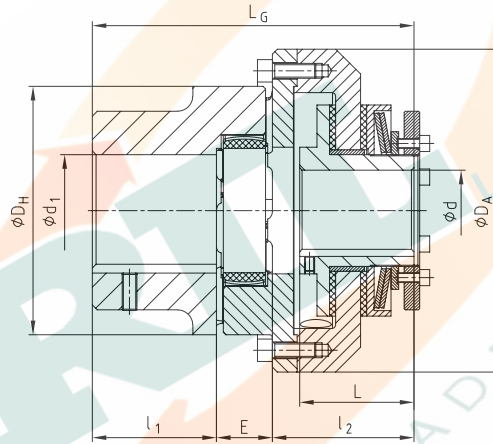


# RUFLEX® Torque limiters

With torsionally flexible ROTEX®



For legend of pictogram refer to flapper on the cover



### Technical data – dimensions

RUFLEX® size	ROTEX® size	RUFLEX® Torques [Nm]			ROTEX® <sup>3)</sup> Torques [Nm]		Dimensions [mm]									
					T <sub>KN</sub>	T <sub>K max</sub>	Bore d		D <sub>H</sub>	D <sub>A</sub>	l <sub>1</sub>	l <sub>2</sub>	E	L	L <sub>G</sub>	
		1TF	2TF	3TF <sup>2)</sup>	Pilot bore	Max. bore	d <sub>1</sub>									
00	14	(0.5) <sup>1)</sup> 1-3	2-5	-	12.5	25	-	10	16	30	44	11	35	13	31	59.5
0	19	2-10	4-20	-	17	34	-	19 (20) <sup>1)</sup>	25	40	63	25	37	16	33	78
01	24	5-35	10-70	-	60	120	-	22	35	55	80	30	50	18	45	98
1	28	20-75	40-150	130-200	160	320	-	25	40	65	98	35	58	20	52	113
2	38	25-140	50-280	250-400	325	650	-	35	48	80	120	45	64	24	57	133
3	48	50-300	100-600	550-800	525	1050	-	45	62	105	162	56	82	28	68	166
4	75	90-600	180-1200	1100-1600	1920	3840	-	55	95	160	185	85	80	40	78	205
5	90	400-800	800-1600	1400-2100	3600	7200	-	65	110	200	260	100	114	45	92	259
6	100	300-1200	600-2400	-	4950	9900	38	80	115	225	285	110	130	50	102	290
7	110	600-2200	1200-4400	-	7200	14400	45	100	125	255	330	120	142	55	113	317
8	140	900-3400	1800-6800	-	12800	25600	58	120	160	320	410	155	152	65	115	372
9	160	2500-6000	6000-12000	-	19200	38400	65	140	185	370	460	175	199	75	161	449

<sup>1)</sup> The figure in brackets specifies the max. bore with keyway to DIN 6885 sheet 3 (low-rise design)

<sup>2)</sup> With clamping setting nut to be used on types limited in dimensions only

<sup>3)</sup> See selection of ROTEX® couplings on page 14 et seqq.

<sup>4)</sup> With special disk spring

Ordering example:

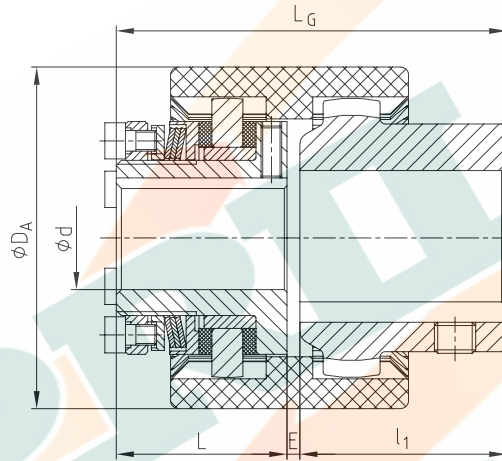
RUFLEX® 1	2TF	d Ø20	ROTEX® 28	98 ShA	d <sub>1</sub> Ø25	100 Nm
Type/size	Disk spring layering	RUFLEX® bore	Type/size	Spider	ROTEX® bore	Torque set

# RUFLEX® Torque limiters

With torsionally stiff BoWex®



For legend of pictogram refer to flapper on the cover



### Technical data – dimensions

RUFLEX® size	BoWex® size	RUFLEX® Torques [Nm]			BoWex® <sup>3)</sup> Torques [Nm]		Dimensions [mm]						
		1TF	2TF	3TF <sup>2)</sup>	TKN	TK max	Max. bore		DA	l <sub>1</sub>	L	E	LG
00	19	(0.5) <sup>4)</sup> 1-3	2-5	–	16	32	d	d <sub>1</sub>	48	25.0	31	2.5	58.5
0	28	2-10	4-20	–	45	90	10	19	66	40.0	33	2.5	75.5
01	38	5-35	10-70	–	80	160	22	38	83	35.5	45	1.0	81.5
1	48	20-75	40-150	130-200	140	280	25	48	95	45.5	52	1.0	98.5
2	65	25-140	50-280	250-400	380	760	35	65	132	64.0	57	1.0	122

<sup>1)</sup> The figure in brackets specifies the max. bore with keyway to DIN 6885 sheet 3 (low-rise design)

<sup>2)</sup> With clamping setting nut to be used on types limited in dimensions only

<sup>3)</sup> See selection of BoWex® couplings on page 14 et seqq.

<sup>4)</sup> With special disk spring

Ordering example:

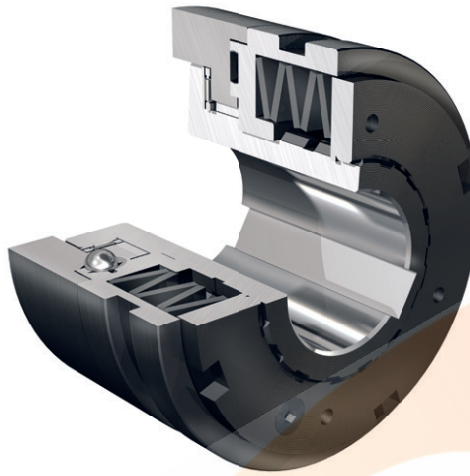
RUFLEX® 1	1TF	d Ø20	BoWex® 48	d <sub>1</sub> Ø25	50 Nm
Type/size	Disk spring layering	RUFLEX® bore	Type/size	BoWex® bore	Torque set

# KTR-SI

## Overload systems

### Design and operation

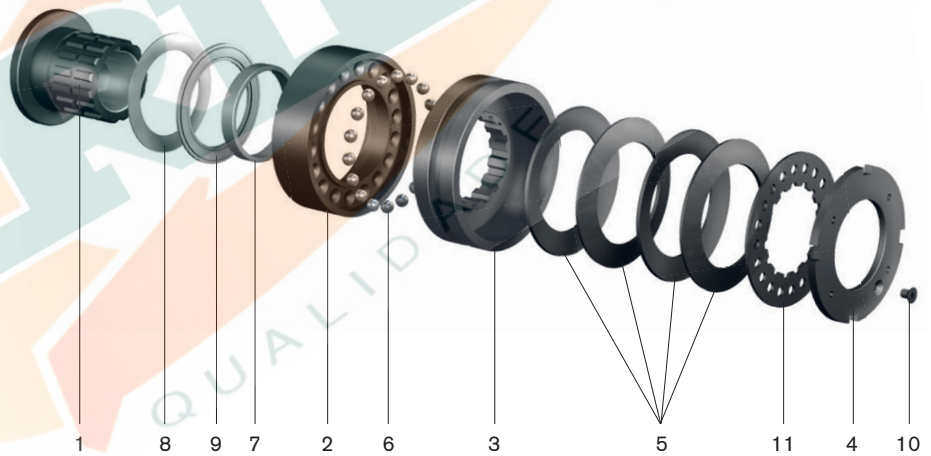
- Overload protection up to 8,200 Nm
- Available as a ratchet, synchronous, idle rotation and fail-safe design with the same dimensions
- Reduction of torque peaks
- High response accuracy, even after a long operating period
- Disconnection of the drive with overload by retrieving limit switch
- Automatically operative (DK, SR, SGR)



- Available in various types (e. g. with needle bearing) and combinations (e. g. with torsionally flexible ROTEX®)
- Easy assembly and torque setting
- Maintenance-free
- Insensitive to oil and grease
- Long service life due to high-quality materials

In case of overload the ratchet components (balls or rollers) leave their indentations, and a relative motion between the driving and driven side is generated. Damages caused by overload are reliably prevented in this way. The shift ring (3) makes an axial motion to the engagement travel „H“ activating the limit switch or proximity initiator. The signal can be used for controlling or disconnecting the drive. For restarting we would recommend to bypass the limit switch or proximity switch electrically for a short time.

Com- ponent	Description
1	Hub
2	Flange ring
3	Shifting ring
4	Setting nut
5	Disk spring
6	Ball bearing cage
7	Plain bush
8	Axial disk
9	Axial needle bearing
10	Setscrew
11	Lock washer



#### No signal with normal operation

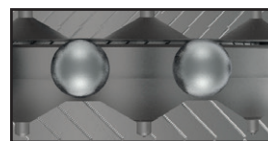


Engaged



Limit switch

#### Signal with overload



Disengaged



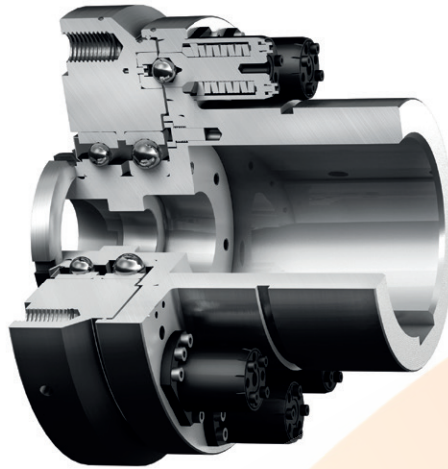
Limit switch

# KTR-SI FRE

## Idle rotation overload system

### Design and operation

- Setting range up to 60,000 Nm (higher torques available on request)
- Idle rotation overload system (load-separating)
- High repeatability



- Flange type to connect toothed belt pulleys or sprockets
- Combination with ROTEX®, GEARex® or RADEX®-N as a shaft-to-shaft connection
- The intelligent further development of shear pin couplings and hydraulic clamping sets

The core of the overload system is formed by the idle rotation elements. They uncouple the driving and driven side in case of overload while protecting the drive train from damages. After eliminating the overload, the idle rotation segments are manually re-engaged so that the drive is released again. In order to set the coupling to the requested release torque, a defined pre-stress is generated on the disk springs in each idle rotation element via the setting nut. The number of idle rotation elements varies depending on the release torque demanded. If requested, the coupling can be preset by the manufacturer. It is also possible to adapt the coupling when in place.

Com- ponent	Description
1	Hub
2	Bearing flange
3	Cap screw
4	Angular ball bearing
5	O-ring
6	KTR-SI FRE connection flange
7	Groove ball bearing
8	NILOS ring
9	Supporting disk
10	Safety plate
11	Groove nut
12	Shim ring
13	Idle rotation element
14	Setscrew

RUFLEX®

KTR-SI

SYNTEX®

SYNTEX®-NC

KTR-SI Compact

Torque  
limiters

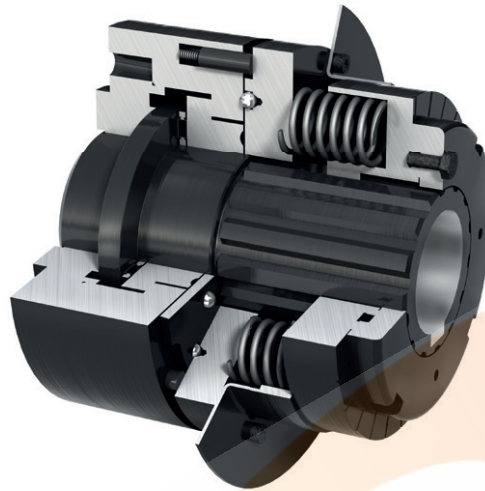
# KTR-SI FRA

## Idle rotation overload system with automatic re-engagement when reversing the direction of rotation

**NEW**

### Design and operation

- Overload protection up to 3,000 Nm
- Idle rotation overload system (load-separating)
- Re-engagement by reversing the direction of rotation, thus optimally suitable for positions difficult to access



- Flange type to connect toothed belt pulleys or sprockets
- Combination with torsionally flexible POLY-NORM® as a shaft-to-shaft connection

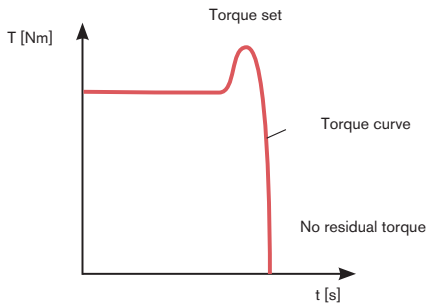
Component	Description
-----------	-------------

- |    |                   |
|----|-------------------|
| 1  | Connection flange |
| 2  | Plain bearing     |
| 3  | Axial disk        |
| 4  | Hub               |
| 5  | Axial bearing     |
| 6  | Bearing flange    |
| 7  | Flange ring       |
| 8  | Balls             |
| 9  | Shifting ring     |
| 10 | Disk springs      |
| 11 | Pressure ring     |
| 12 | Lock washer       |
| 13 | Setting nut       |



### Operating principles

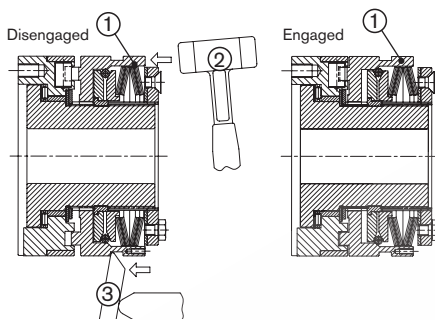
#### 1. Idle rotation design FR/FRE/FRA



Operating principle of KTR-SI idle rotation couplings:

When achieving the torque set, the coupling rotates. Subject to the idle rotation mechanism driving and driven side remain separated. The resulting flywheel mass can slow down in idle state. After eliminating the overload, the coupling can be re-engaged. The re-engagement is effected manually or via a device respectively automatically.

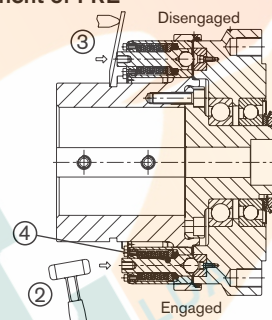
##### Re-engagement of FR



##### Re-engagement of the idle rotation coupling:

Re-engagement is generated by axial pressure on the shifting ring (1). Dependent on the existing resources, accessibility etc., re-engagement can be made in different ways: By several blows of a plastic hammer (2) axially on the shifting ring (see above), via assembly levers (3) or a pneumatic or hydraulic engagement device (automated engagement procedure).

##### Re-engagement of FRE



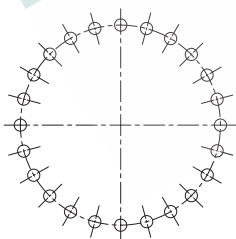
##### Re-engagement of idle rotation elements:

After eliminating the overload, driving and driven side are aligned to each other. By means of a plastic hammer (2) or a tyre lever (3) the idle rotation elements (4) are manually re-engaged. Re-engagement can be heard loudly. The overload coupling is ready for use again.

##### Re-engagement of FRA

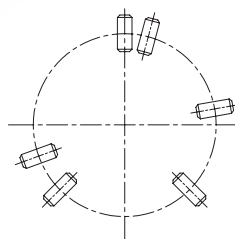
After eliminating the overload the KTR-SI FRA can be re-engaged by reversing the direction of rotation with slow speed (>50 rpm).

#### 2. Ratchet design DK



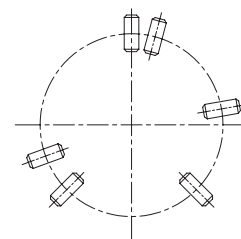
Any engagement after an overload. After eliminating the overload, the balls re-engage automatically with the next following ball indentation.

#### 3. Synchronous design SR



Synchronous engagement after an overload. After eliminating the overload, the balls re-engage automatically with the disk springs after a rotation of 360°. Driving and driven side are always placed in the same position to each other. Other degrees of re-engagement, for example 180°, are also possible.

#### 4. Fail-safe design SGR



The fail-safe design is purely intended for torque measurement without any ratcheting operation. In case of overload a signal is generated by a limit switch along with mechanical separation of driving and driven side = ratcheting is not possible.

# KTR-SI Overload systems

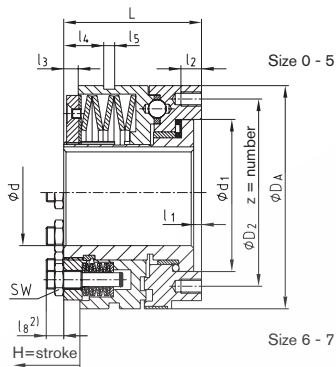
## Flange type



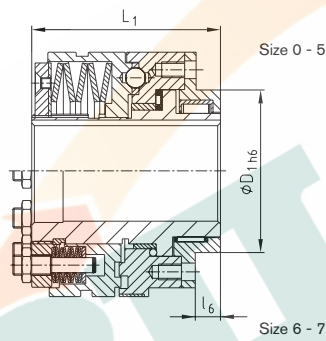
For legend of pictogram refer to flapper on the cover



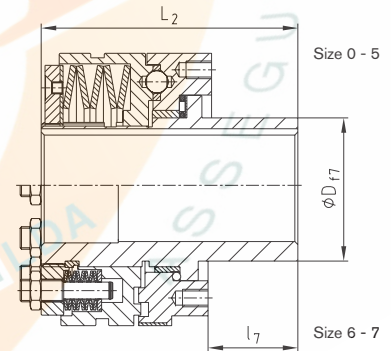
Type FT



Type KT



Type LT



### Technical data

Size	Torques [Nm]												Weight with max. bore [kg]
	Type DK				Type SR and SGR				Type FR				
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	$n_{max.}^{3)}$ [rpm]	
0	2.5-5	5-20	–	20-40	5-10	10-40	–	–	5-10	10-20	20-40	6000	0.41
1	6-12	12-25	25-55	55-100	12-25	25-50	50-100	–	12-25	25-50	50-100	5000	1.30
2	12-25	25-50	50-120	120-200	25-50	50-100	100-200	–	25-50	50-100	100-200	4000	2.27
3	25-50	50-100	100-250	200-450	50-100	100-200	200-450	–	50-100	100-200	200-450	3500	3.88
4	50-100	100-200	200-500	500-1000	100-200	200-400	400-800	800-2000	100-200	200-400	400-800	3000	8.34
5	85-250	230-600	300-1000	600-2000	170-450	350-900	600-1800	1200-3400	170-450	350-900	600-1800	2300	13.51
6	180-480	360-960	720-1950	1600-3300	300-750	600-1500	1200-3000	2900-5800	–	–	–	–	21
7	250-520	500-1050	1000-2100	2000-3600	550-1100	1100-2200	2200-4400	3000-8200	–	–	–	–	37

### Dimensions [mm]

Size	Bore d		d1	D	D1	D2	DA	l1	l2	l3	l4	l5	l6	l7	L	L1	L2	z	H=stroke			
	Pilot bore	Max.																	DK	SR	SGR	FR
0	7	20	41.0	28	38	48	55	4.0	6.5	3.0	7.5	9	8	27.5	38.5	51.0	66.0	6xM5	1.4	1.2	0.6	1.6
1	10	25	60.0	38	50	70	82	4.0	8.0	6.0	11.5	9	10	33.0	52.0	70.0	85.0	6xM5	2.3	1.8	0.8	2.3
2	14	35	78.0	52	60	89	100	5.0	10.0	5.0	12.0	9	12	39.0	61.0	78.0	100.0	6xM6	2.4	2.0	1.1	3.0
3	18	45	90.5	65	80	105	120	5.0	12.0	8.5	21.0	10	12	47.0	78.0	96.0	125.0	6xM8	2.7	2.2	1.2	3.5
4	24	55	105.0	78	100	125	146	6.5	15.0	11.0	27.0	9	16	52.5	100.0	124.5	152.5	6xM10 <sup>1)</sup>	3.7	2.5	1.2	3.8
5	30	65 (70) <sup>4)</sup>	120.5	90	120	155	176	6.5	17.0	12.0	33.0	9	18	57.5	113.5	140.0	171.0	6xM12 <sup>1)</sup>	4.6	3.0	1.6	4.5
6 <sup>2)</sup>	40	80	136.0	108	130	160	200	7.0	20.0	14.0	39.0	9	20	64.0	119.0	150.0	183.0	6xM12 <sup>1)</sup>	5.0	3.5	2.5	–
7 <sup>2)</sup>	50	100 (110) <sup>4)</sup>	168.0	135	160	200	240	8.0	25.0	15.0	46.0	9	25	72.0	141.0	175.0	213.0	6xM16 <sup>1)</sup>	5.5	4.0	2.7	–

<sup>1)</sup> Type T4 SR and SGR: tightening torques according to 12.9

<sup>2)</sup> Size 6: dimension l<sub>8</sub> = 15 mm, size 7: dimension l<sub>8</sub> = 21 mm

<sup>3)</sup> See comments on page 281

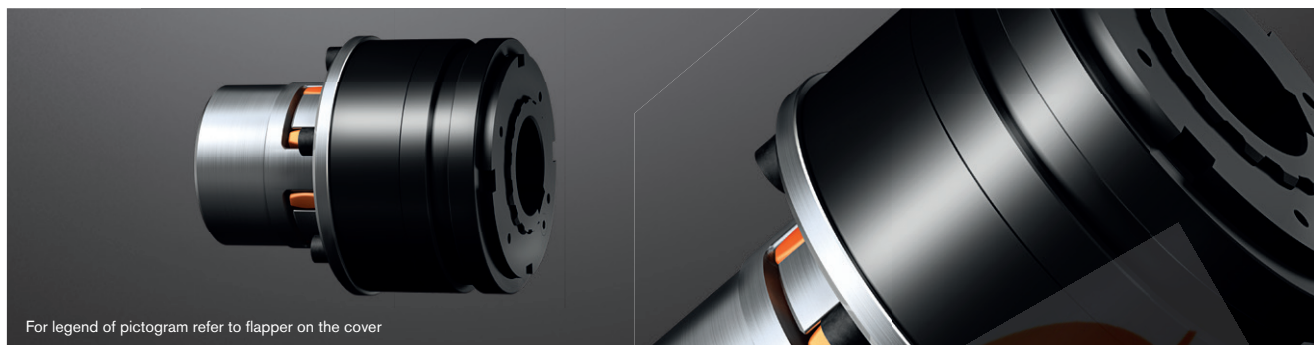
<sup>4)</sup> The figure in brackets specifies the max. bore with keyway to DIN 6885 sheet 3 (low-rise design)

Ordering example:

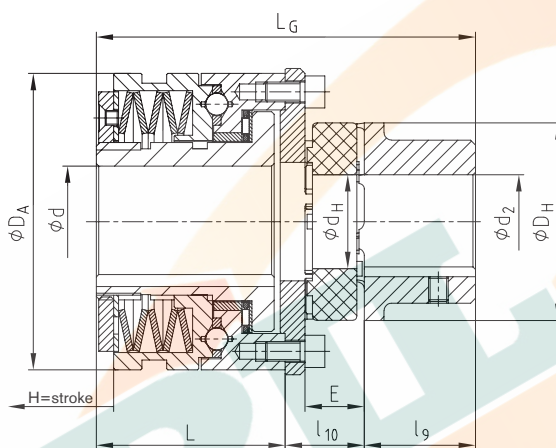
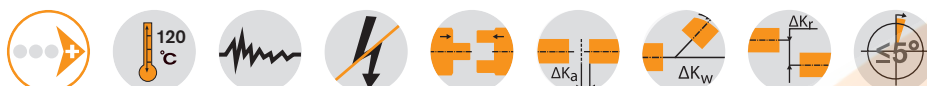
KTR-SI 2	FR	FT	T2	d Ø20	40 Nm
Type/size	Type (DK/SR/SGR/FR)	Type	Disk spring layering	Bore	Torque set

# KTR-SI Overload systems

With torsionally flexible ROTEX®



For legend of pictogram refer to flapper on the cover



### Technical data

KTR-SI size	Torques [Nm]										
	Type DK				Type SR and SGR				Type FR		
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3
0	2.5-5	5-20	-	20-40	5-10	10-40	-	-	5-10	10-20	20-40
1	6-12	12-25	25-55	55-100	12-25	25-50	50-100	-	12-25	25-50	50-100
2	12-25	25-50	50-120	120-200	25-50	50-100	100-200	-	25-50	50-100	100-200
3	25-50	50-100	100-250	200-450	50-100	100-200	200-450	-	50-100	100-200	200-450
4	50-100	100-200	200-500	500-1000	100-200	200-400	400-800	800-2000	100-200	200-400	400-800
5	85-250	230-600	300-1000	600-2000	170-450	350-900	600-1800	1200-3400	170-450	350-900	600-1800
6	180-480	360-960	720-1950	1600-3300	300-750	600-1500	1200-3000	2900-5800	-	-	-
7	250-520	500-1050	1000-2100	2000-3600	550-1100	1100-2200	2200-4400	3000-8200	-	-	-

### Technical data – dimensions

KTR-SI size	ROTEX® size	ROTEX® <sup>1)</sup> Torque [Nm]		Max. bore	Dimensions [mm]										H=stroke		
		98 ShA			d	d2	dH	DH	DA	l9	l10	E	L	LG	Type		
		TKN	TK max												DK	SR	FR
0	19	17	34	20	25	18	40	55	25	22	16	38.5	85.5	1.4	1.2	1.6	
	28	160	320		40	30	65		35	28.5	20		102				
1	24	60	120	25	35	27	55	82	30	24	18	52	106	2.3	1.8	2.3	
	38	325	650		48	38	80		45	32.5	24		129.5				
2	28	160	320	35	40	30	65	100	35	28	20	61	124	2.4	2.0	3.0	
	48	525	1050		62	51	105		56	38	28		155				
3	38	325	650	45	48	38	80	120	45	32	24	78	155	2.7	2.2	3.5	
	55	685	1370		74	60	120		65	43	30		186				
4	48	525	1050	55	62	51	105	146	56	38	28	100	194	3.7	2.5	3.8	
	75	1920	3840		95	80	160		85	56.5	40		241.5				
5	55	685	1370	65 (70) <sup>2)</sup>	70	60	120	176	65	44	30	113.5	222.5	4.6	3.0	4.5	
	90	3600	7200		110	100	200		100	62	45		275.5				
6	100	4950	9900	80	115	113	225	200	110	72	50	119	301	5.0	3.5	-	
7	110	7200	14400	100 (110) <sup>2)</sup>	125	127	255	240	120	78	55	141	339	5.5	4.0	-	

<sup>1)</sup> See selection of ROTEX® couplings on page 14 et seqq.

<sup>2)</sup> The figure in brackets specifies the max. bore with keyway to DIN 6885 sheet 3 (low-rise design)

Ordering example:

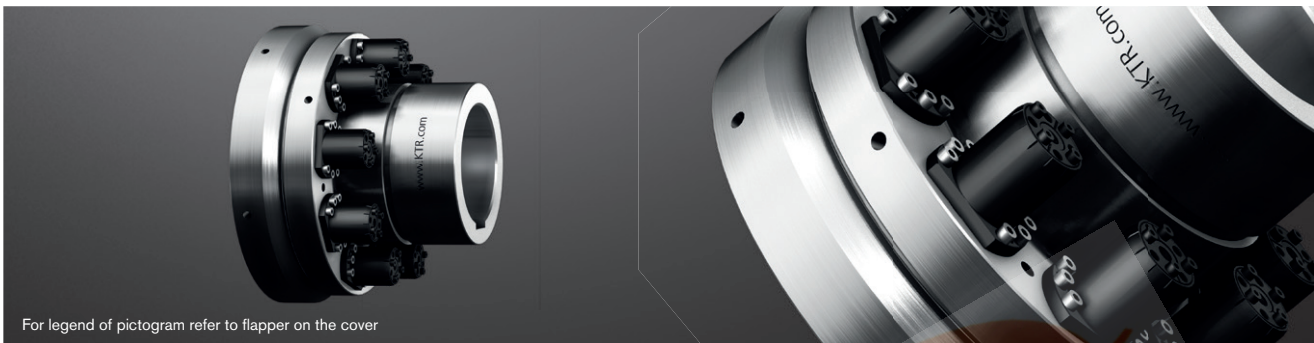
KTR-SI 2	DK	T2	d Ø20	ROTEX® 28	98 ShA	d2 Ø25	40 Nm
Type/size	Type (DK/SR/SGR/FR)	Disk spring layering	KTR-SI bore	Type/size	Spider	ROTEX® bore	Torque set



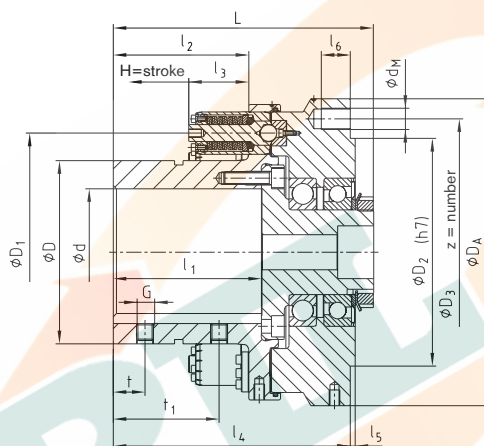
# KTR-SI FRE

## Idle rotation overload system

### Flange type



For legend of pictogram refer to flapper on the cover



### Torques [Nm]

Size	Type of element	3 idle rotation elements		6 idle rotation elements		9 idle rotation elements	
		Min.	Max.	Min.	Max.	Min.	Max.
9	1T1	800	2600	-	-	-	-
	1T2	1000	4000	2000	8000	-	-
	1T3	2400	5500	4800	11000	-	-
12	1T2	1300	5000	2600	10000	3900	15000
	1T3	2900	6700	5800	13400	8700	20100
15	1T2	1700	6000	3400	12000	5100	18000
	1T3	3500	8200	7000	16400	10500	24600
20	2T2	5000	15000	10000	30000	15000	45000
	2T3	13100	20000	26300	40000	39400	60000

### Technical data – dimensions

Size <sup>1)</sup>	Max. bore	Dimensions [mm]																	Max. permissible forces on the flange connection <sup>2)</sup> [kN]		Speed <sup>3)</sup> [rpm]	Weight with max. bore [kg]		
		d	D	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>A</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	l <sub>5</sub>	l <sub>6</sub>	G	t	t <sub>1</sub>	L	d <sub>M</sub>	z	pitch			H=stroke	Radial
9	90	135	185	200	225	260	120	110	56.7	197	2.5	17.5	M12	25	75	213.5	12	12	12x30°	5.2	18	13	3300	38
12	120	173	225	215	252	290	140	128	56.7	224	4.5	27.5	M16	30	100	246	20	15	20x18°	5.2	26	18	2300	57
15	150	215	270	245	282	324	170	160	56.7	258	4.5	27.5	M20	40	120	281	20	15	20x18°	5.2	30	20	2050	81
20	200	285	370	330	375	460	220	200	89.4	341	5	33.0	M20	50	150	366	24	18	24x15°	8.9	50	40	1550	211

<sup>1)</sup> Other sizes on request

<sup>2)</sup> Larger forces on request

<sup>3)</sup> Higher speeds on request, see comments on page 281



### Special type:

- KTR-SI FRE with sprocket
- Available as a complete subassembly with torque preset

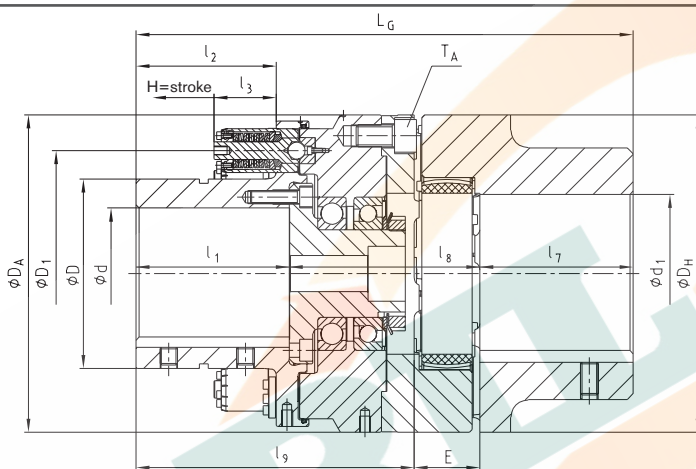
### Ordering example:

KTR-SI FRE 12	1T2	9	d Ø85	7500 Nm
Type/size	Type of element	Number of idle rotation elements	KTR-SI FRE bore	Torque set

# KTR-SI FRE

## Idle rotation overload system

With torsionally flexible ROTEX®



Torques [Nm]

Size	Type of element	3 idle rotation elements		6 idle rotation elements		9 idle rotation elements	
		Min.	Max.	Min.	Max.	Min.	Max.
9	1T1	800	2600	-	-	-	-
	1T2	1000	4000	2000	8000	-	-
	1T3	2400	5500	4800	11000	-	-
12	1T2	1300	5000	2600	10000	3900	15000
	1T3	2900	6700	5800	13400	8700	20100
15	1T2	1700	6000	3400	12000	5100	18000
	1T3	3500	8200	7000	16400	10500	24600
20	2T2	5000	15000	10000	30000	15000	45000
	2T3	13100	20000	26300	40000	39400	60000

Technical data – dimensions

Size <sup>1)</sup>	ROTEX®				Max. bore		Dimensions [mm]														TA [Nm]	Speed <sup>2)</sup> [rpm]	Weight with max. bore [kg]
	Size	Torque <sup>3)</sup> [Nm]		d	d1	D	D1	DH	DA	l1	l2	l3	l7	l8	l9	l17	E	LG	H=stroke				
		TKN	TK max																				
9	90	4500	9000	90	110	135	185	200	260	120	110	56.7	100	133	217	45	362	5.2	117	3300	59		
12	125	12500	25000	120	145	173	225	290	290	146	130	56.7	140	165	254	60	454	5.2	560	2300	106		
15	140	16000	32000	150	160	215	270	320	324	170	160	56.7	155	176	292	65	512	5.2	560	2050	147		
20	180	35000	70000	200	200	285	370	420	460	220	200	88.4	195	227	381	85	661	8.9	970	1550	349		

<sup>1)</sup> Other sizes on request

<sup>2)</sup> Higher speeds on request, see comments on page 281

<sup>3)</sup> See selection of ROTEX® couplings on page 14 et seqq.

### Special type:



- KTR-SI FRE with torsionally flexible pin & bush coupling REVOLEX® KX-D and limitation of axial backlash
- KTR-SI FRE with torsionally stiff all-steel gear coupling GEARex® and integrated brake disk
- KTR-SI FRE with torsionally stiff laminae coupling RADEX®-N and integrated brake disk

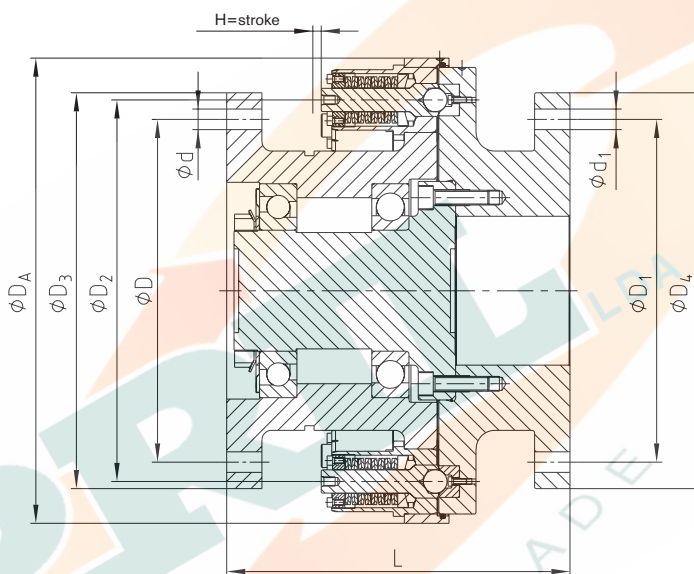
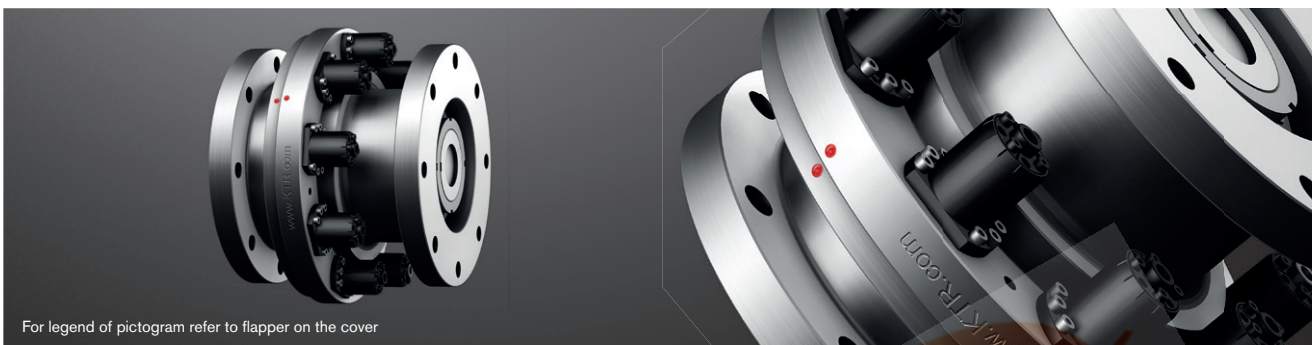
### Ordering example:

KTR-SI FRE 12	1T3	9	d Ø85	ROTEX® 125	98 ShA	d1 Ø85	12000 Nm
Type/size	Type of element	Number of idle rotation elements	KTR-SI FRE bore	Type/size	Spider	ROTEX® bore	Torque set

# KTR-SI FRE

## Idle rotation overload system

Customised type (on request)



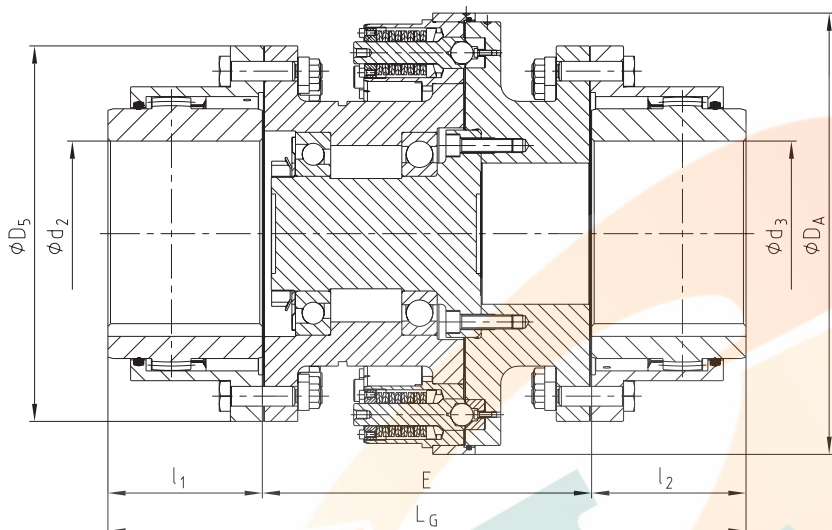
Torques [Nm]									
Size	Type of element	3 idle rotation elements		6 idle rotation elements		9 idle rotation elements		12 idle rotation elements	
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
00-1	1T1	1200	3800	2400	7600	3600	11400	-	-
	1T2	1700	6000	3400	1200	5100	18000	-	-
	1T3	3500	8200	7000	16400	10500	24600	-	-
00-2	2T1	-	-	6800	17200	10200	25800	13600	34400
	2T2	-	-	11700	31900	17550	47850	23400	63800
	2T3	-	-	21200	43000	32400	64500	42400	86000
00-3	3T1	-	-	23000	78000	34500	117000	46000	156000
	3T2	-	-	47000	108000	70500	162000	94000	216000

Technical data – dimensions																								
Size	GEARex®		RADEX®-N		Max. bore			Dimensions [mm]																
	Size	Torque [Nm]	Size	Torque [Nm]	d <sub>2</sub> , d <sub>3</sub>	d <sub>4</sub>	d <sub>5</sub>	d, d <sub>1</sub>	D, D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub> , D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>	D <sub>A</sub>	l <sub>1</sub> , l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	E	E <sub>1</sub>	L	LG	LG <sub>1</sub>	H=stroke	
00-1	35	17000	34000	136	17500	35000	133	135	140	custom-ised	custom-ised	270	280	300	324	105	135	126	256	custom-ised	custom-ised	466	723	5.2
00-2	55	65000	130000	208	70000	140000	210	200	250	custom-ised	custom-ised	410	425.5	425.5	500	175	200	245	373	custom-ised	custom-ised	723	1000	8.9
00-3	85	225000	450000	288	200000	400000	325	290	350	custom-ised	custom-ised	540	585	567	655	292	280	335	416	custom-ised	custom-ised	1000	1000	13.6

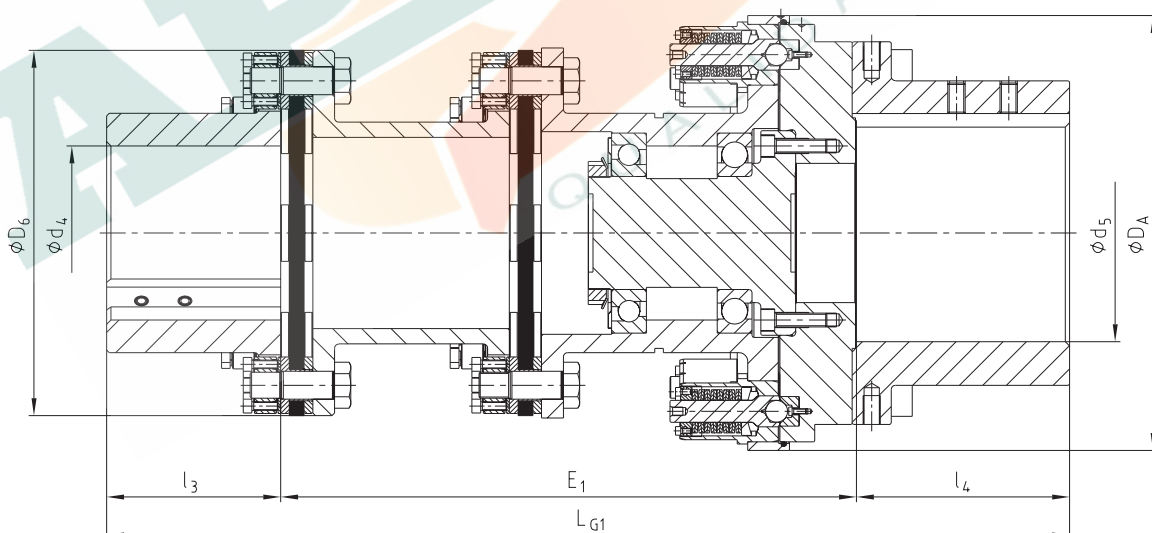
Ordering example:	KTR-SI FRE 00-2	T2	6	Ø350	Ø400	349	25000 Nm
	Type/size	Type of element	Number of idle rotation elements	Flange diameter ØD <sub>3</sub>	Flange diameter ØD <sub>4</sub>	Total length L	Torque set

Other types and combinations available on request.

Type 00 with GEARex®



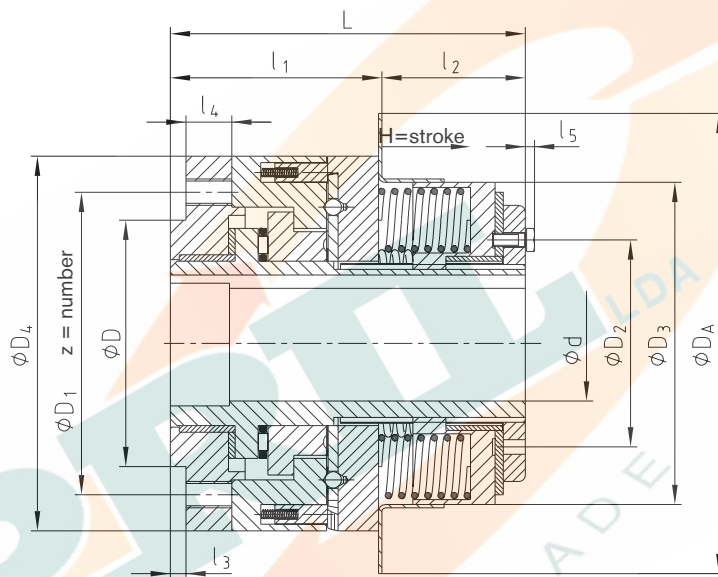
Type 00 with RADEX®-N



# KTR-SI FRA

## Idle rotation overload system with automatic re-engagement when reversing the direction of rotation

### Flange type FT



Torques [Nm]				
Size	T1	T2	T3	T4
2	5-20	15-70	40-135	80-260
3	24-104	57-360	110-540	245-730
4	45-210	145-435	340-960	465-1320
5	90-415	240-640	490-1880	1060-3000

Technical data – dimensions																		
Size	Bore d		Dimensions [mm]														Speed <sup>1)</sup> [rpm]	Weight with max. bore [kg]
	Pilot bore	Max.	D j7	D1	D2	D3	D4	DA	l1	l2	l3	l4	l5	L	z	H=stroke		
2	22	35	75	92	70	98	114	140	63	45	4.7	14	-	108	6xM8	2.8	3600	5
3	22	45	95	114	77	131	149	184	69	42	4.7	15	3.5	111	7xM10	3.5	3600	10
4	25	55	122	144	88	147	166	203	75	46	4.7	15	4.0	121	8xM12	3.5	2000	13
5	30	80	155	184	152	196	223	279	94	70	6.3	23	2.3	164	8xM16	4.4	2000	32

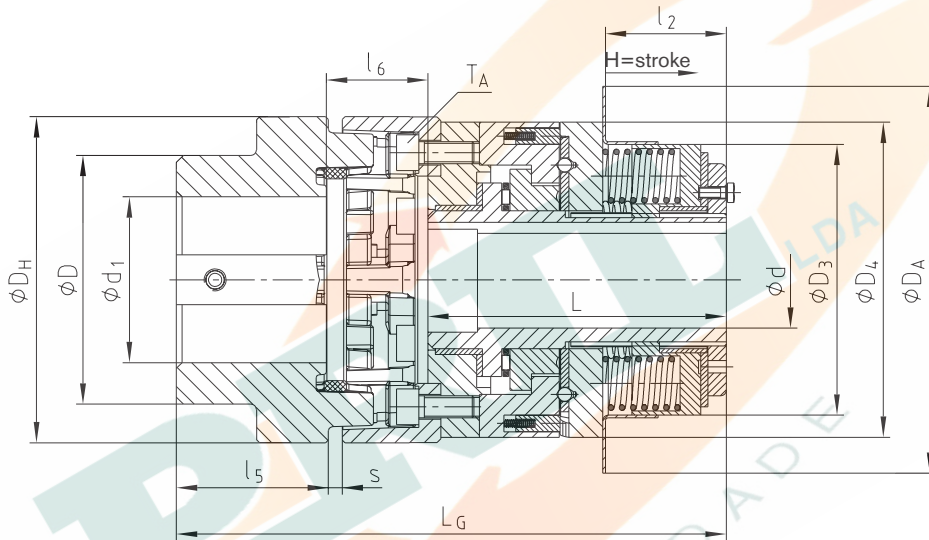
<sup>1)</sup> See comments on page 281

Ordering example:	KTR-SI FRA 3	FT	T3	d Ø35	300 Nm
	Type/size	Type	Torque setting range	KTR-SI FRE bore	Torque set

# KTR-SI FRA

## Idle rotation overload system with automatic re-engagement when reversing the direction of rotation

With torsionally flexible POLY-NORM®



### Torques [Nm]

KTR-SI FRA size	T1	T2	T3	T4
2	5-20	15-70	40-135	80-260
3	24-104	57-360	110-540	245-730
4	45-210	145-435	340-960	465-1320
5	90-415	240-640	490-1880	1060-3000

### Technical data – dimensions

KTR-SI FRA size	POLY-NORM®			Max. bore		Dimensions [mm]													$T_A$ [Nm]	Speed <sup>1)</sup> [rpm]	Weight with max. bore [kg]
	Size	Torque [Nm]		d	d <sub>1</sub>	D	D <sub>3</sub>	D <sub>4</sub>	D <sub>H</sub>	D <sub>A</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	l <sub>5</sub>	l <sub>6</sub>	s	L <sub>G</sub>			
2	55	300	600	35	60	90	98	114	118	140	108	45	55	27	5	189.3	108	2.8	23	3600	9
3	75	850	1700	45	70	123	131	149	158	184	111	42	75	33.8	5	218.8	111	3.5	46	3600	18
4	85	1350	2700	55	80	139	147	166	182	203	121	46	85	52.6	5	257.6	121	3.5	79	2000	25
5	100	3900	7800	80	90	165	196	223	224	279	164	70	100	63.2	6	326.2	164	4.4	195	2000	51

<sup>1)</sup> See comments on page 281

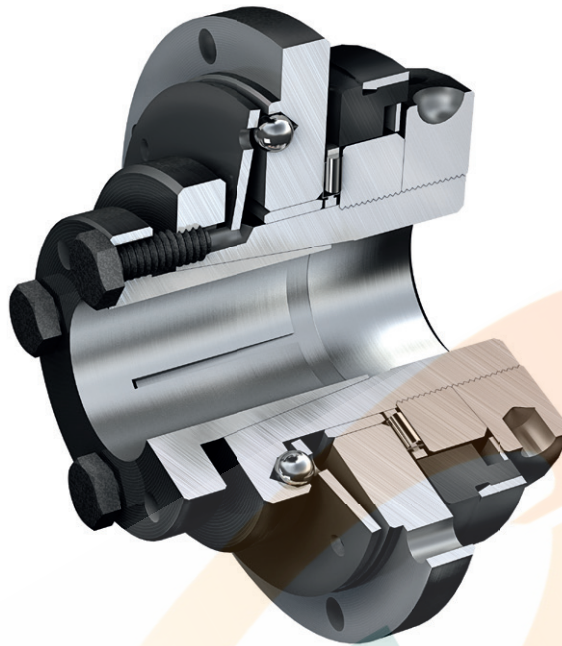
Ordering example:	KTR-SI FRA 3	T3	d Ø35	POLY-NORM® 75	AR	d <sub>1</sub> Ø45	300 Nm
	Type/size	Torque setting range	KTR-SI FRA bore	Type/size	Type	POLY-NORM® bore	Torque set

# SYNTEX®

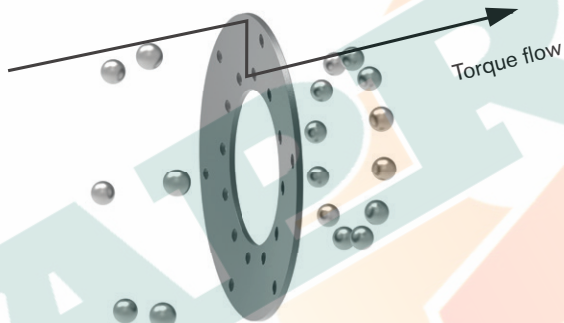
## Backlash-free overload systems

### Design and operation

- Backlash-free, torsionally rigid overload protection up to 400 Nm, suitable for reversing operation
- Disconnection of the drive in case of overload
- Reduction of torque peaks
- High response accuracy, even after a long operating period
- Easy integration of customer components
- Compact design, low mass moment of inertia
- Variable due to modular system
- Special disk springs available for special applications



- Low-cost protection even for simple drives
- Easy assembly and torque setting
- Maintenance-free
- Insensitive to oil and grease
- Long service life due to small internal loads
- Backlash-free shaft-hub-connections
- Any or synchronous re-engagement
- Automatically ready for operation again



SYNTEX® is an overload system with positive locking operation. The punched disk spring is a component serving for transmitting the torque.

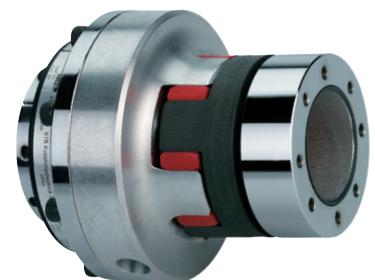
**SYNTEX®**  
Overload system with mounting flange



**SYNTEX®**  
Overload system with sprocket



**SYNTEX®**  
Overload system with ROTEX® GS

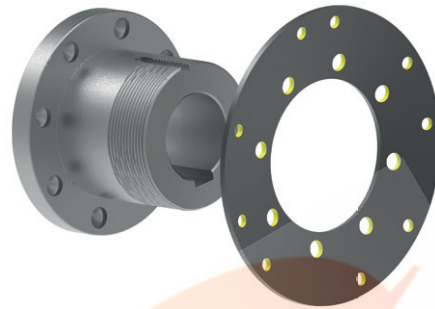


**Operating principles**

Ratchet design DK



Synchronous design SK



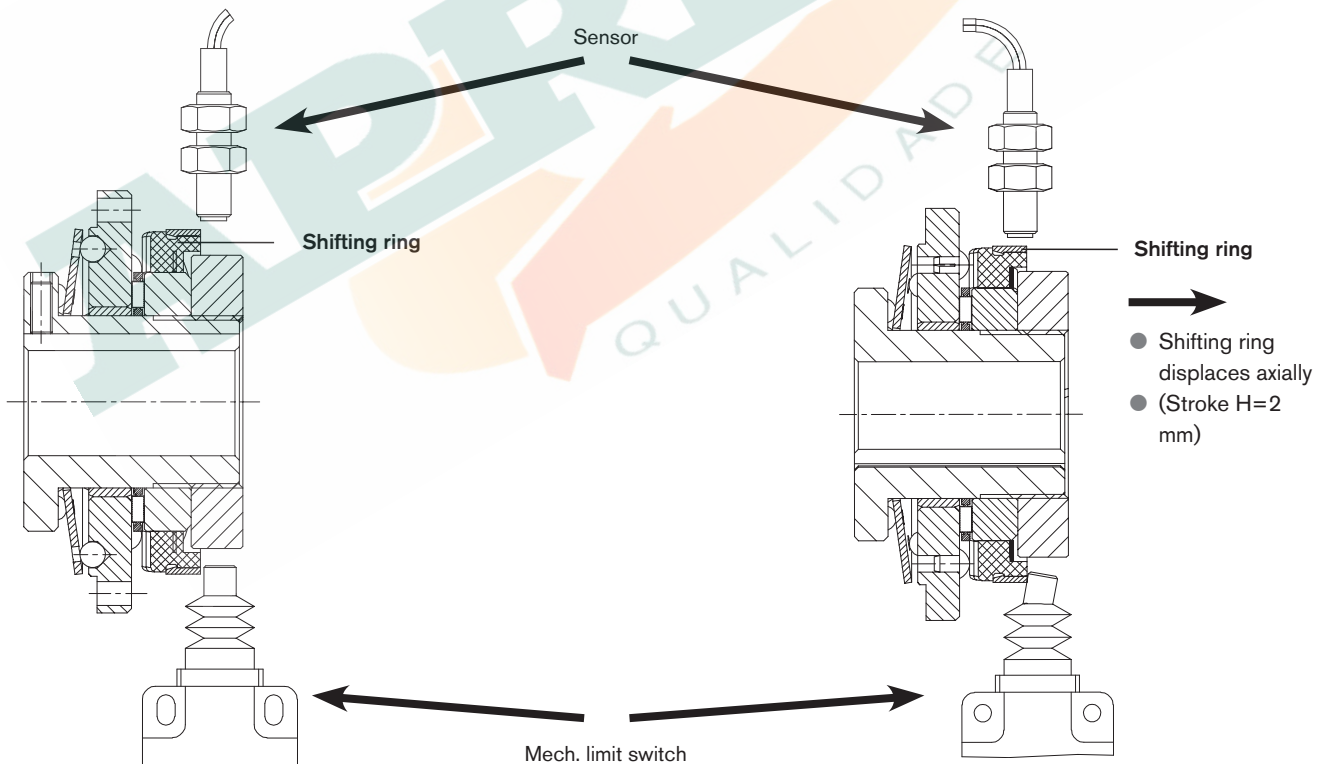
If the torque set is exceeded, a relative movement is generated between the driving and driven side. The transmittable torque is reduced to a low residual figure.

The balls leave the indentations of the disk spring. After eliminating the overload, the balls engage automatically with the next following ball indentation of the disk spring.

If the torque set is exceeded, a relative movement is generated between the driving and driven side. The transmittable torque is reduced to a low residual figure.

The balls leave the indentations of the disk spring. After eliminating the overload, the balls re-engage automatically with the disk springs after a rotation of 360° subject to their special pitch. Driving and driven side are always in the same position to each other (other degrees of re-engagement, for example 180°, are also possible).

Signal by limit switch or sensor in case of overload



**Normal operation:**

No signal by sensor or mechanical limit switch.

**In case of overload:**

The axial motion of the shifting ring activates the sensor resp. mechanical limit switch. The resulting signal can be used for control operation (e. g. motor stop).



# SYNTEX®

## Backlash-free overload systems

### Flange type



For legend of pictogram refer to flapper on the cover



#### Technical data – dimensions

Size	Torques [Nm]				Max. speed <sup>1)</sup> [rpm]	Dimensions [mm]															
	Ratchet design DK		Synchronous design SK			Max. bore d	D	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>A</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	l <sub>5</sub>	d <sub>L</sub>	L	z	H=stroke
	DK1	DK2	SK1	SK2																	
20	6-20	15-30	10-20	20-65	1500	20	48	54	61.5	65	71	80	8	2	16	6	35	4.5	45	8	2
25	20-60	45-90	25-65	40-100	1500	25	60	68	80	81	89	98	8	2	17	8	39	5.5	50	8	2
35	25-80	75-150	30-100	70-180	1000	35	75	78	91	102	110	120	10	2	21	10	42	5.5	60	12	2
50	60-180	175-300	80-280	160-400	1000	50	105	108	121	142	152	162	12	2	25	13	56	6.6	70	12	2

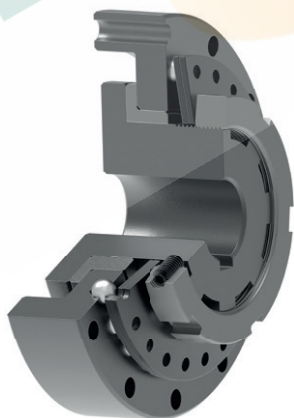
#### Dimensions – Hub type 4.5

Size	Dimensions [mm]							Clamping screws	Tightening torque T <sub>A</sub> [Nm]
	d <sub>1</sub> max.	l <sub>6</sub>	l <sub>7</sub>	l <sub>8</sub>	L <sub>1</sub>	s			
20	20	9	3.5	23	54	3	4 x M5	8.5	
25	25	11	4.0	28	61	4	4 x M6	14	
35	35	10	4.0	31	70	4	4 x M6	14	
50	50	12	4.0	37	82	6	4 x M6	14	

#### Transmittable friction torques T<sub>R</sub> [Nm] (clearance H7/h6) of hub type 4.5

Size	Ø12	Ø14	Ø15	Ø16	Ø17	Ø18	Ø19	Ø20	Ø22	Ø23	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50
20	45	62	71	81	92	103	115	127														
25		72	83	95	107	120	133	148	179	196	213	231										
35									127	139	152	165	207	237	270	323						
50																238	281	311	343	394	448	486

<sup>1)</sup> See comments on page 281



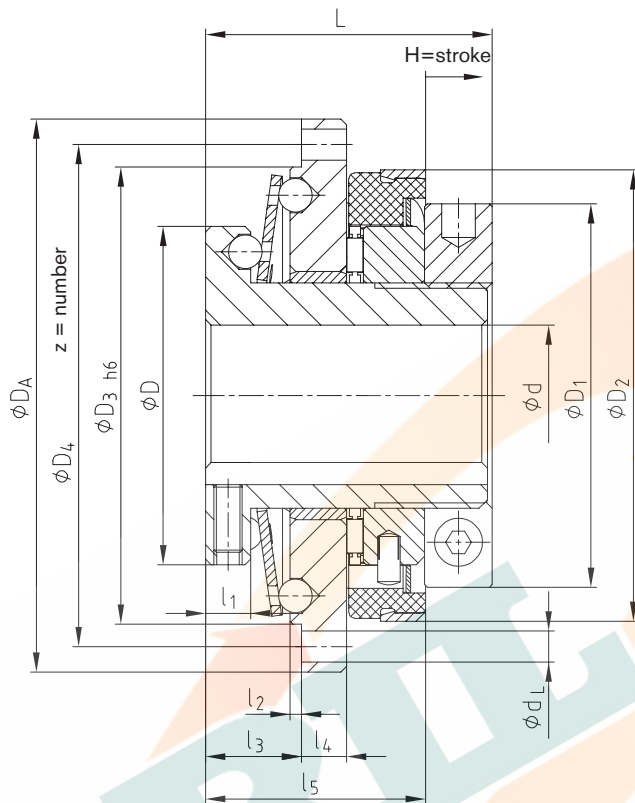
#### Special type:

- SYNTEX® 35 spec. with integrated flange
- Performance range up to 360 Nm
- Adjustment of flange to ambient components possible

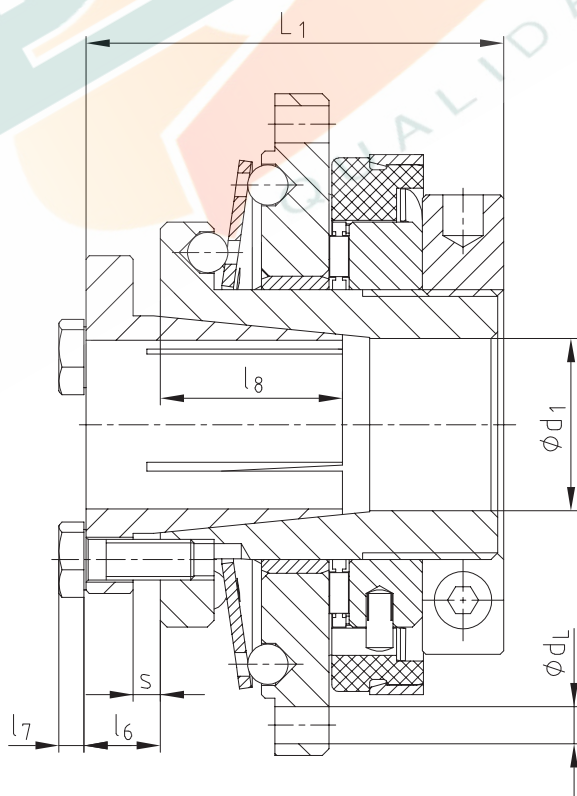
#### Ordering example:

SYNTEX® 25	d Ø20	DK1	1.0	45 Nm
Type/size	Bore	Type (DK/SK)	Hub type	Torque set

Hub type 1.0



Hub type 4.5



KTR-SI

SYNTEX®

SYNTEX®-NC

KTR-SI Compact

Torque limiters

# SYNTEX®

## Backlash-free overload systems

### With sprocket



For legend of pictogram refer to flapper on the cover



#### Technical data – dimensions

Size	Torque [Nm]				Max. speed <sup>2)</sup> [rpm]	Dimensions [mm]									
	Ratchet design DK		Synchronous design SK			Max. bore d	Standard sprocket <sup>1)</sup>	D	D <sub>1</sub>	D <sub>2</sub>	l <sub>1</sub>	l <sub>3</sub>	l <sub>5</sub>	L	H=stroke
	DK1	DK2	SK1	SK2											
20	6-20	15-30	10-20	20-65	1500	20	06 B-1 ( $\frac{3}{8} \times \frac{7}{32}$ ) z = 25	48	54	61.5	8	14	33	45	2
25	20-60	45-90	25-65	40-100	1500	25	08 B-1 ( $\frac{1}{2} \times \frac{5}{16}$ ) z = 24	60	68	80	8	15	37	50	2
35	25-80	75-150	30-100	70-180	1000	35	08 B-1 ( $\frac{1}{2} \times \frac{5}{16}$ ) z = 29	75	78	91	10	19	41	60	2
50	60-180	175-300	80-280	160-400	1000	50	12 B-1 ( $\frac{3}{4} \times \frac{7}{16}$ ) z = 27	105	108	121	12	23	52	70	2

#### Dimensions – Hub type 4.5

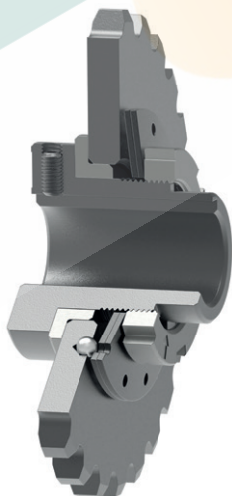
Size	Dimensions [mm]							Clamping screws	Tightening torque T <sub>A</sub> [Nm]
	d <sub>1</sub> max.	l <sub>6</sub>	l <sub>7</sub>	l <sub>8</sub>	L <sub>1</sub>	s			
20	20	9	3.5	23	54	3	4 x M5	8.5	
25	25	11	4.0	28	61	4	4 x M6	14	
35	35	10	4.0	31	70	4	4 x M6	14	
50	50	12	4.0	37	82	6	4 x M6	14	

#### Transmittable friction torques T<sub>R</sub> [Nm] (clearance H7/h6) of hub type 4.5

Size	Ø12	Ø14	Ø15	Ø16	Ø17	Ø18	Ø19	Ø20	Ø22	Ø23	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50	
20	45	62	71	81	92	103	115	127															
25		72	83	95	107	120	133	148	179	196	213	231											
35									127	139	152	165	207	237	270	323							
50																238	281	311	343	394	448	486	

<sup>1)</sup> z = min. number of teeth required / Other sprockets available on request

<sup>2)</sup> See comments on page 281



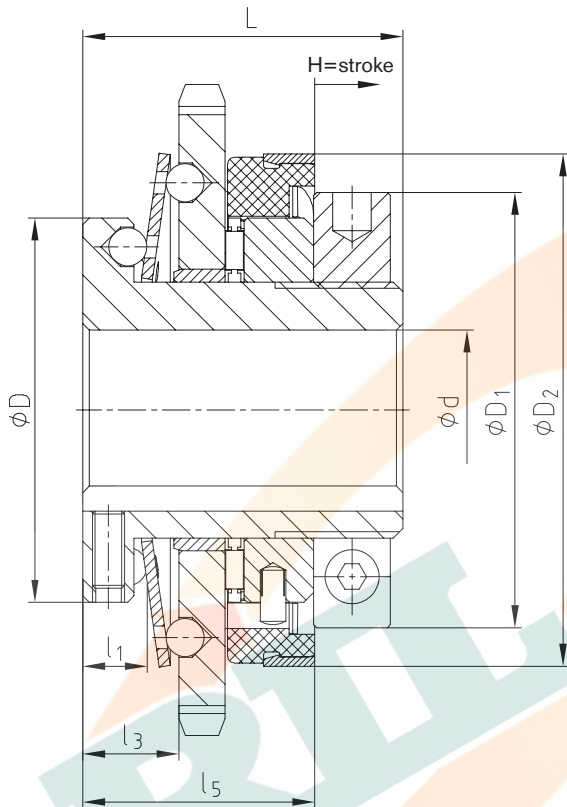
#### Special type:

- Standard SYNTEX® with integrated toothed belt pulley or sprocket
- Available ready for assembly with the torque set
- Reduction of components by integration of components
- Available both as a ratchet and synchronous design
- Torque setting possible while in place
- Finish bore according to ISO fit H7, feather keyway according to DIN 6885, sheet 1 [JS9]
- Also available with a frictionally engaged shaft-hub-connection (hub type 4.5)

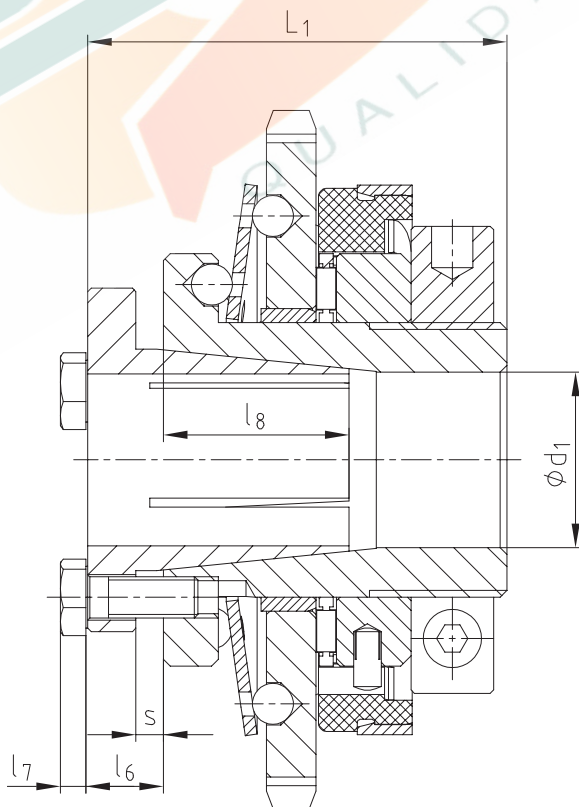
Ordering example:

SYNTEX® 25	DK1	1.0	d Ø20	08 B-1 ( $\frac{1}{2} \times \frac{5}{16}$ ), z = 29	45 Nm
Type/size	Type (DK/SK)	Hub type	Bore	Sprocket	Torque set

Hub type 1.0



Hub type 4.5



KTR-SI

SYNTEX®

SYNTEX®-NC

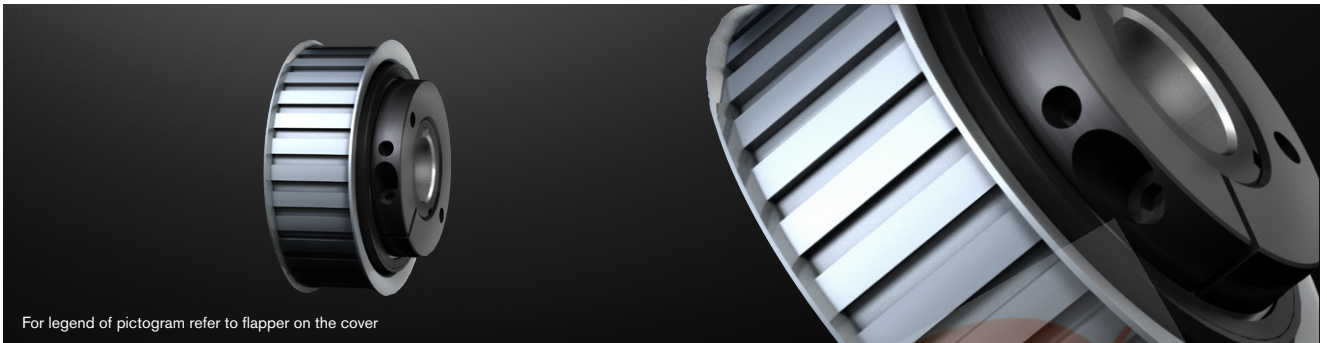
KTR-SI Compact

Torque limiters

# SYNTEX®

## Backlash-free overload systems

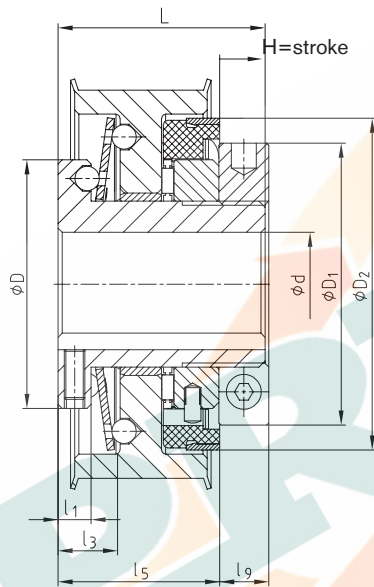
### With toothed belt pulley



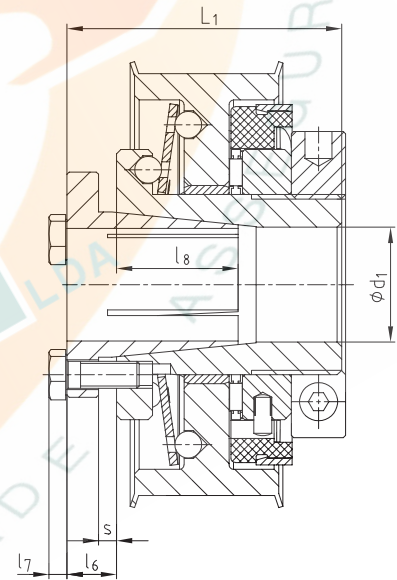
For legend of pictogram refer to flapper on the cover



Hub type 1.0



Hub type 4.5



#### Technical data – dimensions

Size	Torques [Nm]				Max. speed <sup>2)</sup> [rpm]	Dimensions [mm]										
	Ratchet design DK		Synchronous design SK			Max. bore d	Toothed belt pulley		D	D <sub>1</sub>	D <sub>2</sub>	l <sub>1</sub>	l <sub>3</sub>	l <sub>5</sub>	L	H=stroke
	DK1	DK2	SK1	SK2			T10 <sup>1)</sup>	AT10 <sup>1)</sup>								
20	6-20	15-30	10-20	20-65	1500	20	T10, z = 24	AT10, z = 24	48	54	61.5	8	14	35	45	2
25	20-60	45-90	25-65	40-100	1500	25	T10, z = 30	AT10, z = 30	60	68	80	8	15	39	50	2
35	25-80	75-150	30-100	70-180	1000	35	T10, z = 36	AT10, z = 36	75	78	91	10	19	42	60	2
50	60-180	175-300	80-280	160-400	1000	50	T10, z = 48 <sup>3)</sup>	AT10, z = 48 <sup>3)</sup>	105	108	121	12	23	56	70	2

#### Dimensions – Hub type 4.5

Size	Max. bore d <sub>1</sub>	Dimensions [mm]							Clamping screws	Tightening torque T <sub>A</sub> [Nm]
		l <sub>6</sub>	l <sub>7</sub>	l <sub>8</sub>	l <sub>9</sub>	L <sub>1</sub>	s			
20	20	9	3.5	23	10	54	3	4 x M5	8.5	
25	25	11	4.0	28	11	61	4	4 x M6	14	
35	35	10	4.0	31	13	70	4	4 x M6	14	
50	50	12	4.0	37	14	82	6	4 x M6	14	

#### Transmittable friction torques T<sub>R</sub> [Nm] (clearance H7/h6) of hub type 4.5

Size	Ø12	Ø14	Ø15	Ø16	Ø17	Ø18	Ø19	Ø20	Ø22	Ø23	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50
20	45	62	71	81	92	103	115	127														
25		72	83	95	107	120	133	148	179	196	213	231										
35									127	139	152	165	207	237	270	323						
50																238	281	311	343	394	448	486

<sup>1)</sup> z = min. number of teeth required / Other sizes available on request

<sup>2)</sup> See comments on page 281

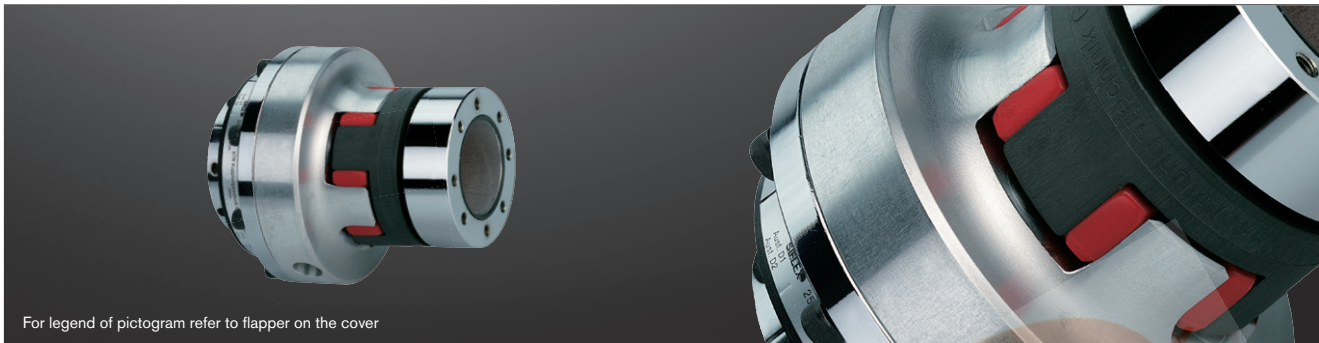
<sup>3)</sup> Without flanged wheel

#### Ordering example:

SYNTEX® 25	DK1	1.0	d Ø20	AT10, z = 24	32	45 Nm
Type/size	Type (DK/SK)	Hub type	Bore	Toothed belt pulley	Width of toothed belt pulley	Torque set

# SYNTEX® Backlash-free overload systems

With backlash-free ROTEX® GS



For legend of pictogram refer to flapper on the cover

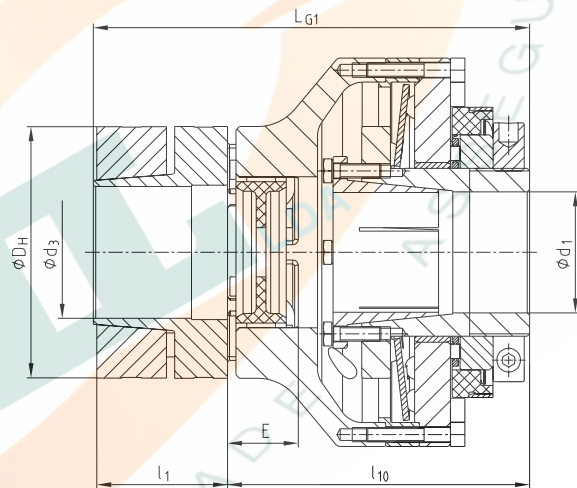
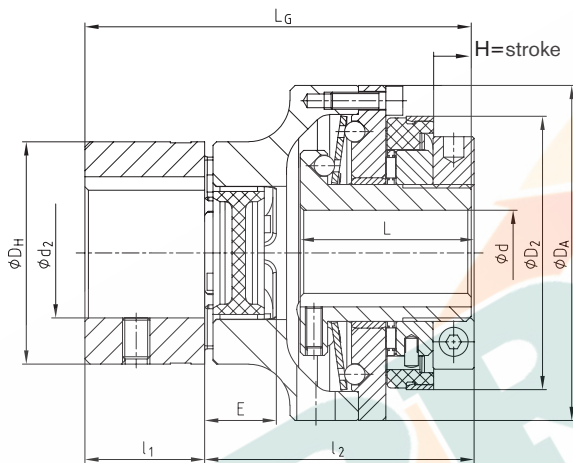


Hub type 1.0

Hub type 1.0

Hub type 6.0

Hub type 4.5



### Technical data – dimensions

SYNTEX® size	ROTEX® GS size	Torques [Nm]							Max. speed <sup>2)</sup> [rpm]	Dimensions [mm]													
		Ratchet design DK		Synchronous design SK		ROTEX® GS <sup>1)</sup> 98 ShA-GS		Max. bore				D <sub>2</sub>	D <sub>H</sub>	D <sub>A</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>10</sub>	E	L	L <sub>G</sub>	L <sub>G1</sub>	H=stroke	
		DK1	DK2	SK1	SK2	T <sub>KN</sub>	T <sub>K max</sub>	d		d <sub>1</sub>	d <sub>2</sub>												d <sub>3</sub>
20	24	6-20	15-30	10-20	20-65	60	120	1500	20	20	28	28 <sup>3)</sup>	61.5	55	80	30	70	83	18	45	100	113	2
25	28	20-60	45-90	25-65	40-100	160	320	1500	25	25	38	38 <sup>3)</sup>	80	65	98	35	78	91	20	50	113	126	2
35	38	25-80	75-150	30-100	70-180	325	650	1000	35	35	45	48 <sup>3)</sup>	91	80	120	45	91	105.5	24	60	136	150.5	2
50	48	60-180	175-300	80-280	160-400	525	1050	1000	50	50	62	55 <sup>3)</sup>	121	105	162	56	111	126	28	70	167	182	2

### Transmittable friction torques T<sub>R</sub> [Nm] (clearance H7/h6) of hub type 4.5

Size	Ø12	Ø14	Ø15	Ø16	Ø17	Ø18	Ø19	Ø20	Ø22	Ø23	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50
20	45	62	71	81	92	103	115	127														
25		72	83	95	107	120	133	148	179	196	213	231										
35									127	139	152	165	207	237	270	323						
50																238	281	311	343	394	448	486

<sup>1)</sup> See selection of ROTEX® GS couplings on page 22 et seqq.

<sup>2)</sup> See comments on page 281

<sup>3)</sup> For transmittable friction torques T<sub>R</sub> [Nm] of ROTEX® GS hub type 2.8 or 6.0 refer to mounting instructions of ROTEX® GS

Ordering example:

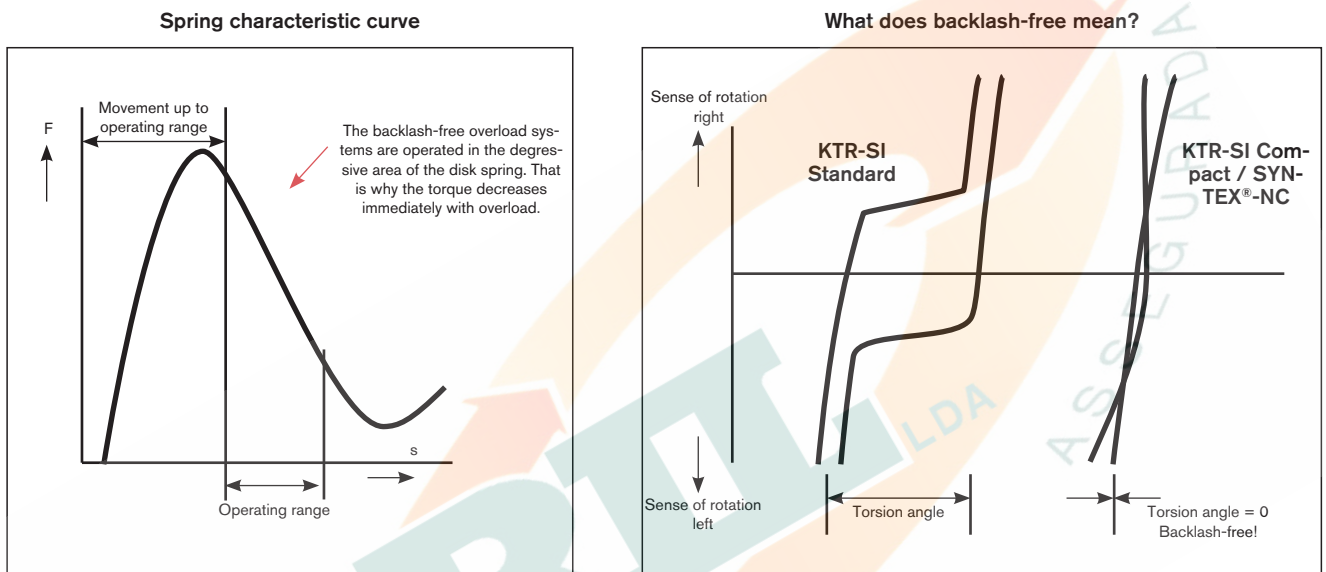
SYNTEX® 25	DK1	1.0	d Ø20	ROTEX® GS 28	98 ShA-GS	1.0	d <sub>2</sub> Ø25	50 Nm
Type/size	Type	Hub type	Bore	Type/size	Spider	Hub type	ROTEX® GS bore	Torque set

# SYNTEX®-NC / KTR-SI Compact Backlash-free overload systems

## Design and operation

The design of the backlash-free overload systems SYNTEX®-NC and KTR-SI Compact is based on a spring-preloaded and positive-locking ball engagement principle allowing for high repeatability and short response times. Moreover, an integrated groove ball bearing provides for the option of direct assembly of toothed belt pulleys, special flanges or other components. Main applications are latest machine tools, control and positioning technology as well as packaging machines and special purpose machinery.

Both systems make use of disk springs with a degressive spring characteristic curve the preset prestress of which drops during the disengaging process. As a result driving and driven end are reliably separated from each other within some milliseconds with the wear on the components being simultaneously reduced to a minimum.



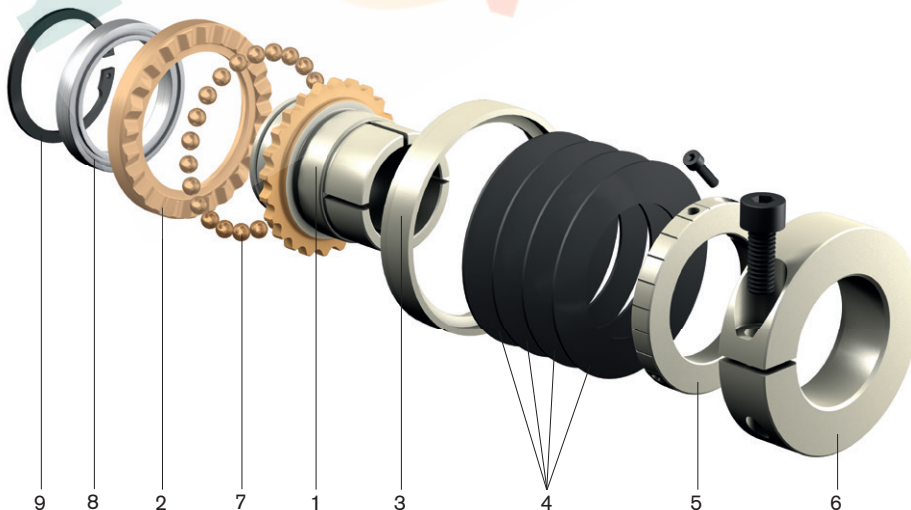
### Ratchet design DK

Any engagement after an overload. After eliminating the overload, the balls re-engage automatically with the next following ball indentation.

### Synchronous design SK

Synchronous engagement after an overload. After eliminating the overload, the balls re-engage automatically with the disk springs after a rotation of 360°. Driving and driven side are always placed in the same position to each other. Other degrees of re-engagement, for example 180°, are also possible.

● = The core of the backlash-free overload systems



### List of components:

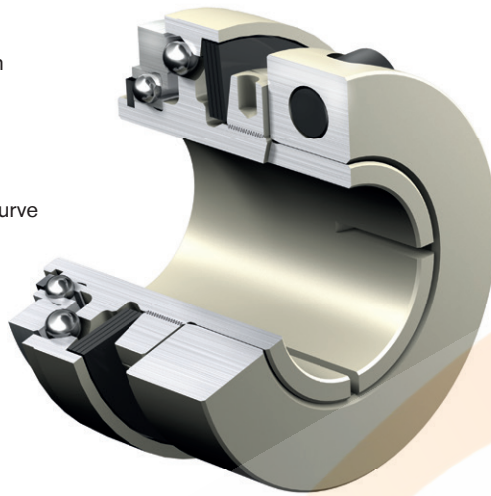
1. Hub with keyway to DIN (type 1.0) or with clamping ring (type 6.1)
2. Flange ring
3. Shifting ring
4. Disk spring
5. Setting nut
6. Clamping ring
7. Balls
8. Groove ball bearing
9. Circlip

# SYNTEX®-NC / KTR-SI Compact Backlash-free overload systems

## Operating principle

### SYNTEX®-NC

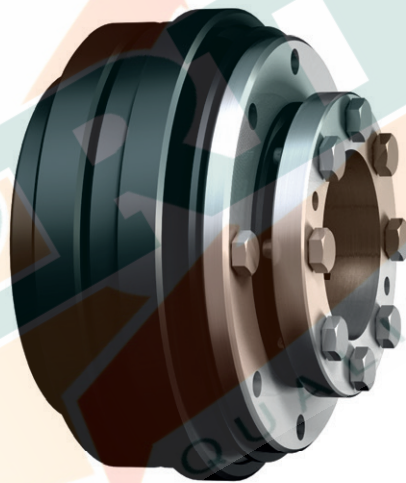
- Overload protection up to 550 Nm
- Backlash-free torque transmission
- Light-weight design
- Degressive spring characteristic curve
- Low mass moment of inertia
- Large bore diameters
- Short response times
- High power density



- Clamping ring design easy to assemble
- Available both as a ratchet (DK) and synchronous design (SK)
- Backlash-free shaft-hub-connection
- In combination with the backlash-free, torsionally flexible ROTEX® GS or backlash-free, torsionally stiff TOOLFLEX®
- Direct assembly of toothed belt pulleys, as an example, possible (integrated groove ball bearing)

### KTR-SI Compact

- Overload protection up to 3,100 Nm
- Backlash-free overload system with a degressive spring characteristic curve
- Solid design
- Accurate disengagement with high repeatability
- Accurate backlash-free torque transmission even in case of wear
- Shifting ring with setting scale for accurate torque setting



- Easy torque setting by torque scale on the coupling
- Connection flange with ball bearing
- Hardened ratchet surfaces for a long service life
- Backlash-free shaft-hub-connection via taper bush
- Can be used with the proven ROTEX® GS as a shaft-to-shaft connection

RUFLEX®

KTR-SI

SYNTEX®

SYNTEX®-NC

KTR-SI Compact

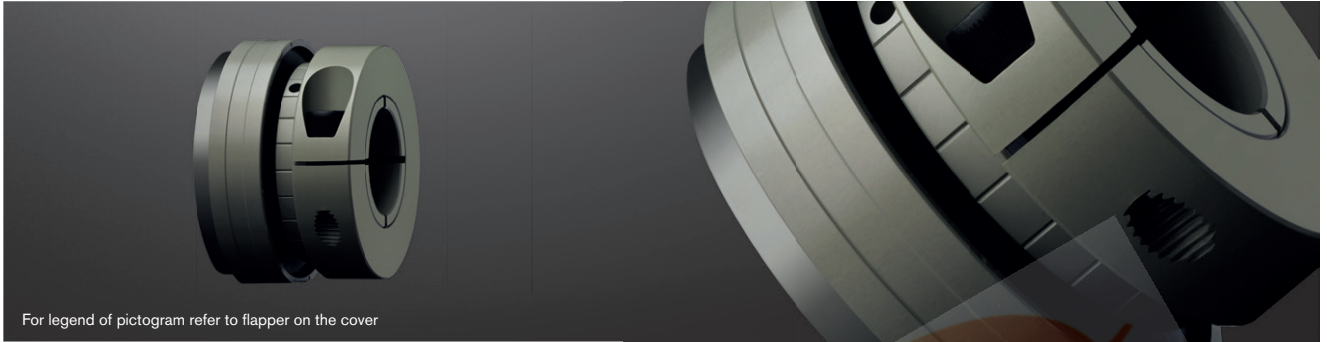
Torque  
limiters



# SYNTEX®-NC

## Backlash-free overload systems

### Hub type

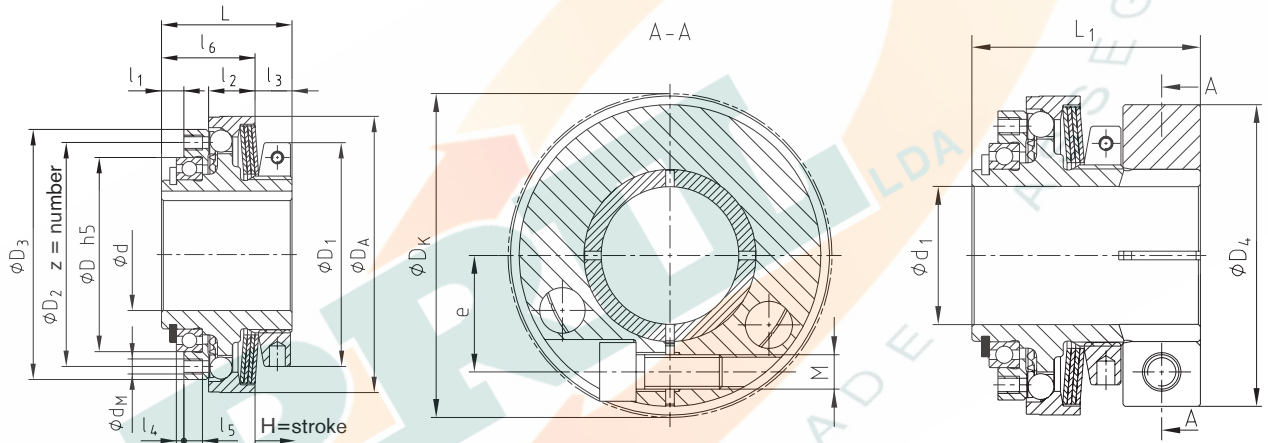


For legend of pictogram refer to flapper on the cover



Hub type 1.0 (keyway acc. to DIN 6885)

Hub type 6.1 (clamping ring)



#### Technical data – dimensions

Size	Max. speed <sup>3)</sup> [rpm]	Torques [Nm]			Max. bore		Dimensions [mm]												
		T1	T2	T3	d	D <sub>h5</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>A</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	l <sub>5</sub>	l <sub>6</sub>	L	z x d <sub>M</sub>	H=stroke
15	3500	2-3.5	3.5-7	7-14	12	32	33	37	42	42	5.0	7.0	9.2	2	4	18.8	28	12xM3	0.8
25	3000	9-15	20-35	40-65	20 (22) <sup>1)</sup>	42	50	48	56	61	5.5	11.5	9.1	2	5	23.9	33	8xM4	1.2
32	3000	25-38	50-75	100-150	27 (30) <sup>1)</sup>	52	60	60	67	74	6	12.5	9.9	2	5	25.1	35	8xM4	1.5
42	2500	30-65	60-135	120-265	36 (38) <sup>1)</sup>	65	72	75	83	90	7	16	11.2	2	6	31.8	43	8xM5	1.5
60 <sup>4)</sup>	2000	70-140	120-180	220-550	50	90	96	100	113	116	8	21	11.8	2	7	38.2	52	12xM6	1.8

#### Dimensions – Hub type 6.1

Size	Bore d <sub>1</sub>		Dimensions [mm]						Weight with max. bore [kg]	Mass moment of inertia <sup>2)</sup> J <sub>total</sub> [kgm <sup>2</sup> ]
	Pilot bore	Max.	D <sub>4</sub>	DK	L <sub>1</sub>	e	M	T <sub>A</sub> [Nm]		
15	7.5	15	40	43	38	15	M4	1.7	0.124	0.029 x 10 <sup>-3</sup>
25	9.5	25	55	-	45	21	M6	14	0.282	0.14 x 10 <sup>-3</sup>
32	13.5	32	70	-	53	27	M8	34	0.471	0.35 x 10 <sup>-3</sup>
42	18.5	42	86	91.2	63	33	M10	67	0.815	0.95 x 10 <sup>-3</sup>
60 <sup>4)</sup>	24	60	112	119.4	75	45	M12	115	3.04	5.9 x 10 <sup>-3</sup>

#### Transmittable friction torques T<sub>R</sub> [Nm] (clearance H7/h6) of hub type 6.1

Size	Ø8	Ø10	Ø11	Ø12	Ø14	Ø15	Ø16	Ø18	Ø19	Ø20	Ø22	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø36	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50	Ø55	Ø60
15	8	12	14	16	22	24																				
25		30	35	42	55	62	69	48	53	58	69	80	86													
32						74	83	104	114	125	148	116	125	153	172	192										
42										149	178	209	225	275	310	264	309	324	356	389	422					
60 <sup>4)</sup>													247	310	356	405	485	513	571	633	394	452	514	558	675	803

<sup>1)</sup> The figure in brackets specifies the max. bore with keyway to DIN 6885 sheet 3 (low-rise design)

<sup>2)</sup> With max. bore

<sup>3)</sup> See comments on page 281

<sup>4)</sup> Material steel

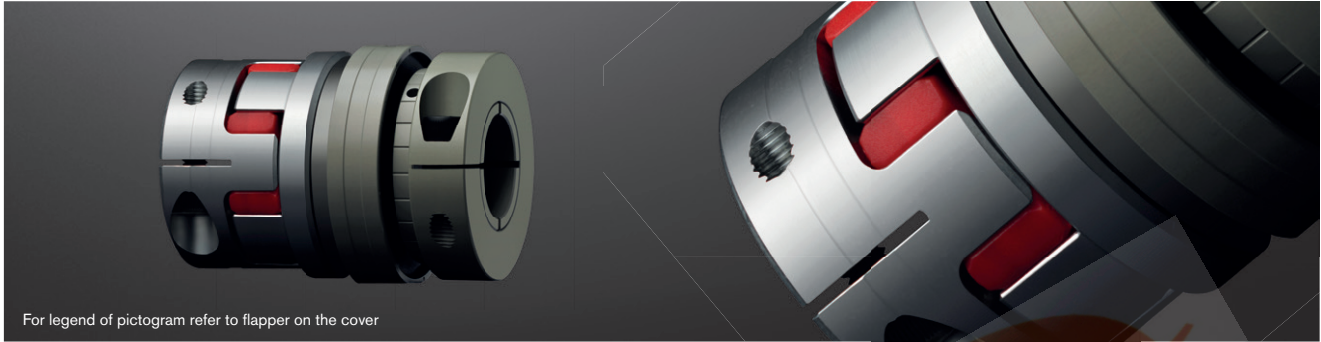
Ordering example:

SYNTEX®-NC 32	SK	6.1	T3	d <sub>1</sub> Ø25	120
Type/size	Type (DK/SK)	Hub type	Disk springs	Bore	Torque set

# SYNTEX®-NC

## Backlash-free overload systems

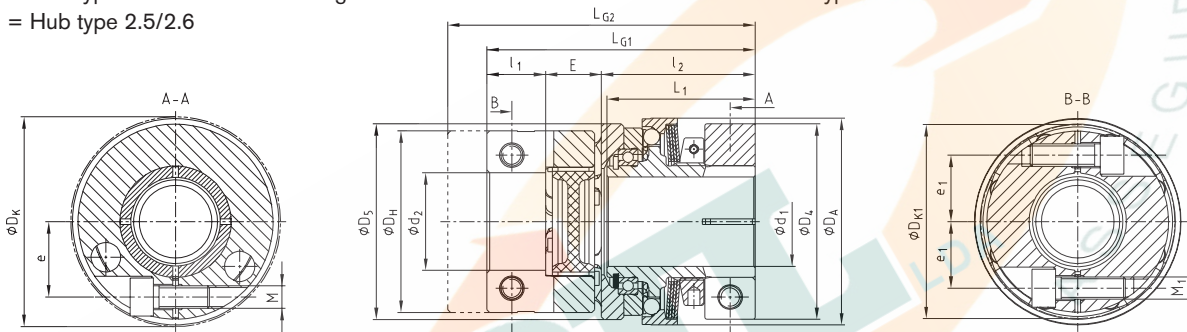
With backlash-free ROTEX® GS



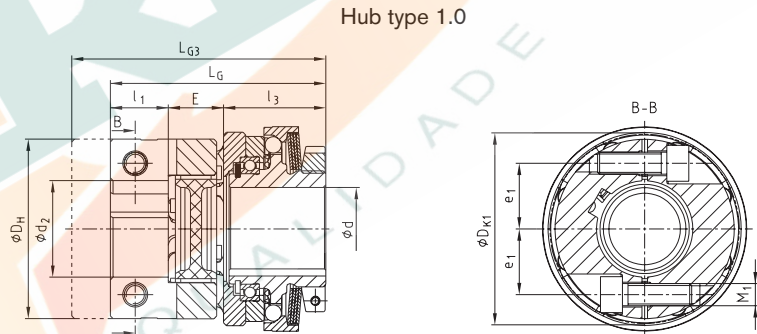
For legend of pictogram refer to flapper on the cover



LG1 = Hub type 2.8 from size 60 6.0 light  
LG2 = Hub type 2.5/2.6



LG = Hub type 2.9 from size 60 1.0  
LG3 = Hub type 2.5/2.6



### Technical data – dimensions

Size	ROTEX® GS size <sup>1)</sup>	Torques [Nm]			Max. speed <sup>2)</sup> [rpm]	Max. bore			Dimensions [mm]																			
		T1	T2	T3		d	d <sub>1</sub>	d <sub>2</sub>	D <sub>5</sub>	D <sub>H</sub>	DK	DK <sub>1</sub>	DA	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	E	e	e <sub>1</sub>	LG	L <sub>1</sub>	LG <sub>1</sub>	LG <sub>2</sub>	LG <sub>3</sub>	M	T <sub>A</sub> [Nm]	M <sub>1</sub>	T <sub>A1</sub> [Nm]
15	19	2-3.5	3.5-7	7-14	3500	12	15	24 <sup>3)</sup>	45	40	-	46.7	42	17	40	30	16	15	15.5	63	38	73	81	71	M4	1.7	M5	6
25	24	9-15	20-35	40-65	3000	20 (22) <sup>4)</sup>	25	32 <sup>3)</sup>	58	55	-	57.5	61	18	47.5	35.5	18	21	20	71.5	45	83.5	95.5	83.5	M6	14	M6	10
32	28	25-38	50-75	100-150	3000	27 (30) <sup>4)</sup>	32	35 <sup>3)</sup>	70	65	-	69	74	21	55	37	20	27	23.8	78	53	96	110	92	M8	34	M8	25
42	38	30-65	60-135	120-265	2500	36 (38) <sup>4)</sup>	42	45 <sup>3)</sup>	88	80	91.2	86	90	26	66	46	24	33	30.5	96	63	116	135	115	M10	67	M10	49
60 <sup>5)</sup>	48	70-140	120-280	220-550	2000	50	60	55 <sup>3)</sup>	113	105	119.4	-	116	56	83	60	28	45	-	144	75	167	167	144	M12	115	M10	49

### Transmittable friction torques T<sub>R</sub> [Nm] (clearance H7/h6) of hub type 6.1

Size	Ø8	Ø10	Ø11	Ø12	Ø14	Ø15	Ø16	Ø18	Ø19	Ø20	Ø22	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø36	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50	Ø55	Ø60
15	8	12	14	16	22	24																				
25		30	35	42	55	62	69	48	53	58	69	80	86													
32					74	83	104	114	125	148	116	125	153	172	192											
42									149	178	209	225	275	310	264	309	324	356	389	422						
60 <sup>5)</sup>													247	310	356	405	485	513	571	633	394	452	514	558	675	803

<sup>1)</sup> See selection of ROTEX® GS couplings on page 22 et seqq.

<sup>2)</sup> See comments on page 281

<sup>3)</sup> For transmittable friction torques T<sub>R</sub> [Nm] of ROTEX® GS hub type 2.8 or 6.0 refer to mounting instructions of ROTEX® GS

<sup>4)</sup> The figure in brackets specifies the max. bore with keyway to DIN 6885 sheet 3 (low-rise design)

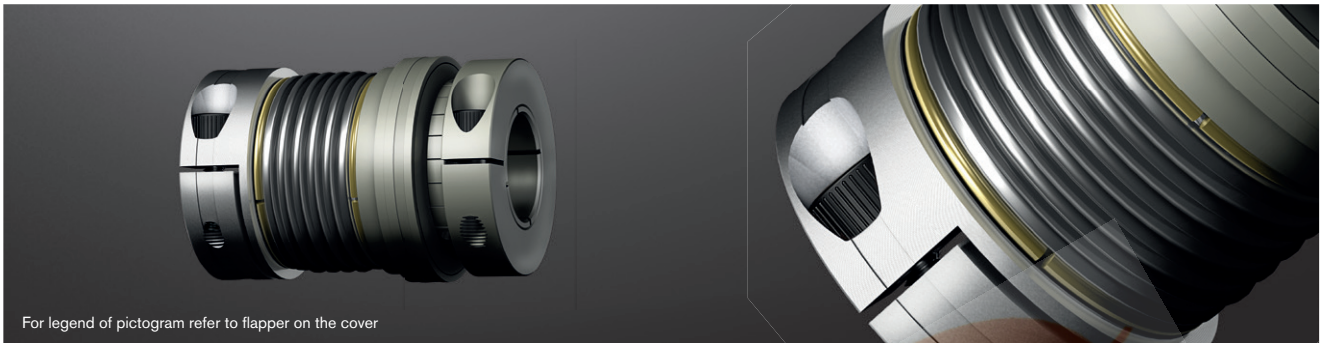
<sup>5)</sup> Material steel

Ordering example:	SYNTEX®-NC 32	SK	6.1	T3	d <sub>1</sub> Ø25	28	2.8	d <sub>2</sub> Ø20	120
	Type/size	Type	Hub type	Disk springs	SYNTEX®-NC bore	ROTEX® GS size	Hub type	ROTEX® GS bore	Torque set

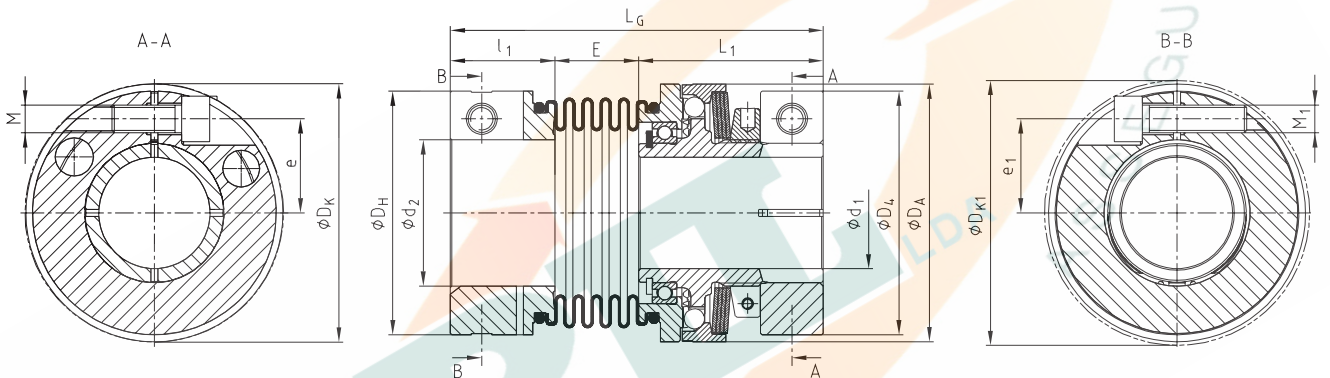
# SYNTEX®-NC

## Backlash-free overload systems

With torsionally stiff TOOLFLEX® S



For legend of pictogram refer to flapper on the cover



Technical data – dimensions																							
Size	TOOLFLEX® size <sup>1)</sup>	Torques [Nm]			Speed <sup>2)</sup> [rpm]	Max. bore		Dimensions [mm]															
		T1	T2	T3		d1	d2	D4	DH	DA	DK	DK1	l1	L1	E	e	e1	LG	M	TA [Nm]	M1	TA1 [Nm]	
15	20	2-3.5	3.5-7	7-14	3500	15	20 <sup>3)</sup>	40	40	52	43	43.5	21.5	38	16.5	15	14.5	76	M4	1.7	M5	6	
25	38	9-15	20-35	40-65	3000	25	38 <sup>3)</sup>	55	65	61	-	72.6	25.5	45	18	21	25	88	M6	14	M8	25	
32	42	25-38	50-75	100-150	3000	32	42 <sup>3)</sup>	70	70	74	-	76.1	30	53	24	27	27	107	M8	34	M8	25	
42	45	30-65	60-135	120-265	2500	42	45 <sup>3)</sup>	86	83	90	91.2	89	32	63	22.5	33	30	114	M10	67	M10	49	
60 <sup>4)</sup>	65	70-140	120-280	220-550	2000	60	65 <sup>3)</sup>	112	125	140	119.4	127.1	45	84	36	45	45	165	M12	115	M14	185	

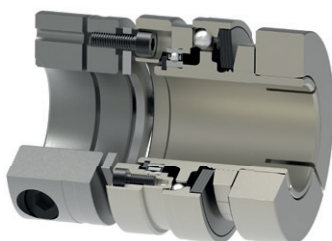
Transmittable friction torques TR [Nm] (clearance H7/h6) of hub type 6.1																										
Size	Ø8	Ø10	Ø11	Ø12	Ø14	Ø15	Ø16	Ø18	Ø19	Ø20	Ø22	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø36	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50	Ø55	Ø60
15	8	12	14	16	22	24																				
25		30	35	42	55	62	69	48	53	58	69	80	86													
32					74	83	104		114	125	148	116	125	153	172	192										
42										149	178	209	225	275	310	264	309	324	356	389	422					
60 <sup>4)</sup>													247	310	356	405	485	513	571	633	394	452	514	558	675	803

<sup>1)</sup> See selection of TOOLFLEX® couplings on page 22 et seqq.

<sup>2)</sup> See comments on page 281

<sup>3)</sup> For transmittable friction torques TR [Nm] of TOOLFLEX® hub type 2.5 refer to mounting instructions of TOOLFLEX®

<sup>4)</sup> Material steel



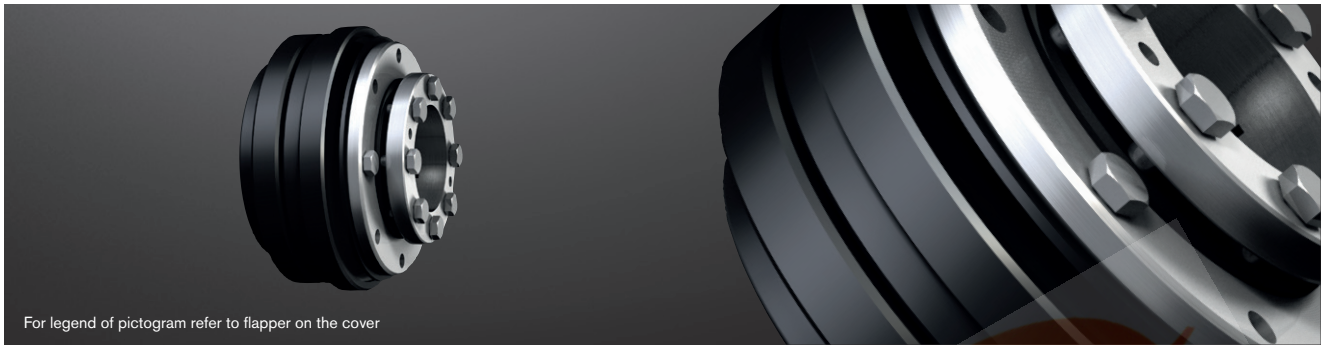
Special type:

- SYNTEX®-NC with RADEX®-NC

Ordering example:	SYNTEX®-NC 32	SK	6.1	T3	d1 Ø25	42-S	2.5	d2 Ø20	120
	Type/size	Type	Hub type	Disk springs	SYNTEX®-NC bore	TOOLFLEX® size	Hub type	TOOLFLEX® bore	Torque set

# KTR-SI Compact Backlash-free overload systems

## Flange type



For legend of pictogram refer to flapper on the cover



Hub type 1.0

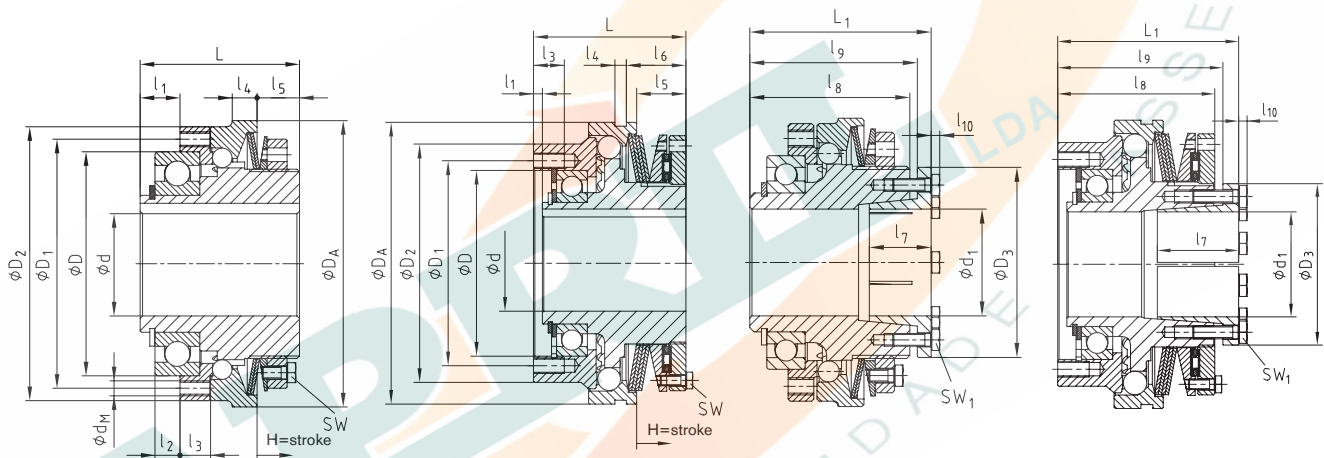
Hub type 4.5  
with taper bush

Size 01 - 3

Size 4

Size 01 - 3

Size 4



### Technical data – dimensions

Size	Speed <sup>1)</sup> [rpm]	Torque [Nm]			Dimensions [mm]														
		T1	T2	T3	Bore d	D <sub>h5</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>A</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	l <sub>5</sub>	l <sub>6</sub>	L	d <sub>M</sub>	SW	H= stroke
01	4000	3-14	6-28	13-56	8-20	47	56	65	70	8	5	7.5	7	12	-	40	8xM4	7	1.2
0	3000	9-35	18-70	40-140	10-25 (30) <sup>3)</sup>	62	71	80	85	11	7	8.0	8	14	-	48	8xM5	7	1.5
1	2500	19-65	38-130	78-260	14-30 (35) <sup>3)</sup>	75	85	95	100	14	9	10.5	9	16	-	59	8xM6	8	1.8
2	2000	35-110	80-220	160-440	18-40 (45) <sup>3)</sup>	90	100	110	115	16	10	12	10	17	-	64	8xM6	10	2.0
3	1200	80-200	160-400	320-800	24-50	100	116	130	135	18	10	12	12	21	-	75	8xM8	10	2.2
4	400	230-730	460-1590	960-3100	40-75	145 <sup>H7</sup>	160	186	220	7	-	24	9	38.5	46.5	119	6xM12	13	3.5

### Dimensions – Hub type 4.5

Size	Bore <sup>2)</sup>		Dimensions [mm]							T <sub>A</sub> [Nm]
	d <sub>1</sub>	D <sub>3</sub>	l <sub>7</sub>	l <sub>8</sub>	l <sub>9</sub>	l <sub>10</sub>	L <sub>1</sub>	SW <sub>1</sub>		
01	10-20	40.5	26	40	42	2.8	47	7	3	
	19-25	42								
0	15-20	40.5	26	46	48	2.8	53	7	4.6	
	19-30	57								
1	19-30	57	40	57	60	4	67	10	10	
	32-40	64								
2	32-50	73.5	29	63	66.5	4	73	10	10	
	32-50	73.5								
3	55-60	89	44	75	78	4	86	10	10	
	55-60	89								
4	50-60	96.5	54	119	125.5	5.5	133.5	13	28	
	65-80	123								

<sup>1)</sup> See comments on page 281

<sup>2)</sup> For transmittable friction torques T<sub>R</sub> [Nm] of hub type 4.5 refer to assembly instructions

<sup>3)</sup> The figure in brackets specifies the max. bore with keyway to DIN 6885 sheet 3 (low-rise design)

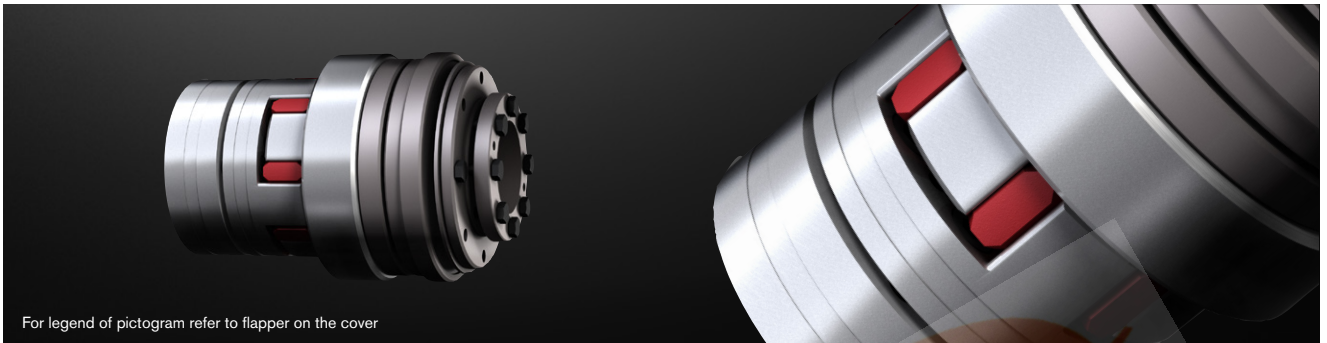
#### Ordering example:

KTR-SI Compact 2	DK	4.5	T2	d <sub>1</sub> Ø40	150 Nm
Type/size	Type (DK/SK)	Hub type	Disk springs	Bore	Torque set

# KTR-SI Compact

## Backlash-free overload systems

With backlash-free ROTEX® GS



For legend of pictogram refer to flapper on the cover

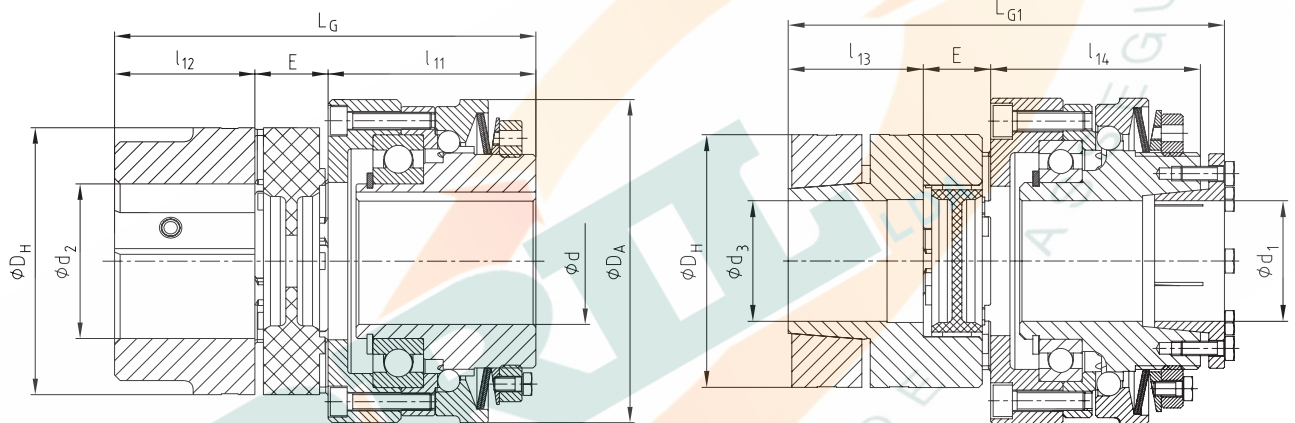


Hub type 1.0

Hub type 1.0

Hub type 6.0

Hub type 4.5



### Technical data – dimensions

Size	Max. speed [rpm] <sup>1)</sup>	Torques [Nm]			ROTEX® GS size <sup>2)</sup>	Max. bore				Dimensions [mm]								
		T1	T2	T3		d	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	D <sub>H</sub>	D <sub>A</sub>	l <sub>11</sub>	l <sub>12</sub>	l <sub>13</sub>	l <sub>14</sub>	E	L <sub>G</sub>	L <sub>G1</sub>
01	4000	3-14	6-28	13-56	24	20	25	28	20	55	70	47	30	30	47	18	95	102
0	3000	9-35	18-70	40-140	28	25	30	38	38	65	85	56.5	35	35	54.5	20	111.5	119.5
1	2500	19-65	38-130	78-260	38	30	40	45	48	80	100	69	45	45	67	24	138	146
2	2000	35-110	80-220	160-440	42	40 (45) <sup>3)</sup>	50	55	51	95	115	74	50	50	73	26	150	159
3	1200	80-210	160-400	320-800	48	50	60	62	55	105	135	87	56	56	87	28	171	182
4	400	230-730	460-1590	960-3100	75	75	80	80	80	160	220	158.5	85	85	139.5	40	283.5	302.5

<sup>1)</sup> See comments on page 281

<sup>2)</sup> See selection of ROTEX® GS couplings on page 22 et seqq.

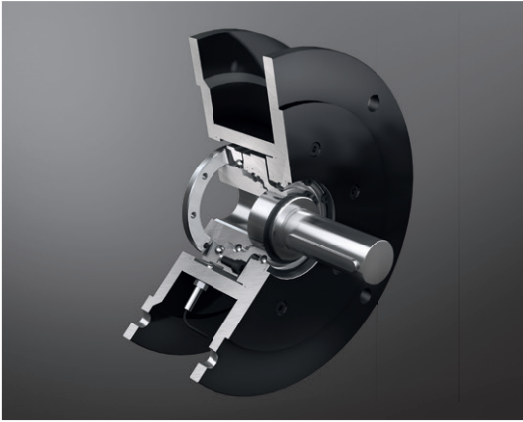
<sup>3)</sup> The figure in brackets specifies the max. bore with keyway to DIN 6885 sheet 3 (low-rise design)

Ordering example:

KTR-SI Compact 1	DK	T2	4.5	d <sub>1</sub> Ø25	6.0 / d <sub>3</sub> Ø25	150 Nm
Type/size	Type (DK/SK)	Disk spring	KTR-SI hub type	KTR-SI bore	ROTEX® GS hub type/bore	Torque set

## Special types

Other types and combinations available on request.



- KTR-SI Compact with IEC flange

**APRIL** LDA  
QUALIDADE ASSEGURADA

RUFLEX®

KTR-SI

SYNTEX®

SYNTEX®-NC

KTR-SI Compact

Torque  
limiters