

**Product features and components**

**SYNTEX® - Torque Limiter with adapter flange**



**SYNTEX® - Torque Limiter with sprocket**



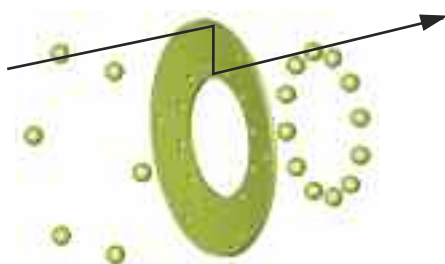
**SYNTEX® - Torque Limiter with ROTEX® GS**



- 1 Zero-backlash, torsionally stiff overload protection suitable for reversing drives
- 1 Disconnection of the drive in case of overload
- 1 Torque peaks reduced
- 1 High repeatable accuracy even after extended operation
- 1 Easy integration of customer components
- 1 Compact design, low mass moment of inertia
- 1 Flexible modular design
- 1 Special disc springs for unique applications



- 1 Low-cost protection even for general applications
- 1 Easy assembly and torque setting
- 1 Reduced maintenance
- 1 Insensitive to oil and grease
- 1 High quality materials for durability and long life
- 1 Zero-backlash shaft-hub connections
- 1 Standard or synchronous re-engagement
- 1 Compatible with proximity and limit switches



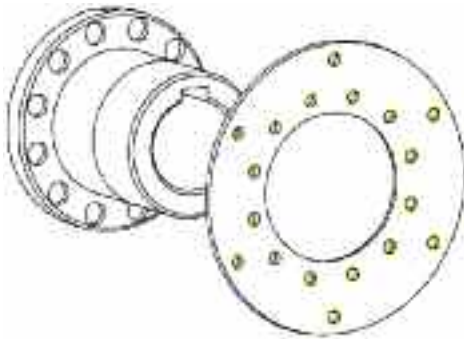
Torque flow



v

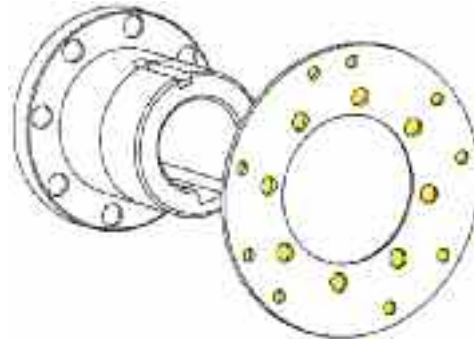
**Function and design**

**Standard design DK**



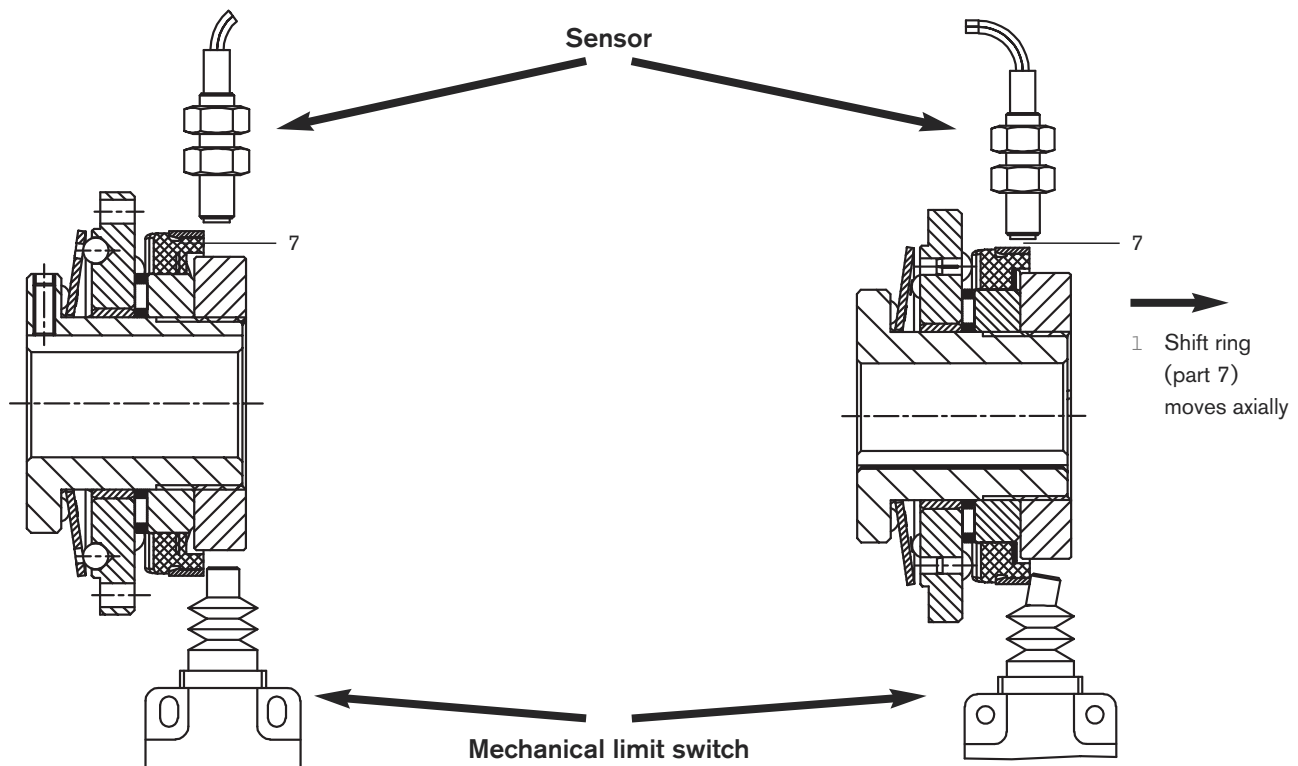
If the torque setting is exceeded, the drive and driven side are disconnected. The balls leave the indentations of the disc springs, reducing the transmittable torque to a minimum. After eliminating the overload, the balls engage automatically to the next following ball indentation of the disc spring and re-engage torque transmission.

**Synchronous design SK**



If the torque setting is exceeded, the drive and driven side are disconnected. The balls leave the indentations of the disc springs, reducing the transmittable torque to a minimum. After eliminating the overload, the balls engage automatically after 360° revolution and re-engage torque transmission. Drive and driven side are always placed in sync with each other (other degrees of re-engagement, for example 180°, are also available).

**Signal by limit switch or sensor upon overload**



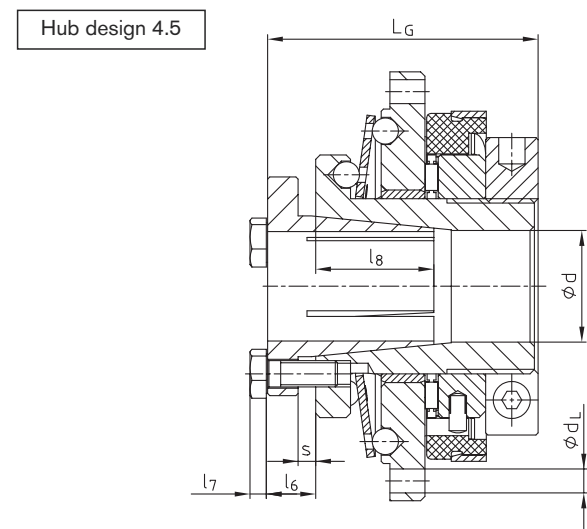
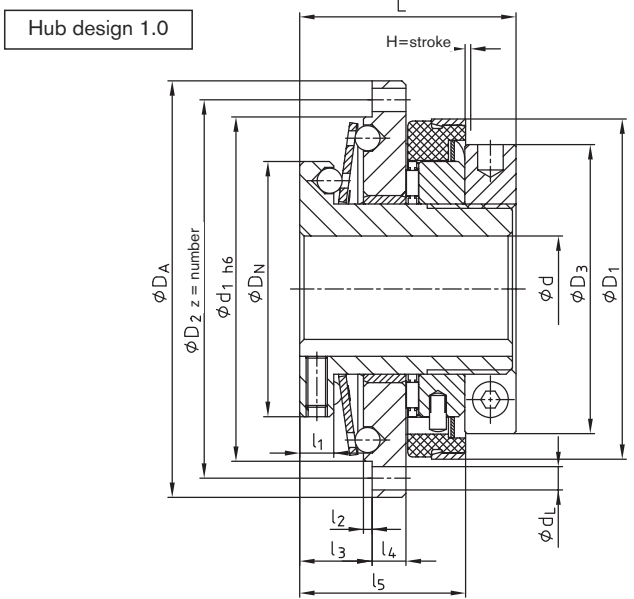
**Normal operation:**  
No signal by sensor or mechanical limit switch

**In the event of an overload:**  
The axial movement of the shifting ring activates the sensor or mechanical limit switch. The resulting signal may be used for operation control (e.g. stop motor).

**SYNTEX® standard flange design**



- 1 Torque settings up to 3,540 lb-in
- 1 Easy slip torque adjustment
- 1 Torque setting adjustable while installed
- 1 Zero-backlash ball detent design
- 1 Integrated flange mount
- 1 Available in non-synchronous and synchronous designs
- 1 Available in keyless design 4.5
- 1 Installation instructions available at [www.ktr.com](http://www.ktr.com)



Technical Data																						
Size	Torques [lb-in]				Max. speed [rpm]	Dimensions [in]																
	Ratchet design DK		Synchronous design SK			Bore d		$D_A$	$D_2$	$d_1$	$D_N$	$D_3$	$D_1$	$d_L$	L	$l_1$	$l_2$	$l_3$	$l_4$	$l_5$	z	H=stroke
	DK1	DK2	SK1	SK2		Pilot bore	max.															
20	53-170	130-260	80-170	170-570	1,500	-	0.813	3.15	2.80	2.56	1.89	2.13	2.42	0.18	1.77	0.31	0.08	0.63	0.24	1.38	8	0.08
25	170-530	390-790	220-570	350-880	1,500	-	1.000	3.86	3.50	3.19	2.36	2.68	3.15	0.22	1.97	0.31	0.08	0.67	0.31	1.54	8	0.08
35	220-700	660-1,320	260-880	620-1,590	1,000	-	1.313	4.72	4.33	4.02	2.95	3.07	3.58	0.22	2.36	0.39	0.08	0.83	0.39	1.65	12	0.08
50	530-1,590	1,540-2,650	700-2,470	1,410-3,540	1,000	-	1.875	6.38	5.98	5.59	4.13	4.25	4.76	0.26	2.76	0.47	0.08	0.98	0.51	2.20	12	0.08

Technical Data – Hub design 4.5									
Size	Dimensions [in]						Clamping bolt	Tightening torque $T_A$ [lb-in]	
	$d_{max.}$	$l_6$	$l_7$	$l_8$	$L_G$	s			
20	0.813	0.35	0.14	0.91	2.13	0.12	4xM5	75	
25	1.000	0.43	0.16	1.10	2.40	0.16	4xM6	120	
35	1.375	0.39	0.16	1.22	2.76	0.16	4xM6	120	
50	1.938	0.47	0.16	1.46	3.23	0.24	4xM6	120	

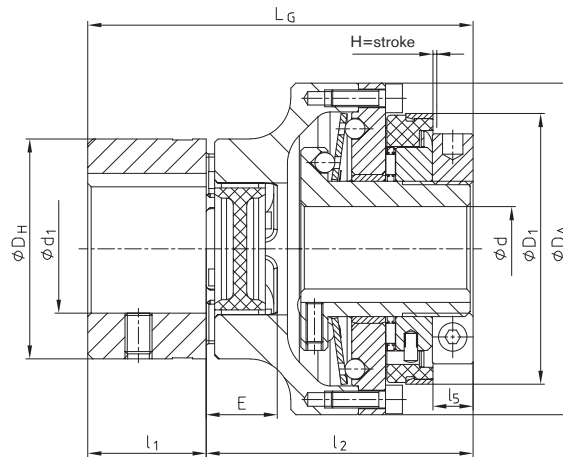
Bores (fitting tolerance H7/h6) and the corresponding transmittable torque TR [lb-in]																						
Size	0.472	0.551	0.591	0.630	0.669	0.709	0.748	0.787	0.866	0.906	0.945	0.984	1.102	1.181	1.260	1.378	1.496	1.614	1.654	1.772	1.890	1.969
20	398	549	628	717	814	912	1018	1124														
25		637	735	841	947	1062	1177	1310	1584	1735	1885	2046										
35									1124	1230	1345	1460	1832	2098	2390	2859						
50																2107	2487	2753	3036	3487	3965	4302

Order form:	SYNTEX®	25	DK1	Ø 20	1.0	398 [lb-in]
	Coupling type	Size	Design	Bore	Hub design	Torque set

## SYNTEX® with shaft coupling ROTEX® GS



- 1 Zero-backlash, axial plug-in
- 1 Integrated with torsionally flexible ROTEX® GS coupling
- 1 Easy slip torque adjustment
- 1 Torque setting adjustable while installed
- 1 Ball detent design
- 1 Low inertia by using aluminum components
- 1 Available in non-synchronous and synchronous design
- 1 Installation instructions available at [www.ktr.com](http://www.ktr.com)



Technical Data																				
SYNTEX® size	ROTEX® GS size	Torques [lb-in]							Max. speed [rpm]	Dimensions [in]										
		Ratchet design DK		Synchronous design SK		ROTEX® GS 98 Sh A-GS		Max. bore		D <sub>A</sub>	D <sub>H</sub>	l <sub>1</sub>	E	l <sub>2</sub>	l <sub>5</sub>	L	L <sub>G</sub>	D <sub>1</sub>	H=stroke	
		DK1	DK2	SK1	SK2	T <sub>KN</sub>	T <sub>Kmax.</sub>	d												d <sub>1</sub> <sup>1)</sup>
20	24	53-170	130-260	89-170	170-570	530	1,060	1,500	0.813	1.250	3.15	2.17	1.18	0.71	2.76	0.39	1.77	3.94	2.42	0.08
25	28	170-530	390-790	220-570	350-880	1,410	2,830	1,500	1.000	1.500	3.86	2.56	1.38	0.79	3.07	0.43	1.97	4.45	3.15	0.08
35	38	220-700	660-1,320	260-880	620-1,590	2,870	5,750	1,000	1.313	1.875	4.72	3.15	1.77	0.94	3.58	0.51	2.36	5.35	3.58	0.08
50	48	530-1,590	1,540-2,650	700-2,470	1,410-3,540	4,640	9,290	1,000	1.875	2.188	6.38	4.13	2.20	1.10	4.37	0.55	2.76	6.57	4.76	0.08

<sup>1)</sup> ROTEX® GS Max bore with 6.0 clamping hub

Order form:	SYNTEX®	25	DK1	1.0	Ø 20	ROTEX® GS	28	98 Sh A-GS	1.0	Ø 25	443 [lb-in]
	Coupling type	Size	Design	Hub design	SYNTEX® bore	Coupling type	Size	Spider	Hub design	ROTEX® GS bore	Torque set

**Assembly / Limit switch / Proximity switch**

Installation instructions are available. Ask for KTR-N 46210.

The operating principle of the SYNTEX® overload system enables zero-backlash torque transmission by constant spring pressure.

The torque is transmitted by balls and disc springs. The constant pressure of the disc spring holds the balls in position on the disc spring.

The torque can easily be adjusted with the cross clamping nut by:

- 1 Locking the hub in place
- 1 Loosening the fastener in the cross clamping nut
- 1 Noting the reference position (colored marking on the hub)
- 1 Turning the setting nut clockwise with a spanner wrench to increase the torque; turn the setting nut counter clockwise to reduce the torque

Once the required torque is set, lock the setting nut again by tightening the fastener in the cross clamping nut.

**Limit switch**

**Operation**

A mechanical limit switch or a proximity switch is triggered by the axial movement of the shifting ring when overload occurs, sending a signal to stop the drive.

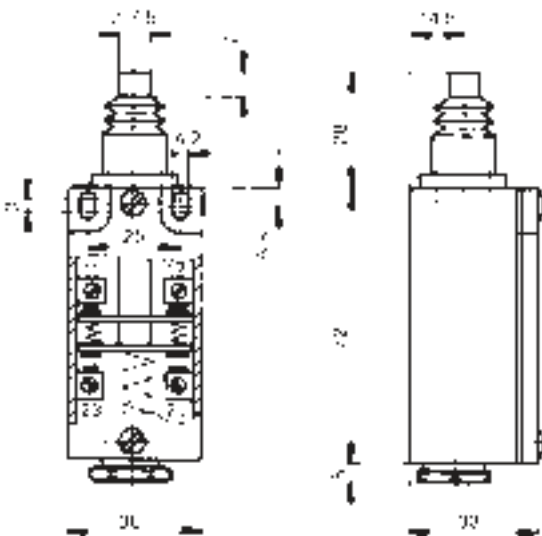
**Assembly**

The sensor must be mounted on a solid surface in order to ensure a smooth operation. The sensor should be protected against dirt, debris and potential mechanical failure.

**Adjustment**

Upon overload, the shifting ring moves axially about 0.08 in. The sensor or the limit switch should be placed in this shifting range. To adapt the mechanical limit switch and the shifting mechanism to the unit, the limit switch must be adjusted accordingly. The shifting unit can be changed at the fastener after opening the cover plate. Please make sure to confirm the operation of the limit switch before using of the unit. Please follow the operating instructions for the sensor or limit switch used.

(KTR does not furnish proximity/limit switches)



**Shifting**

■ On    □ Off

	Degrees	0	3	8	12	16	20
11-12 Break contact		■					
23-24 Make contact							

**Technical data:**

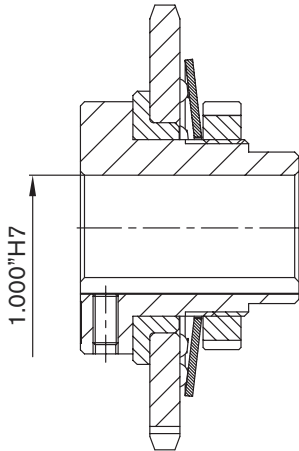
- Maximum voltage : 500 V AC
- Maximum constant current : 10 A
- Kind of protection : IP 65 acc. to DIN 40050
- Switching frequency : 6.000/h
- Operating temperature : - 22 °F to + 176 °F
- Kind of contact : 1 break contact, 1 make contact
- Mechanical service life : 10<sup>7</sup> switches
- Housing : Aluminum die cast
- Cover : Aluminum sheet steel
- Switching direction : Possible from all directions

After opening the cover plate a change of the shifting unit can occur!

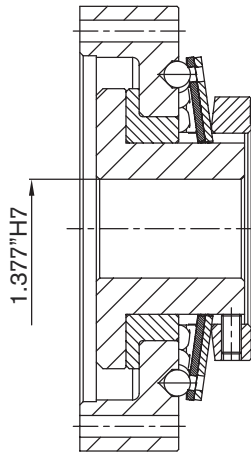
**Cost-optimized version**



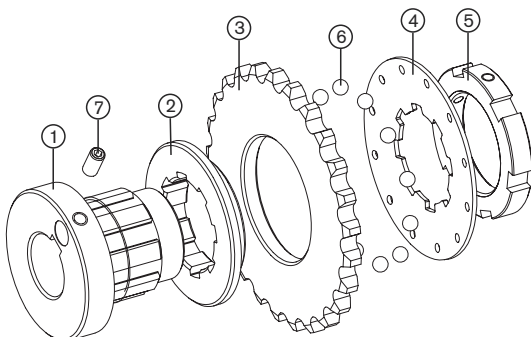
- 1 Low-cost compact version with high torque density
- 1 Use for high volume manufacturing (e.g. for conveyor belt drives)
- 1 Optimized manufacturing processes, (e.g. sintered metal)
- 1 Ask KTR Engineering for details



- 1 Special SYNTEX® 25 with integrated sprocket
- 1 Torque range with 1 disc spring up to 708 lb-in, with 2 disk springs up to 1,416 lb-in
- 1 A variety of sprockets can be used
- 1 Ideal for “simple” drives (e.g. in the conveyor technology)



- 1 Special SYNTEX® 35 with integrated flange
- 1 Torque range with 1 disc spring up to 1,770 lb-in, with 2 disk springs up to 3,540 lb-in
- 1 Adapter flange can be machined to specifications



Components:

- 1 Hub with external spline to support the disc spring (torque transmission)
- 2 Plain bearing sleeve to support the axial and radial forces
- 3 Sprocket with straight bores to support the balls
- 4 Disc spring with internal spline and bores for balls (torque transmission and axial pre-stress, KTR Patent)
- 5 Keyway nut for torque setting
- 6 Balls for torque transmission
- 7 Setscrew for mounting to the shaft