SYNTEX®-NC

Backlash-free overload system

Type DK (ratchet design)

Type SK (synchronous design)

SYNTEX®-NC

SYNTEX®-NC with ROTEX® GS

SYNTEX®-NC with TOOLFLEX®

SYNTEX®-NC is a torque limiting, backlash-free overload system operating with positive locking protecting adjacent components from damage.
In case of overload on the coupling the torque is considerably reduced to a lower residual torque.
SYNTEX®-NC is a not load-holding coupling.

- In case of overload **type DK** (ratchet design) re-engages every 15° with the next following ball indentation.
- In case of overload **type SK** (synchronous design) re-engages after a rotation of 360°.

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1 Technical data

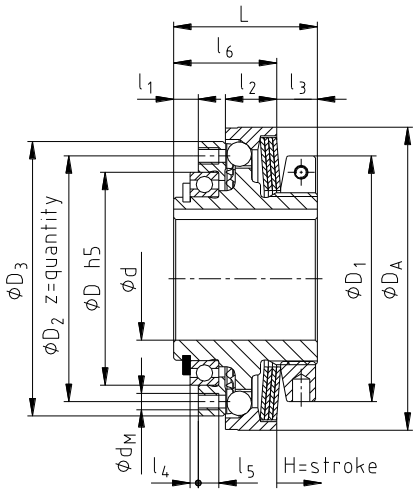


Illustration 1: SYNTEX®-NC
(hub design 1.0)

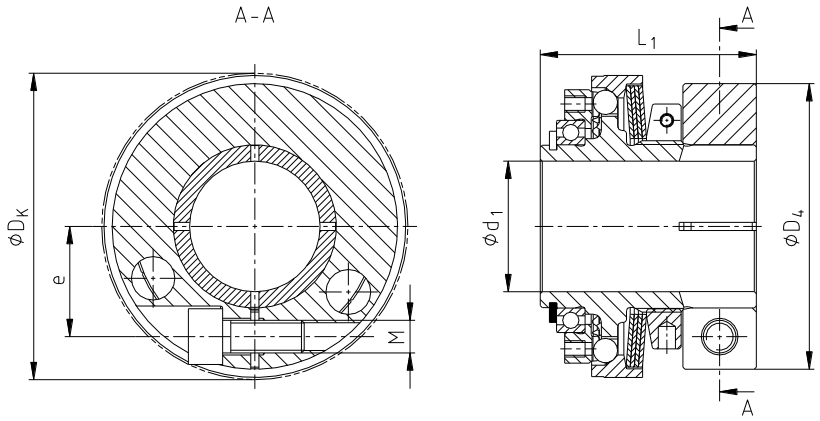


Illustration 2: SYNTEX®-NC
(hub design 6.1)

Table 1: Technical data and dimensions

Size	Speed [rpm]	Torques [Nm]			Dimensions [mm]					
		T1	T2	T3	Max. bore d 1)	D	D_1	D_2	D_3	D_A
15	3500	2 - 3.5	3.5 - 7	7 - 14	12	32	33	37	42	42
25	3000	9 - 15	20 - 30	40 - 65	22	42	50	48	56	61
32	3000	25 - 38	50 - 75	100 - 150	30	52	60	60	67	74
42	2500	30 - 65	60 - 135	120 - 265	38	65	72	75	83	90
60	2000	70 - 140	120 - 280	220 - 550	50	90	96	100	113	116

Size	Dimensions [mm]								
	l_1	l_2	l_3	l_4	l_5	l_6	L	z x d_M	H=stroke
15	5.0	7.0	9.2	2	4	18.8	28	12 x M3	0.8
25	5.5	11.5	9.1	2	5	23.9	33	8 x M4	1.2
32	6.0	12.5	9.9	2	5	25.1	35	8 x M4	1.5
42	7.0	16.0	11.2	2	6	31.8	43	8 x M5	1.5
60	8.0	21.0	11.8	2	7	38.2	52	12 x M6	1.8

1) Max. finish bore, feather keyway according to DIN 6885 sheet 3

Table 2: Technical data and dimensions – hub design 6.1

Size	Bore d_1		Dimensions [mm]						Weight 2) [kg]	Mass moment of inertia 2) J_{total} [kgm²]
	Pilot bored	Max.	D_4	D_K	L_1	e	M	T_A [Nm]		
15	7.5	15	40	43.0	38	15	M4	1.7	0.124	2.9×10^{-5}
25	9.5	25	55	-	45	21	M6	14	0.282	1.4×10^{-4}
32	13.5	32	70	-	53	27	M8	34	0.471	3.5×10^{-4}
42	18.5	42	86	91.2	63	33	M10	67	0.815	9.5×10^{-4}
60	24.0	60	112	119.4	75	45	M12	115	3.04	5.9×10^{-3}

2) With max. finish bore

1 Technical data

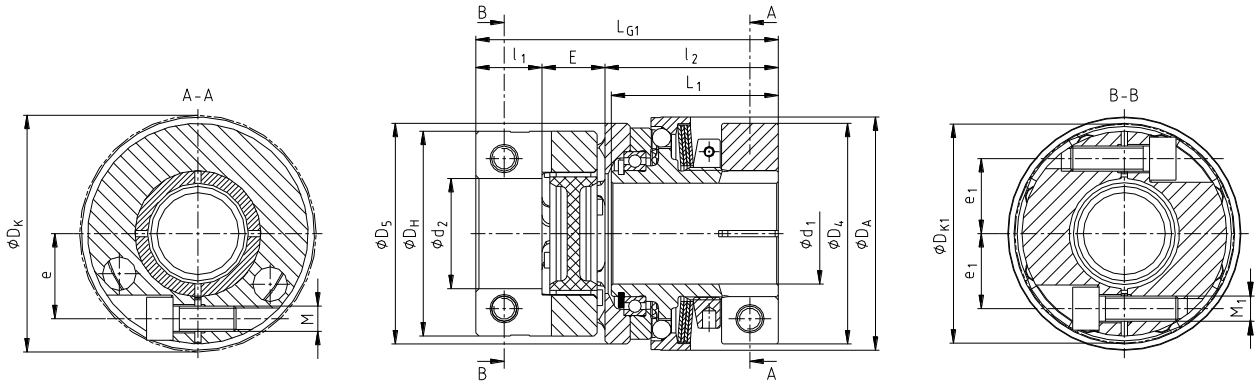


Illustration 3: SYNTEX®-NC with ROTEX® GS (hub design 2.8, from size 60 - 6.0/6.1)

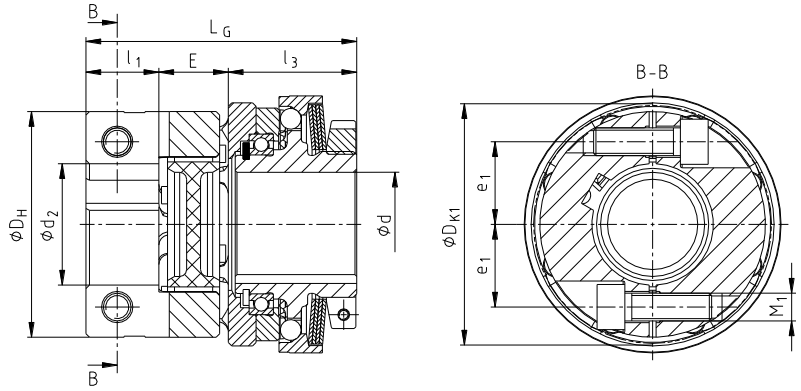


Illustration 4: SYNTEX®-NC with ROTEX® GS (hub design 2.9, from size 60 1.0/1.0)

Table 3: Dimensions and technical data with ROTEX® GS

Size	ROTEX® GS size	Speed [rpm]	Torques [Nm]			Max. bore [mm]		
			T1	T2	T3	d	d_1	d_2
15	19	3500	2 - 3.5	3.5 - 7	7 - 14	12	15	24
25	24	3000	9 - 15	20 - 30	40 - 65	22	25	32
32	28	3000	25 - 38	50 - 75	100 - 150	30	32	35
42	38	2500	30 - 65	60 - 135	120 - 265	38	42	45
60	48	2000	70 - 140	120 - 280	220 - 550	50	60	55

Size	Dimensions [mm]								
	D_5	D_H	D_K	D_{K1}	D_A	l_1	l_2	l_3	E
15	45	40	-	46.7	42	17	40.0	40	16
25	58	55	-	57.5	61	18	47.5	35.5	18
32	70	65	-	69.0	74	21	55.0	37.0	20
42	88	80	91.2	86.0	90	26	66.0	46.0	24
60	113	105	119.4	-	116	56	83.0	60	28

Size	Dimensions [mm]								
	e	e_1	L_G	L_1	L_{G1}	M	T_A [Nm]	M_1	T_{A1} [Nm]
15	15	15.5	63	38	73.0	M4	1.7	M5	6
25	21	20.0	71.5	45	83.5	M6	14	M6	10
32	27	23.8	78.0	53	96.0	M8	34	M8	25
42	33	30.5	96.0	63	116.0	M10	67	M10	49
60	45	-	144	75	167.0	M12	115	M10	49

1 Technical data

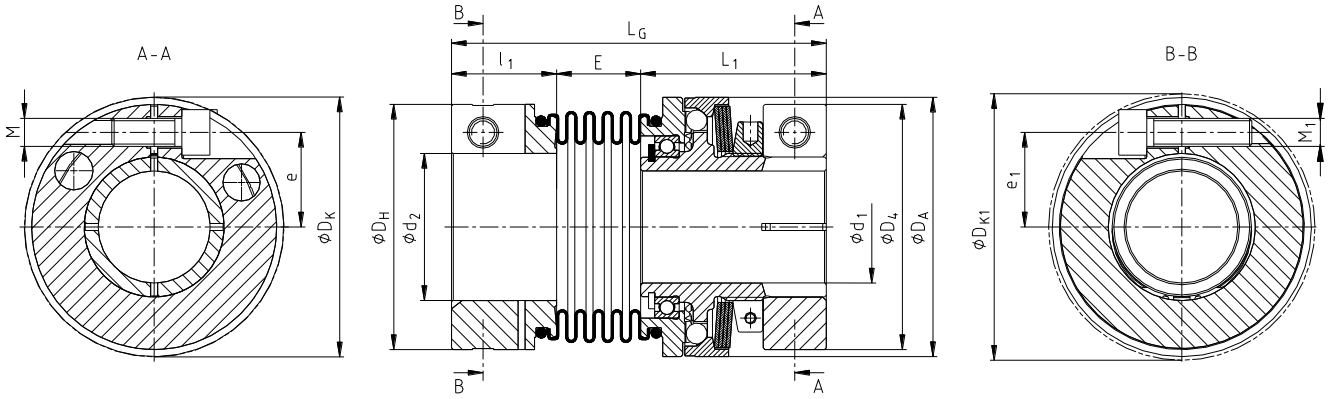


Illustration 5: SYNTEX®-NC with TOOLFLEX®

Table 4: Technical data and dimensions with TOOLFLEX®

Size	TOOLFLEX® size	Speed [rpm]	Torques [Nm]			Max. bore [mm]	
			T1	T2	T3	d_1	d_2
15	20	3500	2 - 3.5	3.5 - 7	7 - 14	15	20
25	38	3000	9 - 15	20 - 30	40 - 65	25	38
32	42	3000	25 - 38	50 - 75	100 - 150	32	42
42	45	2500	30 - 65	60 - 135	120 - 265	42	45
60	65	2000	70 - 140	120 - 280	220 - 550	60	65

Size	Dimensions [mm]							
	D_4	D_H	D_A	D_K	D_{K1}	l_1	L_1	E
15	40	40	52 [1)]	43	43.5	21.5	38	16.5
25	55	65	61	-	72.6	25.5	45	18.0
32	70	70	74	-	76.1	30.0	53	24.0
42	86	83	90	91.2	89.0	32.0	63	22.5
60	112	125	140 [1)]	119.4	127.1	45.0	84	36.0

Size	Dimensions [mm]						
	e	e_1	L_G	M	T_A [Nm]	M_1	T_{A1} [Nm]
15	15	14.5	76	M4	1.7	M5	6
25	21	25.0	88	M6	14	M8	25
32	27	27.0	107	M8	34	M8	25
42	33	30.0	114	M10	67	M10	49
60	45	45.0	165	M12	115	M14	185

1) Outside diameter shifting ring see table 1.

1 Technical data

Table 5: Torques and surface pressure – hub design 6.1 (without feather keyway)

Size	15	25	32	42	60
Clamping screw M	M4	M6	M8	M10	M12
Tightening torque T_A [Nm]	1.7	14	34	67	115
Bore Ø	Transmittable torque [Nm] / Surface pressure [N/mm²]				
8	8				
	94.5				
10	12	30			
	92	131			
11	14	35			
	90.5	129.5			
12	16	42			
	88	127.5			
14	22	55			
	85	123.5			
15	24	62	74		
	83.5	121	97		
16		69	83		
		119	96		
18		48	104		
		66	94		
19		53	114		
		65	93		
20		58	125	149	
		64.5	92	99	
22		69	148	178	
		63	90	97.5	
24		80	116	209	
		61.5	59.5	96	
25		86	125	225	247
		61	59	95	113.5
28			153	275	310
			57.5	93	113.5
30			172	310	356
			56.5	91.5	113.5
32			192	264	405
			55.5	68.5	113.5
35				309	485
				67	113.5
36				324	513
				66.5	113.5
38				356	571
				65.5	113.5
40				389	633
				64.5	113.5
42				422	394
				63.5	63.98
45					452
					63.98
48					514
					63.98
50					558
					63.98
55					674
					63.98
60					803
					63.98

2 Advice

2.1 General advice

Please read through these operating/assembly instructions carefully before you start up the coupling.
Please pay special attention to the safety instructions!
The operating/assembly instructions are part of your product. Please store them carefully and close to the coupling. The copyright for these operating/assembly instructions remains with KTR.

2.2 Safety and advice symbols

	**Warning of personal injury**	This symbol indicates notes which may contribute to preventing bodily injuries or serious bodily injuries that may result in death.
	**Warning of product damages**	This symbol indicates notes which may contribute to preventing material or machine damage.
	**General advice**	This symbol indicates notes which may contribute to preventing adverse results or conditions.
	**Warning of hot surfaces**	This symbol indicates notes which may contribute to preventing burns with hot surfaces resulting in light to serious bodily injuries.

2.3 General hazard warnings

With assembly, operation and maintenance of the coupling it has to be made sure that the entire drive train is secured against accidental switch-on. You may be seriously hurt by rotating parts. Please make absolutely sure to read through and observe the following safety indications.

- All operations on and with the coupling have to be performed taking into account "safety first".
- Please make sure to switch off the power pack before you perform your work on the coupling.
- Secure the power pack against accidental switch-on, e. g. by providing warning signs at the place of switch-on or removing the fuse for current supply.
- Do not reach into the operating area of the coupling as long as it is in operation.
- Please secure the coupling against accidental contact. Please provide for the necessary protection devices and covers.

2 Advice

2.4 Intended use

You may only assemble, operate and maintain the coupling if you

- have carefully read through the operating/assembly instructions and understood them
- had technical training
- are authorized by your company

The coupling may only be used in accordance with the technical data (see chapter 1). Unauthorized modifications on the coupling design are not admissible. We will not assume liability for any damage that may arise. In the interest of further development we reserve the right for technical modifications.
The **SYNTEX®-NC** described in here corresponds to the technical status at the time of printing of these operating/assembly instructions.

2.5 Coupling selection

To review the coupling selection please consult with KTR.

3 Storage, transport and packaging

3.1 Storage

The couplings are supplied in preserved condition and can be stored at a dry and covered place for 6 - 9 months.

Humid storage rooms are not suitable.
Please make sure that condensation is not generated. The best relative air humidity is less than 65 %.

3.2 Transport and packaging

In order to avoid any injuries and any kind of damage please always make use of proper transport and lifting equipment.

The couplings are packed differently each depending on size, number and kind of transport. Unless otherwise contractually agreed, packaging will follow the in-house packaging specifications of KTR.

4 Assembly

The coupling is supplied fully assembled (as specified by the buyer) and optionally with the torque set.

4.1 Components of the couplings

Component assembly 1: Components of SYNTEX®-NC (hub design 1.0)

Component	Quantity	Description
1.1	1	Hub 1.0
1.2	1	Flange ring DK or SK
1.3	1	Shifting ring
1.4	see table 9	Disk springs (set)
1.5	1	Setting nut with cap screw DIN EN ISO 4762 - 12.9
1.6	1 1)	Balls
1.7	1	Groove ball bearing DIN 625
1.8	1	Circlip

1) Complete set

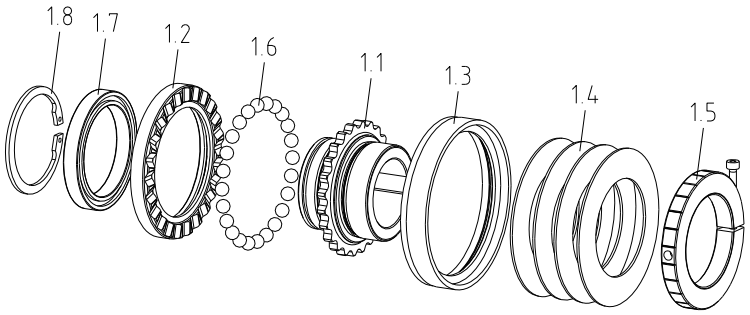


Illustration 6: SYNTEX®-NC (hub design 1.0)

Component assembly 2: Components of SYNTEX®-NC (hub design 6.1)

Component	Quantity	Description
2.1	1	Clamping ring hub design 6.1
2.2	1	Flange ring DK or SK
2.3	1	Shifting ring
2.4	see table 9	Disk springs (set)
2.5	1	Setting nut with cap screw DIN EN ISO 4762 - 12.9
2.6	1 1)	Balls
2.7	1	Groove ball bearing DIN 625
2.8	1	Circlip
2.9	1	Clamping ring
2.10	1	Clamping screw DIN EN ISO 4762 - 12.9

1) Complete set

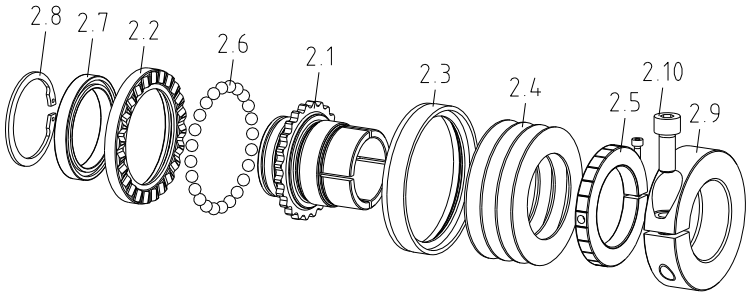


Illustration 7: SYNTEX®-NC (hub design 6.1)

Components of SYNTEX®-NC with ROTEX® GS

Component/ component assembly	Quantity	Description
1/2	1	SYNTEX®-NC (complete coupling)
3	1	ROTEX® GS driving flange
4	1	ROTEX® GS spider
5	1	ROTEX® GS clamping hub
6	1)	Cap screws DIN EN ISO 4762 - 12.9

1) see quantity in table 1

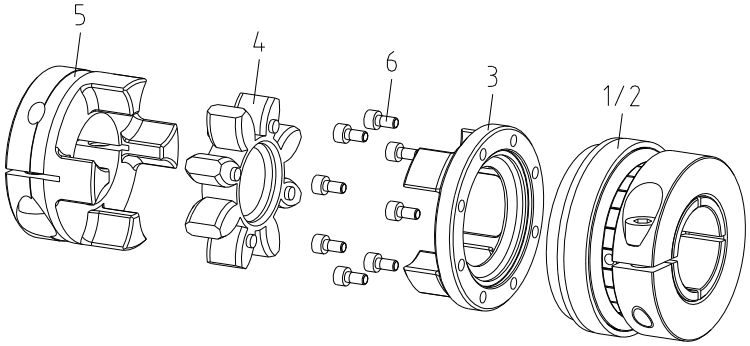


Illustration 8: SYNTEX®-NC with ROTEX® GS

4 Assembly

4.1 Components of the couplings

Components of SYNTEX®-NC with TOOLFLEX®

Component/ component assembly	Quantity	Description
7	1	SYNTEX®-NC (complete coupling)

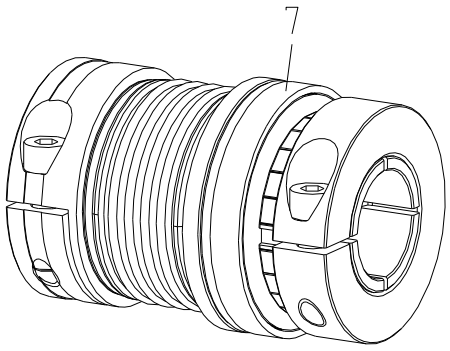


Illustration 9: SYNTEX®-NC with TOOLFLEX®

4.2 Advice on remachining

The customer bears the sole responsibility for all machining processes performed subsequently on unbored or pilot bored as well as finish machined coupling components and spare parts. KTR does not assume any warranty claims resulting from insufficient remachining.

4.3 Assembly (general)

We recommend to inspect bores, shaft, keyway and feather key for dimensional accuracy before assembly.

Heating the SYNTEX®-NC (hub design 1.0) lightly (approx. 80 °C) allows for an easier mounting on the shafts.

STOP

Touching the heated coupling or clamping hub causes burns.
Please wear safety gloves.

- Please make sure the perfect technical condition of the **SYNTEX®-NC** overload system.
- Please only use original **KTR** components (no purchased parts).

4 Assembly

4.4 Assembly of SYNTEX®-NC (hub design 1.0)

- Clean the hub bore and shaft and review for dimensional accuracy, afterwards lubricate with a thin-fluid oil (e. g. Castrol 4 in 1 or Klüber Quietsch-Ex).

Oils and greases containing molybdenum disulfide or other high-pressure additives as well as internal lubricants must not be used.

- Mount the SYNTEX®-NC (component assembly 1) on the shaft of the driving or driven side.
- Please provide for an end plate to fasten the SYNTEX®-NC axially (see illustration 10).

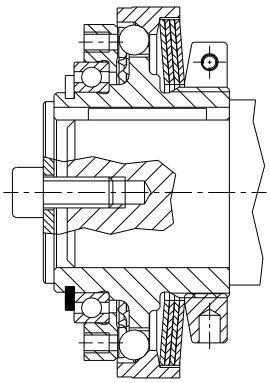


Illustration 10: axial locking

We recommend to secure all screw connections against working loose additionally, e. g. conglutinating with Loctite (average strength).

4.5 Assembly of SYNTEX®-NC (hub design 6.1)

With the use of hollow shafts please observe chapter 4.6 before assembly of SYNTEX®-NC.

- Unscrew the clamping screw (component 2.10) in the clamping ring (component 2.9).
- Clean the hub bore and shaft and review for dimensional accuracy, afterwards lubricate with a thin-fluid oil (e. g. Castrol 4 in 1 or Klüber Quietsch-Ex).

Oils and greases containing molybdenum disulfide or other high-pressure additives as well as internal lubricants must not be used.

- Mount the SYNTEX®-NC (component assembly 2) on the shaft of the driving or driven side.
- Tighten the clamping screw to the tightening torque T_A specified in table 2.

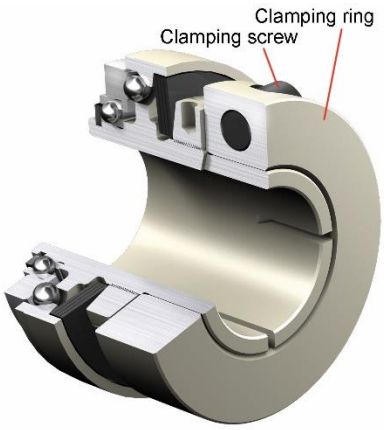


Illustration 11: Assembly of SYNTEX®-NC (hub design 6.1)

If the assembly is repeated the bore of the hub and shaft have to be cleaned and afterwards lubricated with a thin-fluid oil (e. g. Castrol 4 in 1 or Klüber Quietsch-Ex).

All screw connections must be secured against working loose additionally, e. g. conglutinating with Loctite (average strength).

4 Assembly

4.6 Notes with the use of hollow shafts

The power transmission of **SYNTEX®-NC** with hub design 6.1 is frictionally engaged. The necessary surface pressure is transmitted via the clamping ring to the clamping ring hub and consequently to the shaft. The torques or surface pressure specified in table 5 have to be considered.

The stiffness and dimensions of the shafts (here specifically hollow shafts) have to be selected in a way that sufficient safety against plastic deformation is ensured. This may roughly be reviewed as per the following criterion.

With clamping connections with hollow shafts the internal diameter of the hollow shaft d_{iW} required is calculated based on the following formula:

$$d_{iW} \leq d \cdot \sqrt{\frac{R_{p0,2} - 2 \cdot p_W}{R_{p0,2}}} \quad [mm]$$

Shear stress on the internal shaft diameter for hollow shaft:

$$\sigma_{tiW} \approx - \frac{2 \cdot p_W}{1 - C_W{}^2} \quad [N/mm^2]$$

Shear stress for solid shaft:

$$\sigma_{tW} = - p_W \; [N/mm^2]$$

$R_{p0.2}$ = yield strength of shaft material [N/mm²]
p_W = surface pressure of hub/shaft [N/mm²]

d_{iW} = internal diameter of hollow shaft [mm]
d = shaft diameter [mm]
C_W = d_{iW} / d

The strength required is not provided if the hollow shaft bore is bigger than the max. internal bore calculated or if the shear stress exceeds the yield strength of the material.
For a detailed calculation please contact KTR.

4.7 Assembly of SYNTEX®-NC with ROTEX® GS

- Mount the SYNTEX®-NC on the shaft of the driving or driven side each depending on the hub design as per chapter 4.4 or 4.5, respectively.
- Clean the hub bore of the ROTEX® GS clamping hub (component 5) and review for dimensional accuracy, afterwards lubricate with a thin-fluid oil (e. g. Castrol 4 in 1 or Klüber Quietsch-Ex).

Oils and greases containing molybdenum disulfide or other high-pressure additives as well as internal lubricants must not be used.

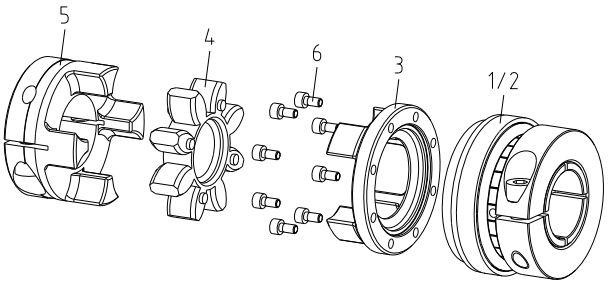


Illustration 12: SYNTEX®-NC with ROTEX® GS

- Mount the ROTEX® GS clamping hub on the shaft of the driving or driven side.
- Tighten the cap screws of the ROTEX® GS clamping hub to the tightening torques T_{A1} specified in table 3.
- Hand-tighten the ROTEX® GS driving flange (component 3) with the SYNTEX®-NC coupling for the time being.
- Tighten the cap screws (component 6, see illustration 12) crosswise to the tightening torques T_A specified in table 6.
- Insert the ROTEX® GS spider (component 4) into the cam section of the ROTEX® GS clamping hub.

4 Assembly

4.7 Assembly of SYNTEX®-NC with ROTEX® GS

- Shift the power packs in axial direction until the distance dimension E is achieved (see illustration 13, table 3).
- If the power packs are already firmly assembled, shifting the hubs axially on the shafts allows for adjusting the distance dimension E.

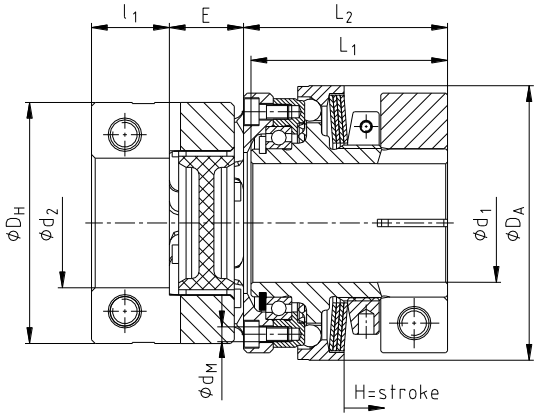


Illustration 13: Assembly of coupling

With the assembly please make sure that the distance dimension E (see table 3) is observed so that the coupling components are not in contact with each other during the operation.
Disregarding this advice may cause damage to the coupling.

All screw connections must be secured against working loose additionally, e. g. conglutinating with Loctite (average strength).

Table 6: Cap screws DIN EN ISO 4762

Size	15	25	32	42	60
Screw dimension d_M	M3	M4	M4	M5	M6
Tightening torque T_A [Nm]	1.7	2.8	4.1	8.1	14

Please consider our operating/assembly instructions KTR-N 45510 additionally when using the ROTEX® GS coupling.

4.8 Assembly of SYNTEX®-NC with TOOLFLEX®

- Clean the hub bore and shaft and review for dimensional accuracy, afterwards lubricate with a thin-fluid oil (e. g. Castrol 4 in 1 or Klüber Quietsch-Ex).

Oils and greases containing molybdenum disulfide or other high-pressure additives as well as internal lubricants must not be used.

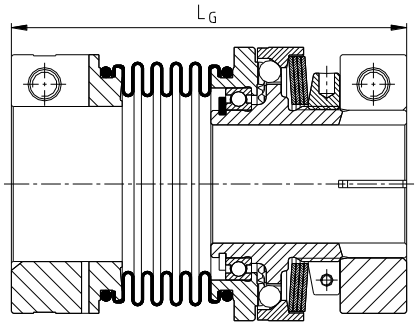


Illustration 14: SYNTEX®-NC with TOOLFLEX®

- Unscrew the clamping screws of TOOLFLEX®.
- Insert the shaft end of the driving machine in the coupling half of TOOLFLEX®.
- Secure the clamping hub by tightening the clamping screws at the tightening torques T_{A1} specified in table 4.
- Insert the shaft end of the driven machine in the coupling half of SYNTEX®-NC.
- Shift the power packs in axial direction until the distance dimension L_G is achieved (see illustration 14, table 4).
- Secure the clamping ring hub of SYNTEX®-NC by tightening the clamping screws at the tightening torques T_A specified in table 4.

4 Assembly

4.8 Assembly of SYNTEX®-NC with TOOLFLEX®

☞ **All screw connections must be secured against working loose additionally, e. g. conglutinating with Loctite (average strength).**

☞ **Please consider our operating/assembly instructions KTR-N 45810 additionally when using the TOOLFLEX® coupling.**

5 Adjustment of torque

☞ **KTR supplies the torque limiter pre-set to each approx. 75 % of the maximum torque of the respective disk spring layering in case that SYNTEX®-NC is ordered without torque setting by the customer.**

☞ **If the torque pre-set cannot be modified by the customer any more, the screw of the setting nut (component 1.5 or 2.5) has to be removed and coated with Loctite (average strength). Afterwards tighten the screw at the tightening torque T_A specified in table 2.**

5.1 Torque setting - SYNTEX®-NC

Modifying the torque pre-set (release torque)

☞ **The right disk spring layering is a pre-condition to perform a correct torque adjusting. Please use the respective disk spring layering as per table 9 each depending on the setting range (chapter 1).**

- Release the cap screw in the setting nut (component 1.5 or 2.5) by a maximum of one rotation.
- Specify the torque pre-set (see step 1 in illustration 15).
- Mark the torque pre-set on the label (see step 2 in illustration 15).
- Set a reference mark on the setting nut (see step 3 in illustration 15).

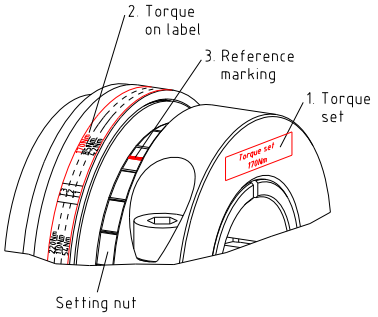


Illustration 15

5 Adjustment of torque

5.1 Torque setting - SYNTEX®-NC

- Rotate the setting nut by the requested number of notches (see step 1 and 2 in illustration 16) by means of a hook spanner (see table 8).

☞ **With torque setting please note the setting diagrammes of the respective sizes (see chapter 5.3).**

- Remove the torque value from the label (see step 3 in illustration 16).
- Mark the coupling with the new torque pre-set (see step 1 in illustration 17).
- Remove the reference mark from the setting nut (see step 2 in illustration 17).
- Remove the cap screw from the setting nut.
- Coat the cap screw with Loctite (average strength). Afterwards screw in the cap screw and tighten at the tightening torque T_A specified in table 7.

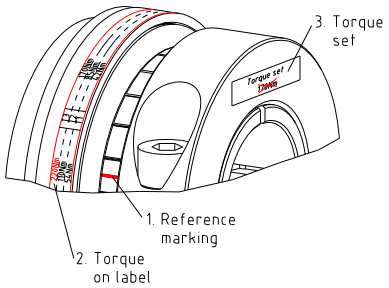


Illustration 16

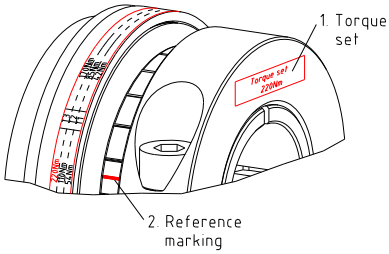


Illustration 17

☞ **All screw connections must be secured against working loose additionally, e. g. conglutinating with Loctite (average strength).**

Table 7: Cap screws DIN EN ISO 4762

Size	15	25	32	42	60
Screw size	M3	M3	M3	M3	M4
Tightening torque T_A [Nm]	1.2	1.2	1.2	1.2	2.8

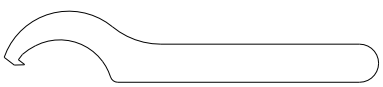
⚠ **Please bear in mind that setting the torque beyond the torque range (see chapter 1) may result in misoperation and damage of the coupling.**

☞ **In order to ensure an optimum torque setting, SYNTEX®-NC should be inspected after initial disengagement processes and reset, if necessary.**

☞ **If SYNTEX®-NC was pre-set only or set to the requested torque as per these operating/assembly instructions, the torque should be considered as a reference value only. For accurate torque setting we would recommend to inspect the torque by means of a suitable measuring system and reset, if necessary.**

☞ **We basically recommend to perform torque setting on KTR's test benches in order to ensure the optimum accuracy of torque setting.**

Table 8: Tools for torque setting

Hook spanner DIN 1810-A 	Size	Hook spanner
	10	Ø34-36
	25	Ø45-50
	32	Ø58-62
	42	Ø68-75
	60	Ø95-100

5 Adjustment of torque

5.2 Replacement of layering of disk springs

If torque setting is beyond the requested torque range as per chapter 1, the coupling can be reset to the requested torque by adapting the disk spring layering.
We recommend to have the modification and resetting of the coupling performed by KTR's qualified staff.

STOP

Driving components falling down may cause injury to persons or damage on the machine.
Secure the driving components during disassembly.

- Release the clamping screw (component 2.10) of the clamping ring (component 2.9).
  [Applies with hub design 6.1 only]

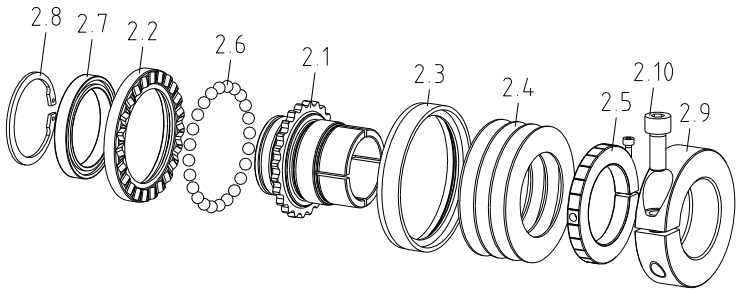
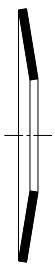
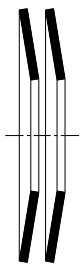
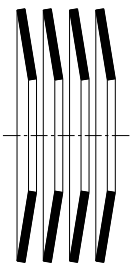


Illustration 18: Example - Assembly of SYNTEX®-NC (hub design 6.1)

- Disassemble the coupling from the machine and mount it onto a suitable auxiliary shaft.
- Release the cap screw in the setting nut (component 1.5 or 2.5). Do not fully unscrew the cap screw.
- Turn back the setting nut by means of a hook spanner (see illustration 18 and table 8) until the disk springs are fully released.
- Remove the clamping ring (component 2.9) from the clamping ring hub (component 2.1).
  [Applies with hub design 6.1 only]
- Remove the setting nut from the hub (component 1.1) or clamping ring hub (component 2.1), respectively.
- Adjust the disk spring layering as per table 9 to the requested torque (see chapter 1).

Table 9: Layering of disk springs

Layering of disk springs	Design DK and SK		
	T1	T2	T3
Illustration			
Designation	1x1	1x2	1x4

5 Adjustment of torque

5.2 Replacement of layering of disk springs

- Screw the setting nut onto the hub or clamping ring hub and hand-tighten it.
- Hand-tighten the cap screw in the setting nut. Afterwards turn back the cap screw by half a rotation.
- Mount the clamping ring onto the clamping ring hub. [Applies with hub design 6.1 only]

☞ **With the assembly please make sure that the balancing bores of the clamping ring (component 2.9) point towards the disk spring(s).**

- Screw in the setting nut by means of a hook spanner (see illustration 19 and table 8) until it cannot be turned any more. Afterwards turn back the setting nut by one notch (see illustration 19).
- The torque pre-set corresponds to the minimum release torque (see illustration 20) now.
- Set the torque required as described in chapter 5.1.

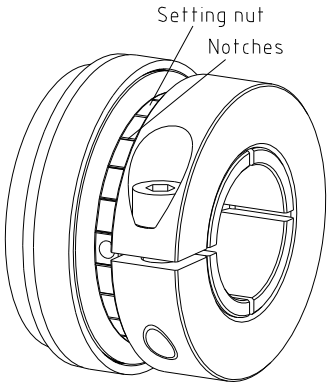


Illustration 19: Notches of setting nut

☞ **The disk springs are operated in the negative sector of the characteristic curve. Tightening the setting nut causes a reduced release torque. The release torque is increased by untightening the setting nut.**

- Remove the cap screw from the setting nut and paint with Loctite (average strength). Afterwards screw in the cap screw and tighten at the tightening torque T_A specified in table 7.
- Unscrew the clamping screw of the clamping ring. [Applies with hub design 6.1 only]
- Disassemble the coupling from the auxiliary shaft.

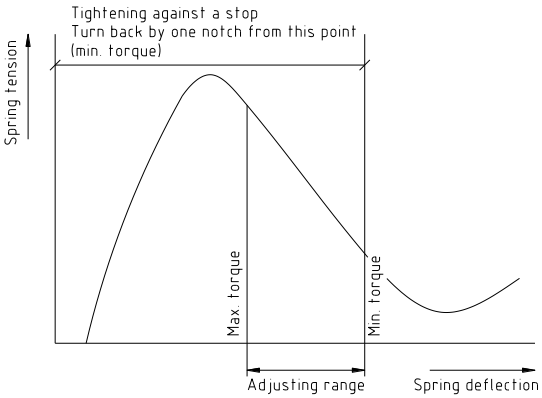


Illustration 20: Spring characteristic

⚠ **Please bear in mind that setting the torque beyond the torque range (see chapter 1) may result in misoperation and damage of the coupling.**

☞ **In order to ensure an optimum torque setting, SYNTEX®-NC should be inspected after initial disengagement processes and reset, if necessary.**

☞ **If SYNTEX®-NC was pre-set only or set to the requested torque as per these operating/assembly instructions, the torque should be considered as a reference value only. For accurate torque setting we would recommend to inspect the torque by means of a suitable measuring system and reset, if necessary.**

☞ **We basically recommend to perform torque setting on KTR's test benches in order to ensure the optimum accuracy of torque setting.**

☞ **All screw connections must be secured against working loose additionally, e. g. conglutinating with Loctite (average strength).**

5 Adjustment of torque

5.3 Setting diagrammes

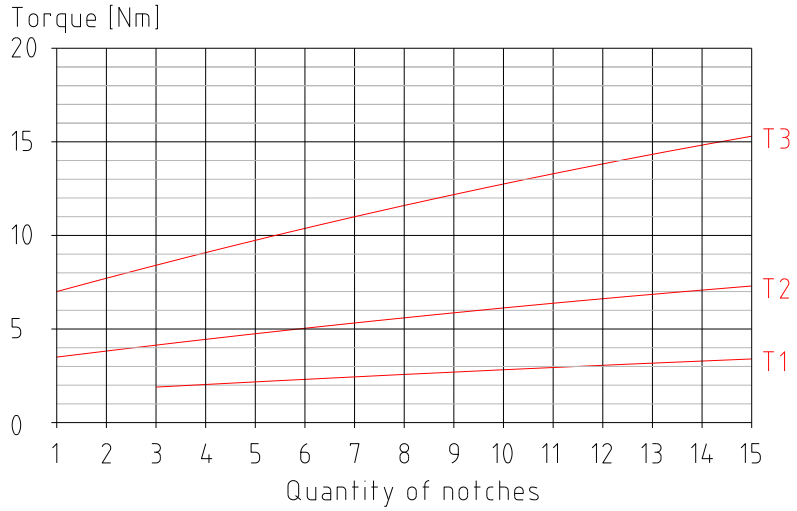


Diagramme 1: SYNTEX®-NC size 15

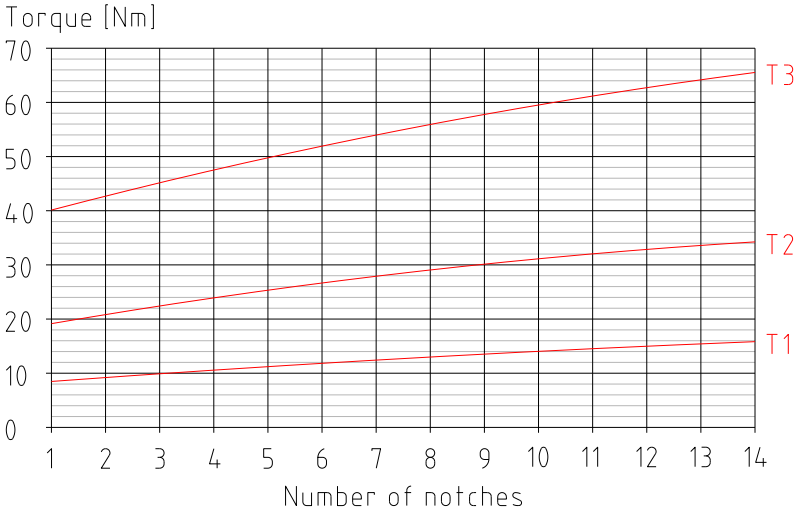


Diagramme 2: SYNTEX®-NC size 25

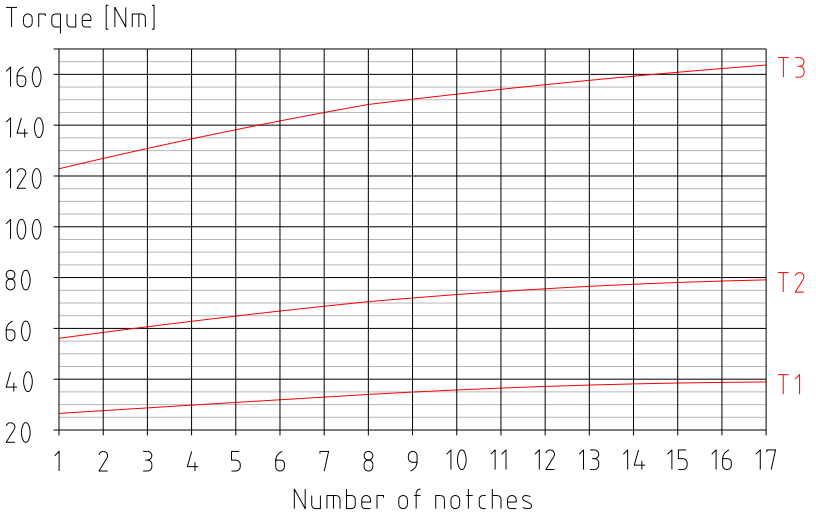


Diagramme 3: SYNTEX®-NC size 32

5 Adjustment of torque

5.3 Setting diagrammes

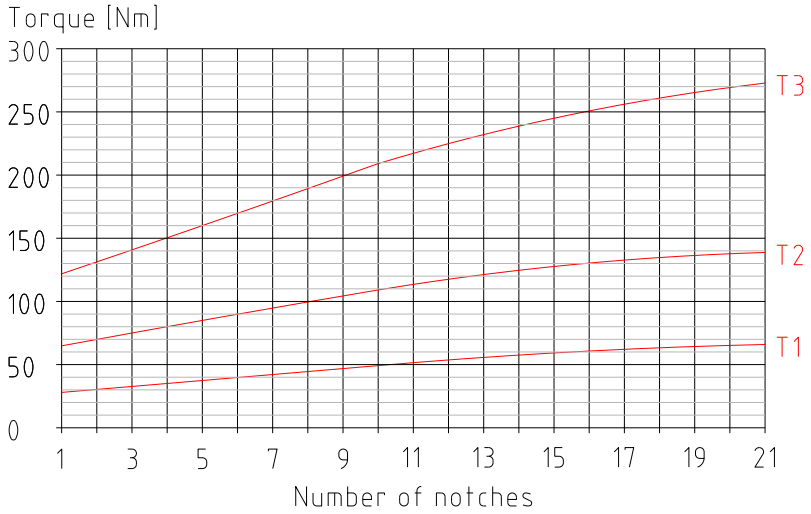


Diagramme 4: SYNTEX®-NC size 42

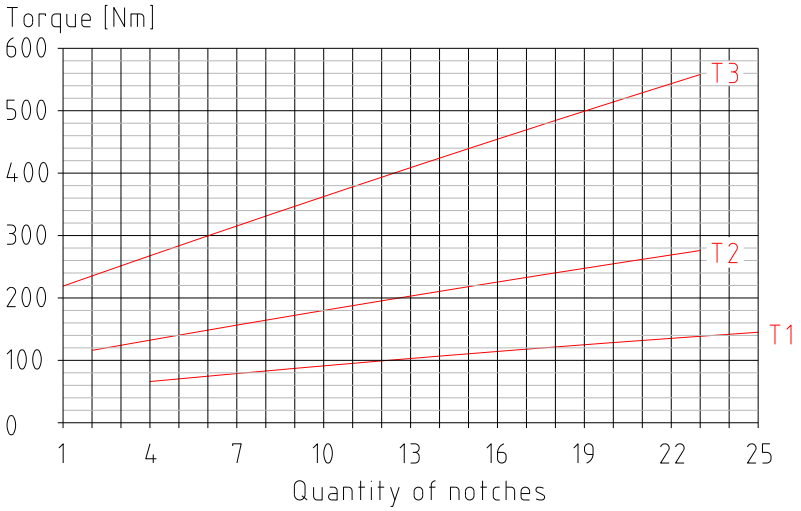


Diagramme 5: SYNTEX®-NC size 60

6 Assembly of limit switch

If the torque set is exceeded, the coupling disengages with the shifting ring being moved back axially by dimension H (see table 10).
The sensor or limit switch has to be mounted such that signal recording is ensured in this shifting range.

The sensor or limit switch has to be aligned versus SYNTEX®-NC such that signal recording of the disengagement process is ensured.

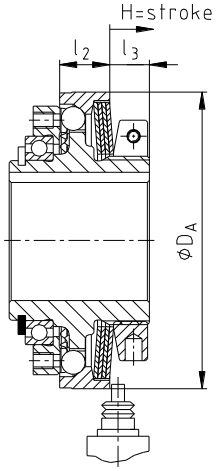


Illustration 21: Mechanical limit switch

Table 10: Position of limit switch

Size	Dimensions [mm]			
	l_2	l_3	$ØD_A$	H=stroke
15	7.0	9.2	42	0.8
25	11.5	9.1	61	1.2
32	12.5	9.9	74	1.5
42	16.0	11.2	90	1.5
60	21.0	11.8	116	1.8

Function

The axial stroke of the shifting ring generated with overload may activate a mechanical limit switch or an inductive sensor. As a result a control signal is generated which can be evaluated for disengaging the drive.

Assembly

The sensor needs to be mounted in a solid device to ensure a smooth operation. The sensor should be protected from dirt and potential mechanical faults.

We recommend using a limit switch!
Please absolutely observe the operation of the limit switch before the machine is supplied.
Please also observe the operating instructions for the sensor or limit switch, respectively.
The axial stroke of the shifting ring must not be blocked by any other components.
As soon as the limit switch or sensor is activated (overload: release of overload coupling) the drive should immediately be stopped.
With higher speeds respective braking devices may be necessary.

7 Breakdowns, causes and elimination

The below-mentioned failures can result in a use of the **SYNTEX®-NC** coupling other than intended. In addition to the specifications given in these operating and assembly instructions please make sure to avoid such failures. The errors listed can only be clues to search for the failures. When searching for the failure the adjacent components must generally be considered.

General failures with use other than intended:

- Important data for the coupling selection were not forwarded.
- The calculation of the shaft-hub-connection was not considered.
- Coupling components with damage occurred during transport are assembled.
- If the heated hubs are assembled, the permissible temperature is exceeded.
- The clearance of the components to be assembled is not coordinated with one another.
- Tightening torques have been fallen below/exceeded.
- Components are mixed up by mistake/assembled incorrectly.
- No original **KTR** components (purchased parts) are used.
- Maintenance intervals are not observed.

Breakdowns	Causes	Elimination
Different operating noise and/or vibrations occurring	Screws working loose	1) Set the unit out of operation 2) Inspect tightening torque of screws. 3) Inspect torque setting. 4) If you cannot find out the cause of the failure, return the coupling to KTR for inspection.
	Setting nut has worked loose	
The coupling releases undefinedly	Torque is not set	1) Set the unit out of operation 2) Adjust torque 3) If you cannot find out the cause of the failure, return the coupling to KTR for inspection.
	Torque set incorrectly	
	Setting nut has worked loose	
	Wear	1) Set the unit out of operation 2) Send the coupling to KTR for inspection/repair.
Torque is no longer transmitted	Setting nut has worked loose	1) Set the unit out of operation 2) Reset the release torque 3) Tighten and fasten clamping screw of setting nut

8 Disposal

In respect of environmental protection we would ask you to dispose of the packaging or products on termination of their service life in accordance with the legal regulations and standards that apply, respectively.

- **Metal**
  Any metal components have to be cleaned and disposed of by scrap metal.
- **Nylon materials**
  Nylon materials have to be collected and disposed of by a waste disposal company.
- **Greases/oils**
  Greases and oils have to be collected and disposed of by a waste disposal company.

9 Maintenance and service

SYNTEX®-NC is a low-maintenance coupling. We recommend to perform a visual inspection on the coupling **at least once a year**. Please pay special attention to the condition, alignment and screw connection of the coupling and the condition of the spider (if applicable).

The **SYNTEX®-NC** overload hub is finish bored and provided with grease filling. With normal drive conditions this grease filling is sufficient during the overall service life. In case of extreme drive conditions or heavy dirt, respectively, the **SYNTEX®-NC** has to be regularly inspected for its operation.

In case of overload the drive should be stopped by return.

Having started up the coupling the tightening torques of the screws have to be inspected during the usual inspection intervals.

When using the ROTEX® GS coupling please consider our operating/mounting instructions as per KTR-N 45510 additionally or the mounting instructions as per KTR-N 45810 when using the TOOLFLEX®coupling, respectively.

10 Notes for using drive components/attachments

- Insert the drive element such as belt pulleys or gear wheels with the centering (H7 fit) on the deep groove ball bearing (component 1.7 or 2.7).
- Design the deep groove ball bearing as a fixed bearing.
- Screw the drive component to the flange ring (component 1.2 or 2.2).

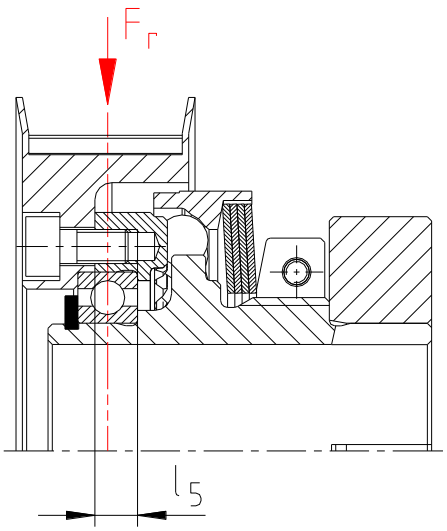


Illustration 22

With the asssembly the maximum depth of engagement l_5 (see table 1, illustration 22) needs to be observed.
The customer needs to select the screw connection for transmitting the torque.

The pitch line of radial forces F_r arising has to lead through the center of the bearing (see illustration 22).

The radial and axial forces passed into the coupling bearing must not exceed the maximum permissible figures (see table 11).

Table 11: Max. bearing load

Size	15	25	32	42	60
Axial force [N]	300	400	500	800	1200
Radial force [N]	300	400	500	800	1200

11 Spares inventory, customer service addresses

A basic requirement to ensure the readiness for use of the coupling is a stock of the most important spare parts on site.

Contact addresses of the KTR partners for spare parts and orders can be obtained from the KTR homepage at www.ktr.com.

KTR does not assume any liability or warranty for the use of spare parts and accessories which are not provided by KTR and for the damages which may incur as a result.