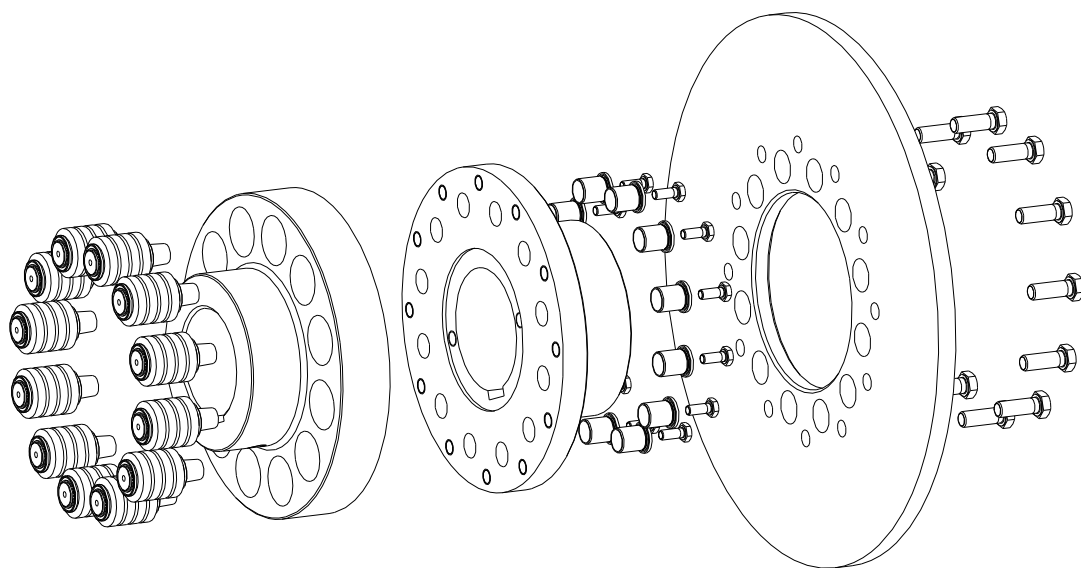


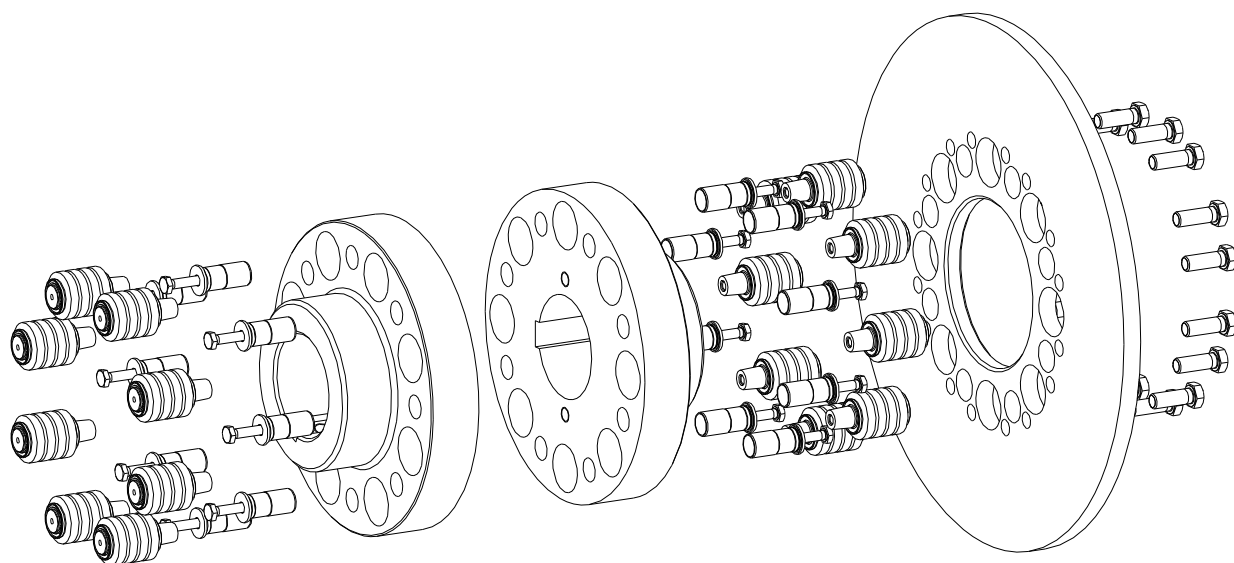


# REVOLEX<sup>®</sup> KX / KX-D Type SB with brake disk

Flexible pin & bush couplings types KX and KX-D  
and their combinations



**Type KX - SB**  
(taper pin design B)



**Type KX-D - SB**  
(taper pin design B)

 <b>KTR-Group</b>	<b>REVOLEX® KX / KX-D</b> <b>Operating/Assembly instructions</b> <b>Type SB</b>	KTR-N 49412 EN Sheet: 2 of 21 Edition: 4
---	---	--

**REVOLEX® KX / KX-D** is a torsionally flexible pin & bush coupling. It is able to compensate for shaft misalignment, for example caused by manufacturing inaccuracies, thermal expansion, etc.

## Table of contents

<b>1</b>	<b>Technical data</b>	<b>3</b>
<b>2</b>	<b>Advice</b>	<b>5</b>
2.1	Coupling selection	5
2.2	General advice	5
2.3	Safety and advice symbols	5
2.4	General hazard warnings	6
2.5	Intended use	6
2.6	Reference to EC Machinery Directive 2006/42/EC	6
<b>3</b>	<b>Storage, transport and packaging</b>	<b>6</b>
3.1	Storage	6
3.2	Transport and packaging	7
<b>4</b>	<b>Assembly</b>	<b>7</b>
4.1	Components of the couplings	7
4.2	Components of the pins	9
4.3	Advice for finish bore	10
4.4	Assembly of the coupling (general)	11
4.5	Assembly of type KX - SB	12
4.6	Assembly of type KX-D - SB	13
4.7	Replacement of elastomer rings	15
4.8	Displacements - alignment of the coupling	16
<b>5</b>	<b>Start-up</b>	<b>18</b>
<b>6</b>	<b>Breakdowns, causes and elimination</b>	<b>18</b>
<b>7</b>	<b>Disposal</b>	<b>20</b>
<b>8</b>	<b>Maintenance and service</b>	<b>20</b>
<b>9</b>	<b>Spares inventory, customer service addresses</b>	<b>21</b>

Please observe protection note ISO 16016.	Drawn: 2016-11-29 Kb Verified: 2016-12-08 Kb	Replacing: KTR-N dated 2010.03.12 Replaced by:
---	---	---

**KTR-Group**

# **REVOLEX® KX / KX-D** **Operating/Assembly instructions** **Type SB**

KTR-N 49412 EN  
 Sheet: 3 of 21  
 Edition: 4

## 1 Technical data

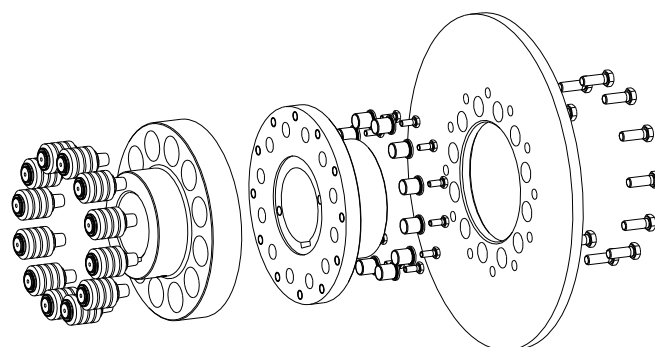
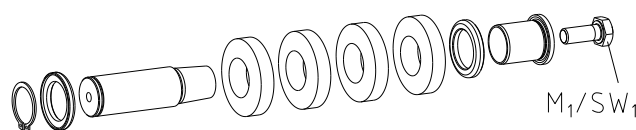
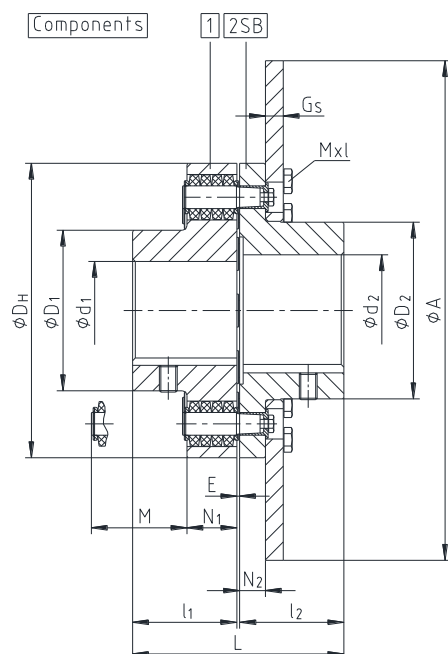


Illustration 1: REVOLEX® type KX – SB (taper pin design B)

**Table 1: Torques and dimensions – type KX – SB (taper pin design B)**

REVOLEX® KX - SB															
Size	Torque <sup>1)</sup> [Nm]		Finish bore max. <sup>2)</sup> d <sub>1</sub> /d <sub>2</sub>		Dimensions [mm]										
	T <sub>KN</sub>	T <sub>K max.</sub>	Cast iron	Steel	General										
					L	l <sub>1</sub> , l <sub>2</sub>	E	D <sub>H</sub>	D <sub>1</sub>	D <sub>2</sub>	N <sub>1</sub>	N <sub>2</sub>	M*	A	G <sub>s</sub>
KX 105	6485	12970	110/125	120/135	237	117	3	330	180	198	56	29	76	Dimensions according to customer specification	Dimensions according to customer specification
KX 120	10080	21060	125/145	140/155	270	132	6	370	206	223	76	45	100		
KX 135	14030	28060	140/150	160/165	300	147	6	419	230	237	76	45	100		
KX 150	17960	35920	160	185	336	165	6	457	256	257	76	45	100		
KX 170	26360	52720	180	220	382	188	6	533	292	289	92	62	130		
KX 190	36160	72320	205	245	428	211	6	597	330	327	92	62	130		
KX 215	48160	96320	230	275	480	237	6	660	368	365	92	62	145		
KX 240	65740	131480	250	310	534	264	6	737	407	400	122	75	167		

1) Standard material NBR (Perbunan) 80 ± 5 Shore A

\* Drop-out center dimension required

2) Bores H7 with keyway according to DIN 6885, sheet 1 [JS9] and thread for setscrews on the keyway (see table 9)

Maximum circumferential speed = 60 m/s referring to the maximum outside diameter (dimension A)

**Table 2: Hexagon screw DIN EN ISO 4017 - 10.9**

Size	KX 105	KX 120	KX 135	KX 150	KX 170	KX 190	KX 215	KX 240
Dimension M x l [mm]	M16 x 45	M20 x 50	M20 x 50	M20 x 55	M20 x 55	M20 x 55	M20 x 55	M24 x 65
Quantity z	12	10	12	14	20	24	28	20
Tightening torque T <sub>A</sub> [Nm]	295	580	580	580	580	580	580	1000

**Table 3: Pins – type KX - SB (taper pin design B)**

Size	KX 105	KX 120	KX 135	KX 150	KX 170	KX 190	KX 215	KX 240
Pin size	3		4			5		6
M <sub>1</sub> [mm]	M10		M12			M16		M24
SW <sub>1</sub> [mm]	16		18			24		36
Tightening torque T <sub>A</sub> [Nm]	67		115			290		970

Please observe protection  
note ISO 16016.

Drawn: 2016-11-29 Kb

Verified: 2016-12-08 Kb

Replacing: KTR-N dated 2010.03.12

Replaced by:

**KTR-Group**

# **REVOLEX® KX / KX-D** **Operating/Assembly instructions** **Type SB**

KTR-N 49412 EN  
 Sheet: 4 of 21  
 Edition: 4

## **1 Technical data**

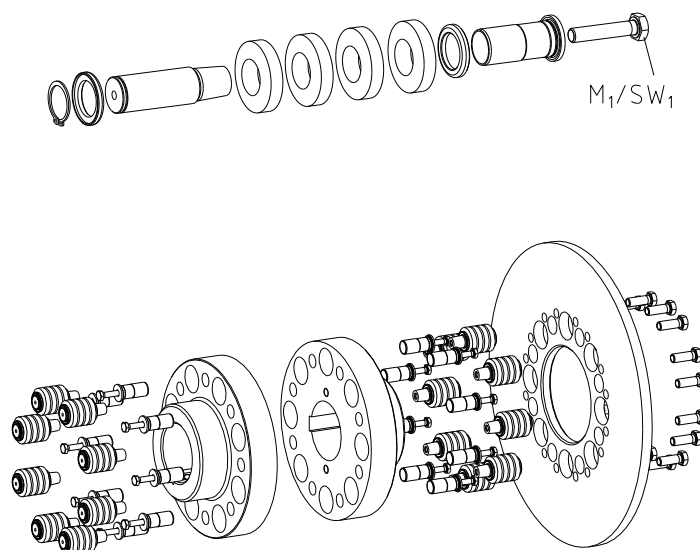
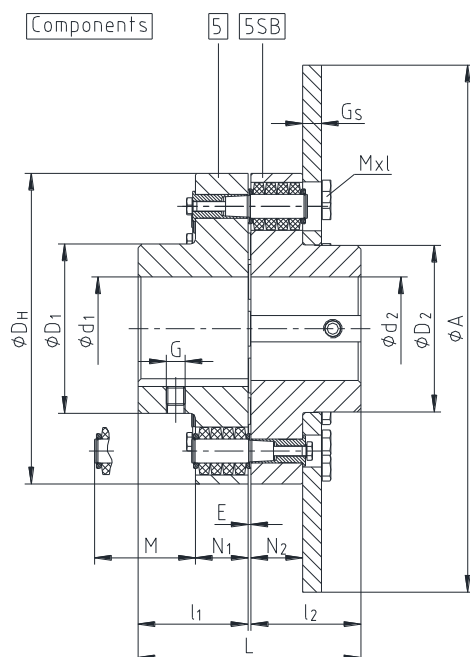


Illustration 2: REVOLEX®, type KX-D (taper pin design B)

**Table 4: Torques and dimensions – type KX-D – SB (taper pin design B)**

REVOLEX® KX-D - SB															
Size	Torque <sup>1)</sup> [Nm]		Finish bore max. <sup>2)</sup> d <sub>1</sub> /d <sub>2</sub>		Dimensions [mm]										
	T <sub>KN</sub>	T <sub>K max.</sub>	Cast iron	Steel	General										
					L	l <sub>1</sub> ; l <sub>2</sub>	E	D <sub>H</sub>	D <sub>1</sub>	D <sub>2</sub>	N <sub>1</sub>	N <sub>2</sub>	M*	A	G <sub>s</sub>
KX-D 105	8650	17300	110	120	237	117	3	330	180	177	56	55	76	Dimensions according to customer specification	Dimensions according to customer specification
KX-D 120	14110	28220	125	140	270	132	6	370	206	203	76	75	100		
KX-D 135	18690	37380	140	160	300	147	6	419	230	227	76	75	100		
KX-D 150	23100	46200	160	185	336	165	6	457	256	253	76	75	100		
KX-D 170	36900	73800	180	220	382	188	6	533	292	289	92	91	130		
KX-D 190	48210	96420	205	245	428	211	6	597	330	327	92	91	130		
KX-D 215	61900	123800	230	275	480	237	6	660	368	365	92	91	145		
KX-D 240	92030	184060	250	310	534	264	6	737	407	404	122	121	167		

1) Standard material NBR (Perbunan) 80 ± 5 Shore A

\* Drop-out center dimension required

2) Bores H7 with keyway according to DIN 6885, sheet 1 [JS9] and thread for setscrews on the keyway (see table 9)

Maximum circumferential speed = 60 m/s referring to the maximum outside diameter (dimension A)

**Table 5: Hexagon screw DIN EN ISO 4017 - 10.9**

Size	KX-D 105	KX-D 120	KX-D 135	KX-D 150	KX-D 170	KX-D 190	KX-D 215	KX-D 240
Dimension M x l [mm]	M12 x 45	M16 x 50	M16 x 60	M16 x 60	M24 x 65	M24 x 65	M24 x 65	M30 x 70
Quantity z	16	14	16	18	14	16	18	14
Tightening torque T <sub>A</sub> [Nm]	120	295	295	295	1000	1000	1000	2000

**Table 6: Pins – type KX-D - SB (taper pin design B)**

Size	KX-D 105	KX-D 120	KX-D 135	KX-D 150	KX-D 170	KX-D 190	KX-D 215	KX-D 240
Pin size	3	4			5			6
M <sub>1</sub> [mm]	M10	M12			M16			M24
SW <sub>1</sub> [mm]	16	18			24			36
Tightening torque T <sub>A</sub> [Nm]	67	115			290			970

Please observe protection  
note ISO 16016.

Drawn: 2016-11-29 Kb  
 Verified: 2016-12-08 Kb

Replacing: KTR-N dated 2010.03.12  
 Replaced by:

 <b>KTR-Group</b>	<b>REVOLEX® KX / KX-D</b> <b>Operating/Assembly instructions</b> <b>Type SB</b>	KTR-N 49412 EN Sheet: 5 of 21 Edition: 4
---	---	--

## 1 Technical data

The rated torques apply under the following conditions:

- Use of original KTR components made of Perbunan or natural rubber in 80 Shore
- Permanent operation
- Up to 25 torque shocks (up to 3 times the rated torque) per hour
- Observing the misalignment figures specified
- Operation within the permissible temperature range taking into account the service factors for temperature
  - - 30 °C to + 80 °C with elastomers made of Perbunan (NBR)
  - - 50 °C to + 70 °C with elastomers made of natural rubber (NR)

## 2 Advice

### 2.1 Coupling selection



**For a permanent and failure-free operation of the coupling it must be selected according to the selection instructions (according to DIN 740 part 2) for the particular application (see catalogue drive technology "REVOLEX®").**

**We would recommend balancing from a circumferential speed of 30 m/s.**

**If the operating conditions (performance, speed, modifications on engine and machine) change, the coupling selection must be reviewed.**

**Please make sure that the technical data regarding torque refer to the elastomers only. The transmittable torque of the shaft-hub-connection must be reviewed by the customer and is subject to his responsibility.**

For drives subject to torsional vibrations (drives with cyclic stress due to torsional vibrations) it is necessary to perform a torsional vibration calculation to ensure a reliable selection. Typical drives subject to torsional vibrations are e. g. drives with diesel engines, piston pumps, piston compressors etc. If requested, KTR will perform the coupling selection and the torsional vibration calculation.

### 2.2 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.

### 2.3 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.

Please observe protection note ISO 16016.	Drawn: 2016-11-29 Kb Verified: 2016-12-08 Kb	Replacing: KTR-N dated 2010.03.12 Replaced by:
---	---	---

 <b>KTR-Group</b>	<b>REVOLEX® KX / KX-D</b> <b>Operating/Assembly instructions</b> <b>Type SB</b>	<b>KTR-N</b> 49412 EN <b>Sheet:</b> 6 of 21 <b>Edition:</b> 4
---	---	---

## 2 Advice

### 2.4 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.

### 2.5 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 table 1 to 6 in 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 **REVOLEX® KX / KX-D** described in here corresponds to the technical status at the time of printing of these operating/assembly instructions.

### 2.6 Reference to EC Machinery Directive 2006/42/EC

The couplings supplied by KTR should be considered as components, not machines or partly completed machines according to EC Machinery Directive 2006/42/EC. Consequently KTR does not have to issue a declaration of incorporation. For details about safe assembly, start-up and safe operation please refer to the present operating/assembly instructions considering the warnings.

## 3 Storage, transport and packaging

### 3.1 Storage

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

The features of the elastomer rings remain unchanged for up to 5 years with favourable storage conditions.



**The storage rooms must not include any ozone-generating devices like e. g. fluorescent light sources, mercury-vapour lamps or electrical high-voltage appliances.**

**Humid storage rooms are not suitable.**

**Please make sure that condensation is not generated. The best relative air humidity is less than 65 %.**

Please observe protection note ISO 16016.	Drawn: 2016-11-29 Kb Verified: 2016-12-08 Kb	Replacing: KTR-N dated 2010.03.12 Replaced by:
---	---	---



### 3 Storage, transport and packaging

#### 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 in the following component assemblies and single parts. Before assembly the coupling has to be inspected for completeness.

#### 4.1 Components of the couplings

##### Components of REVOLEX®, type KX - SB (taper pin design B)

Component	Quantity	Description
1 <sup>1)</sup>	1	Hub part 1
2SB <sup>1)</sup>	1	FN hub part 2SB
3a	see table 7	Pins KX complete (design B)
4	see table 7	KX bush
8a	1	Brake disk
9	see table 7	Hexagon screw acc. to DIN EN ISO 4017
10 <sup>2)</sup>		Setscrew acc. to DIN EN ISO 4029

1) Material and balancing condition as specified by the customer

2) Axial fastening of the hub and tolerances of the shaft-hub-connections as specified by the customer

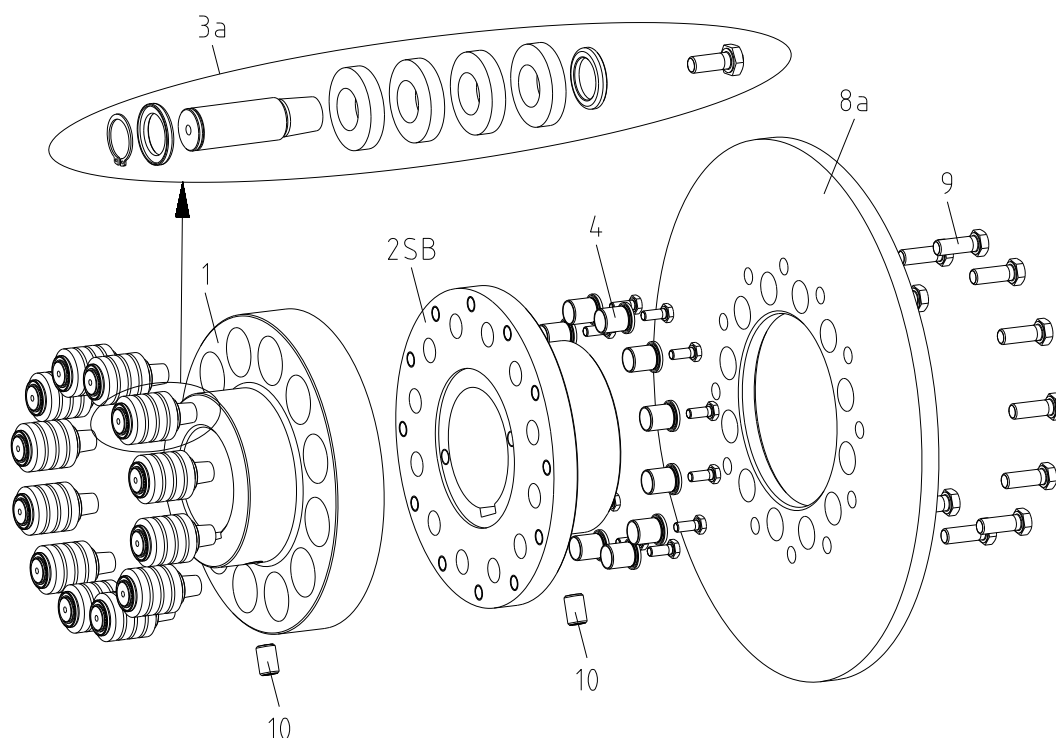


Illustration 3: REVOLEX® type KX – SB (taper pin design B)





## 4 Assembly

### 4.1 Components of the couplings

If requested, the FN hub part 2SB and brake disk are supplied with the hexagon screws mounted.

**Table 7:**

Quantity z of components	REVOLEX® size							
	KX 105	KX 120	KX 135	KX 150	KX 170	KX 190	KX 215	KX 240
3a, 4	12	10	12	14	10	12	14	10
9	12	10	12	14	20	24	28	20

### Components of REVOLEX®, type KX-D - SB (taper pin design B)

Component	Quantity	Description
5 <sup>1)</sup>	1	Hub part 5
5SB <sup>1)</sup>	1	FN hub part 5SB
3c	see table 8	Pin KX-D complete (design B)
6	see table 8	KX-D bush
8b	1	Brake disk
9	see table 8	Hexagon screw acc. to DIN EN ISO 4017
10 <sup>2)</sup>		Setscrew acc. to DIN EN ISO 4029

1) Material and balancing condition as specified by the customer

2) Axial fastening of the hub and tolerances of the shaft-hub-connections as specified by the customer

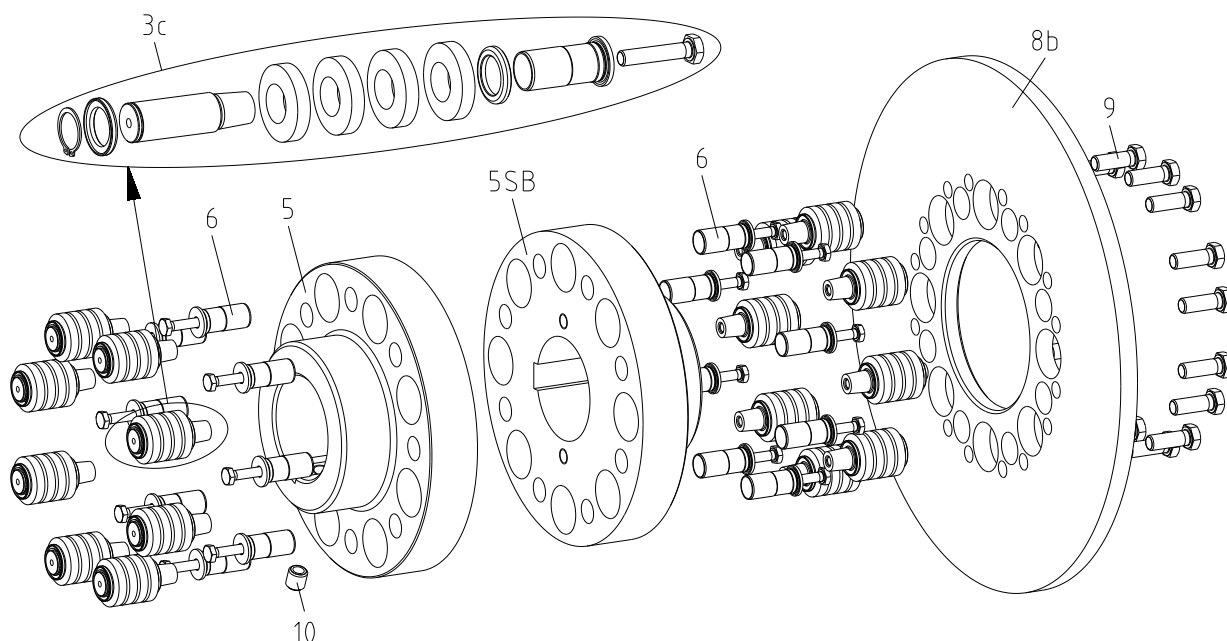


Illustration 4: REVOLEX® type KX-D - SB (taper pin design B)

If requested, the FN hub part 5SB and brake disk are supplied with the hexagon screws mounted.

**Table 8:**

Quantity z of components	REVOLEX® size							
	KX-D 105	KX-D 120	KX-D 135	KX-D 150	KX-D 170	KX-D 190	KX-D 215	KX-D 240
3c, 6, 9	16	14	16	18	14	16	18	14



**4 Assembly****4.2 Components of the pins****Components of complete pin KX (design B) – component 3a**

Component	Quantity	Description
3.1b	1	Pin KX (design B)
3.2	4	Elastomer ring
3.3b	2	Disk
3.4a	1	Hexagon screw acc. to DIN EN ISO 4017
3.5	1	Circlip DIN 471

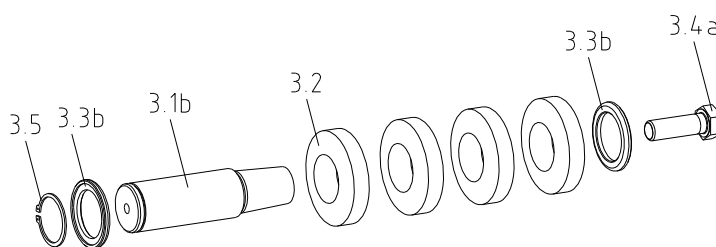


Illustration 5: Pin KX complete (design B)

**Components of complete pin KX-D (design B) – component 3c**

Component	Quantity	Description
3.1b	1	Pin KX (design B)
3.2	4	Elastomer ring
3.3b	2	Disk
3.4c	1	Hexagon screw acc. to DIN EN ISO 4017
3.5	1	Circlip DIN 471

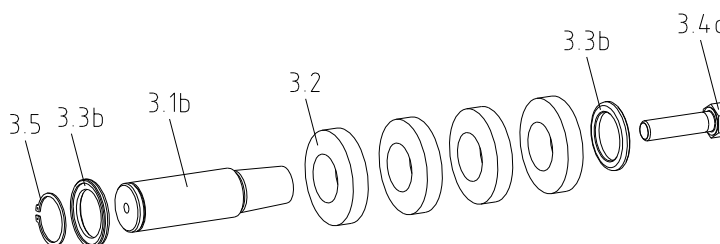


Illustration 6: Pin KX-D complete (design B)



## 4 Assembly

### 4.3 Advice for finish bore



The maximum permissible bore diameters  $d$  (see table 1 and 4 in chapter 1 - technical data) must not be exceeded. If these figures are disregarded, the coupling may tear. Rotating particles may cause danger to life.

- Hub bores machined by the customer have to observe concentricity or axial runout, respectively (see illustration 7).
- Please make absolutely sure to observe the figures for  $d_{max}$ .
- Carefully align the hubs when the finish bores are drilled.
- The bore tolerance should preferably be selected as per table 10.
- Please provide for a setscrew according to DIN EN ISO 4029 with a cup point or an end plate to fasten the hubs axially.

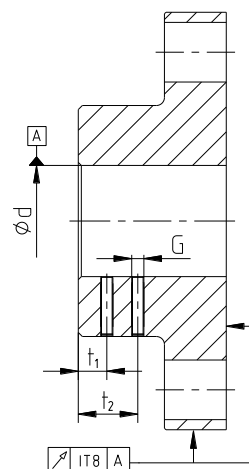


Illustration 7: Concentricity and axial runout



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.

Table 9: Setscrews DIN EN ISO 4029

Size (KX / KX-D)	105	120	135	150	170	190	215	240
Dimension G [mm]	M20	M24	M24	M24	M24	M24	M24	M24
Dimension $t_1$ [mm]	40	30	45	45	50	50	50	50
Dimension $t_2$ [mm]	-	-	-	-	-	-	110	110
Tightening torque $T_A$ [Nm]	140	220	220	220	220	220	220	220

Table 10: Recommended fit pairs acc. to DIN 748/1

Bore [mm]		Shaft tolerance	Bore tolerance
above	up to		
	50	k6	H7
50		m6	(KTR standard)

If a feather keyway is intended to be used in the hub, it should correspond to the tolerance ISO JS9 (KTR standard) with normal operating conditions or ISO P9 with difficult operating conditions (frequently alternating torsional direction, shock loads, etc.). In this case the keyway should be flush with one of the hub bores for the pins. With axial fastening by setscrews the tapping should be located on the keyway.

The transmittable torque of the shaft-hub-connection must be reviewed by the customer and is subject to his responsibility.

**4 Assembly****4.3 Advice for finish bore**

Unbored/pilot bored hubs are supplied without balancing. If balancing is necessary subject to the application, it should be made on completion of the finish bore. The balancing bores have to be made in the positions marked in illustration 8.



**The balancing bores have to be made between the pin bores in every case.**

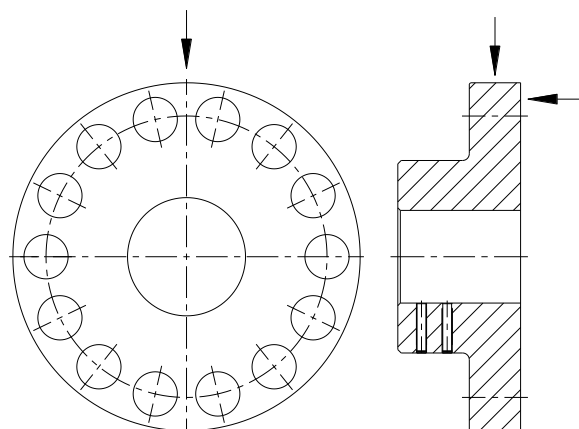


Illustration 8

**4.4 Assembly of the coupling (general)**

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



**Heating the hubs lightly (approx. 80 °C) allows for easier mounting onto the shaft.**



**Touching the heated hubs causes burns. Please wear safety gloves.**



**With the assembly please make sure that the distance dimension E (see table 1 and 4) is observed so that the hubs are not in contact with each other during the operation. Disregarding this advice may cause damage to the coupling.**



**With the assembly of screw connections only those screws specified by the manufacturer have to be used. When tightening the screws the torque indicated by the manufacturer has to be observed. The screws have to be secured against working loose (e. g. Loctite 243 average strength).**



**In order to avoid any injuries please always make use of proper lifting equipment.**

Tappings exist on the face and outside diameter of the coupling serving for using proper sling gears or lifting equipment, respectively. If proper sling gears are used they should be dismantled after assembly of the coupling.

**4 Assembly****4.5 Assembly of type KX - SB****With supply of components only (FN hub and brake disk):**

- Screw up the brake disk (component 8a) with the FN hub part 2SB (component 2SB) and tighten the hexagon screws (component 9) evenly to the tightening torques specified in table 2 by means of a torque key (see illustration 9).

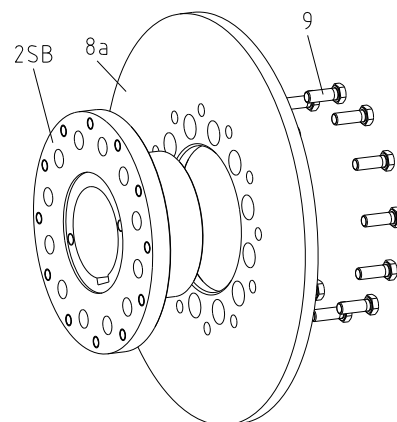


Illustration 9

- Drive the sleeves (component 4) into the bores of the FN-hub part 2SB by light blows (see illustration 10).

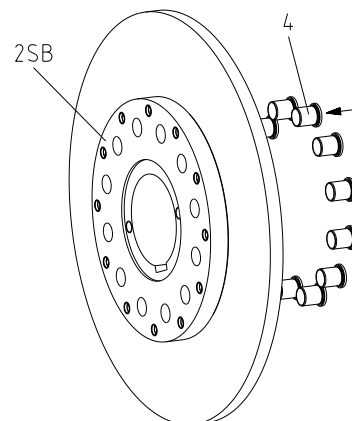


Illustration 10

- Please assemble the hubs onto the shafts of the driving and driven side in a way that the flat faces of the coupling hubs are flush with the faces of the shafts (see illustration 11).

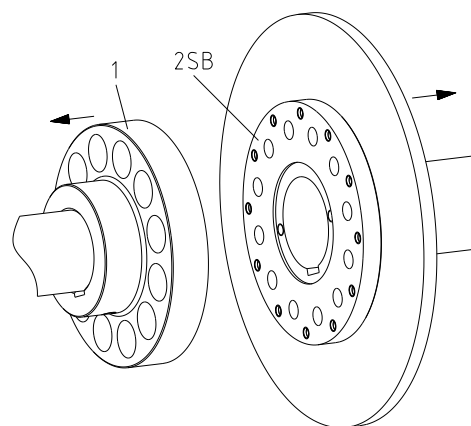


Illustration 11



## 4 Assembly

### 4.5 Assembly of type KX - SB

- Shift the power packs in axial direction until the distance dimension E has been achieved (see illustration 12).
- If the power packs are already firmly assembled, shifting the hubs axially on the shafts allows for setting the distance dimension E.
- Fasten the hubs by tightening the setscrews DIN EN ISO 4029 at the tightening torque acc. to table 9.
- Align the coupling hubs in a way that the bores for the pins are flush.



**Please consider permissible shaft displacements from chapter 4.8!**

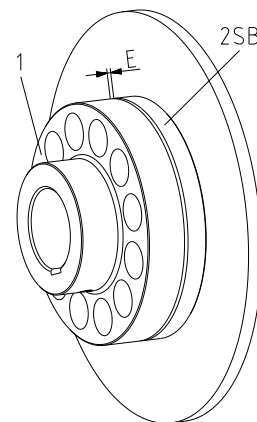


Illustration 12

- Insert the pins (component 3a) in the hub part 1 (component 1) (see illustration 13).
- Screw up the pins to the hexagon screws (component 3.4a) and tighten them evenly to the tightening torques specified in table 3 by means of a torque key (see illustration 13).



**Secure screws against relieving by means of glue (e. g. Loctite 243 average strength).**



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

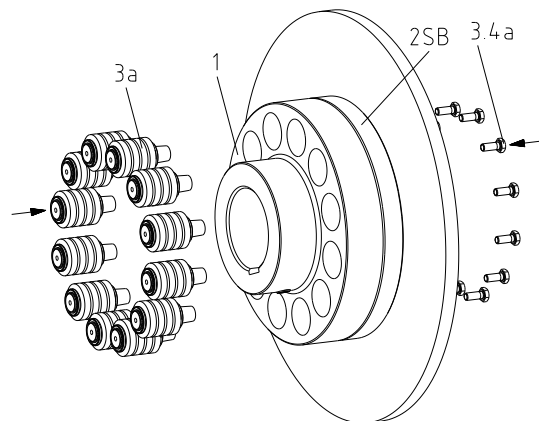


Illustration 13

### 4.6 Assembly of type KX-D - SB

#### **With supply of components only (FN hub and brake disk):**

- Screw up the brake disk (component 8b) with the FN hub part 5SB (component 5SB) and tighten the hexagon screws (component 9) evenly to the tightening torques specified in table 5 by means of a torque key (see illustration 14).

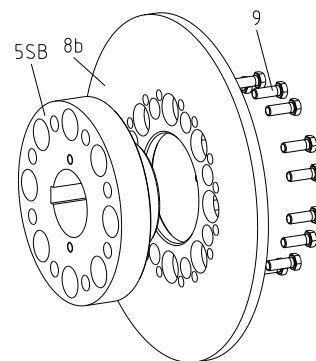


Illustration 14



## 4 Assembly

### 4.6 Assembly of type KX-D - SB

- Drive the sleeves (component 6) into the smaller bores of the hubs part 5 (component 5) or part 5SB (see illustration 15).

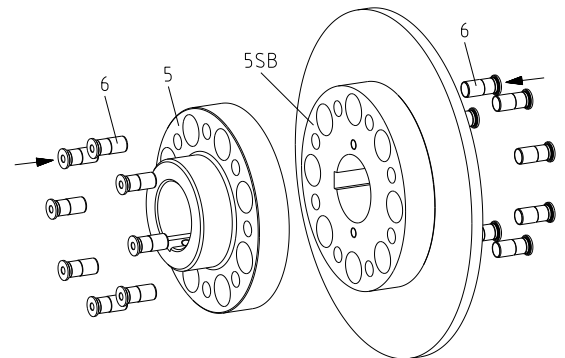


Illustration 15

- Please assemble the hubs onto the shafts of the driving and driven side in a way that the flat faces of the coupling hubs are flush with the faces of the shafts (see illustration 16).
- Shift the power packs in axial direction until the distance dimension E is achieved (see illustration 17).
- If the power packs are already firmly assembled, shifting the hubs axially on the shafts allows for setting the distance dimension E.
- Fasten the hubs by tightening the setscrews DIN EN ISO 4029 at the tightening torque acc. to table 9.
- Align the coupling hubs in a way that the bores for the pins are flush.

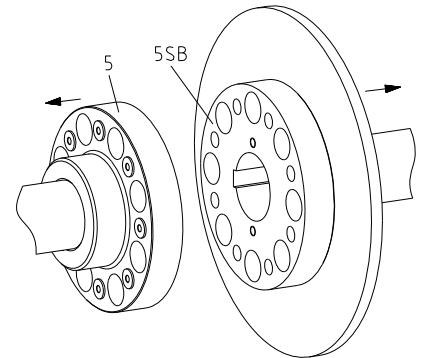


Illustration 16

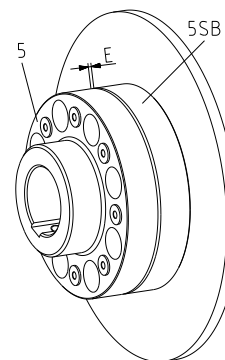


Illustration 17

- Insert the pins (component 3c) in the larger holes of the hub part 5 or FN hub part 5SB (see illustration 18).
- Screw up the pins with the hexagon screws (component 3.4c) and tighten them evenly to the tightening torques specified in table 6 by means of a torque key (see illustration 18).

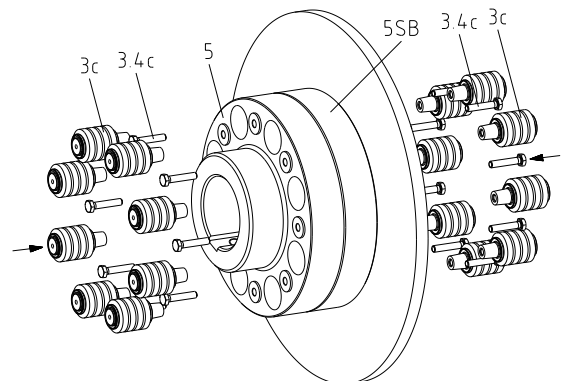


Illustration 18



**Please consider permissible shaft displacements from chapter 4.8!**



**Secure screws against relieving by means of glue (e. g. Loctite 243 average strength).**



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



## 4 Assembly

### 4.7 Replacement of elastomer rings

#### Option 1: Replacement of elastomer rings without dismounting the pins:

- Pull the driving and driven side so far apart that the coupling is separated or shift the coupling free from load.
- Remove the circlip (component 3.5) and the disk (component 3.3b).
- Disassemble the elastomers (component 3.2).
- Replace the elastomer rings in sets only.



**Elastomer rings of the same size only may be used.**

- The new elastomer rings are mounted in reverse order.

#### Option 2: Replacement of pins or elastomer rings by dismounting the pins:

- Pull the driving and driven side so far apart that the coupling is separated or shift the coupling free from load.
- Disassemble the screw (illustration 19; component 3.4a or 3.4c). Afterwards clean the tapping and the thread of the screw.

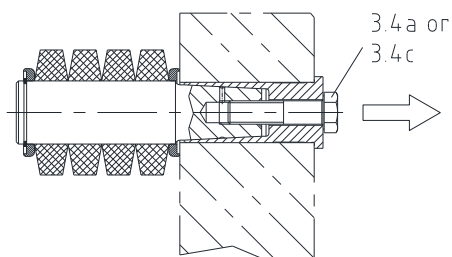


Illustration 19: Disassembly of hexagon screw

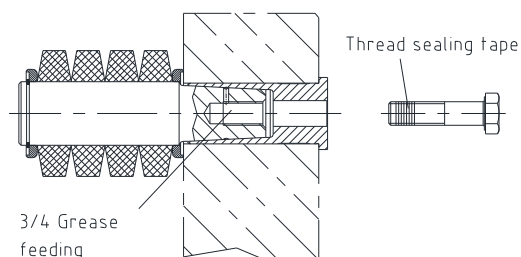


Illustration 20: Cleaning the tapping



**Wear safety glasses.**

- Fill the tapping of the pin (component 3.1b) with standard grease by three quarters.
- Wrap a thread sealing tape Loctite 55 around the screw. Leave out the first 2 to 3 threads to make sure that the screw can be screwed in properly (see illustration 20).
- Screw the screw manually into the pin by 2 to 3 tappings.

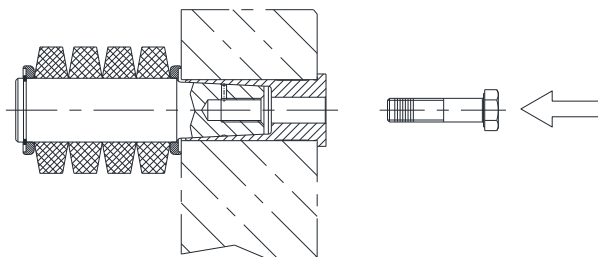


Illustration 21: Assembly of hexagon screw

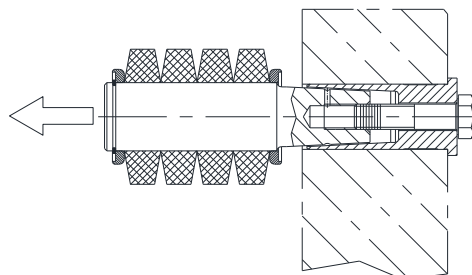


Illustration 22: Unscrewing the pin



 <b>KTR-Group</b>	<b>REVOLEX® KX / KX-D</b> <b>Operating/Assembly instructions</b> <b>Type SB</b>	KTR-N 49412 EN Sheet: 16 of 21 Edition: 4
---	---	---

## 4 Assembly

### 4.7 Replacement of elastomer rings



**Abrupt movement of the screw (component 3.4a or 3.4c) or sudden unscrewing of the pin (component 3.1b) results in the danger of getting jammed.**

**A sudden movement of the pin can be realized by loud noise.**

- Screw the screw slowly deeper into the pin via a spanner. The grease flows through the cross hole of the pin pressing between pin and bush (illustration 22; component 4 or 6).
- If feasible resistance is not built up, it may be necessary to refill the grease or vent the system.



**If grease escapes from the tapping, the screw needs to be re-sealed with thread sealing tape Loctite 55.**

- As soon as the pin has come off the taper seat of the bush, the extraction process is finished.
- Press all pins out of their seats one after another following the system described above.
- Replace the elastomer rings on the pins as per chapter 4.7 of option 1 described.



**If the pins are re-used they have to be cleaned from grease free from any residues.**

- The pins are mounted as per chapter 4.5 or 4.6.

### 4.8 Displacements - alignment of the coupling

The **REVOLEX® KX / KX-D** compensates for displacements generated by the shafts to be combined as specified in table 11. Excessive misalignment may be generated by inaccurate alignment, production tolerances, thermal expansion, shaft deflection, twisting of machine frames, etc.



**In order to ensure a long service life of the coupling, the shaft ends have to be accurately aligned. Please absolutely observe the displacement figures specified (see table 11). If the figures are exceeded, the coupling will be damaged.**

**The more accurate the alignment of the coupling, the longer is its service life.**

#### Please note:

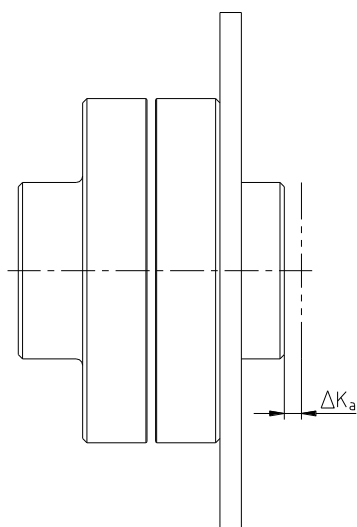
- The displacement figures specified in table 11 are maximum figures which must not arise in parallel. If radial and angular displacement occurs at the same time, the sum of the displacement figures must not exceed  $\Delta K_r$  or  $\Delta K_w$  (see illustration 24).
- Please check with a dial gauge, ruler, feeler or laser measuring device whether the permissible displacement figures of table 11 can be observed.

Please observe protection note ISO 16016.	Drawn: 2016-11-29 Kb Verified: 2016-12-08 Kb	Replacing: KTR-N dated 2010.03.12 Replaced by:
---	---	---

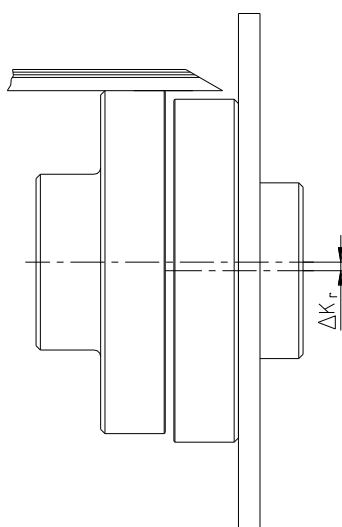


## 4 Assembly

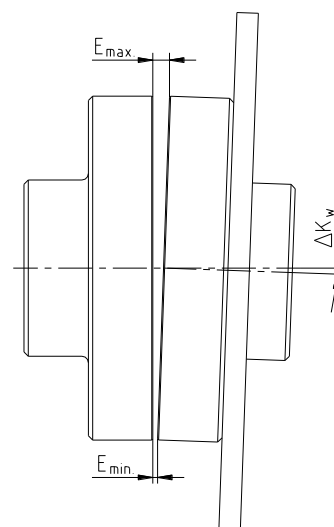
### 4.8 Displacements - alignment of the coupling



Axial displacements



Radial displacements



Angular displacements

$$L_{adm.} = L + \Delta K_a \text{ [mm]}$$

$$\Delta K_w = E_{max.} - E_{min.} \text{ [mm]}$$

Illustration 23: Displacements

Examples of the displacement combinations specified in illustration 24:

Example 1:

$$\Delta K_r = 30 \%$$

$$\Delta K_w = 70 \%$$

Example 2:

$$\Delta K_r = 60 \%$$

$$\Delta K_w = 40 \%$$

$$\Delta K_{total} = \Delta K_r + \Delta K_w \leq 100 \%$$

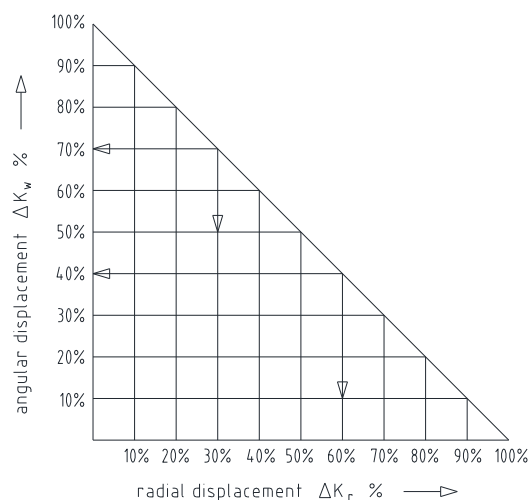


Illustration 24: Combinations of displacement

**Table 11: Displacement figures**

Size (KX / KX-D)		105	120	135	150	170	190	215	240
Max. axial displacement $\Delta K_a$ [mm]		±2	±2	±2	±2	±2.5	±2.5	±2.5	±2.5
Max. radial displacement $\Delta K_r$ [mm] or Max. angular displacement $\Delta K_w$ [mm] with speed n [rpm]	250	1.2	1.3	1.4	1.5	1.7	1.9	2.0	2.2
	500	0.9	0.9	1.0	1.1	1.2	1.3	1.4	1.6
	750	0.7	0.8	0.8	0.9	1.0	1.1	1.2	1.3
	1000	0.6	0.7	0.7	0.8	0.9	0.9	1.0	1.1
	1500	0.5	0.5	0.6	0.6	0.7	0.8	0.8	0.9
	2000	0.4	0.5	0.5	0.5	0.6	0.7	-	-
	3000	0.4	0.4	-	-	-	-	-	-

 <b>KTR-Group</b>	<b>REVOLEX® KX / KX-D</b> <b>Operating/Assembly instructions</b> <b>Type SB</b>	KTR-N 49412 EN Sheet: 18 of 21 Edition: 4
---	---	---

## 5 Start-up

Before start-up of the coupling, please inspect the tightening of the setscrews in the hubs, the alignment and the distance dimension E and adjust, if necessary, and also inspect all screw connections for the tightening torques specified.

Finally the coupling protection against accidental contact must be fitted.

During operation of the coupling, please pay attention to

- different operating noise
- vibrations occurring.



**If you note any irregularities with the coupling during operation, the drive unit must be switched off immediately. The cause of the breakdown must be specified by means of the table „Breakdowns“ and, if possible, be eliminated according to the proposals. The potential breakdowns specified can be hints only. To find out the cause all operating factors and machine components must be considered.**

## 6 Breakdowns, causes and elimination

The below-mentioned failures may result in a use of the **REVOLEX® KX / KX-D** 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.
- A wrong or no pin/elastomer ring is inserted in the coupling.
- No original KTR components (purchased parts) are used.
- Old/already worn out elastomer rings or elastomer rings stored for too long are used.
- Maintenance intervals are not observed.

Please observe protection note ISO 16016.	Drawn: 2016-11-29 Kb Verified: 2016-12-08 Kb	Replacing: KTR-N dated 2010.03.12 Replaced by:
--	---	---


**6 Breakdowns, causes and elimination**

Breakdowns	Causes	Elimination
Different operating noise and/or vibrations occurring	Misalignment	1) Set the unit out of operation 2) Eliminate the reason for the misalignment (e. g. loose foundation bolts, breaking of the engine mount, heat expansion of unit components, modification of the installation dimension E of the coupling) 3) For inspection of wear see item inspection
	Wear of elastomers	1) Set the unit out of operation 2) Disassemble the coupling and remove remainders of the elastomer rings/pins 3) Inspect coupling components and replace coupling hubs that are damaged 4) Generally assemble new elastomer rings with new pins 5) Assemble coupling components 6) Inspect alignment, adjust if necessary
	Thread for setscrews for axial fastening of hubs working loose	1) Set the unit out of operation 2) Inspect alignment of coupling 3) Tighten the thread for setscrews to fasten the hubs and secure against working loose 4) For inspection of wear see item inspection
Fracture of hub	Fracture of hub due to high impact energy/overload	1) Set the unit out of operation 2) Replace complete coupling 3) Find out the reason for overload 4) Inspect alignment
	Operating parameters do not meet with the performance of the coupling	1) Set the unit out of operation 2) Review the operating parameters and select a bigger coupling (consider mounting space) 3) Assemble new coupling size 4) Inspect alignment
	Operating error of the unit	1) Set the unit out of operation 2) Replace complete coupling 3) Inspect alignment 4) Instruct and train the service staff
Early wear of elastomers	e. g. contact with aggressive liquids/oils, ozone influence, too high/low ambient temperatures etc. causing a physical modification of the elastomer rings	1) Set the unit out of operation 2) Disassemble the coupling and remove remainders of the elastomer rings/pins 3) Inspect coupling components and replace coupling hubs that are damaged 4) Generally assemble new elastomer rings with new pins 5) Assemble coupling components 6) Inspect alignment, adjust if necessary Make sure that further physical modifications of the pins are excluded

## 6 Breakdowns, causes and elimination

Breakdowns	Causes	Elimination
Early wear of elastomers	ambient/contact temperatures which are too high for the elastomer ring, max. permissible - 30 °C/+ 80 °C	1) Set the unit out of operation 2) Disassemble the coupling and remove remainders of the elastomer rings/pins 3) Inspect coupling components and replace coupling hubs that are damaged 4) Generally assemble new elastomer rings with new pins 5) Assemble coupling components 6) Inspect alignment, adjust if necessary 7) Inspect and adjust ambient/contact temperature
Early wear of pins (hardening/embrittlement of the pin elastomer)	Vibrations of drive	1) Set the unit out of operation 2) Disassemble the coupling and remove remainders of the elastomer rings/pins 3) Find out the reason for vibrations 4) Inspect coupling components and replace coupling hubs that are damaged 5) Generally assemble new elastomer rings with new pins 6) Assemble coupling components 7) Inspect alignment, adjust if necessary

## 7 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.

## 8 Maintenance and service

**REVOLEX® KX / KX-D** 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 of the pins of the coupling.

- Since the flexible machine bearings of the driving and driven side settle during the course of load, please inspect the alignment of the coupling and re-align the coupling, if necessary.
- The coupling parts have to be inspected for damages.
- The screw connections have to be inspected visually.



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

 <b>KTR-Group</b>	<b>REVOLEX® KX / KX-D</b> <b>Operating/Assembly instructions</b> <b>Type SB</b>	KTR-N 49412 EN Sheet: 21 of 21 Edition: 4
---	---	---

## 9 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](http://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.**

Please observe protection note ISO 16016.	Drawn: 2016-11-29 Kb	Replacing: KTR-N dated 2010.03.12
	Verified: 2016-12-08 Kb	Replaced by: