

# Installation and operating instructions for elastic jaw coupling REK ... DCO

E 06.707e







10550 Anderson Place Franklin Park, IL 60131 United States Telephone 847 678-3581 Fax 847 678-3583 www.ringspanncorp.com info@ringspanncorp.com

RINGSPANN	Installation ar elastic ja	E 06.707			
As of: 24.09.2020	Version: 01	Signed: SCCE	Checked: SCHW	Number of pa- ges: 22	Page: 2

### Important

Before installation and commissioning of the product takes place, these installation and operating instructions must be read carefully. Notes of caution and hazard warnings are to be paid particular attention to.

These installation and operating instructions apply on condition that the product meets the selection criteria for its proper use. The selection and dimensioning of the product are not the subject of these installation and operating instructions.

If these installation and operating instructions are not observed or are interpreted wrongly, this shall invalidate any product liability and warranty of RINGSPANN CORPORATION; the same also applies in the case that our product is taken apart or changed.

These installation and operating instructions are to be kept in a safe place and must, in the event of onward delivery of our product – be it individually or as part of a machine – be passed on along with the product so that the user has access to them.

## Safety information

- The installation and commissioning of our product may only be carried out by trained personnel.
- Repair work may only be performed by the manufacturer or by authorised RINGSPANN agencies.
- If there is suspected malfunctioning, the product, or the machine into which it is built, must be taken out of operation immediately and RINGSPANN CORPORATION or an authorised RING-SPANN agency is to be informed.
- The power supply is to be switched off during work on electrical components.
- Rotating parts must be secured by the operator against unintentional touching.
- In the case of supplies made to a foreign country, the safety regulations applicable in that country are to be taken into consideration.

#### German original version!

If there should be any discrepancies between the German original and versions of these installation and operating instructions in other languages, the German version shall take precedence.

#### Contents

#### 1. General information

- 1.1. Function
- 1.2. General safety instructions
- 1.3. Other applicable provisions, standards etc.
- 1.4. Classification in accordance with EC Machinery Directive 2006/42/EC

#### 2. Design and function / parts list

- 2.1. Labelling
- 2.2. Dimensions
- 2.3. Parts list

#### 3. Intended use

- 4. Warning signs / Impermissible use
- 5. Condition as delivered
- 6. Storage

#### 7. Technical prerequisite for reliable operation

- 7.1. Maximum speeds
- 7.2. Permissible misalignments
- 7.3. Manufacturing the hub bore
- 7.4. Spider

#### 8. Assembly

- 8.1. General assembly instructions
- 8.2. Assembly description

#### 9. Start-up

- 10. Operational disturbances
- 11. Maintenance and repair
- 12. Spare part stockpiling
- 13. Disposal

#### 14. Supplement for operation in areas with potentially explosive atmosphere

- 14.1. Normal operation
- 14.1.1. Explosive atmosphere
- 14.1.2. Instructions for use
- 14.2. Instructions on occupational health and safety
- 14.3. Setup and assembly
- 14.4. Control, inspection and repair
- 14.5. Testing

#### 15. Declaration of Conformity according to Directive 2014/34/EU

ges: 22

#### 1. General information

#### 1.1. Function

RINGSPANN

As of: 24.09.2020

The main task of the elastic jaw coupling consists in transferring the torque of one shaft end onto another shaft. Additionally, the coupling is designed to compensate angular, radial and axial misalignments and reduce the intensity of vibrations and shocks.

#### 1.2. General safety instructions

#### Safety takes the highest priority for all works with and on the coupling.

To ensure this, the following safety instructions must be observed:

- During installation and maintenance work, the drive motor must be secured against unintended start-up and the load side against turning back.
- Accidental touching of the coupling during operation must be prevented with a suitable cover or protective device.
- Do not reach into the working area of the coupling during operation. -
- 1.3. Other applicable provisions, standards etc.

The couplings are designed on the basis of DIN 740, part 2 (see RINGSPANN catalogue "shaft coupling"). If the operating conditions (e.g. output, speed) should change, the original design of the coupling must be reviewed along with the load-bearing capacity of the shafts and the used shaft-hub-connections.

1.4. Classification in accordance with EC Machinery Directive 2006/42/EC Type REK ... DCO couplings are a machine element. Since machine elements do not fall under EC Machinery Directive 2006/42/EC, RINGSPANN does not draw up a declaration of incorporation. All important information with regards to the installation, commissioning and operation is explained in the following.

#### 2. **Design and function / parts list**

#### 2.1. Labelling

Depending on the coupling size, the parts are labelled as follows: Hubs:

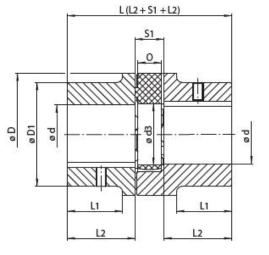
- **RINGSPANN** logo -
- Material number
- Abbreviated designation -

Spiders:

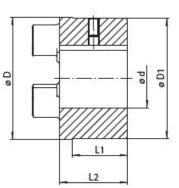
- **RINGSPANN** logo
- Size designation

RINGSPANN	Installation and opera elastic jaw coup	E 06.707			
As of: 24.09.2020	Version: 01	Signed: SCCE	Checked: SCHW	Number of pa- ges: 22	Page: 5

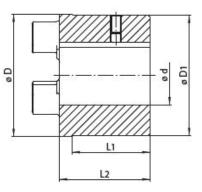
#### 2.2. Dimensions



Type 0



Type I



Type II - from coupling size 0038

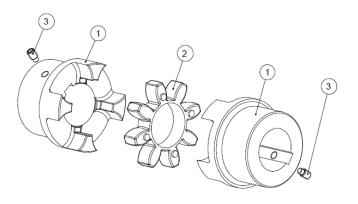
Figure 2.1: Drawing REK...DCO

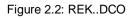
		Dimensions [inch]								
			[	D1	L	1	L	2		
Size	d3	D	Hub type 0	Hub type I+II	Hub type 0 + I	Hub type II	Hub type 0 + I	Hub type II	0	S1
0019	0.709	1.61	1.26	1.61	0.79	-	0.98	-	0.47	0.63
0024	1.603	2.20	1.57	2.20	0.94	-	1.18	-	0.55	0.71
0028	1.181	2.60	1.89	2.60	1.10	-	1.38	-	0.59	0.79
0038	1.496	3.15	2.60	3.07	1.46	2.44	1.77	2.76	0.71	0.94
0042	1.811	3.74	2.95	3.70	1.57	2.56	1.97	2.95	0.79	1.02
0048	2.008	4.13	3.35	4.09	1.77	2.72	2.20	3.15	0.83	1.10
0055	2.362	4.72	3.86	4.65	2.05	3.03	2.56	3.54	0.87	1.18
0065	2.677	5.31	4.53	5.24	2.40	3.39	2.95	3.94	1.02	1.38
0075	3.150	6.30	5.31	6.22	2.72	3.31	3.35	4.33	1.18	1.57
0090	3.937	7.87	7.87	7.80	3.19	4.17	3.94	4.92	1.34	1.77

Table 2.1: Dimensions

Position	Quantity	Description
1	2	Hub
2	1	Spider
3	2	Set screw

Table 2.2: Parts list





#### 3. Intended use

The coupling may only be installed, operated and serviced if

- the operating instructions have been read and understood,
- the executing person possesses the necessary qualifications,
- authorization has been given by the company.

The coupling type REK ... DCO may only be operated within the operating limits specified in section "7. Technical prerequisite for reliable operation".

#### RINGSPANN shall not assume any liability for damages that result from unauthorised constructional changes or an unintended use.

#### 4. Warning signs / impermissible use

An impermissible use is given if:

- the shaft-hub-connection was not designed correctly
- the coupling hubs have been thermally overloaded during assembly
- the fit pair for parts to be joined has not been coordinated correctly
- the parameters necessary for the selection of the coupling were not communicated
- the tightening torques of the screw connection do not correspond with the specifications
- the coupling is wrongly fitted
- parts from other manufacturers are used
- damaged coupling parts are used

The further operation of coupling type REK ... DCO is not permissible under the following conditions:

- if the permissible limits of use (torque, speed, permissible misalignments, ...) are exceeded
- exceeding or falling below the permissible temperature limits
- if the wear limit of the parts is reached
- changed running noises or the occurrence of vibrations

If the unit should be operated despite the aforementioned states, it can result in damages to the coupling and the drivetrain.



Attention! RINGSPANN shall not assume any liability for any damages that result in the event of any impermissible use.

#### 5. Condition as delivered

Couplings are generally delivered ready-for-installation in individual parts. Upon customer request, pre-bored hubs are also available. If the hub bores are manufactured by the customer, the information in chapter 7.3 must be observed:

#### 6. Storage

The coupling hubs can be stored for 6 - 9 months in a roofed, dry room.

Under the same storage conditions, the properties of the coupling spiders remain unchanged for up to 5 years.

Storage rooms must:

- have a roof and be dry,

- be free of ozone-producing equipment,

- have a relative humidity of less than 65%,
- be free of condensation.

#### 7. Technical prerequisite for reliable operation

#### 7.1. Maximum speeds

Size	max. speed [rpm]					
Size	Steel	Grey cast iron	Aluminium			
0019	18 650	-	19 000			
0024	13 650	-	14 000			
0028	11 600	-	11 800			
0038	9 500	7 100	-			
0042	8 000	6 000	-			
0048	7 200	5 600	-			
0055	6 350	4 750	-			
0065	5 650	4 250	-			
0075	4 750	3 550	-			
0090	3 800	2 800	-			

Table 7.1: Maximum permissible speeds

#### 7.2. Permissible misalignments

Größe	Max. permissible misalignments					
Große	Axial $\Delta K_a$ [inch]	Radial ∆K <sub>r</sub> [inch]	Angular ∆K <sub>w</sub> [∘]			
0019	0.063	0.006	0.8			
0024	0.071	0.008	0.8			
0028	0.079	0.008	0.8			
0038	0.087	0.010	0.9			
0042	0.091	0.012	0.9			
0048	0.118	0.014	1.0			
0055	0.118	0.014	1.0			
0065	0.138	0.016	1.0			
0075	0.138	0.018	1.1			
0090	0.177	0.020	1.1			

Table 7.2: Maximum permissible misalignments

The maximum permissible misalignment values (table 7.2) must be adhered to and may not occur at the same time. In the event of the simultaneous occurrence of radial and angular offset, misalignments need to be exploited differently percentage-wise (see figure 7.2). If not observed, damage to the coupling may result.

RINGSPANN	Installation and oper elastic jaw coup	E 06.707			
As of: 24.09.2020	Version: 01	Signed: SCCE	Checked: SCHW	Number of pa- ges: 22	Page: 8

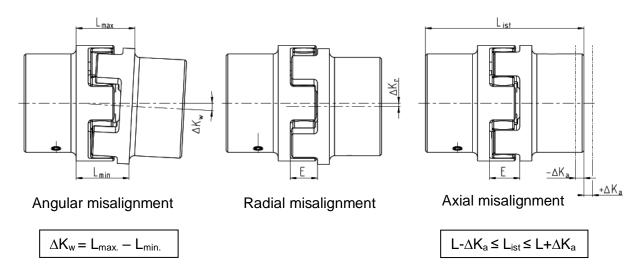


Figure 7.1: Misalignment types

The figure 7.2 shows the relationship for radial ( $K_r$ ) and angular misalignments ( $K_w$ ) occurring at the same time:

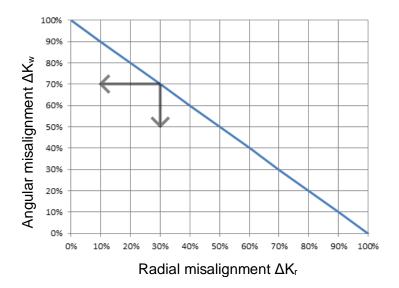


Figure 7.2: Misalignment combination

The misalignment as a percentage is calculated as follows:

$$\Delta K[\%] = \frac{\Delta K}{max. \, permissible \, displacement}$$

More information on the measurement method can be found in chapter 8.2 Assembly.

RINGSPANN	Installation and opera elastic jaw coup	E 06.707			
As of: 24.09.2020	Version: 01	Signed: SCCE	Checked: SCHW	Number of pa- ges: 22	Page: 9

#### 7.3. Manufacturing the hub bore



#### Life-threatening danger!

The max. permissible bore diameters specified in table 7.3 may not be exceeded. If the permissible values are exceeded, the hub could tear during operation. Here, there is life-threatening danger due to flying parts.

	Bore d1/d2 [mm]							
Size	Hub	type 0	Hub	type I	Hub t	ype II		
	min.	max.	min.	max.	min.	max.		
0019	6	19	19	24	-	-		
0024	9	24	22	28	-	-		
0028	10	28	28	38	-	-		
0038	12	40	38	48	12	48		
0042	14	45	42	55	14	55		
0048	15	52	48	62	15	62		
0055	20	60	55	74	20	74		
0065	22	70	65	80	22	80		
0075	30	80	75	95	30	95		
0090	40	97	90	110	40	110		

Table 7.3: Permissible bore diameter [mm]

	Bore d1/d2 [inch]							
Size	Hub t	ype 0	Hub	type I	Hub t	ype II		
	min.	max.	min.	max.	min.	max.		
0019	0.24	0.75	0.75	0.94	-	-		
0024	0.35	0.94	0.87	1.25	-	-		
0028	0.39	1.10	1.10	1.50	-	-		
0038	0.47	1.50	1.50	1.75	0.47	1.75		
0042	0.55	1.65	1.65	2.13	0.55	2.13		
0048	0.59	1.88	1.89	2.31	0.59	2.31		
0055	0.79	2.13	2.17	2.75	0.79	2.75		
0065	0.87	2.50	2.56	2.94	0.87	2.94		
0075	1.18	2.94	2.95	3.50	1.18	3.50		
0090	1.57	3.50	3.54	3.94	1.57	3.94		

Table 7.4: Permissible bore diameter [inch]

RINGSPANN	Installation and opera elastic jaw coup	E 06.707			
As of: 24.09.2020	Version: 01	Signed: SCCE	Checked: SCHW	Number of pa- ges: 22	Page: 10

When manufacturing the hub bore, it must be ensured that:

- the hub is precisely aligned,
- the form and positional tolerances in accordance with DIN ISO 286 are adhered to (see figure 7.3).

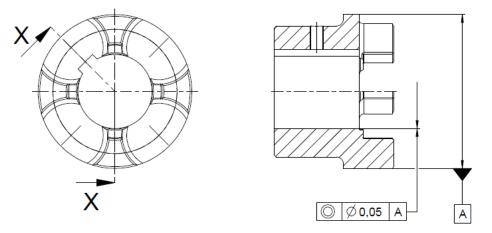


Figure 7.3: Specifications for the form and positional tolerance of the bore and position of the keyway nut

If the hub is to be designed with a keyway, it is preferably to be introduced between the jaws as in figure 7.3. The design and inspection of the keyway connection falls to the operator and is his responsibility.

Bore [mm]	Shaft tolerance	Bore tolerance
≤ 50	k6	
> 50	m6	Π/

Table 7.5: Fit pairs DIN 748/1

RINGSPANN	Installation and operating instructions for elastic jaw coupling REKDCO			E 06.707	
As of: 24.09.2020	Version: 01	Signed: SCCE	Checked: SCHW	Number of pa- ges: 22	Page: 11

Nominal bor	e <sup>1)</sup> diameters	Shaft	Clearan	ce fit <sup>3), 4)</sup>	Interfere	ence fits
From	To (Incl.)	tolerance <sup>2)</sup>	Bore tolerance	Fit	Bore tolerance	Fit
0.4375	1.5000	+0.0000 -0.0005	+0.0010 -0.0000	+0.0015 +0.0000	-0.0005 -0.0010	-0.0000 -0.0010
1.5000	2.0000		+0.0010 -0.0000	+0.0020 +0.0000	-0.0010 -0.0020	-0.0000
2.0000	3.0000				-0.0020	-0.0020
3.0000	4.0000		+0.0015	+0.0025	-0.0015 -0.0030	-0.0005 -0.0030
4.0000	5.0000		-0.0000	+0.0025	-0.0020 -0.0035	-0.0010 -0.0035
5.0000	6.5000				-0.0025 -0.0040	-0.0015 -0.0040
6.5000	7.0000				-0.0025 -0.0040	-0.0015 -0.0040
7.0000	8.0000	+0.0000 -0.0010			-0.0030 -0.0050	-0.0020 -0.0050
8.0000	9.0000				-0.0035 -0.0055	-0.0025 -0.0055
9.0000	10.0000				-0.0040 -0.0060	-0.0030
10.0000	11.0000				-0.0045 -0.0065	-0.0035 -0.0065
11.0000	12.0000				-0.0050 -0.0070	-0.0040 -0.0070
12.0000	13.0000				-0.0055 -0.0075	-0.0045 -0.0075
13.0000	14.0000				-0.0065 -0.0085	-0.0050 -0.0085
14.0000	15.0000				-0.0070 -0.0090	-0.0055 -0.0090
15.0000	16.0000	+0.0000 -0.0015			-0.0075 -0.0100	-0.0060 -0.0100
16.0000	17.0000				-0.0080 -0.0105	-0.0065 -0.0105
17.0000	18.0000				-0.0085 -0.0110	-0.0070 -0.0110
0.500, 0.62 1.9375, 2.0 3.625, 3.75 Agrees with Non-shaded	ominal shaft sizes 5, 0.750, 0.875, 0 00, 2.125, 2.250, 0, 4.000, 4.250, 4 NEMA standard 1 areas are prefer Jefined as Class	.9375, 1.000, 1.1 2.375, 2.4375, 2. .500, 4.750, 5.00 MG 1-4.9 (2010), red.	500, 2.625, 2.75( 0, 5.250, 5.500, 5	0, 2.875, 2.9375,	3.000, 3.250, 3.3	375, 3.500,

#### The following fit pair in accordance with AGMA 9002-C14 is recommended:

Table 7.6: Fit pairs AGMA 9002-C14

Deviating fits are possible and should be communicated to RINGSPANN as part of any query.



#### Note!

The operator bears the sole responsibility for damages that may occur as a result of defective rework on the unbored / pre-bored coupling parts .

RINGSPANN	Installation and operating instructions for elastic jaw coupling REKDCO			E 06.	707
As of: 24.09.2020	Version: 01	Signed: SCCE	Checked: SCHW	Number of pa- ges: 22	Page: 12

Locking screws should be used for axial securing. Here are the following applies:

Bore d1/d2	from	9	22	38	58	75	110
[mm]	to	22	38	58	75	110	260
Size locking scr	ew	M5	M6	M10	M12	M16	M20
Tightening torque [	[lb-in]	18	35	150	354	708	1,239

Table 7.7: Size and tightening torques of metric locking screws

Bore d1/d2	from	0.375	0.938	1.438	1.875	2.313	2.813
[inch]	to	0.875	1.375	1.813	2.250	2.750	3.500
Size locking sc	rew	UNC No 8	UNC No 10	UNC 1/4"	UNC 5/16"	UNC 3/8"	UNC 1/2"
Tightening torque	[lb-in]	23	40	94	183	317	750

Table 7.8: Size and tightening torques of inch locking screws



#### Attention!

RINGSPANN shall not assume any liability for any resulting damages that arise from work carried out by the operator .

RINGSPANN	Installation and operating instructions for elastic jaw coupling REKDCO			E 06.	707
As of: 24.09.2020	Version: 01	Signed: SCCE	Checked: SCHW	Number of pa- ges: 22	Page: 13

#### 7.4. Spider



Figure 7.4: PU 92 Shore-A

Elastomer element PU 92 Shore-A		
Material:	Polyurethane	
Hardness:	92±2 Shore-A	

Hardness:	92±2 Shore-A
Deployment temperature:	-22 °F to 176 °F
Colour:	yellow

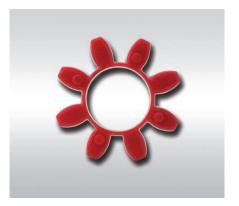


Figure 7.5: PU 95 Shore-A

#### Elastomer element PU 95 Shore-A

Material:	Polyurethane
Hardness:	95±2 Shore-A
Deployment temperature:	-22 °F to 194 °F
Colour:	red

Size	Nominal torque דגא [lb-in]	Max. torque Ткмах [lb-in]
0019	85	173
0024	296	610
0028	800	1,650
0038	1,610	3,300
0042	2,240	4,600
0048	2,620	5,400
0055	3,470	7,100
0065	5,300	10,800
0075	10,800	22,200
0090	20,300	41,700

Table 7.9: Technical specifications PU 92

Size	Nominal torque Τκν [lb-in]	Max. torque Ткмах [Ib-in]
0019	144	283
0024	510	1,010
0028	1,350	2,690
0038	2,750	5,500
0042	3,800	7,600
0048	4,440	8,800
0055	5,800	11,500
0065	8,000	15,800
0075	16,200	32,300
0090	30,400	60,500

Table 7.10: Technical specifications PU 95

#### 8. Assembly

8.1. General assembly instructions

Before beginning with assembly, check for the completeness of the delivery (see chapter 2.3 Parts list) and the dimensional accuracy of the bores, the shaft, the feather key, and the keyway (see 7. Technical prerequisite for reliable operation).

RINGSPANN	Installation and opera elastic jaw coup	•		E 06.	707
As of: 24.09.2020	Version: 01	Signed: SCCE	Checked: SCHW	Number of pa- ges: 22	Page: 14

#### 8.2. Assembly description

1. Mount the hub on the input and output side  $\rightarrow$  if needed, facilitate sliding onto the shaft by heating up the hub (approx. 176°F)



#### Attention!

Use suitable means of protection when working with the heated hubs. Touching the heated hubs without safety gloves causes burns .

- 2. Insert the spider between the jaws of the input-sided or output-sided hub
- 3. Slide the units in axial direction until the S1 measure is achieved (see chapter 2.2 Dimensions)

 $\rightarrow$  if the units are already mounted, the S1 measure can be adjusted by sliding the hubs onto the shaft. Here, a sufficient supporting length of the keyway must be ensured.

 $\rightarrow$  if S1 is not adhered to, the coupling may be damaged.

- 4. Tighten the set screws with the respective tightening torque (see table 7.5 Manufacturing the hub bore),
- 5. Measurement of the misalignments:

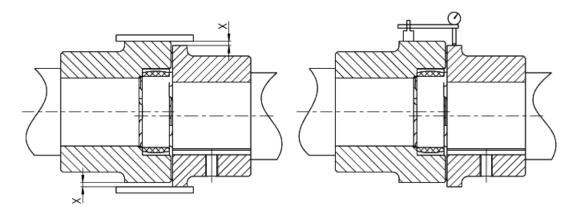


Figure 8.1: Measuring the misalignments

The given misalignments should be measured with suitable measuring equipment, e.g. dial gauge, straightedge, feeler gauge or depth gauge.



#### Information

If the  $d_3$  measure of the spider is greater than the shaft diameter with the inserted keyway, one or two shaft ends may protrude into the spider.

The remaining misalignments should generally be as small as possible. When commissioning, the actual misalignments should be no more than 25% of the max. permissible misalignment figures (see chapter 7.2 Permissible misalignments). The remaining 75% of misalignments provide security against external influences that arise during operation, such as deformation in the machine and thermal expansion.

RINGSPANN	Installation and opera elastic jaw coup	E 06.	707		
As of: 24.09.2020	Version: 01	Signed: SCCE	Checked: SCHW	Number of pa- ges: 22	Page: 15

#### 9. Start-up

Before putting it into operation for the first time, the following parameters need to be checked:

- the tightening torque of all screws,
- the tightness of the set screws,
- the alignment of the coupling,
- the clearance S1.

The operator has the task of attaching a suitable coupling protection to prevent the unintended touching of the coupling during operation. It may only be removed when the machine is at a standstill.

During commissioning, attention must be paid to vibrations and running noises. If any vibrations or unusual running noises should occur, the drive unit must be immediately switched off.

#### **10.** Operational disturbances

Possible operational disturbances are listed in the following table. In order to remedy them, **first bring the unit to a complete stop**, and then follow the further instructions in the column "Remedy". This table only provides a starting point for the search for the cause. All neighbouring components should also be subjected to an examination.

Disturbances	Causes	Remedy	Danger notice for areas with poten- tially explosive at- mosphere
	Alignment error	<ol> <li>Eliminate the cause of the alignment error</li> <li>Carry out wear inspection</li> </ol>	Increased tempera- ture on the spider surface, ignition risk as a result
Changes in sounds or vibra- tions	Spider wear → transfer torque via metal contact	<ol> <li>Disassemble coupling, remove spider residues</li> <li>Check coupling parts, replace damaged parts</li> <li>Insert spider, mount coupling parts</li> <li>Check alignment, correct if necessary</li> </ol>	Ignition risk due to formation of sparks
	Screws for axial hub securing are loose	<ol> <li>Check alignment</li> <li>Tighten screws for hub securing, secure against repeated loosening</li> <li>Carry out wear inspection</li> </ol>	Ignition risk due to hot surfaces and spark formation
Broken Jaw(s)	Spider wear → transfer torque through metal contact	<ol> <li>Replace entire coupling</li> <li>Check alignment</li> </ol>	Ignition risk due to
DIOKEII Jaw(S)	Overload	<ol> <li>Replace entire coupling</li> <li>Check alignment</li> <li>Determine reason for over- load</li> </ol>	spark formation

RINGSPANN	Installation and opera elastic jaw coup	E 06.	707		
As of: 24.09.2020	Version: 01	Signed: SCCE	Checked: SCHW	Number of pa- ges: 22	Page: 16

	Operating param- eters do not cor- respond to the coupling output	1) 2) 3) 1) 2) 3)	Check operating parame- ters, select larger coupling if necessary Install new coupling Check alignment Replace the entire coupling Check alignment Instruct and train operating staff	
	Alignment error	1) 2)	Eliminate the reason for the alignment error Carry out wear inspection	Increased tempera- ture on the spider surface, ignition risk as a result
Premature spi- der wear	Physical changes due e.g. to too low/high ambient temperature, con- tact with aggres- sive liquids	<ol> <li>1)</li> <li>2)</li> <li>3)</li> <li>4)</li> <li>5)</li> <li>1)</li> </ol>	Disassemble coupling, re- move spider residues Check coupling parts, re- place damaged parts Insert spider, install cou- pling parts Check alignment, correct if necessary Ensure that all triggers for the physical changes have been eliminated Disassemble coupling, re-	
	Impermissible ambient, contact temperatures	2) 3) 4) 5)	move spider residues Check coupling parts, re- place damaged parts Insert spider, install cou- pling parts Check alignment, correct if necessary Check and regulate tem- peratures, possibly select different spider material	Ignition danger due to spark formation for metallic contact of the cams
Spider wear due to liquefaction on the inside of the spider cams	Drive vibrations	1) 2) 3) 4) 5)	Disassemble coupling, re- move spider residues Check coupling parts, re- place damaged parts Insert spider, install cou- pling parts Check alignment, correct if necessary Determine cause of vibra- tions, possibly select spider with smaller/higher shore hardness	

Table 10.1: Operational disturbances

To ensure that the coupling can be operated safely, the specified wear values may not be exceeded.

Size	Wear limit	Tooth width
------	------------	-------------

RINGSPANN	Installation and opera elastic jaw coup	E 06.	707		
As of: 24.09.2020	Version: 01	Signed: SCCE	Checked: SCHW	Number of pa-	Page: 17

	Xmax [inch]	B <sub>new</sub> [inch]
0019	0.118	0.276
0024	0.118	0.354
0028	0.118	0.433
0038	0.118	0.551
0042	0.157	0.630
0048	0.157	0.709
0055	0.197	0.787
0065	0.197	0.906
0075	0.236	1.024
0090	0.315	1.299

Table 10.2: Wear limits

Check these wear values as follows:

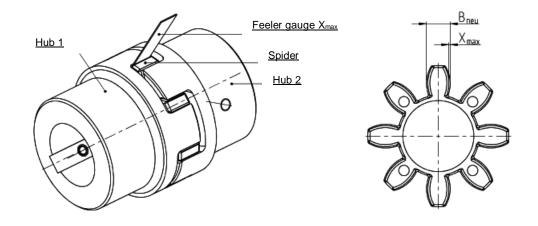


Figure 10.1: Check the wear limit

#### 11. Maintenance and repair

Even if REK ... DCO ranks among the more low-maintenance couplings, it should be subject to a visual inspection at least once a year. This includes:

- examining the coupling alignment,
- examining the coupling for damages,
- examining the screw connections,
- examining the spider wear.

The tightening torques of the screws must be examined at regular intervals.

#### 12. Spare part stockpiling

RINGSPANN	Installation and opera elastic jaw coup	E 06.	707		
As of: 24.09.2020	Version: 01	Signed: SCCE	Checked: SCHW	Number of pa- ges: 22	Page: 18

In order to keep disturbances in operation to a minimum, it is advisable to keep a stock of spare parts directly at the deployment site in order to be able to guarantee optimal operational capability.



Attention! RINGSPANN shall not assume any liability for any occurring damages if spare parts from other manufacturers are used .

#### 13. Disposal

At the end of its operating life:

- plastics must be disposed of via a disposal company,
- metals must be cleaned and disposed of properly with other scrap
  - metal.

Please also properly dispose of the packaging.

#### 14. Supplement for operation in areas with potentially explosive atmosphere

If the elastic shaft coupling REK ... DCO is operated in or in connection with potentially explosive atmosphere, the following supplemental information must also be observed.

#### 14.1 Normal operation

The coupling REK ... DCO is a device in the sense of Directive 2014/34/EU and may only be used in or in connection with explosive atmosphere under observation of the following information.

#### 14.1.1 Explosive atmosphere

Surrounding pressure p <sub>U</sub>	0.8 to 1.1	bar
Oxygen content r <sub>02</sub>	approx. 21	Vol-%

The permissible ambient temperature  $T_a$  depends on the spider material used, see section 3.2.

The use in potentially explosive atmosphere due to explosive dusts or instable substances is excluded.

#### 14.1.2 Instructions for use

Coupling REK ... DCO is designed ignition source-free according to the respective category pursuant to DIN EN ISO 80079-36. The use of coupling REK ... DCO in connection with explosive atmosphere is dependent on the used material and the frame size of the spider. The following approvals apply:

In equipment group I, category M2 or EPL Mb in all frame sizes from 0019 to 0090 with the label:

CE I M2 Ex h Mb X T<sub>a</sub> in accordance with the operating instructions

In equipment group II, category 2G and 2D or EPL Gb and Db in all frame sizes from

0019 to 0090 with the label:

 $\begin{array}{l} \mathsf{CE} \textcircled{\sc {s}} \ \mathsf{II} \ \mathsf{2G} \ \mathsf{Ex} \ \mathsf{h} \ \mathsf{IIC} \ \mathsf{TX} \ \mathsf{Gb} \\ \mathsf{CE} \textcircled{\sc {s}} \ \mathsf{II} \ \mathsf{2D} \ \mathsf{Ex} \ \mathsf{h} \ \mathsf{IIC} \ \mathsf{TX} \ \mathsf{Db} \\ \mathsf{T}_a \ \mathsf{and} \ \mathsf{TX} \ \mathsf{in} \ \mathsf{accordance} \ \mathsf{with} \ \mathsf{the} \ \mathsf{operating} \ \mathsf{instructions} \end{array}$ 

The permissible ambient temperature  $T_a$  and the temperature class (for gases) / max. surface temperature (for dusts) are as follows according to the colour of the spider material:

The minimum ambient temperature amounts to:

Colour	Ambient
Spider material	temperature
yellow red	-40°C≤ Ta -30°C ≤ Ta

The maximum ambient temperature, the temperature class and the maximum surface temperature amount to:

Colour	Ambient	Temperature	max.
Spider material	temperature	class	surface temperature
yellow	T <sub>a</sub> ≤ 55°C	T6	T80°C
red	T <sub>a</sub> ≤ 65°C	T5	T90°C

The elastomers used are not flame retardant. The elastomers of coupling size 0090 have a total weight of more than 0.5 kg. The suitability of this coupling size for use in Group I must be checked by the operator (DIN EN ISO 80079-38:2017, 6.2).

The design limits in accordance with RINGSPANN catalogue "shaft coupling" must be observed. The permissible misalignment values in accordance with the installation and operating instructions may not be exceeded. The coupling may not be operated in the area of natural oscillations.

The coupling materials used may not be chemically influenced by the ambient atmosphere.

To prevent mechanical ignition sources, metallic contact with the turning coupling must be prevented. This can, for example, be ensured using suitable coupling protection (fixed separating protection device). Openings or gaps in/with the separating protective equipment must be designed at least in IP 2X in accordance with IEC 60529. In group I, the coupling protection must be able to withstand the difficult operating conditions.

Couplings are not available in aluminium in group I.

RINGSPANN	Installation and operating instructions for elastic jaw coupling REKDCO			E 06.707	
As of: 24.09.2020	Version: 01	Signed: SCCE	Checked: SCHW	Number of pa- ges: 22	Page: 20



If coupling REK ... DCO is used as a component of a device or an assembly group in the sense of Directive 2014/34/EU, the device manufacturer must establish and confirm the compliance of this device or assembly group with the specified directive before commissioning.

If coupling REK ... DCO is used as a part of a facility, the operator of the facility must adhere to the requirements of Directive 1999/92/EC and if necessary national requirements that go beyond it.

It is the operator's responsibility to review whether coupling REK ... DCO is suitable for operation in the actual given explosive atmosphere based on the instructions for use.

Coupling REK ... DCO does not exhibit any effective ignition sources in disturbance-free operation. Disturbance-free operation must be ensured by the operator through inspection, maintenance and repair in accordance with the information in the installation and operating instructions.

An improperly functioning coupling must be brought to a standstill by the operator. The coupling may only put back into operation after repair.

No burning, welding or cutting works are required for maintenance and repair.

When working in an explosive atmosphere, the operator must take protective measures in accordance with Directive 1999/92/EC, e.g. in accordance with DIN EN 1127-1 appendix A. Smoking, fire and naked flames must be prohibited.

#### 14.3 Setup and assembly



The coupling halves are to be secured against axial misalignment. If the coupling halves are not threaded up against a shaft shoulder, they must be secured with a locking screw. The locking screw is to be secured with an adhesive, Loctite 243 or equivalent, against becoming loose.

To guarantee preventing metallic contact, the coupling halves must be installed with the specified gap " $S_1$ ".

All screws must be tightened with the specified torque.

The spider is made of an insulating material and prevents a direct potential equalisation between the coupling halves. The potential equalisation between the coupling halves must be secured by the unit.

RINGSPANN	Installation and operating instructions for elastic jaw coupling REKDCO			E 06.707	
As of: 24.09.2020	Version: 01	Signed: SCCE	Checked: SCHW	Number of pa- ges: 22	Page: 21



To prevent and recognize disturbances, the following instructions must be observed in addition to the inspection instructions in the installation and operating instructions.

Disturbances must be eliminated immediately under observation of the repair information.

In daily inspections, attention must be paid to changes in running noises or any vibrations that should arise.

The spider may be worn due to friction, meaning that the coupling halves touch and ignitable impact sparks can form. The wear must therefore be regularly examined in accordance with the installation and operating instructions. In the event of impermissible wear, the spider must be replaced.

To preserve the explosion protection concept, only spare parts specified by the manufacturer may be used.

#### 14.6 Testing



Coupling REK ... DCO is to be examined in accordance with Directive 1999/92/EC before commissioning for correct assembly and proper function by a specialist or by RINGSPANN or an authorised RINGSPANN representative. This test must be documented.

Coupling REK ... DCO must at the latest every 3 years be checked for proper function by a specialist or by RINGSPANN or an authorised RINGSPANN representative in accordance with Directive 1999/92/EC. This test must be documented.

RINGSPANN	Installation and operating instructions for elastic jaw coupling REKDCO			E 06.707	
As of: 24.09.2020	Version: 01	Signed: SCCE	Checked: SCHW	Number of pa- ges: 22	Page: 22

#### 15. Declaration of Conformity according to Directive 2014/34/EU

## **EU Declaration of Conformity**

in the sense of the explosion protection directive 2014/34/EU

Hereby declared: RINGSPANN GmbH Schaberweg 30-38 61348 Bad Homburg

that the operating instructions described in the operating instructions are complied with.

Device: Coupling REK...DCO

complies with the essential health and safety requirements of Directive 2014/34/EC, Annex II. The application possibilities result from the marking and the instructions for use in chapter "14. Supplement for operation in areas with potentially explosive atmosphere" of the operating instructions.

The following harmonized standards and/or normative documents have been taken into account, in whole or in part, in the design and manufacture of this equipment:

European standards	National standards / normative documents
DIN EN 1127-1 :2008	
DIN EN 15198 :2007	
DIN EN ISO 80079-36 :2016	
DIN EN ISO 80079-38 :2017	
DIN EN ISO 80079-37 :2017	

The special operating instructions in chapter "14. Supplement for operation in areas with potentially explosive atmosphere " of the Operating Instructions must be observed.

The technical documentation in accordance with Annex VIII, No. 3 has been prepared and deposited with the notified body 0044. The deposit number is <u>35256895</u>.

A. Matin Sellina

Martin Schneweis, Product Manager Shaft Couplings Bad Homburg, 16.12.2019