

**Installation and operating instructions for
grid couplings RES ... EYO/ ... ETO**

E 06.706e



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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 a suspected malfunction, the product, or the machine into which it is built, must be taken out of operation immediately and RINGSPANN CORPORATION or an authorised RINGSPANN agency must be informed.
- The power supply must be turned off during work on electrical components.
- Rotating parts must be secured by the operator against unintentional contact.
- In the case of supplies made to a foreign country, the safety regulations applicable in that country must 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.

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1. General information

1.1. Function

The main function of the grid coupling consists in transferring the torque of a shaft end to another element. Additionally, the coupling is designed to compensate angular, radial and axial misalignments.

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 standards.

The design of the coupling is carried out with the help of operating factors that come from experience (see RINGSPANN catalogue "shaft coupling"). If the operating conditions (e.g. output, speed) should change, the original design of the coupling must be reviewed to determine if it is still the proper selection.

2. Design and function / parts list

2.1. Labeling

Depending on the coupling size, the parts are labeled as follows:

Hubs:

- RINGSPANN logo
- Abbreviated designation

2.2. Dimensions

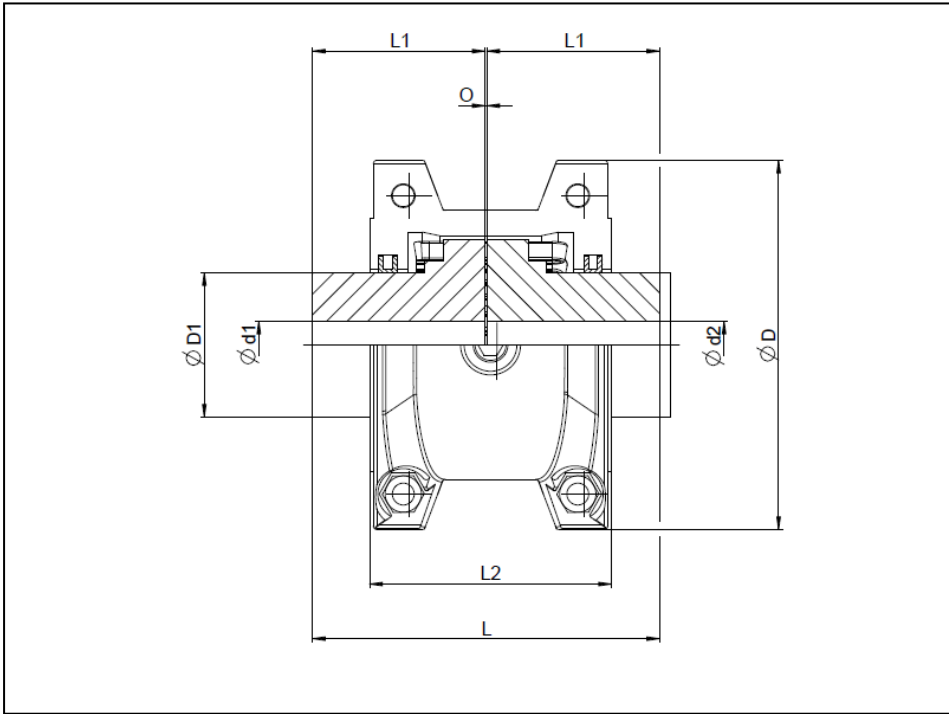


Figure 2.1: Drawing RES ... EYO

Size	D inch	D1 inch	L inch	L1 inch	L2 inch	O inch	Weight at max. bore lbs
1020	4.00	1.56	3.86	1.87	2.62	0.12	4.2
1030	4.33	1.94	3.86	1.87	2.68	0.12	5.7
1040	4.63	2.25	4.11	2.01	2.76	0.12	7.5
1050	5.43	2.63	4.86	2.36	3.13	0.12	12
1060	5.93	3.00	5.12	2.50	3.62	0.12	16
1070	6.38	3.44	6.12	2.99	3.74	0.12	22
1080	7.64	4.13	7.13	3.50	4.57	0.12	40
1090	8.39	4.87	7.87	3.88	4.80	0.12	55
1100	9.84	5.59	9.67	4.74	6.12	0.18	92
1110	10.63	6.31	10.18	5.00	6.36	0.18	119
1120	12.13	7.06	11.99	5.89	7.54	0.24	178
1130	13.62	8.56	12.99	6.38	7.68	0.24	266
1140	15.12	10.00	14.63	7.20	7.91	0.24	392
1150	17.83	10.60	14.65	7.20	10.67	0.24	515
1160	19.74	12.00	15.83	7.80	10.98	0.24	697
1170	22.30	14.00	17.24	8.50	11.97	0.24	986
1180	24.80	15.50	19.04	9.41	12.64	0.24	1,362
1190	26.59	17.20	20.65	10.20	12.80	0.24	1,707
1200	29.80	19.60	22.24	11.00	14.00	0.24	2,327
1210	33.25	21.00	24.51	12.01	17.01	0.50	3,133
1220	36.24	22.50	26.10	12.80	19.29	0.50	3,927

Table 2.1: Dimensions RES ... EYO

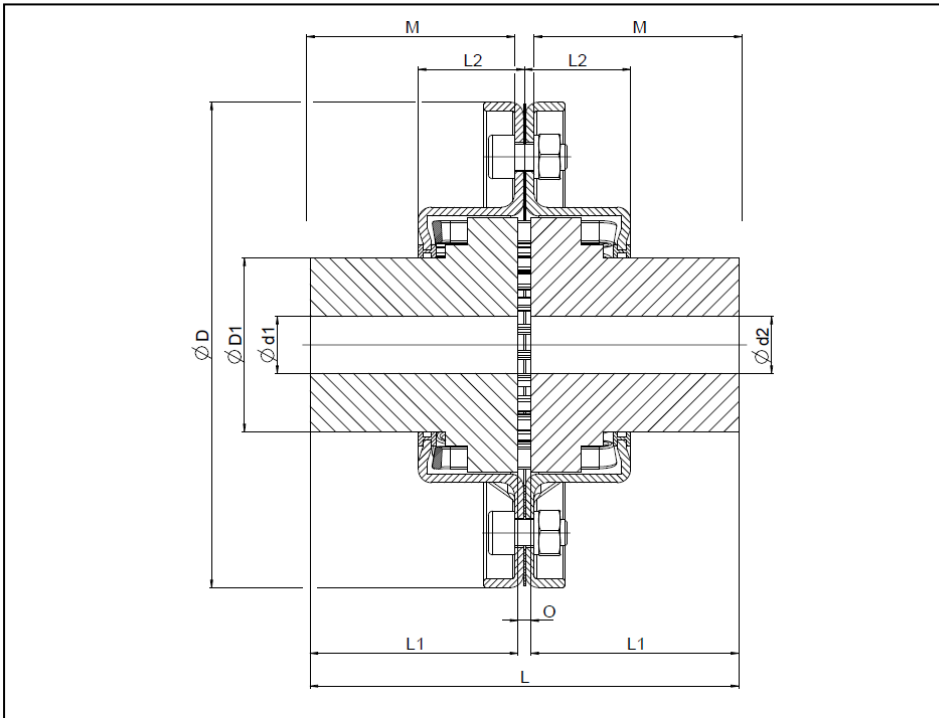


Figure 2.2: Drawing RES ... ETO

Size	D inch	D1 inch	L inch	L1 inch	L2 inch	M inch	O inch	Weight at max. bore lbs
1020	4.37	1.56	3.86	1.87	0.94	1.87	0.12	4.2
1030	4.76	1.94	3.86	1.87	0.98	1.87	0.12	5.7
1040	5.06	2.25	4.11	2.01	1.00	2.01	0.12	7.5
1050	5.81	2.63	4.86	2.38	1.22	2.38	0.12	12
1060	6.38	3.00	5.12	2.50	1.26	2.50	0.12	16
1070	6.81	3.44	6.12	2.99	1.32	2.99	0.12	23
1080	7.87	4.13	7.13	3.50	1.73	3.50	0.12	39
1090	9.13	4.87	7.87	3.88	1.87	3.88	0.12	56
1100	10.51	5.59	9.67	4.74	2.36	4.74	0.18	93
1110	11.26	6.31	10.18	5.00	2.52	5.00	0.18	120
1120	12.56	7.06	11.99	5.87	2.89	5.87	0.24	180
1130	14.88	8.56	12.99	6.38	2.95	6.38	0.24	270
1140	16.38	10.00	14.63	7.20	3.07	7.20	0.24	396
1150	18.76	10.60	14.65	7.20	4.21	7.20	0.24	506
1160	21.00	12.00	15.83	7.80	4.51	7.80	0.24	706
1170	22.99	14.00	17.24	8.50	4.72	8.50	0.24	986
1180	24.80	15.50	19.04	9.41	5.12	9.41	0.24	1,300
1190	26.97	17.20	20.63	10.24	5.31	10.20	0.24	1,674
1200	29.02	19.60	22.24	11.00	5.71	11.00	0.24	2,246

Table 2.2: Dimensions RES ... ETO

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2.3. Parts list

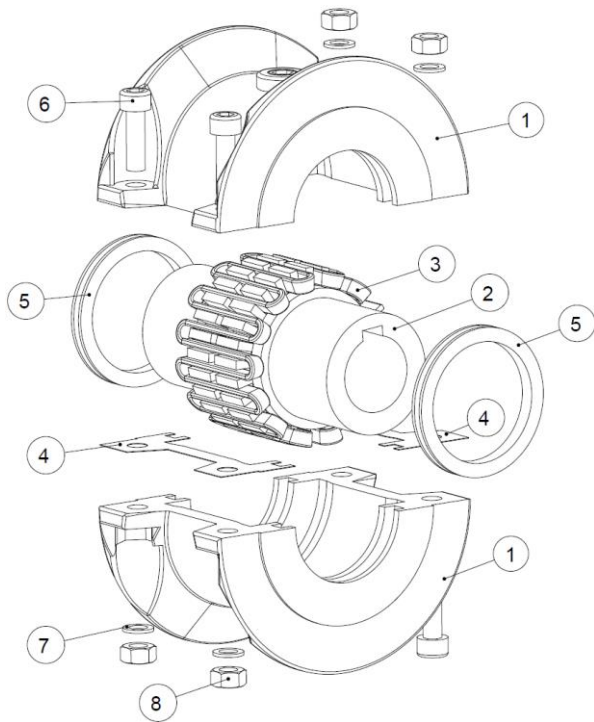


Figure 2.3: RES ... EYO

Position	Quantity	Description
1	2	Half horizontal split cover
2	2	Hub
3	Size dependent	Grid segment
4	2	Gasket
5	2	Seal ring
6	Size dependent	Screw
7	Size dependent	Spring ring
8	Size dependent	Nut

Table 2.3: Parts list RES ... EYO

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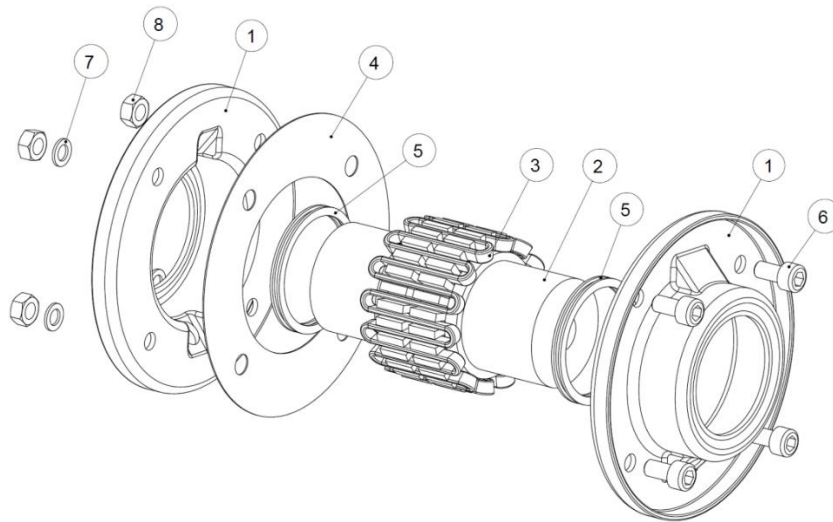


Figure 2.4: RES...ETO

Position	Quantity	Description
1	2	Half vertical split cover
2	2	Hub
3	Size dependent	Grid segment
4	1	Gasket
5	2	Seal ring
6	Size dependent	Screw
7	Size dependent	Spring ring
8	Size dependent	Nut

Tabelle 2.4: Parts list RES...ETO

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,
- authorisation has been given by the company.

The couplings type RES ... EYO and RES ... ETO 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 / non permissible use

Non permissible use is determined if:

- the coupling hubs have been overheated during assembly
- the fit of the parts to be connected has not been coordinated correctly
- the parameters necessary for the selection of the coupling were not considered properly, and/or communicated to RINGSPANN
- the tightening torques of any screw connections do not match specifications
- the coupling is not properly selected for form, fit, and function

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- the shaft-hub-connection (if any used) was not designed correctly
- parts from other manufacturers are used in conjunction with this coupling
- damaged coupling parts are used in conjunction with the coupling

The further operation of coupling type RES...EYO/...ETO is not permissible under the following conditions:

- if the permissible limits of use (torque, speed, misalignments, ...) are exceeded
- exceeding or falling below the permissible temperature limits
- if the wear limit of the parts is reached
- Changes in resonance 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 in a room that has a roof and is dry. The hubs and coupling halves, as well as all screws and nuts, are delivered in preserved condition and can be stored for up to 6 months. In the event of a longer storage, the corrosion protection should be refreshed.

The maximum storage duration of the O-rings is approx. 3 years under optimum storage conditions. The storage, cleaning and maintenance should be carried out in accordance with the provisions of ISO 2230 or DIN 7716. Storage is best carried out in sealed polyethylene bags.

Optimum service life of the coupling is given if the storage rooms:

- have a roof and are dry,
- are free of ozone-producing equipment,
- have a relative humidity of less than 65 %,
- have a storage temperature between +41 °F and +70 °F,
- are free of condensation.

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7. Technical prerequisite for reliable operation

7.1. Permissible operating parameters

Size	RES ... EYO				RES ... ETO			
	Nominal torque T_{KN} lb-in	Nominal power at 100 rpm P_{K100} HP	Max. speed n_{max} rpm	Weight at max. bore lbs	Nominal torque T_{KN} lb-in	Nominal power at 100 rpm P_{K100} HP	Max. speed n_{max} rpm	Weight at max. bore lbs
1020	425	0.7	4,500	4.2	425	0.7	4,500	4.2
1030	1,200	1.9	4,500	5.7	1,200	1.9	4,500	5.7
1040	2,000	3.2	4,500	7.5	2,000	3.2	4,500	7.5
1050	3,500	5.6	4,500	12	3,500	5.6	4,500	12
1060	5,500	8.7	4,350	16	5,500	8.7	4,350	16
1070	8,000	12.7	4,125	22	8,000	12.7	4,125	23
1080	16,500	26.2	3,600	40	16,500	26.2	3,600	39
1090	30,000	47.6	3,600	55	30,000	47.6	3,600	56
1100	50,500	80.1	2,400	92	50,500	80.1	2,400	93
1110	75,000	119	2,250	119	75,000	119	2,250	120
1120	100,000	175	2,025	178	100,000	175	2,025	180
1130	160,000	254	1,800	266	160,000	254	1,800	270
1140	230,000	365	1,650	392	230,000	365	1,650	396
1150	320,000	508	1,500	515	320,000	508	1,500	506
1160	450,000	714	1,350	697	450,000	714	1,350	706
1170	600,000	952	1,225	986	600,000	952	1,225	986
1180	832,000	1,320	1,100	1,362	832,000	1,320	1,100	1,300
1190	1,100,000	1,746	1,050	1,707	1,100,000	1,746	1,050	1,674
1200	1,500,000	2,381	900	2,327	1,500,000	2,381	900	2,246
1210	2,203,500	3,497	820	3,133				
1220	2,973,000	4,719	730	3,927				

Table 7.1: Permissible operating parameters

7.2. Permissible misalignments

Size	Max. permissible misalignments in operation RES ... EYO/... ETO			
	Axial ΔK_a [inch]	Radial ΔK_r [inch]	Angular ΔK_w [°]	Angular $X_{max} \times X_{min}$ [inch]
1020	±0.012	0.012	0.25	0.009
1030				0.011
1040				0.013
1050				0.015
1060				0.018
1070				0.020
1080	±0.018	0.016	0.25	0.024
1090				0.028
1100				0.032
1110				0.035
1120				0.040
1130				0.047
1140	±0.024	0.022	0.25	0.053
1150				0.061
1160				0.070
1170				0.079
1180				0.089
1190				0.096
1200	±0.030	0.030	0.25	0.107
1210				
1220				

Table 7.2: Max. permissible misalignments

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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 misalignment, misalignments must be calculated percentage-wise (see figure 7.2). If not observed, damage to the coupling may result.

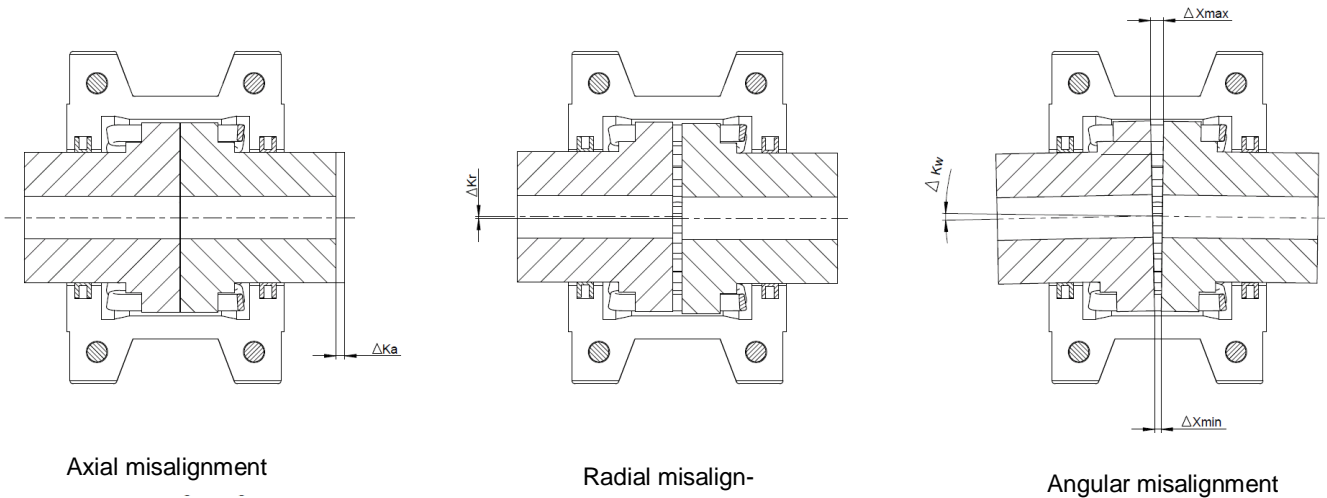


Figure 7.2: Misalignment types

Figure 7.3 shows the relationship for radial (K_r) and angular misalignments (K_w) occurring at the same time:

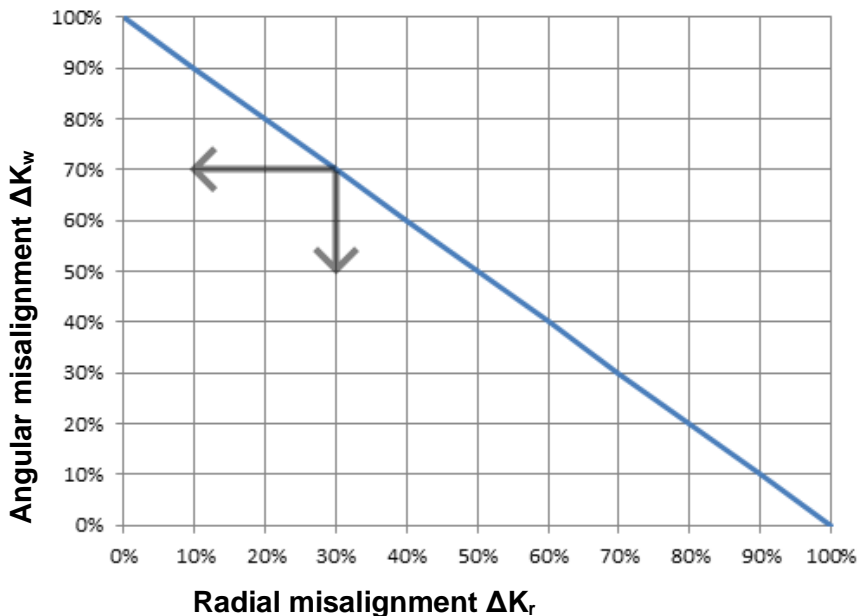



Figure 7.3: Misalignment combination

The misalignment as a percentage is calculated as follows:


$$\Delta K [\%] = \frac{\Delta K}{\text{max. permissible misalignment}} * 100$$

7.3. Hub bore specifications

	<p>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.</p>
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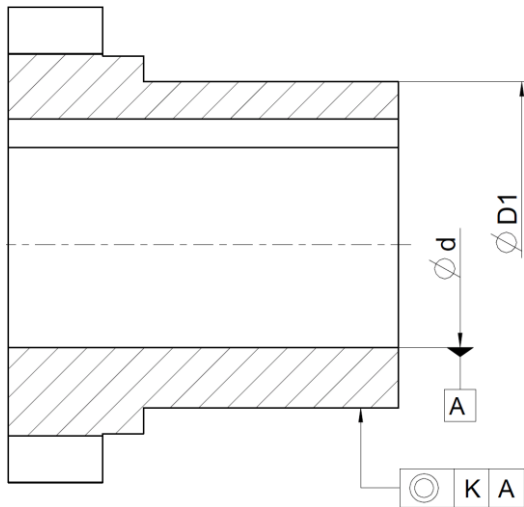
When manufacturing the hub bore, it must be ensured that:

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

	<p>Attention! The sealing surfaces may not be damaged during reworks. The operator bears the sole responsibility for damages that may occur as a result of defective rework on the unbored / pre-bored coupling parts.</p>
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RES ... EYO			RES ... ETO		
Size	Bore d1/d2 [inch]		Size	Bore d1/d2 [inch]	
	min.	max.		min.	max.
1020	0.71	1.125	1020	0.71	1.125
1030	0.71	1.375	1030	0.71	1.375
1040	0.71	1.625	1040	0.71	1.625
1050	0.71	2.875	1050	0.71	2.875
1060	0.79	2.125	1060	0.79	2.125
1070	0.79	2.500	1070	0.79	2.500
1080	1.06	3.000	1080	1.06	3.000
1090	1.06	3.500	1090	1.06	3.500
1100	1.65	4.000	1100	1.65	4.000
1110	1.65	4.500	1110	1.65	4.500
1120	2.40	5.000	1120	2.40	5.000
1130	2.64	6.000	1130	2.64	6.000
1140	2.64	7.250	1140	2.64	7.250
1150	4.25	8.000	1150	4.25	8.000
1160	4.76	9.000	1160	4.76	9.000
1170	5.28	10.000	1170	5.28	10.000
1180	6.02	11.000	1180	6.02	11.000
1190	6.02	12.000	1190	6.02	12.000
1200	7.01	13.000	1200	7.01	13.000
1210	7.01	14.000			
1220	7.99	15.000			

Table 7.3: Permissible bore diameter



Diameter D1 [inch]		Max. permissible concentricity [inch]
from	to	
0.3937	7.0866	0.0020
7.0866	15.7480	0.0035
15.7480	24.8032	0.0043

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

The design and inspection of the keyway connection falls to the operator and is his responsibility.

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The grid couplings in the catalogue are designed with bore tolerance and keyway tolerance per AGMA 9002-C14. Deviating fits are possible and should be communicated to RINGSPANN as part of any query.

The following fit pairs are recommended:

Nominal bore ¹⁾ diameters		Shaft tolerance ²⁾	Clearance fit ^{3), 4)}		Interference fits	
From	To (Incl.)		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	+0.0000 -0.0010	+0.0010 -0.0000	+0.0020 +0.0000	-0.0010 -0.0020	-0.0000 -0.0020
2.0000	3.0000		+0.0015 -0.0000	+0.0025 +0.0000	-0.0015 -0.0030	-0.0005 -0.0030
3.0000	4.0000				-0.0020 -0.0035	-0.0010 -0.0035
4.0000	5.0000				-0.0025 -0.0040	-0.0015 -0.0040
5.0000	6.5000				-0.0025 -0.0040	-0.0015 -0.0040
6.5000	7.0000				-0.0030 -0.0050	-0.0020 -0.0050
7.0000	8.0000				-0.0035 -0.0055	-0.0025 -0.0055
8.0000	9.0000		-0.0040 -0.0060	-0.0030 -0.0060		
9.0000	10.0000		-0.0045 -0.0065	-0.0035 -0.0065		
10.0000	11.0000		-0.0050 -0.0070	-0.0040 -0.0070		
11.0000	12.0000	+0.0000 -0.0015	--	--	-0.0055 -0.0075	-0.0025 -0.0075
12.0000	13.0000				-0.0065 -0.0085	-0.0045 -0.0085
13.0000	14.0000				-0.0070 -0.0090	-0.0050 -0.0090
14.0000	15.0000				-0.0075 -0.0100	-0.0055 -0.0100
15.0000	16.0000				-0.0080 -0.0105	-0.0060 -0.0105
16.0000	17.0000				-0.0085 -0.0110	-0.0065 -0.0110
17.0000	18.0000					

NOTES:
¹⁾ Preferred nominal shaft sizes: 0.500, 0.625, 0.750, 0.875, 0.9375, 1.000, 1.125, 1.1875, 1.250, 1.375, 1.4375, 1.500, 1.625, 1.750, 1.875, 1.9375, 2.000, 2.125, 2.250, 2.375, 2.4375, 2.500, 2.625, 2.750, 2.875, 2.9375, 3.000, 3.250, 3.375, 3.500, 3.625, 3.750, 4.000, 4.250, 4.500, 4.750, 5.000, 5.250, 5.500, 5.750, 6.000, 6.250, 6.500, 6.750, 7.000
²⁾ Agrees with NEMA standard MG 1-4.9 (2010), thru 6.500.
³⁾ Non-shaded areas are preferred.
⁴⁾ Previously defined as Class 1 clearance fits.

Table 7.4: Recommended fit pairs

The axial position is normally achieved through the correct fit on the shaft and does not require any additional securing. In the event of a loose fit between the shaft and hub or vertical installation, additional measures must be taken to secure the axial position. In such cases, a locking screw or a spring washer could be used for this purpose. The need for additional axial securing should be communicated to RINGSPANN as part of any query.

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

Size	1020	1030	1040	1050	1060	1070	1080	1090
Available locking screw sizes, depending on the bore diameter	UNC No. 8	UNC No. 8	UNC No. 8	UNC No. 8	UNC 1/4"	UNC 1/4"	UNC 5/16"	UNC 3/8"
	/ UNC No. 10	/ UNC No. 10	/ UNC No. 10	/ UNC No. 10	/ UNC 1/4"			
Tightening torque [lb-in]	13.5-15 / 32-36	13.5-15 / 32-36	13.5-15 / 32-36 / 80	13.5-15 / 32-36 / 80	80	78-87	150-165	275

Table 7.5: 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.

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 nut and the keyway (see 7. Technical prerequisite for reliable operation).

The parts are to be cleaned of preservatives, the seal rings may not come into contact with solvent or cleaning agents.

8.2. Assembly description RES ... EYO.

1. First, lubricate the seal rings (item 5) and slide them onto the shafts.
2. Mount the hubs (item 2) on the input and output side. The shaft end may not protrude out of the hub for normal applications.
 - facilitated sliding onto the shaft can be achieved by heating up the hub (approx. 80°C)
 - The seal rings (item 5) may not touch the heated-up hubs



Attention!

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

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3. Slide the units in axial direction until the O measure is achieved (see chapter 2.2 Dimensions)
 - if the units have already been securely installed, the O measure can be adjusted by sliding the hubs onto the shaft. A sufficient supporting length of the keyway nut must be ensured.
 - if O is not adhered to, the coupling may be damaged.
4. Align the hubs (item 2) radially and angularly to one another. (see also chapter 8.4)
5. Lubricate the steel grid and steel grid segments and the gearing of the hubs.
6. Insert the steel grid and steel grid segments into the gearing of the hubs. Ensure that the open ends of the steel grid segments show in the same direction. Drive the steel grid with a rubber hammer into the gearing until the steel grid fully sits in the grid teeth.
7. Apply sufficient grease onto the steel grid and hub teeth (see table 9.2)
8. Position the seal rings onto the hub, so that they fit in to the sealing grooves of the cover halves (item 1).
9. Mount the cover halves (item 1) with the seals (item 4), screws (item 6), spring rings (item 7) and nuts (item 8).
 - Ensure that that assembly marks of the cover halves are on the same side

Size	Number of screws	Screw size	Tightening torque T _A [lb-in]
1020	4	M6 x 25	73
1030		M6 x 25	
1040		M6 x 25	
1050		M8 x 30	177
1060		M8 x 30	
1070		M8 x 35	
1080		M8 x 35	
1090	M8 x 35	354	
1100	M10 x 35		
1110	M10 x 35	611	
1120	M12 x 45		
1130	M12 x 45		
1140	M12 x 45		
1150	M12 x 80		
1160	M12 x 80		
1170	M12 x 80		
1180	6	M16 x 100	1505
1190		M20 x 120	3009
1200		M20 x 120	
1210		M20 x 120	
1220	8	M20 x 140	

Table 8.1: Number and tightening torque of housing screws RES ... EYO

8.3. Assembly description RES ... ETO.

1. First, grease the cover halves (item 1) and the seal rings (item 5) and slide them onto the shafts.
2. Mount the hubs (item 2) on the input and output side. The shaft end may not protrude out of the hub for normal applications.
 - facilitated sliding onto the shaft can be achieved by heating up the hub (approx. 80°C)
 - The seal rings (item 5) may not touch the heated-up hubs

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Attention!

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

3. Slide the units in axial direction until the O measure is achieved (see chapter 2.2 Dimensions)
 - if the units have already been securely installed, the O measure can be adjusted by sliding the hubs onto the shaft. A sufficient supporting length of the keyway nut must be ensured.
 - if O is not adhered to, the coupling may be damaged.
4. Align the hubs (item 2) radially and angularly to one another. (see also chapter 8.4)
5. Place the seal (item 4) loosely on one of the shafts.
6. Lubricate the steel grid and steel grid segments and the gearing of the hubs.
7. Insert the steel grid and steel grid segments into the gearing of the hubs. Ensure that the open ends of the steel grid segments show in the same direction. Drive the steel grid with a rubber hammer into the gearing until the steel grid sits fully in the hub teeth.
8. Apply sufficient grease onto the steel grids (see table 9.2).
9. Slide the cover halves (item 1) and the seal rings (item 5) over the hubs and screw the cover halves (item 1) and the seal (item 4) together.
 - Ensure that the lubricant openings up to size 1140 stand at an angle of 180° to one another, and from size 1150 at an angle of 90° to one another.

Size	Number of screws	Screw size	Tightening torque T _A [lb-in]
1020	4	M6 x 15	73
1030	6		
1040			
1050			
1060			
1070		M8 x 15	177
1080			
1090			
1100			
1110	8	M10 x 20	354
1120		M10 x 25	
1130		M14 x 30	
1140			
1150	12	M12 x 35	611
1160	14		
1170	16		
1180	20		
1190	24		
1200			

Table 8.2: Number and tightening torque of housing screws RES ... ETO

8.4. Alignment procedure

For simplification, the suitable measurement method for each type of misalignment will be described. Whereby all misalignment types can occur simultaneously.

The remaining misalignments should generally be as small as possible. The size of the misalignments that may occur during assembly are listed in table 8.2.



Attention!

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

Size	Recommended misalignment values during installation RES ... EYO/... ETO			
	Axial ΔK_a [inch]	Radial ΔK_r [inch]	Angular ΔK_w [°]	Angular $X_{max}-X_{min}$ [inch]
1020	±0.012	0.006	0.063	0.002
1030				0.003
1040				0.003
1050		0.008		0.004
1060				0.004
1070				0.005
1080				0.006
1090	±0.018	0.007		
1100		0.008		
1110	±0.024	0.010		0.009
1120		0.010		0.010
1130				0.012
1140				0.013
1150		0.011		0.015
1160			0.017	
1170		0.012	0.020	
1180	0.022			
1190	0.024			
1200	0.015		0.027	
1210			0.002	
1220			0.003	

Table 8.3: Permissible initial misalignments

8.4.1. Check the radial misalignment

Measure the radial misalignment by laying the straightedge on both hubs (item 1) and measuring the gap between the hubs with the help of a feeler gauge (see figure 8.1).

The straightedge must be aligned with the axis of the hub. This measurement should be repeated multiple times until the point with the largest gap has been found. The size of the gap indicates the radial misalignment at that point. The maximal radial misalignment is given at the point of the largest gap. Alternatively, a depth gauge or dial gauge can also be used.

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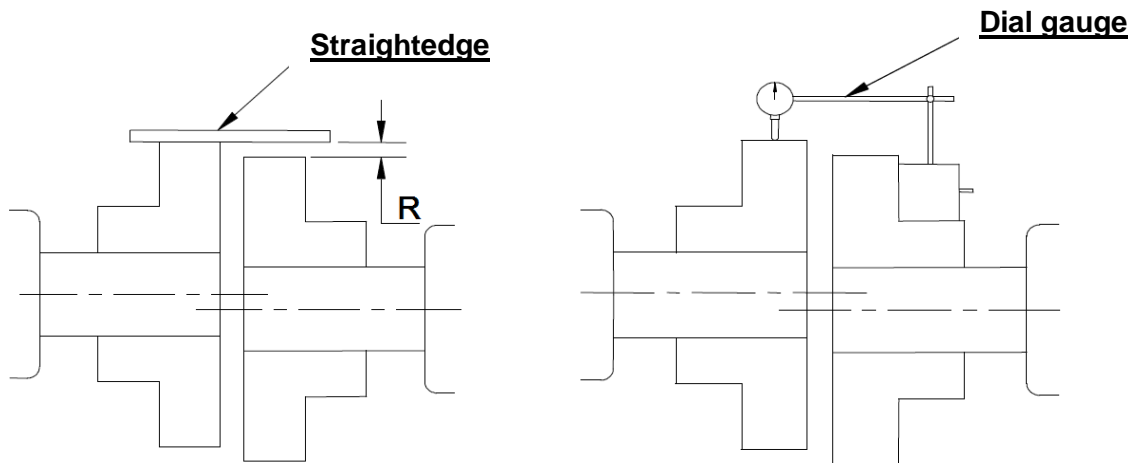


Figure 8.1: Measurement of the radial misalignment

8.4.2. Check the angular misalignment

Determine the maximum ($X_{max.}$) and minimum ($X_{min.}$) distance between the hubs (see figure 7.4) with a feeler gauge. The difference between the values provides the indicator value for the angular misalignment in inch. The indicator value belonging to the respective angular misalignment can be found in table 7.2.

Alternatively, a measurement can be carried out with the dial gauge. To do so, position the dial gauge stand on a hub (item 1) and the volumetric flask onto the machined plane surface of the other hub (item 2), as shown in figure 7.5. It should be positioned as close to the outer diameter as possible. Turn the hub at the coupling RES...EYO/...ETO one full revolution and note the full deflection value. The deflection gives the indicator value for the angular misalignment in mm.

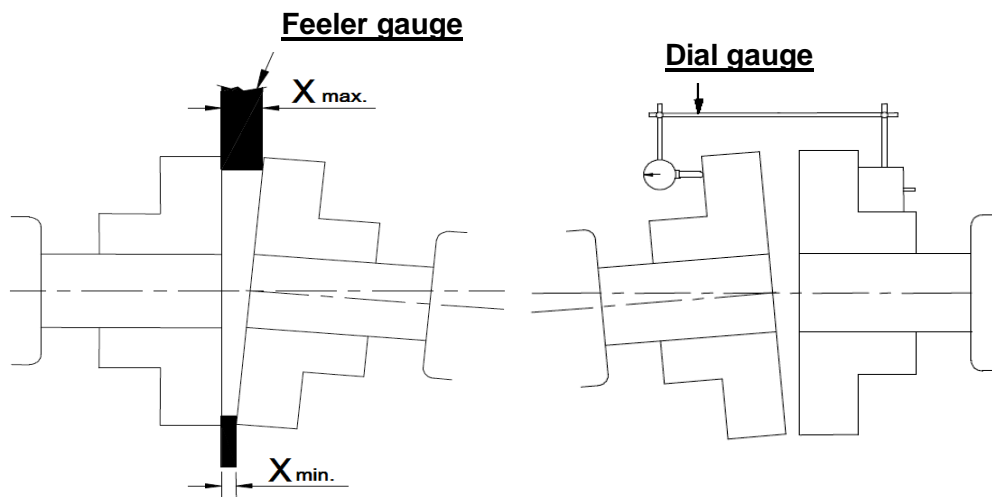


Figure 8.2: Measurement of the angular misalignment

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9. Start-up and lubrication

9.1 Start-up

Before first start, 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 O.

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.

9.2 Lubrication

The initial filling of the coupling with lubricant is described in the following. Only lubricants that have been approved by RINGSPANN may be used.










Manufacturer			
Lubricant	Fibrax 370	Ronex MP	Alvania Grease #2
Manufacturer			
Lubricant	Mobilith SHC 1500 Mobilux EP111 Mobilgrease XTC	Klüberplex	Marfak 1 Marfak EPO
Manufacturer			
Lubricant	Gulfcrown Grease #2	Energrease LS-EP2	EP Conolith #2

Table 9.1 Lubricants approved by RINGSPANN

Before filling the coupling with lubricant, the quantity must be measured in accordance with table 9.2. After the assembly of the steel grid, the lubricant should be applied evenly in the cavity between loops of the steel grid. Afterwards, the seal (item 4) should be inserted and the two housing halves should be screwed together. Excess lubricant must be completely collected and disposed of in an environmentally friendly manner.

Lubricant quantity				
Size	RES ... EYO		RES ... ETO	
	lbs.	oz.	lbs.	oz.
1020	0.07	1.06	0.07	1.06
1030	0.07	1.06	0.07	1.06
1040	0.11	1.76	0.11	1.76
1050	0.11	1.76	0.11	1.76
1060	0.20	3.17	0.20	3.17
1070	0.24	3.89	0.24	3.89
1080	0.38	6.00	0.38	6.00
1090	0.55	8.82	0.55	8.82
1100	0.95	15.71	0.95	15.71
1110	1.12	17.98	1.12	17.98
1120	1.61	25.74	1.61	25.74
1130	2.01	32.10	2.01	32.10
1140	2.49	39.86	2.49	39.86
1150	4.30	68.78	4.30	68.78
1160	6.20	99.12	6.20	99.12
1170	7.69	123.10	7.69	123.10
1180	8.29	132.62	8.29	132.62
1190	9.70	155.20	9.70	155.20
1200	12.39	198.24	12.39	198.24
1210	23.15	370.38		
1220	35.49	567.90		

Table 9.2: Lubricant quantity



Attention!

You may not mix different lubricants. The lubricant must be replaced after 6 months.

To replace the lubricant, we recommend disassembling the housing halves and thoroughly cleaning all parts. Afterwards, the re-filling with lubricant should then subsequently take place as described above.

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10. Operational disturbances

The possible operational disturbances are listed in the following table. In order to remedy them, **first bring the unit to a standstill** 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
Changes in sounds or vibrations	Alignment error	<ol style="list-style-type: none"> 1) Eliminate the cause of the alignment error 2) Carry out wear inspection 3) Re-align the coupling
	Lack of lubricant	<ol style="list-style-type: none"> 1) Carry out wear inspection 2) Replace lubricant 3) Check seals and replace if necessary
Excessive gearing wear	Vibrations in the drivetrain	<ol style="list-style-type: none"> 1) Disassemble coupling 2) Replace damaged parts 3) Find and eliminate cause for the vibrations 4) Align coupling
	Misalignment is outside the permissible range	<ol style="list-style-type: none"> 1) Disassemble coupling and examine 2) Replace worn parts 3) Check alignment, correct if necessary
	Lack of lubricant	<ol style="list-style-type: none"> 1) Carry out wear inspection 2) Replace lubricant 3) Check seals and replace if necessary
Lubricant leaking	Seal rings worn	<ol style="list-style-type: none"> 1) Carry out wear inspection 2) Clean coupling 3) Replace seal rings 4) Fill with lubricant
	Seal ring porous due to false storage or damaged during assembly	<ol style="list-style-type: none"> 1) Carry out wear inspection 2) Clean coupling 3) Optimise storage and eliminate the reason for assembly errors 4) Replace seal rings 5) Fill with lubricant
	Seal rings damaged due to contact with aggressive media, ozone or hot surfaces	<ol style="list-style-type: none"> 1) Carry out wear inspection 2) Clean coupling 3) Eliminate negative influences 4) Replace seal rings 5) Fill with lubricant
Gearing or steel grid breaks	Break due to overload	<ol style="list-style-type: none"> 1) Disassemble coupling 2) Replace damaged parts 3) Eliminate cause of the overload 4) Align coupling

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	The coupling selected was too weak	<ol style="list-style-type: none"> 1) Disassemble coupling 2) Check the design of the coupling 3) Install, align and lubricate larger coupling
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Table 10.1: Operational disturbances

11. Maintenance and repair

The coupling must be regularly inspected and relubricated. The scope of the inspection includes:

- checking the coupling alignment,
- checking the coupling for damages,
- checking the screw connections,
- checking for leakages,
- checking the wear

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

To ensure that the coupling can be safely operated, the specified wear values may not be exceeded. The thickness of the steel band must amount to at least 70% of the thickness in a non-worn state in each position.



Attention!

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

12. 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
- the lubricant must be disposed of in accordance with the applicable regulations

Please also properly dispose of the packaging.