RINGSPANN®
CORPORATION
Power Transmission

# Installation and operating instructions for torsionally stiff gear couplings GFF / GFR

**E 06.710 en**

## 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 Corp.; 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.

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## 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 authorized 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 Corp. or an authorized RINGSPANN 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.

**Contents**

## 1. General information

1.1. Function

The main task of the torsionally stiff gear coupling consists in transferring the torque of one shaft end onto 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 guard or protective device.
- Do not reach into the working area of the coupling during operation.

1.3. Other applicable provisions, standards etc.

The design of the couplings is carried out utilizing applicable AGMA Couplings Standards, along with the help of operating factors that come from experience (see RINGSPANN catalog “Gear Couplings – Series G”). 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 GFF / GFR 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
- Abbreviated designation

Sleeves:

- RINGSPANN logo
- Abbreviated designation

Accessory Kits:

- RINGSPANN logo
- Abbreviated designation

## 2.2. Dimensions

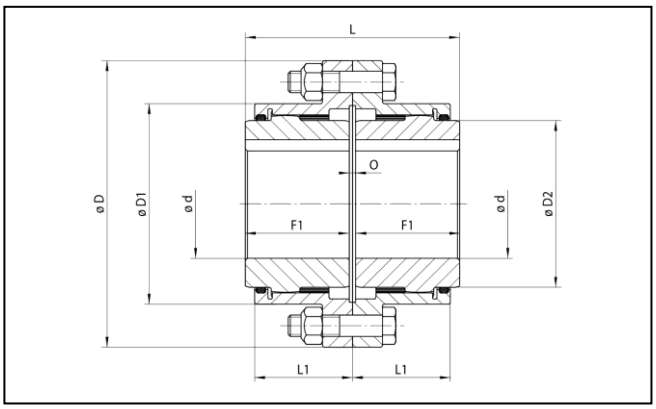



Figure 2.1: Drawing GFF

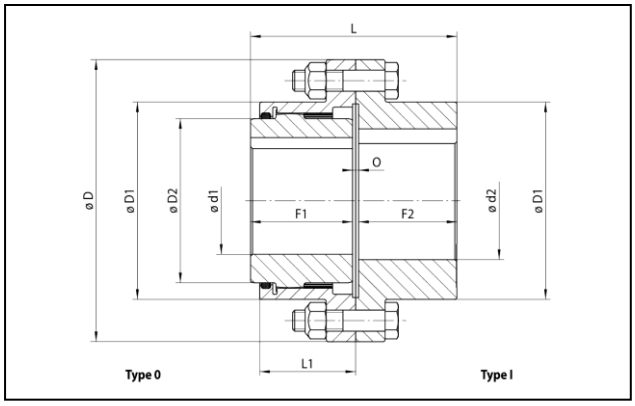



Figure 2.2: Drawing GFR

| Size | Bore: d* | | | D | D1 | D2 | F1 | L | L1 | O |
|---|---|---|---|---|---|---|---|---|---|---|
| | Pilot | Max (SQ) | Max (Red) | | | | | | | |
| | Inch | Inch | Inch | Inch | Inch | Inch | Inch | Inch | Inch | Inch |
| 1010 | Solid | 1.63 | 1.75 | 4.56 | 3.06 | 2.38 | 1.69 | 3.50 | 1.64 | 0.13 |
| 1015 | Solid | 2.25 | 2.38 | 6.00 | 3.92 | 3.13 | 1.94 | 4.00 | 1.82 | 0.13 |
| 1020 | Solid | 2.75 | 3.00 | 7.00 | 4.86 | 4.00 | 2.44 | 5.00 | 2.34 | 0.13 |
| 1025 | Solid | 3.50 | 3.75 | 8.37 | 5.86 | 4.88 | 3.03 | 6.25 | 2.86 | 0.19 |
| 1030 | 1.44 | 4.00 | 4.38 | 9.44 | 6.86 | 5.75 | 3.59 | 7.37 | 3.47 | 0.19 |
| 1035 | 1.44 | 4.50 | 5.00 | 11.00 | 7.88 | 6.50 | 4.19 | 8.63 | 3.91 | 0.25 |
| 1040 | 1.44 | 5.50 | 5.88 | 12.50 | 9.22 | 7.75 | 4.75 | 9.75 | 4.53 | 0.25 |
| 1045 | 2.00 | 6.25 | 6.75 | 13.63 | 10.35 | 9.00 | 5.31 | 10.94 | 5.00 | 0.31 |
| 1050 | 2.69 | 6.75 | 7.00 | 15.31 | 11.44 | 9.50 | 6.03 | 12.38 | 5.78 | 0.31 |
| 1055 | 3.00 | 7.50 | 7.75 | 16.75 | 12.69 | 10.50 | 6.62 | 13.56 | 6.34 | 0.31 |
| 1060 | 3.50 | 8.13 | 8.75 | 18.00 | 13.75 | 11.50 | 7.41 | 15.12 | 6.94 | 0.31 |
| 1070 | 4.00 | 9.63 | 10.25 | 20.75 | 16.00 | 13.50 | 8.69 | 17.75 | 7.95 | 0.38 |

Table 2.1: Dimensions GFF

| Size | Bore: d1 (Flex-Type 0) d2 (Rigid-Type 1) | | | | | D | D1 | D2 | F1 | F2 | L | L1 | O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | d1 (Max.) | | d2 (Max.) | | | | | | | | | |
| | Pilot | SQ | Red. | SQ | Red. | | | | | | | | |
| | Inch | Inch | Inch | Inch | Inch | Inch | Inch | Inch | Inch | Inch | Inch | Inch | Inch |
| 1010 | Solid | 1.63 | 1.75 | 2.25 | 2.38 | 4.56 | 3.06 | 2.38 | 1.69 | 1.59 | 3.44 | 1.64 | 0.16 |
| 1015 | Solid | 2.25 | 2.38 | 2.75 | 2.88 | 6.00 | 3.92 | 3.13 | 1.94 | 1.89 | 4.00 | 1.82 | 0.16 |
| 1020 | Solid | 2.75 | 3.00 | 3.25 | 3.50 | 7.00 | 4.86 | 4.00 | 2.44 | 2.33 | 4.93 | 2.34 | 0.16 |
| 1025 | Solid | 3.50 | 3.75 | 4.38 | 4.50 | 8.37 | 5.86 | 4.88 | 3.03 | 2.92 | 6.12 | 2.86 | 0.19 |
| 1030 | 1.44 | 4.00 | 4.38 | 5.00 | 5.19 | 9.44 | 6.86 | 5.75 | 3.59 | 3.47 | 7.25 | 3.47 | 0.19 |
| 1035 | 1.44 | 4.50 | 5.00 | 5.38 | 5.75 | 11.00 | 7.88 | 6.50 | 4.19 | 3.91 | 8.31 | 3.91 | 0.22 |
| 1040 | 1.44 | 5.50 | 5.88 | 6.50 | 7.00 | 12.50 | 9.22 | 7.75 | 4.75 | 4.56 | 9.63 | 4.53 | 0.31 |
| 1045 | 2.000 | 6.25 | 6.75 | 7.38 | 7.88 | 13.63 | 10.35 | 9.00 | 5.31 | 5.10 | 10.71 | 5.00 | 0.34 |
| 1050 | 2.690 | 6.75 | 7.00 | 7.88 | 8.38 | 15.31 | 11.44 | 9.50 | 6.03 | 5.88 | 12.25 | 5.78 | 0.34 |
| 1055 | 3.000 | 7.50 | 7.75 | 9.00 | 9.25 | 16.75 | 12.69 | 10.50 | 6.62 | 6.12 | 13.77 | 6.34 | 0.34 |
| 1060 | 3.500 | 8.13 | 8.75 | 10.00 | 10.25 | 18.00 | 13.75 | 11.50 | 7.41 | 7.06 | 14.88 | 6.94 | 0.41 |
| 1070 | 4.000 | 9.63 | 10.25 | 11.25 | 12.25 | 20.75 | 16.00 | 13.50 | 8.69 | 8.25 | 17.50 | 7.95 | 0.50 |

Table 2.2: Dimensions GFR

| Size | Weight with solid bore [lbs] | |
|---|---|---|
| | GFF | GFR |
| 1010 | 9 | 9 |
| 1015 | 16 | 16 |
| 1020 | 32 | 33 |
| 1025 | 56 | 59 |
| 1030 | 87 | 90 |
| 1035 | 137 | 140 |
| 1040 | 198 | 210 |
| 1045 | 279 | 290 |
| 1050 | 370 | 390 |
| 1055 | 440 | 460 |
| 1060 | 654 | 695 |
| 1070 | 1013 | 1070 |

Table 2.3: Weight with solid bore GFF/GFR

## 2.3. Parts list

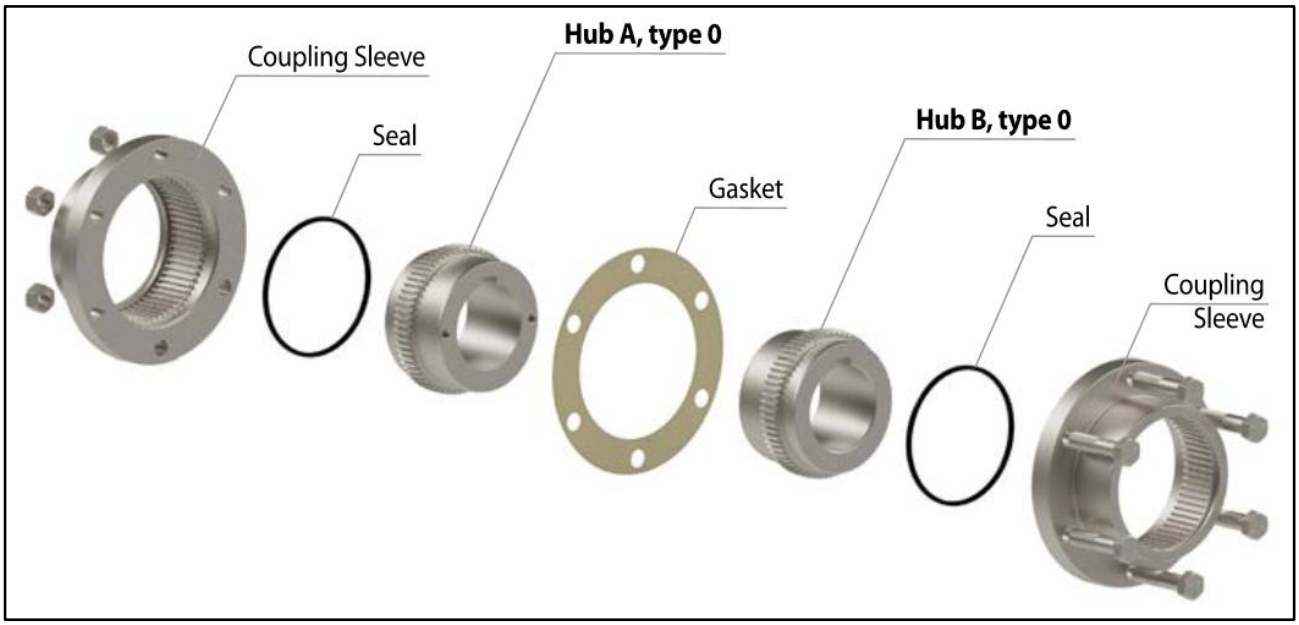



Figure 2.3: GFF

| Position | Quantity | Description |
|---|---|---|
| 1 | 2 | Hub Gear |
| 2 | 2 | Coupling Sleeve |
| 3 | Size dependent | Fitted Bolt |
| 4 | Size dependent | Hexagon Locknut |
| 5 | 1 | Gasket |
| 6 | 4 | Pipe Plug |
| 7 | 2 | Seal – O-Ring |

Table 2.3: Parts list GFF

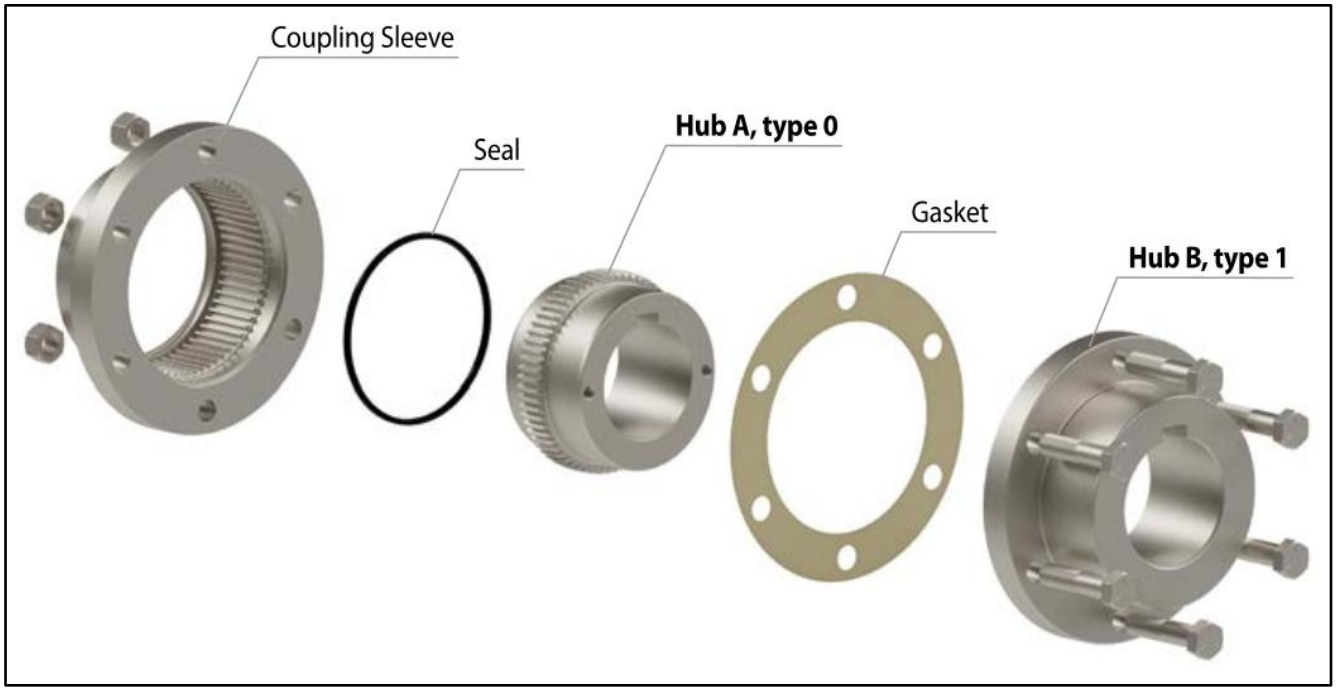



Figure 2.4: GFR

| Position | Quantity | Description |
|---|---|---|
| 1 | 1 | Hub Gear |
| 2 | 1 | Coupling Sleeve |
| 3 | Size dependent | Fitted Bolt |
| 4 | Size dependent | Hexagon Locknut |
| 5 | 1 | Gasket |
| 6 | 2 | Pipe Plug |
| 7 | 1 | Seal – O-Ring |
| 8 | 1 | Rigid Adaptor |

Table 2.4: Parts list GFR

## 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 GFF and GFR 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 unauthorized 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 bolted connection do not correspond with specifications
- the coupling is wrongly fitted
- parts from other manufacturers are used
- damaged coupling parts are used

The further operation of coupling type GFF / GFR 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 damage 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 bolts 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. 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 (5 °C) and +68 °F (20 °C)
- are free of condensation.

## 7. Technical prerequisite for reliable operation

### 7.1. Permissible operating parameters

| | GFF | | | | GFR | | | |
|---|---|---|---|---|---|---|---|---|
| Size | Nominal torque $T_{KN}$ lb-in | Nominal Power at 100 RPM HP | Max. speed $n_{max}$ rpm | Moment of inertia (Solid Hubs) $J_K$ lb-in$^2$ | Nominal torque $T_{KN}$ lb-in | Nominal Power at 100 RPM HP | Max. speed $n_{max}$ rpm | Moment of inertia (Solid Hubs) $J_K$ lb-in² |
| 1010 | 9,600 | 15.3 | 7000 | 18.25 | 9,600 | 15.3 | 7000 | 18.64 |
| 1015 | 17,000 | 27 | 5400 | 63.15 | 17,000 | 27 | 5400 | 66 |
| 1020 | 31,500 | 50 | 4800 | 146.6 | 31,500 | 50 | 4800 | 150 |
| 1025 | 53,550 | 85 | 4300 | 360 | 53,550 | 85 | 4300 | 380 |
| 1030 | 94,500 | 150 | 4000 | 687 | 94,500 | 150 | 4000 | 720 |
| 1035 | 141,500 | 225 | 3600 | 1,488 | 141,500 | 225 | 3600 | 1520 |
| 1040 | 218,500 | 347 | 3200 | 2,835 | 218,500 | 347 | 3200 | 2,895 |
| 1045 | 324,000 | 515 | 3200 | 4,539 | 324,000 | 515 | 3200 | 4,640 |
| 1050 | 415,500 | 660 | 3200 | 8,529 | 415,500 | 660 | 3200 | 9,075 |
| 1055 | 551,000 | 875 | 2400 | 13,535 | 551,000 | 875 | 2400 | 14,180 |
| 1060 | 749,500 | 1190 | 2200 | 17,957 | 749,500 | 1190 | 2200 | 18,670 |
| 1070 | 1,033,000 | 1640 | 1800 | 35,948 | 1,033,000 | 1640 | 1800 | 37,685 |

Table 7.1: Permissible operating parameters

## 7.2. Permissible misalignments

| Size | Max. permissible misalignments GFF | | | Max. permissible misalignments GFR | |
|---|---|---|---|---|---|
| | Axial $\Delta K_a$ [in] | Radial $\Delta K_r$ [in] | Angular $\Delta K_w$ [°] | Axial $\Delta K_a$ [in] | Angular $\Delta K_w$ [°] |
| 1010 | ±0.02 | 0.054 | 1.5 | ±0.01 | 1.5 |
| 1015 | | 0.057 | | | |
| 1020 | | 0.078 | | | |
| 1025 | | 0.102 | | | |
| 1030 | | 0.119 | | | |
| 1035 | ±0.04 | 0.142 | | ±0.02 | |
| 1040 | | 0.163 | | | |
| 1045 | | 0.187 | | | |
| 1050 | | 0.219 | | | |
| 1055 | | 0.245 | | | |
| 1060 | ±0.08 | 0.274 | | ±0.04 | |
| 1070 | | 0.314 | | | |

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 percentagewise (see figure 7.2). If not observed, damage to the coupling may result.

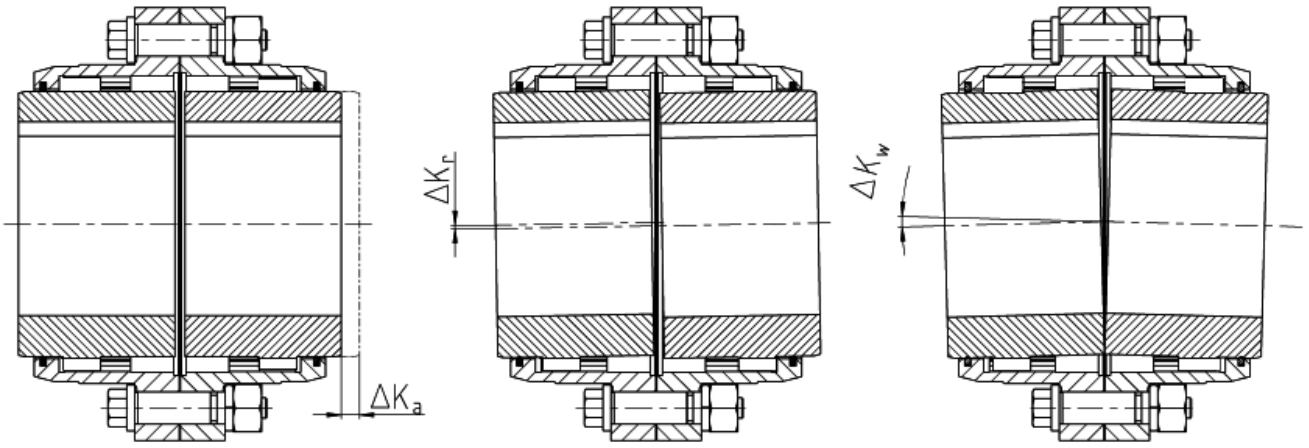



Figure 7.2: Misalignment types

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

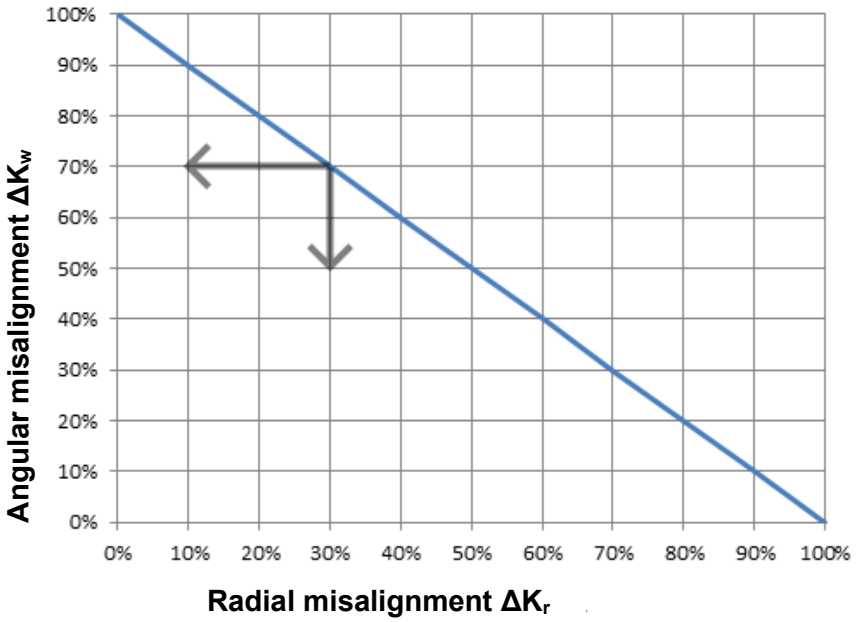



Figure 7.2: Misalignment combination

The misalignment as a percentage is calculated as follows:

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

## 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 fail during operation. Here, there is life-threatening danger due to flying parts.

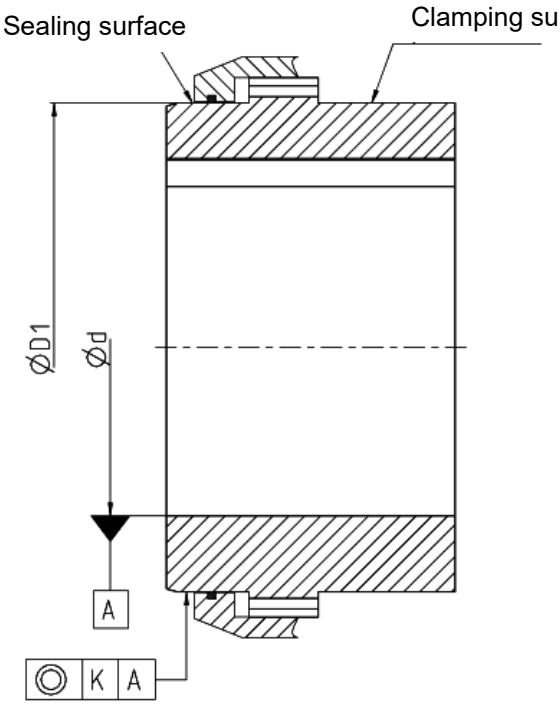
When manufacturing the hub bore, it must be ensured that:

- the hub is precisely aligned,
- the form and positional tolerances in accordance with ANSI Y14.5 are adhered to (see figure 7.3).

**Attention!**

Never clamp onto the sealing surface! The operator bears the sole responsibility for the damages that can arise due to defective rework on the unbored / roughly bored coupling parts.

For maximum bores sizes for each coupling size, refer to Tables 2.1 and 2.2 on Page 5.




| Diameter D1 | | Max. permissible concentricity |
|---|---|---|
| from | to | |
| .393” (10mm) | 7.08” (180mm) | .002” (0.05mm) |
| 7.09” (181mm) | 15.75” (400mm) | .0035” (0.09mm) |
| 15.76” (401mm) | 24.80” (630mm) | .0043” (0.11mm) |

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

RINGSPANN recommends the use of Interference Fits, per AGMA / ANSI standards for bore and keyway tolerances. Deviances from this should be consulted with RINGSPANN.

The axial position is recommended to be achieved through the correct interference fit on the shaft which does not require any additional securing. The need for additional axial securing should be communicated to RINGSPANN as part of any query.

**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, and the keyway (see 7. Technical prerequisite for reliable operation).
The parts are to be cleaned of preservative agents, the O-rings may not come into contact with solvents or cleaning agents as a result.

8.2. Assembly description

1. Firstly, insert the O-Rings (item 7) into the groove of the Coupling Sleeves (item 2). To ensure that they don't fall out, you can apply a small amount of approved grease into the groove. Also lubricate the sealing plane surfaces of the Coupling Sleeves.

2. Slide the Coupling Sleeves (item 2) onto the shaft ends. Ensure hereby that the O-rings (item 7) are not damaged.

3. Mount the Hub Gear (item 1) 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. 176°F or 80°C)
   → the O-Rings (item 7) may not touch the heated-up Hubs here

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

4. Slide the units in axial direction until the "O" dim. is achieved (see chapter 2.2 Dimensions)
   → if the units are already mounted, the "O" dim. can be adjusted by sliding the Hubs onto the shaft. Here, a sufficient supporting length of the keyway must be ensured.
   → if "O" is not adhered to, the coupling may be damaged.
   - align the Hubs (item 1) to one another.
   - the available misalignments should be measured using suitable measuring equipment e.g. dial gauge, straightedge, feeler gauge or depth gauge.
   - the maximum permissible misalignments may not be exceeded.

5. Lightly lubricate the gearing of the Coupling Sleeves (item 2) with lubricant and slide on the Hubs (item 1).

6. Align the fit bores of Coupling Sleeves (item 2 and 8) to one another.

7. Insert the Gasket (item 5) between Coupling Sleeves and fasten them together with fitted bolts, as well as the locknuts, and tighten to the specified tightening torque (see table 8.1).

| Size | Number of Bolts | Tightening torque $T_A$ [ft-lb] |
|---|---|---|
| 1010 | 6 | 10 |
| 1015 | 8 | 29 |
| 1020 | 6 | 63 |
| 1025 | 6 | 125 |
| 1030 | 8 | 125 |
| 1035 | 8 | 210 |
| 1040 | 8 | 210 |
| 1045 | 10 | 210 |
| 1050 | 8 | 313 |
| 1055 | 14 | 313 |
| 1060 | 14 | 313 |
| 1070 | 16 | 440 |

Table 8.1: Number and tightening torque of fitted bolts

**Information**

In the event of repeated assembly, it is recommended to replace the gasket (item 6), fitted bolts (item 3), and the locknuts (item 4).

## 8.3. Alignment procedure

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

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

**Attention!**
When putting the coupling 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 external influences that arise during operation, such as deformation in the machine and thermal expansion.

| Size | GFF | | | | GFR | | |
|---|---|---|---|---|---|---|---|
| | Angular misalignment | | Radial misalignment [in] | Axial misalignment [in] | Angular misalignment | | Axial misalignment [in] |
| | Angle per flex. coupling halve [°] | X [in] | | | Angle per flex. coupling halve [°] | X [in] | |
| 1010 | ±0.5° | 0.0118 | 0.0059 | ±0.0049 | ±0.5° | 0.0118 | ±0.0024 |
| 1015 | | 0.0157 | 0.0079 | | | 0.0157 | |
| 1020 | | 0.0197 | 0.0098 | | | 0.0197 | |
| 1025 | | 0.0236 | 0.0118 | | | 0.0236 | |
| 1030 | | 0.0276 | 0.0138 | | | 0.0276 | |
| 1035 | | 0.0315 | 0.0169 | ±0.0098 | | 0.0315 | ±0.0049 |
| 1040 | | 0.0354 | 0.0197 | | | 0.0354 | |
| 1045 | | 0.0394 | 0.0209 | | | 0.0394 | |
| 1050 | | 0.0433 | 0.0256 | | | 0.0433 | |
| 1055 | | 0.0472 | 0.0287 | | | 0.0472 | |
| 1060 | | 0.0512 | 0.0315 | ±0.0197 | | 0.0512 | ±0.0098 |
| 1070 | | 0.0591 | 0.0366 | | | 0.0591 | |

Table 8.2: Permissible initial offsets

**Coupling GFR cannot compensate any radial misalignment.**

### 8.3.1. Check the radial misalignment

Measure the radial misalignment by laying a 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 hereby 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 maximum radial misalignment is given at the point of the largest gap. Alternatively, a depth gauge or dial gauge can also be used.

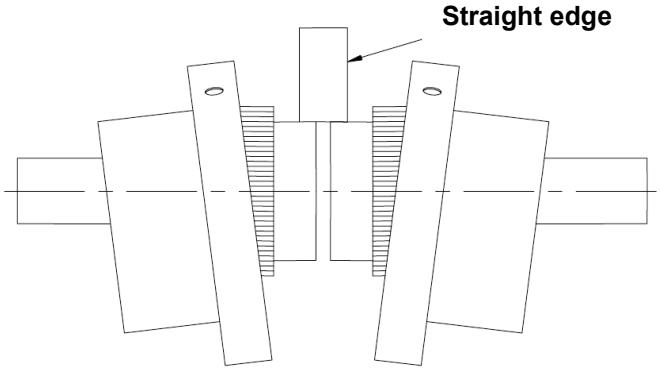



Figure 8.1: Measuring the radial misalignment

8.3.2. Check the angular misalignment

Check the angular offset with the help of dial gauges by measuring the axial run-out at the inner plane surface of the hub (item 1). The dial gauge must hereby be positioned as close to the outer diameter as possible. The angular offset 'X' in inch amounts to half of the calculated total value (see figure 8.2). The values of the angular offsets should not exceed the permissible initial offsets specified in table 8.2.

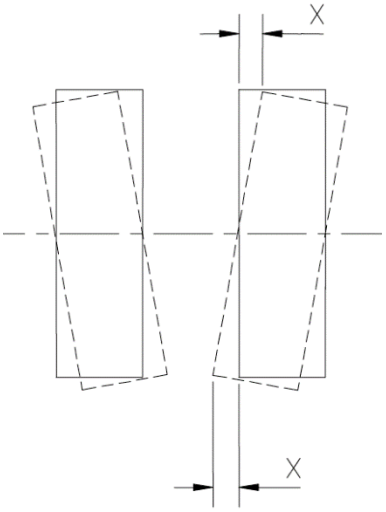



Figure 8.2: Measuring the angular misalignment

## 9. Start-up and lubrication

9.1 Start-up

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

- the tightening torque of all fasteners,
- the tightness of the set screws (if applicable),
- the alignment of the coupling,
- the clearance L.

The operator has the task of mounting 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. We recommend the use of AGMA 9001 compliant coupling lubricant, suitable for the particular operating conditions. Couplings should be disassembled, cleaned, inspected for wear and re-lubricated annually at a minimum, preferably twice a year. Below are some examples of approved lubricants.

| **Manufacturer** | Mobil | ExxonMobil |  |
|---|---|---|---|
| **Lubricant** | **MOBILUX EP111** | **MOBILGREASE XTC** | **Shell Gadus S2 High Speed Coupling Grease** |

Table 9.1 Example Lubricants approved by RINGSPANN

Before filling the coupling with lubricant, the quantity must be measured in accordance with table 9.2. After assembly of the flexible coupling halve, the lubricant should be applied in the cavity between the hub (item 1) and the sleeve (item 2). This approach should be carried out for all flexible coupling halves. Afterwards, the gasket (item 6) should be inserted and the two halves should be fastened together via the fitted bolts. Excess lubricant must be completely collected and disposed of in an environmentally friendly manner.

| Size | GFF Lubricant quantity [lbs] | GFR Lubricant quantity [lbs] |
|---|---|---|
| 1010 | 0.092 | 0.046 |
| 1015 | 0.280 | 0.140 |
| 1020 | 0.400 | 0.200 |
| 1025 | 0.760 | 0.380 |
| 1030 | 1.080 | 0.540 |
| 1035 | 1.640 | 0.820 |
| 1040 | 2.160 | 1.080 |
| 1045 | 3.080 | 1.540 |
| 1050 | 5.160 | 2.580 |
| 1055 | 6.240 | 3.120 |
| 1060 | 6.960 | 3.480 |
| 1070 | 14.080 | 7.040 |

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 flexible coupling halves and thoroughly cleaning all parts. The re-filling with lubricant should then subsequently take place as described above.

## 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 neighboring components should also be subjected to an examination.

| Disturbances | Causes | Remedy |
|---|---|---|
| Changes in sounds or vibrations | Alignment error | 1) Eliminate the cause of the alignment error<br>2) Carry out wear inspection<br>3) Re-align the coupling |
| | Lack of lubricant | 1) Carry out wear inspection<br>2) Replace lubricant<br>3) Check seals and replace if necessary |
| Impermissible gearing wear | Vibrations in the drivetrain | 1) Disassemble coupling<br>2) Replace damaged parts<br>3) Find and eliminate cause for the vibrations<br>4) Align coupling |
| | Misalignment is outside the permissible range | 1) Disassemble coupling and examine<br>2) Replace worn parts<br>3) Check alignment and correct if necessary |
| | Lack of lubricant | 4) Carry out wear inspection<br>5) Replace lubricant<br>6) Check seals and replace if necessary |
| Untightness / lubricant leaks out | O-rings worn | 1) Carry out wear inspection<br>2) Clean coupling<br>3) Replace O-rings<br>4) Fill with lubricant |
| | O-ring porous due to poor storage or damaged during assembly | 1) Carry out wear inspection<br>2) Clean coupling<br>3) Optimize storage and eliminate the reason for assembly errors<br>4) Replace O-rings<br>5) Fill with lubricant |

| | | |
|---|---|---|
| | O-rings damaged due to contact with aggressive media, ozone or hot surfaces | 1) Carry out wear inspection<br>2) Clean coupling<br>3) Eliminate negative influences<br>4) Replace O-rings<br>5) Fill with lubricant |
| Gearing or coupling halve break | Break due to overload | 1) Disassemble coupling<br>2) Replace damaged parts<br>3) Eliminate cause for the overload<br>4) Align coupling |
| | The coupling selected was too weak | 1) Disassemble coupling<br>2) Check the design of the coupling<br>3) Install, align and lubricate larger coupling |

Table 10.1: Operational disturbances

## 11. Maintenance and repair

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

- examining the coupling alignment,
- examining the coupling for damages,
- examining the screw connections,
- checking the tightness,
- check the torsional backlash.

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

To ensure that the coupling can be safely operated, the specified wear values may not be exceeded. The wear due to torsional backlash is measured for the gear coupling.

**Attention!**
The wear measurement needs to be carried out on both coupling halves for coupling GFF .

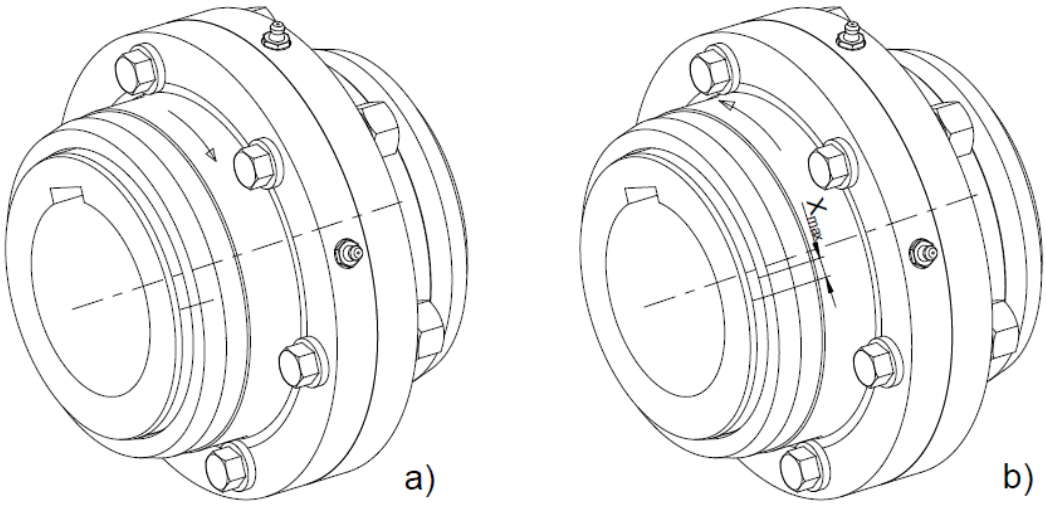



Figure 11.1: Checking the wear limit

## 12. Spare part stockpiling

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,
- dispose of the lubricant under observation of the applicable provisions

Please also properly dispose of the packaging.

**END OF DOCUMENT**