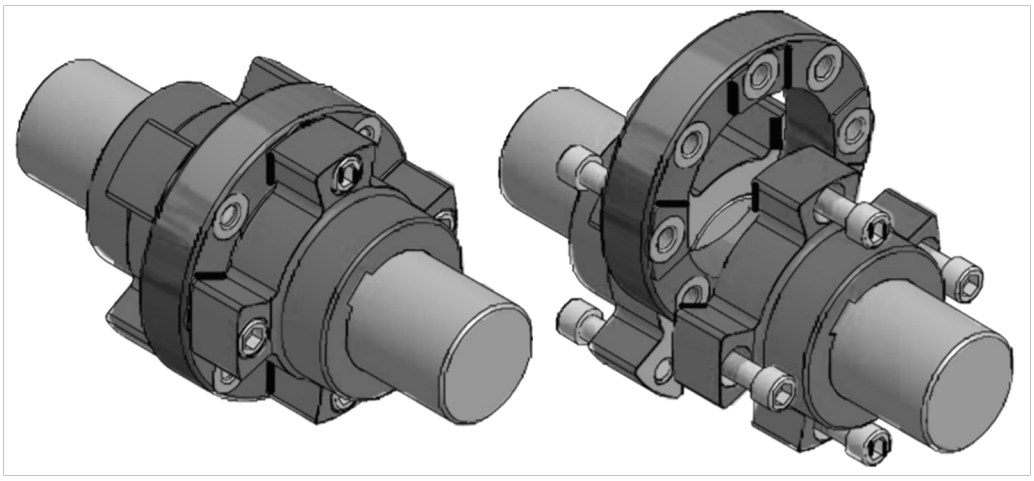
OPERATING INSTRUCTION

ROTOFLEXI Couplings

ROTOFLEXI MANUAL ENGLISH EDIZ.2019-10 COD. 24777-EN



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Operating Instruction

Valid for type G and GN

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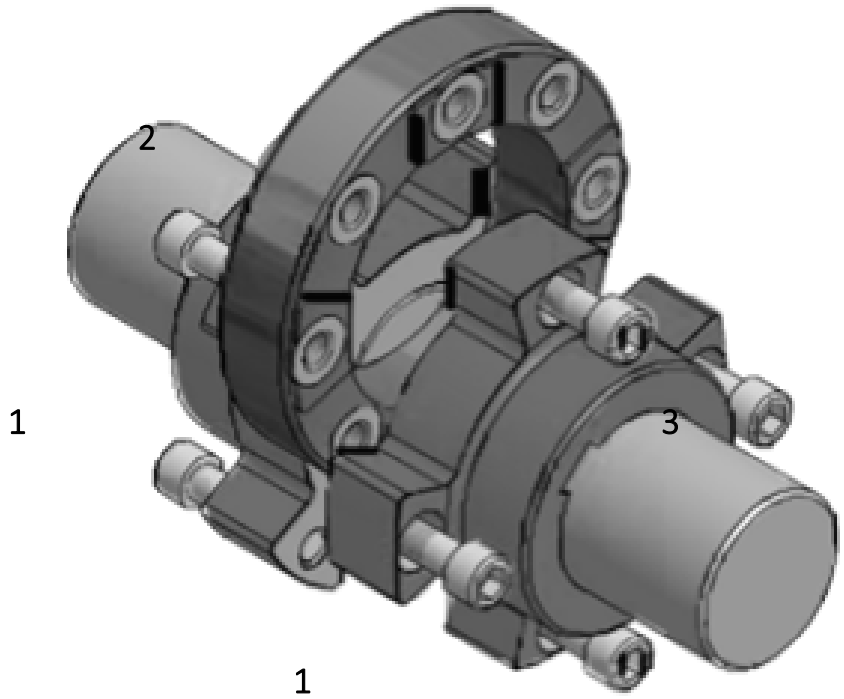
1) Coupling parts

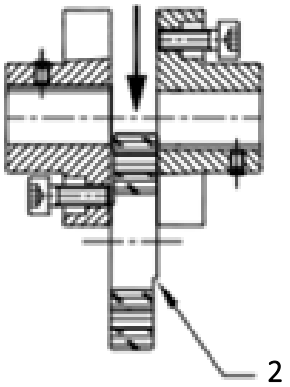
1) Hubs
2) Elastic elements
3) Assembly bolts-nuts

Use only Original Spare Parts



2) Coupling installation

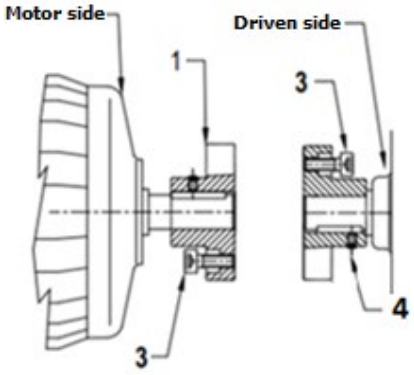
- Remove the elastic element **2**
- Clean the surfaces before assembly
  holes and tree surfaces
- Place hubs in the direction of the shafts
- for big sizes use suitable lifting equipment



(fig. 3)

- Assemble the hubs, **1,** in such a way that the shaft's head are aligned to hubs' internal surface (fig. 4)
  NB preventively insert the screws, **3**, in their seats.
  Tighten the eventual grub screws 4,

Ex <u>in risk of explosion areas, use a medium threadlocker, eg Loctite 222</u>



(fig. 4)

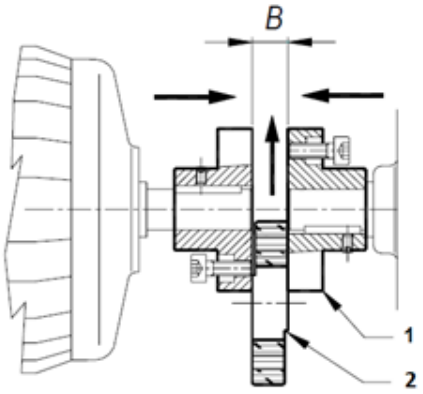
Note: In case of interference between the hole and the shaft it is possible to uniformly heat the hubs from 80 ° C to 100 ° C in this case use gloves to protect your hands.

Ex <u>In risk of explosion areas, consider the danger of ignition</u>

Attenzione: Before inserting the elastic element, make sure that the hubs are at room temperature

- Move the shafts, with the hubs installed , closer, respecting the **B** quote
- Insert the elastic element, **2,** (fig5)
- Align the coupling, in according to the indication of chapter **3** "Coupling alignment"
- Serrare le viti **3** come indicato alla tabella 1

Ex <u>in risk of explosion areas, use a medium threadlocker, eg Loctite 222</u>



(fig5)

- Provide an adeguate coupling protection

tab. 1. Bolts and tightening.

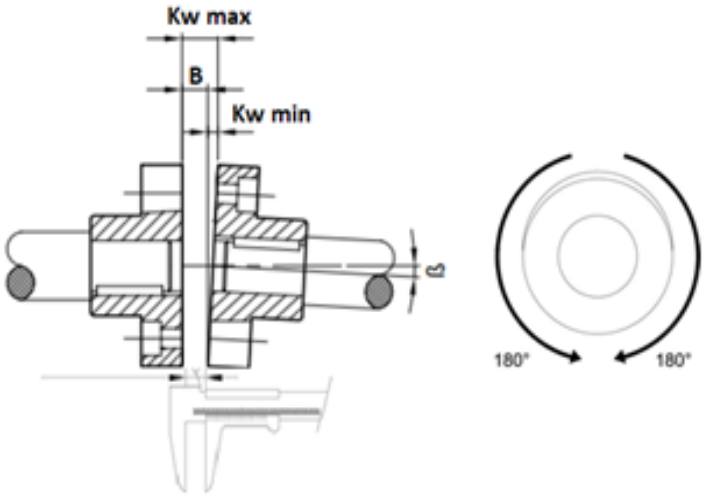
Size	1	2	3	4	5	6	7	8
Torque Nm	25		50	87	138		212	291
Bolts number	6 M8		8 M10	8 M12	8 M14		8 M16	8 M18

3) Alignment of the coupling's ΔKw.

If installing in an explosive zone, the indicated values must be reduced by a half

a) Angular Misalignment

- Rotate the coupling through 360° and determine the maximum deviation between Kw_{max} and Kw_{min}.
- Calculate the angular misalignment $Kw_{max} - Kw_{min} = \Delta Kw$.
- Compare the measured value with the values in table 1, valid up to 1500 rpm.



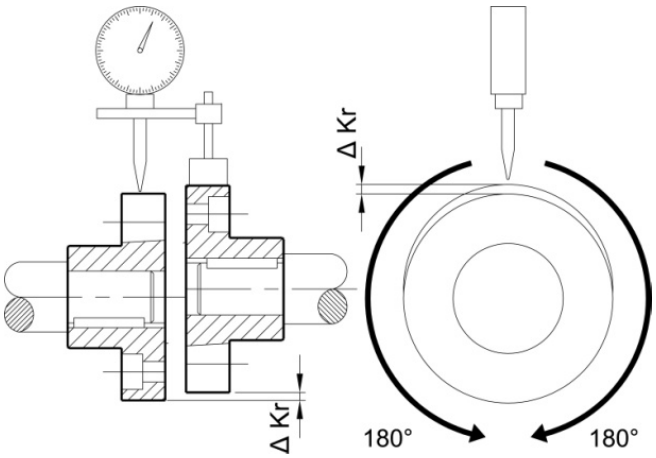
(fig. 6)

tab. 2. Maximum angular misalignment values *

Size	1	2	3	4	5	6	7	8
ΔKw_{max} (mm)	0.3	0.4				0.6		
ΔKw_{max} (°)	1		1.15			1.30		

b) Radial/Parallel Misalignment

- Rotate the coupling through 360° and determine the deviation ΔKr and its minimum & maximum values
- Calculate the radial misalignment $\Delta Kr = \Delta Kr_{max} - \Delta Kr_{min}$.
- Compare the measured value with the values in table 2, valid up to 1500 rpm.



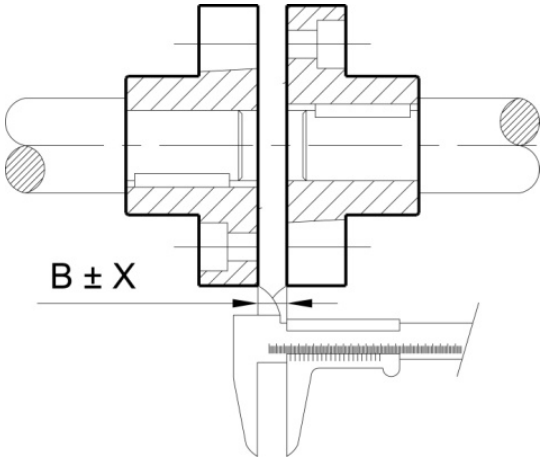
(fig. 7)

tab. 3. Maximum radial misalignment values *

Size	1	2	3	4	5	6	7	8
ΔKw_{max} (mm)	0.3	0.4				0.6		

c) Axial Misalignment

- Measure the axial gap as indicated in (fig. 8)
- Compare the "B" dimension recorded with the table 3 values



(fig.8)

tab. 4. Maximum axial misalignment values*

Size	1	2	3	4	5	6	7	8
B (mm)	15 ± 0.5	22 ± 0.5	30 ± 0.5	34 ± 0.5	38 ± 0.5	42 ± 0.5	48 ± 0.5	56 ± 0.5

* WARNING: the reference values indicated are maximum when the others are at zero.

See below for Simultaneous Alignment

d) Simultaneous misalignment

Examples of simultaneous misalignment, sum of multiple misalignments:

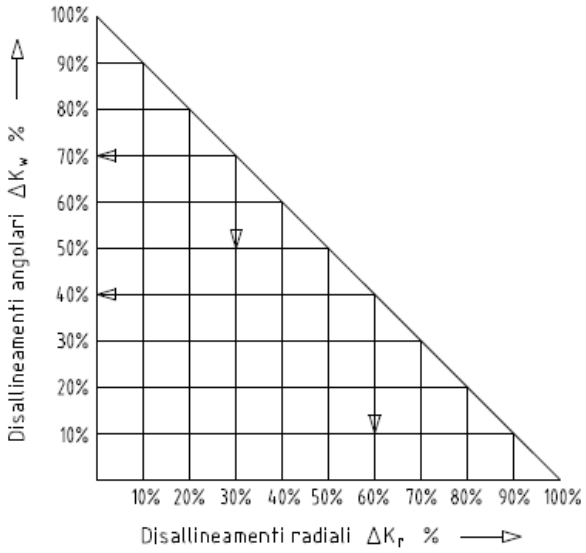
example 1:

ΔKr = 30%
ΔKw = 70%

Example 2:

ΔKr = 40%
ΔKw = 60%

$\Delta K_{total} = \Delta Kr + \Delta Kw \leq 100\%$



(fig. 9)

4) Coupling maintenance

The ROTOELASTIC coupling requires simple maintenance, the working life of the elastic element depends on the operating parameters.

During the routine system checks, you should:

- Check the alignment, see point **3**
- Assess the condition of the elastomer
- Remove any dust or deposits on the coupling parts and elastic element
- Check the tightening of the screws as in table **1.**

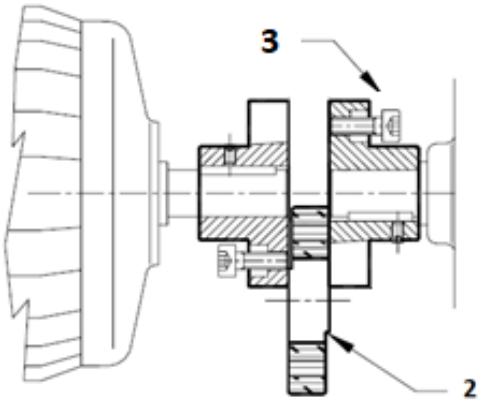
(fig. 10)

a) Inspection and assessment of the condition of the elastic element

- Visually check for any cracks or signs of ageing
- Assessment of the wear and fatigue limit of the elastic element, persistent deformations, squaring of rounded contours. If it is worn, replace it.

b) Replacement of the elastic element

- Loosen the screws **3**
- Remove the elastic element **2**
- Insert the new, elastic element into its seat. (fig. 11)
- Refit the screws and tighten them as indicated in table **1**.



(fig. 11)

5) Inspection intervals

A check of torsional slack and a visual inspection of the coupling elastic element must be performed for the first time after 2,000 operating hours from commissioning, or at latest after 4 months.
If during this first inspection, little or no wear of the elastic element is found and the same operating conditions apply, further inspections may be performed with a 4,000 operating hour interval, or at the latest after 12 months. If signs of severe wear are found during the first inspection, requiring replacement of the elastic element (point 4), proceed as indicated in (points 3-6).

If installing in an explosive zone, the indicated values must be reduced by a half

6) Malfunctions, causes and solutions

RISK	CAUSES	REASON	SOLUTION
The onset of abnormal noises and/or vibrations	Misalignment	Increase in temperature of the elastic element: Ignition hazard due to temperature rise.	1) Stop the motor/take the coupling out of service 2) Eliminate the cause of misalignment, e.g. loose motor fixing bolts, crankcase structural failure, thermal expansion 3) Assess the condition of the elastic element and replace it if necessary 4) Restore the correct alignment.
	Loose axial detent grub screws on the hub	Ignition hazard due to hot surfaces and frictional sparking	1) Stop the motor/take the coupling out of service 2) Check coupling alignment 3) Tighten the hub detent grub screws and secure them so that they do not loosen again 4) Check the wear of the elastic element.
	Loose fixing bolts.		1) Stop the motor/take the coupling out of service 2) Check the wear of the elastic element 3) Tighten the elastic element fastening bolts and secure them so that they do not loosen again 4) Check coupling alignment.
Premature wear of the elastic element	Misalignment	Ignition hazard due to rising temperature of the elastic element	1) Stop the motor/take the coupling out of service 2) Eliminate the cause of misalignment, e.g. loose motor fixing bolts, crankcase structural failure, thermal expansion 3) Assess the condition of the elastic element and replace it if necessary 4) Restore the correct alignment.
	Contact with aggressive liquids or oils, ozone action, and other conditions that cause a physical change of the elastic element	Danger of ignition, spark formation due to contact between internal metal parts	1) Stop the motor/take the coupling out of service 2) Open the coupling and remove rubber residues 3) Check the coupling components, replace any damaged parts of the coupling 4) Insert the new elastic element and mount the coupling components 5) Check and restore proper alignment if necessary.
	High ambient temperatures or contact temperatures that are excessive for the elastic element	Ignition hazard due to rising temperature of the elastic element	1) Stop the motor/take the coupling out of service 2) Open the coupling and remove rubber residues 3) Check the coupling components, replace any damaged parts of the coupling 4) Insert the elastic element and mount the coupling components 5) Check and restore proper alignment if necessary. 6) Check and adjust the ambient/contact temperature, in extreme cases change the type of coupling e.g. use a fully metal coupling.
	The usage parameters do not correspond to the performance of the coupling	Danger of ignition, spark formation due to contact between internal metal parts	1) Stop the motor/take the coupling out of service 2) Check the coupling's operational specifications against the requirements and switch to a higher size if necessary 3) Fit the new coupling and check the alignment.
	Incorrect use of the unit in the system		1) Stop the motor/take the coupling out of service 2) Fit the new coupling and check the alignment 3) Instruct and train personnel in the proper use of the unit.
Accumulation of electrostatic charge	Accumulation of electrostatic charge on the elastic element	Possible spark formation	Ground the motor and the driven machine
	Accumulation of electrostatic charge on metal parts		Ground the motor and the driven machine
	Accumulation of electrostatic charge on coated parts		If painting is required, anti-static paints or coating thicknesses of less than 200 µm should be used

7) Disposal

The coupling should be disposed of in compliance with prevailing environmental regulations

8) Responsibilities

This item must be used only for the functions for which it was designed, in accordance with the standard safety parameters, taking into account the applicable operational parameters and information regarding use, assembly, alignment, control and maintenance indicated in the respective technical catalogue and in these assembly and maintenance instructions. Failure to comply with said information shall free WESTCAR from all liability in this regard.

9) Specific indications for hazardous areas

a. The ROTOFLEXI coupling is suitable and confirmed for use in hazardous areas at risk of explosion. When using the coupling in these areas, observe the special instructions and measures stated in the catalogue and in these instructions.
b. ROTOFLEXI couplings with attached parts capable of generating heat, sparks and electrostatic discharges (e.g. in combination with brake drums/discs and overload systems such as friction joints and impellers) are NOT allowed in explosive areas; in such cases, a separate risk assessment is required.
c. Sizing of the coupling with adequate Service Factor -- in areas at risk of explosion, increase the SF by 20% compared to the standard value for the application.
d. In explosion hazard areas, detent grub screws and/or pins for fastening tapered sleeves must be secured against loosening e.g. bonding with Loctite (medium strength).
e. Conical sleeve assemblies without tabs or keys, self-locking hubs and/or similar solutions devoid of keyways are NOT to be considered admissible in explosive zones.
f. The greater the alignment accuracy of the coupling, the longer its life. Misalignment values must be reduced by 50% in case of use in explosion hazard zones (see point 3).
g. If the couplings are used in areas at risk of dust explosion and in mining areas, excessive accumulation of dust between the coupling and its protective cover must be avoided.
   The coupling must not operate in a dusty environment.

h. If couplings are used in ATEX Zones I and II, protective covers must not be made of metals with a risk of sparking (prefer AISI 316L stainless steel). Aluminium may be used only if the Mg value is less than 7.5% in ATEX Zones IM2, the cover surfaces must be protected with suitable paint coatings.

   These protection covers must be spaced at least 10 mm from the coupling and have adequate ventilation holes.
i. When used in explosion hazard zones and where surface coating is required, the conductivity and thickness requirements of the paint layer must be observed.
   The build-up of electrostatic charges is not expected for coating thicknesses less than 200 µm. When thicknesses exceed 200 µm, appropriate cycles with specific anti-static paints are required.
j. Both the motor and the machine must be grounded.
k. To avoid unforeseeable consequences, perform inspections regularly and check that coupled moving parts are in proper working order.
l. Do not stress the coupling beyond the operating limits prescribed by the speed/torque specifications stated in the catalogue.
m. It is forbidden to tamper with or improperly replace the components of the flexible couplings.