# 1 About the Information sheet

## 1.1 Preliminary documentation

**CAUTION**

The information sheet with the corresponding coupling assembly instructions does not replace the operating manual.
If you have questions on the attachment and the assembly, please contact our Customer Service.
Documentation is also available from www.wittenstein-alpha.de.

## 1.2 Notes regarding the instructions

- These instructions are written for all persons who install and operate this coupling.
- They may only carry out work on the coupling if they have read and understood this information sheet and the corresponding coupling assembly instructions.
- Please pass the safety instructions on to other persons as well.
- Store this documentation within reach near the coupling.

## 1.3 Symbol description

The following signal words are used in this information sheet to warn you of hazards:

**DANGER**

The signal word “DANGER” warns you about an increased injury risk.

**WARNING**

The signal word “WARNING” warns you about an potential injury risk.

**CAUTION**

The signal word “CAUTION” warns you about a low injury risk or property damage.

For special situations, the general warning symbol is replaced by appropriate warning symbols (e.g. “electrical voltage”).

**Dangerous for the environment**

The signal word “Dangerous for the environment” warns you about contamination hazards for the environment.

## 1.4 Customer Service

Please contact our customer service department if you have any technical questions:

WITTENSTEIN alpha

**WITTENSTEIN alpha GmbH**
Walter-Wittenstein-Str. 1
97999 Igersheim, Germany

Tel.: +49 7931 493- 10900
Fax: +49 7931 493- 10903
E-mail: service-alpha@wittenstein.de

## 1.5 Technical modifications

WITTENSTEIN alpha GmbH reserves the right of carrying out technical modifications to improve the product. Modifications or reconstructions of the motor may only be carried out with the express written authorization of WITTENSTEIN alpha GmbH.

## 1.6 Copyright

© 2008, WITTENSTEIN alpha GmbH

## 1.7 Exclusion of liability

The manufacturer does not accept liability for damage or injury ensuing from improper handling of the product.

# 2 Safety

## 2.1 Personnel

**DANGER**

Improperly executed work can lead to injury and damage.

➲ Make sure that the coupling is mounted, operated and maintained only by trained and instructed technicians.

➲ All these tasks should be done only when the machine is at a standstill. Make sure that no one can start the machine while you are working on it.

## 2.2 EC Machinery Directive

Within terms of the EC machinery directive 98/37 EC, the coupling is not considered an autonomous machine, but as a component to install in machines.
Operation is prohibited within the area of validity of the EC directive until it has been determined that the machine in which this product is installed corresponds to the regulations within this directive.

## 2.3 Intended use

- The coupling is designed for use in applications in machine and plant engineering.
- A metal bellows coupling (BC2, BC3, EC2) / flange coupling (BCT) is a flexible shaft coupling requiring little maintenance.
- Function of the metal bellows coupling / flange coupling:
  - Backlash-free, torsional rigid torque transmission by the metal bellows (made of thin-walled, stainless steel) connected by different hubs
  - The metal bellows evens out lateral, axial, and angular shaft misalignments with little restoring forces.
- Conditions for the function are known (e.g. dust, increased humidity, mounting frame, vertical installation, and the such).
- Design of the coupling according to installation conditions has been done (e.g. shaft diameter, permanent operation, and the such).
- *Please refer to our current catalogue or our Internet site for example for the maximum permitted torques: www.wittenstein-alpha.de*

## 2.4 Improper use

Any use transgressing the above-named restrictions (especially higher torques and speeds) is not compliant with the regulations, and is thus prohibited. The operation of the coupling is prohibited if the coupling:

- Is not employed according to the technical data of the catalogue
- Was not mounted according to regulations (e.g., misalignment)
- Was not installed according to regulations (e.g., fastening screws)
- Is very soiled
- Unauthorized modification have been made
- Should you have any other questions, please contact our customer service department.

## 2.5 Delivery status, transport, storage

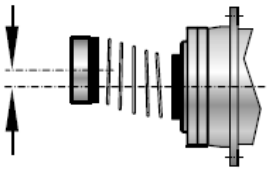
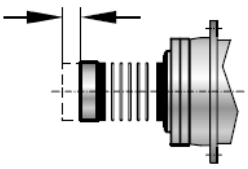
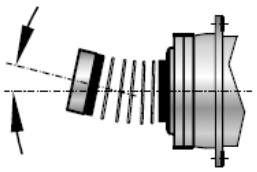
**CAUTION**

Observe the specifications on the coupling's weight.

➲ Use hoisting equipment if necessary to transport the coupling.

- All couplings are delivered ready for installation.
- Please dispose of packing material according to the valid national regulations.

## 2.6 Types of misalignment

| Lateral misalignment (ΔKr) | Axial misalignment (ΔKa) | Angular misalignment (ΔKw) |
|---|---|---|
|  |  |  |
| The lateral misalignment is the term for the misalignment parallel to the shaft axis. [specification in mm] | The axial misalignment is the term for the misalignment in the length of an axis or shaft, that is in axial direction. [specification in mm] | The angular misalignment is the term for the angular misalignment of two shafts towards each other. [specification in °] |

**CAUTION**

Observe the maximum values for axial, lateral, and angular misalignment.

- Make sure that the maximum values are not exceeded during operation. Refer to the catalogue for the maximum values of the misalignments (lateral, axial, angular). They provide reliability to even out operational influences such as heat expansion or the sinking of the foundation.

**CAUTION**

The lateral misalignment is detrimental to the service life of the metal bellows.

- An exact alignment of the metal bellows coupling significantly increases the service life of the metal bellows. The loads for the neighboring bearings are reduced and the smooth running of the entire drive train is influenced positively.
- For drives with very high speeds, we recommend aligning the metal bellows coupling using a dial gauge.

# 3 Working on the coupling

## 3.1 General

**DANGER**

Make sure that the drive is secured against unintentional switching on.

- Switch the drive off before all work on the coupling.
- Secure against unintentional switching back on, for example with signs or by securing the power supply.

**DANGER**

Loose or overloaded screw connections can cause damage.

- Use a calibrated torque wrench basically to tighten and check all screw connections for which tightening torques have been specified.

**CAUTION**

The couplings can be damaged by too much force.

- Never deform the couplings more than 1.5 times the permitted misalignment value in the catalogue.

## 3.2 Cleaning

**CAUTION**

Aggressive cleaning agents can cause corrosion.

- Use only conventional cleaning agents that are grease-dissolving, but not aggressive.
- Please observe the instructions of the detergent manufacturer.

## 3.3 Lubricants

**CAUTION**

Oils and greases with high-pressure additives reduce the clamping force.

- Oils and greases with slide additives (or example MoS2, Molybdän-Disulfit) may not be used.
- Please observe the instructions of the lubricant manufacturers.



**Dangerous for the environment**

Lubricants (oils and greases) are hazardous substances that can contaminate soil and water.

- Dispose of the lubricant according to the valid national directives.

## 3.4 Coupling assembly

**CAUTION**

- When assembling the coupling make sure that the metal bellows is not damaged or bent.
- The torques and the axial misalignments may not exceed the double value **during the assembly**.
- During permanent operation however, the misalignment values and the torques specified in the catalogue may not be exceeded. Only this way will the coupling's service life be ensured. **Special attention should be given to the lateral misalignment** (see values in the catalogue).
- The fit tolerance of the shaft/hub connection has to lie between 0.01 and 0.05.
- Before the assembly, check that the coupling hub runs smoothly on the shaft.
- Keyways in the shaft do not hinder the function of the clamp connection.

| Assembly steps refer to assembly instructions | **BC2/ EC2** | **BC3** | **BCT** |
|---|---|---|---|
| Doc. no. | 2022-D031498_e04 | 2022-D031497_e04 | 2022-D031499_e04 |

### 3.4.1 Assembly BC2/ EC2

**CAUTION**

- To ensure a secure clamping of the hub, the torque values of the fastening screws need to be adhered to exactly.
- For dimensions for applying the mounting bore, refer to catalogue.
- An additional securing of the screw is not necessary.
- To remove the coupling, simply loosen the fastening bolts.

### 3.4.2 Assembly BC3

**CAUTION**

- Be sure to tighten the fastening screws uniformly.
- The tightening of the fastening screws should be done in 3 circulations to avoid jamming the coupling hubs. First, tighten by using a torque wrench in steps (T: 1/3, 2/3) and then in a circle (T: completely).
- The forcing out of the cone sockets in case of repair is safely possible by 3 undetachable forcing screws each.
- The alignment surfaces at the hub outer sides serve to control the hub tension during the assembly.

**WARNING**

Further tightening of the cone sockets is not permitted.

- Tighten screws with no more than 3 rotations. Do not tighten cone socket any further. This is possible, but it can damage the clamp connection.

### 3.4.3 Assembly BCT

**CAUTION**

- Be sure to tighten the fastening screws uniformly.
- The tightening of the fastening screws should be done in 3 circulations (T: 1/3, 2/3 and completely) to avoid jamming the coupling hubs.

## 3.5 Startup

**CAUTION**

Impurities spinning through the air can cause serious injury.

- Before putting the coupling (in the machine) into operation, check that there are no impurities or tools near the coupling.

## 3.6 Operation

**WARNING**

Touching hot surfaces can lead to burns.

- Do not touch the coupling during high operational temperature. Use suitable safety equipment (e.g. gloves).

**WARNING**

Rotating machinery can lead to injury. There is danger of being trapped or pulled in!

- Keep a sufficient distance to rotating machinery.
  Mount appropriate protective equipment to prevent reaching into the work area of the coupling.

**WARNING**

Make sure that the maximum values to lateral misalignment (Kr) and axial misalignment (Ka) are not exceeded during operation.

- Refer to the catalogue for these values.

**WARNING**

The misalignment values and the torques may not be exceeded during permanent operation.

- Only this way will the coupling's service life be ensured. Refer to the catalogue for these values.
- Special attention should be given to the lateral axial misalignment.

**DANGER**

An unintentional start of the machine during maintenance work can lead to serious accidents.

- Make sure that no one can start the machine while you are working on it.

**CAUTION**

Carry out regular visual checks of the coupling.

- Check the entire coupling regularly by carrying out a thorough visual inspection for exterior damage, for example also for corrosion or deforming of metal bellows or damages to the coupling.

# 4 Appendix

## 4.1 Assembly tightening torques

### 4.1.1 Tightening torques BC2/ EC2

A*), B*) = Variant length (refer to ordering code in the catalogue)
a) 2x screws per clamping hub; mounted 180° offset.

| | T [Nm] | | | | |
|---|---|---|---|---|---|
| Series | BC2 A*) | BC2 B*) | EC2 A*) | EC2 B*) | A (ISO 4762) |
| 2 | - | - | 2,3 | 2,3 | M3 |
| 4,5 | - | - | 4 | 4 | M4 |
| 10 | - | - | 4,5 | 4,5 | M4 |
| 15 | 8 | 8 | 8 | 8 | M5 |
| 30 | 15 | 15 | 15 | 15 | M6 |
| 60 | 40 | 40 | 40 | 40 | M8 |
| 80 | 50 | 50 | 70 | 70 | M10 |
| 150 | 70 | 70 | 85 | 85 | M10 |
| 200 | 120 | 120 | - | - | M12 |
| 300 | 130 | 130 | 120 | 120 | M12 |
| 500 | 200 | 200 | 200 | 200 | M16 |
| 800 | 250 | 250 | - | - | 2 x M16 a) |
| 1500 | 470 | 470 | - | - | 2 x M20 a) |

### 4.1.2 Tightening torques BC3

NOTE: Forcing screws (B) for disassembly.

| T [Nm] | | |
|---|---|---|
| Series | BC3 | A (ISO 4017) |
| 15 | 4 | 3 x M4 |
| 30 | 6 | 3 x M5 |
| 60 | 8 | 3 x M5 |
| 150 | 12 | 3 x M6 |
| 200 | 14 | 3 x M6 |
| 300 | 18 | 3 x M8 |
| 500 | 25 | 3 x M8 |
| 800 | 40 | 3 x M10 |
| 1500 | 70 | 6 x M12 |
| 4000 | 120 | 6 x M16 |
| 6000 | 150 | 6 x M16 |
| 10000 | 160 | 8 x M16 |

### 4.1.3 Tightening torques BCT

| Series | Flange size (gearhead / actuator product size | Ø clamping hub [mm] | A (ISO 4017) | $T_A$ [Nm] | B (ISO 4762) | $T_B$ [Nm] | C (ISO 4762) | $T_C$ [Nm] |
|---|---|---|---|---|---|---|---|---|
| BCT 15 | 004 | 12–28 | 8 x M5x16 | 8 | 10 x M4x12 | 4,6 | 1 x M5 | 8 |
| BCT 60 | 010 | 14–35 | 8 x M6x16 | 15 | 10 x M5x16 | 8 | 1 x M8 | 40 |
| BCT 150 | 025 | 19–42 | 12 x M6x16 | 14 | 10 x M6x20 | 14 | 1 x M10 | 75 |
| BCT 300 | 050 | 24–60 | 12 x M8x25 | 40 | 12 x M6x20 | 14 | 1 x M12 | 120 |
| BCT 1500 | 110 | 50–80 | 12 x M10x30 | 75 | 16 x M6x20 | 35 | 2 x M20 | 470 |