

Assembly instructions

## Elastomer coupling

ELC / ELT / EL6 / ECS



**WITTENSTEIN alpha GmbH**

Walter-Wittenstein-Straße 1  
D-97999 Igersheim  
Germany

**Customer Service department**

		✉	)
Deutschland	WITTENSTEIN alpha GmbH	service@wittenstein.de	+49 7931 493-12900
Benelux	WITTENSTEIN BVBA	service@wittenstein.biz	+32 9 326 73 80
Brasil	WITTENSTEIN do Brasil	vendas@wittenstein.com.br	+55 15 3411 6454
中国	威騰斯坦（杭州）实业有限公司	service@wittenstein.cn	+86 571 8869 5856
Österreich	WITTENSTEIN GmbH	office@wittenstein.at	+43 2256 65632-0
Danmark	WITTENSTEIN AB	info@wittenstein.dk	+45 4027 4151
France	WITTENSTEIN sarl	info@wittenstein.fr	+33 134 17 90 95
Great Britain	WITTENSTEIN Ltd.	sales.uk@wittenstein.co.uk	+44 1782 286 427
Italia	WITTENSTEIN S.P.A.	info@wittenstein.it	+39 02 241357-1
日本	ヴィッテンシュタイン株式会社	sales@wittenstein.jp	+81-3-6680-2835
North America	WITTENSTEIN holding Corp.	technicalsupport@wittenstein-us.com	+1 630-540-5300
España	WITTENSTEIN S.L.U.	info@wittenstein.es	+34 93 479 1305
Sverige	WITTENSTEIN AB	info@wittenstein.se	+46 40-26 50 10
Schweiz	WITTENSTEIN AG Schweiz	sales@wittenstein.ch	+41 81 300 10 30
台湾	威騰斯坦有限公司	info@wittenstein.tw	+886 3 287 0191
Türkiye	WITTENSTEIN Güç Aktarma Sistemleri Tic. Ltd. Şti.	info@wittenstein.com.tr	+90 216 709 21 23

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## 1 About this manual

This operating manual contains necessary information to safely operate the coupling.

If this manual is supplied with any amendments (e.g. for special applications), the information in the amendments is primarily and exclusively valid.

The operator must ensure that this operating manual is read and fully understood by all persons assigned to install, operate, or maintain the coupling.

This manual should be stored where it can be easily accessed near the coupling.

Inform colleagues who work in the area around the machine about the **safety and warning notices** to avoid injuries.

The original instructions were prepared in German; all other language versions are translations of these instructions.

### 1.1 Information symbols and cross references

The following information symbols are used:

- Indicates an action to be performed
  - ➔ Indicates the results of an action
- ① Provides additional information about the action

A cross reference refers to the chapter number and the header of the target section (e. g. 2.3 "Intended use").

A cross reference on a table refers to the table number (e. g. Table "Tbl-15").

### 1.2 Scope of delivery

- Check the completeness of the delivery against the delivery note.
  - ① Missing parts or damage must be notified immediately in writing to the carrier, the insurance company, or **WITTENSTEIN alpha GmbH**.

## 2 Safety

These instructions, especially the safety and warning notices and the rules and regulations valid for the operating site, must be observed by all persons working with the coupling.

The following, especially, must be strictly adhered to:

- Observe the instructions for transport and storage.
- Use the coupling only in accordance with its intended use.
- Carry out maintenance and repair work appropriately and professionally in conformity with the specified intervals.
- Always mount, dismantle, and operate the coupling properly (e.g. even test run only with secure mounting).
- In accordance with his risk assessment, the manufacturer of the higher-level machine shall, if necessary, install protective devices and equipment to protect the user from the residual hazards of the coupling. Operate the coupling only if these protective devices and guards are intact and active.
- Prevent the coupling from becoming extremely soiled.
- Only carry out modifications or reconstructions when these are approved in writing by the **WITTENSTEIN alpha GmbH**.

Personal injuries or material damage, or other claims arising from non-observance of these minimum requirements, are the sole responsibility of the operator.

In addition to the safety-related information in this manual, also observe any legal and otherwise applicable rules and regulations, particularly for accident prevention (e.g. personal safety equipment) and environmental protection.

## 2.1 Product conformity

### 2.1.1 Machine safety

The coupling is considered a "machine component" and is therefore not subject to the EC Machinery Directive 2006/42/EC.

Startup is prohibited within the scope of the EC directive until it has been determined that the machine in which this coupling is installed corresponds to the regulations within this directive.

## 2.2 Personnel

Only technicians who have read and understood this operating manual may perform work on the coupling. Based on their training and experience, technicians must be able to evaluate the tasks assigned to them in order to recognize and avoid risks.

## 2.3 Intended use

The coupling is used for torque transmission and is intended for mounting on shafts while complying with the performance data. It is suitable for all industrial applications.

The coupling may not be operated in potentially explosive atmospheres.

The coupling has been constructed according to current technological standards and accepted safety regulations.

- To avoid any hazard to the operator or damage to the machine, use the coupling only in accordance with its intended use and in a technically flawless and safe condition.
- If you notice any altered operating behavior, check the coupling in accordance with chapter 8 "Malfunctions".
- Read the general safety instructions before starting any work (see chapter 2.5 "General safety instructions").

## 2.4 Reasonably foreseeable misuse

Any use is prohibited if

- it contradicts the requirements of chapter 2.3 "Intended use",
- it exceeds the permissible technical data, e.g. speed, force and torque load, temperature, service life (see also chapter 3.3 "Dimensions and performance data").

**2.5 General safety instructions**

The functioning of the coupling involves residual risks even when adhering to the intended use.

**Rotating components** can cause serious injuries:

- Before startup, remove objects, loose components, and tools from the coupling, in order to avoid danger from thrown parts.
- Keep a sufficient distance to moving machine components when the coupling is running.
- Secure the higher-level machine against restarting and unintentional movements during assembly and maintenance work (e.g. uncontrolled lowering of lifting axes).

A **hot coupling** can cause serious burns:

- Only touch the hot coupling with protective gloves.

**Loose or overloaded screw connections** can cause damage to the coupling:

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

**Solvents** are flammable, can cause skin irritation, and can pollute soil and water:

- In case of fire: Do not use a jet of water to extinguish.
  - ① Suitable extinguishing agents are powder, foam, water mist and carbon dioxide.
- Use protective gloves to avoid direct skin contact with solvents.
- Use and dispose of solvents properly.

A **damaged coupling** can cause accidents and injury:

- Immediately shut down the coupling that has been overloaded due to misuse or a machine crash (see chapter 2.4 "Reasonably foreseeable misuse").
- Replace the damaged coupling, even if no external damage is visible.

**2.6 Signal words**

The following signal words are used to indicate possible hazards, prohibitions, and important information:

	<b>⚠ DANGER</b>
	This signal word indicates an imminent danger that will cause serious injuries or even death.
	<b>⚠ WARNING</b>
	This signal word indicates a potential hazard that could cause serious injuries and even death.
	<b>⚠ CAUTION</b>
	This signal word indicates a potential hazard that could cause minor or serious injuries.
	<b>NOTICE</b>
	This signal word indicates a potential hazard that could lead to material damage.
	A note without a signal word indicates application hints or especially important information for handling the coupling.

### 3 Coupling description

The elastomer couplings are plug-in flexible shaft couplings. The torque is transmitted backlash-free via the preloaded elastomer insert. The elastomer insert as intermediate element compensates for axial, angular, as well as lateral shaft misalignments. Through different degrees of hardness of the elastomer insert, the rigidity and the dampening behavior can be varied.

Connection between shaft pinions and hubs can be established in different ways:

- **Clamping hubs - connection (backlash-free)**
- **Tapered clamping ring - connection (backlash-free)**

For the use of the coupling, both external conditions (e.g. dust, high humidity, temperature, etc.) as well as the technical design (torque to be transmitted, maximum speeds, shaft diameter, etc.) should be inspected for compliance with the maximum permissible values listed in our accessories product catalog ([www.wittenstein-alpha.de](http://www.wittenstein-alpha.de)).

#### 3.1 Overview of coupling components

		Coupling components
	C	Clamping hub
	C <sub>7</sub>	Elastomer insert (see chapter 3.1.1 "Elastomer insert")
	H	Clamping screw / Set screw
	I	Clamping ring
	S <sub>2</sub>	Fastening screw

Tbl-1: Overview of coupling components

#### 3.1.1 Elastomer insert

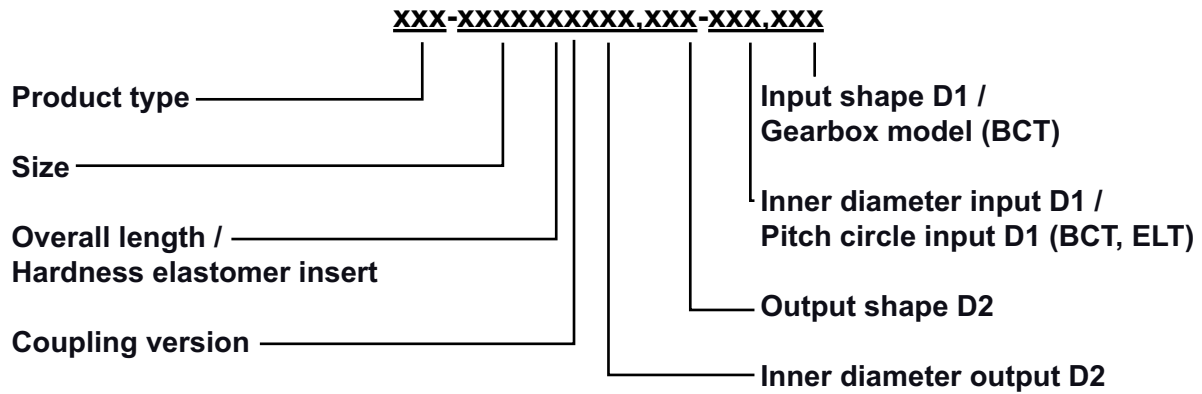
The compensating element of the coupling is the elastomer insert. It transmits the torque without backlash, impact or vibration. The elastomer insert of the coupling determines the behavior of the entire drive train. It is available in three versions.

	Version	Color	Shore hardness	Material	Temperature range	Properties
	A	red	98 Sh A	TPU	-30°C ... +100°C	Good damping
	B	green	64 Sh D	TPU	-30°C ... +120°C	High torsional rigidity
	C	yellow	80 Sh A	TPU	-30°C ... +100°C	Very good damping

Tbl-2: Elastomer insert

### 3.2 Ordering code

① The ordering code is specified on the delivery note.



More information is available in our catalog or at [www.wittenstein-alpha.de](http://www.wittenstein-alpha.de).

### 3.3 Dimensions and performance data

The dimensions, the maximum permissible speeds and torques, and information on the service life can be found

- in our accessories product catalog,
- under [www.wittenstein-alpha.de](http://www.wittenstein-alpha.de)
- in the **cymex**<sup>®</sup> design software,
- in the respective customized performance data (X093–D...).

Consult our Customer Service department if the coupling is older than one year. The user will then receive the valid performance data.





## 4 Transport and storage

### 4.1 Packaging

The coupling is delivered packed in foil and cardboard boxes.

- Dispose of the packaging materials at the recycling sites intended for this purpose. Observe the applicable national regulations concerning disposal.

### 4.2 Transport

	<p style="text-align: center;"><b>⚠ WARNING</b></p> <p><b>Suspended loads can fall and can cause serious injuries and even death.</b></p> <ul style="list-style-type: none"> <li>• Do not stand under suspended loads.</li> <li>• Secure the coupling before transport with suitable fasteners (e.g. belts).</li> </ul>
	<p style="text-align: center;"><b>NOTICE</b></p> <p><b>Hard knocks, for instance because of falling or hard dropping, can damage the coupling.</b></p> <ul style="list-style-type: none"> <li>• Only use hoisting equipment and lifting accessories with sufficient capacity.</li> <li>• Never exceed the maximum permissible load for hoisting equipment.</li> <li>• Slowly put down the coupling.</li> </ul>

The table "Tbl-3" specifies the maximum coupling weights. Depending on the version, the actual weight can be considerably less.

Size EL. / ECS	2	5	10	20	60	150	300	450	800
<b>Maximum weight [kg]</b>	0.008	0.02	0.08	0.12	0.3	0.5	0.9	1.5	9.6

Tbl-3: Maximum weight [kg]

No special transport mode is prescribed for transporting the coupling.

### 4.3 Storage

Store the coupling in a dry area in the closed original packaging.

For storage logistics, we recommend the "first in - first out" method.

## 5 Assembly

- Read the general safety instructions before beginning to work (see Chapter 2.5 "General safety instructions").
- If you have questions about correct mounting, consult our Customer Service department.

### 5.1 Preparations

	<h3>⚠ CAUTION</h3>
	<p><b>Burrs can damage components and cause injury.</b></p> <ul style="list-style-type: none"> <li>• Remove burrs and dirt from components to be connected, such as shafts and couplings, before assembly.</li> <li>• Wear protective gloves.</li> </ul>

	<p><b>Lubricants can reduce the transmission of force in the area of the coupling (slippage).</b></p> <ul style="list-style-type: none"> <li>• Do not use any oils/greases with molybdenum disulfide or other high-pressure additives or gliding pastes.</li> </ul>
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- Clean/de-grease the following components with a clean and lint-free cloth and grease-dissolving, non-aggressive detergent:
  - All fitting surfaces to neighboring components
  - Bores, hubs and the shafts to be connected
- In addition, check the fitting surfaces for damage and impurities.
- Check all connection dimensions (e.g. shafts) and check tolerances (e.g. key dimensions). The coupling has a H7 fit. The fit tolerance of the shaft/hub connection has to lie between 0.01 and 0.05 mm.
- Check that the coupling runs smoothly on the shaft.

During assembly and disassembly, the coupling must not be displaced by more than 1.5 times the permissible misalignment values specified in the catalog.

- Avoid applying any type of force.

#### 5.1.1 Types of misalignment

Axial misalignment ( $\Delta K_a$ )	Angular misalignment ( $\Delta K_w$ )	Lateral misalignment ( $\Delta K_r$ )
<p>The axial misalignment is the term for the misalignment in the length of an axis or shaft, i.e., in the axial direction. [specification in mm]</p>	<p>The angular misalignment is the term for the angular misalignment of two shafts in relation to each other. [specification in °]</p>	<p>The lateral misalignment is the term for the misalignment parallel to the shaft axis. [specification in mm]</p>

Tbl-4: Types of misalignment

	<p><b>Observe maximum values to offset.</b></p> <ul style="list-style-type: none"> <li>• Ensure that the maximum values are not exceeded during operation.</li> <li>• Refer to the catalog for the maximum values of the misalignments (lateral, axial, angular) under <a href="http://www.wittenstein-alpha.de">www.wittenstein-alpha.de</a>.</li> </ul>
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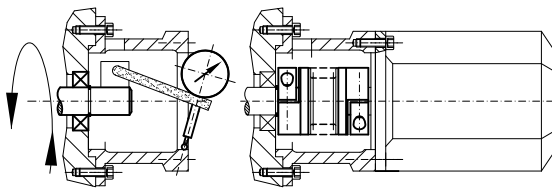
**The lateral misalignment is detrimental to the service life of the metal bellows / elastomer insert.**

**Accurate alignment of the coupling significantly increases the service life of the metal bellows / elastomer insert. The loads for the neighboring bearings are reduced and the smooth running of the entire drive train is influenced positively.**

**For inputs with very high speeds, we recommend aligning the coupling with a dial gauge.**

**5.2 Mounting of the coupling**

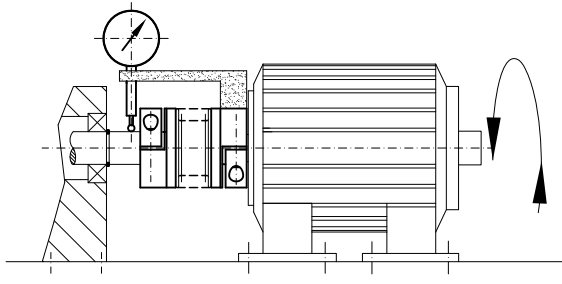
- When mounting the coupling, observe the different types of mounting:



**Installation with intermediate housing**

When the coupling is installed in a housing:

- Arrange the centering of the fit and the plane parallelism of the machine/housing and housing/input as precisely as possible, in order to minimize misalignments.



**Open installation**

For open installation of the coupling between gearbox/motor with feet as well as installation of the connecting load shaft.

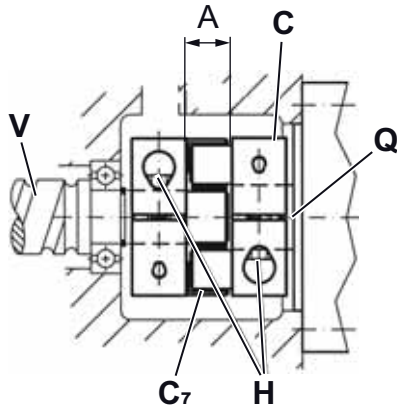
- Carefully and thoroughly perform the alignment using a dial gauge, straight edge, or sensing gauge.

- Check the spacing A of the coupling halves during assembly. The elastomer insert must be axially movable.
  - ① See table "Tbl-5" for spacing.

	Size	2	5	10	20	60	150	300	450	800
	<b>Spacing (A) [mm]</b>	7	9	11.5	16	18	20	24	26	31

Tbl-5: Coupling spacing

### 5.2.1 Mounting of ELC



- Slide the coupling halves [C] onto the motor shaft/gear shaft stub [Q] and ball screw/load shaft stub [V] until the correct axial position is reached.
- Tighten the clamping screws / set screws [H] with a torque wrench.
  - ① The screw size and specified tightening torque can be found in chapter 9.1 "Information for mounting the coupling".

- Set the elastomer insert [C<sub>7</sub>] in one coupling half.
  - ① The compressive preload of the elastomer insert when the coupling halves are pushed together requires an axial assembly force. This force can be reduced by lightly oiling the contact surfaces. Use only PU-compatible lubricants e.g. Vaseline.
- Connect the coupling halves with each other.
- Check the spacing A of the coupling halves.
  - ① See table "Tbl-5" for prescribed spacing.

For information on **disassembly** of the coupling:

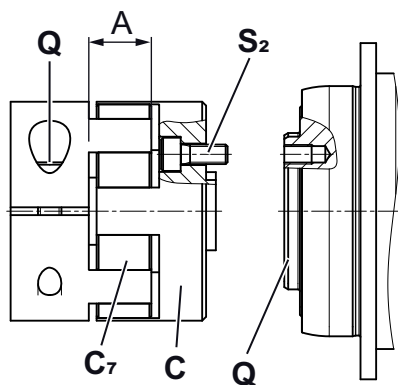
- Loosen the clamping screws / set screws [H].

### 5.2.2 Mounting of ELT

The ELT elastomer couplings are both technically and geometrically matched to our alpha Value Line flanged gearboxes:

Product type	ELT				
Gearbox	NPT, NPTK				
Gearbox size	005	015	025	035	045
ELT Size	20	60	150	300	450

Tbl-6: Assignment of ELT elastomer coupling – flanged gearbox



- Set the coupling half with the flange [C] on the gearbox flange [Q] and crosswise tighten the supplied fastening screws [S<sub>2</sub>].
  - ① The screw size and specified tightening torque can be found in chapter 9.1 "Information for mounting the coupling".
- Slide the coupling half [C] into the flange bell until the correct axial position is reached.
- Tighten the flange screws of the flange bell and gearbox.

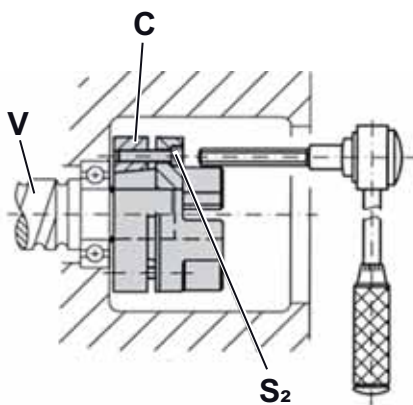
- Slide the coupling half [C] with the clamping hub onto the ball screw/load shaft stub until the correct axial position is reached.
- Tighten the clamping screw with a torque wrench.
  - ① The screw size and specified tightening torque can be found in chapter 9.1 "Information for mounting the coupling".

- Set the elastomer insert [C<sub>7</sub>] in one coupling half.
  - ① The compressive preload of the elastomer insert when the coupling halves are pushed together requires an axial assembly force. This force can be reduced by lightly oiling the contact surfaces. Use only PU-compatible lubricants e.g. Vaseline.
- Connect the coupling halves with each other.
- Check the spacing A of the coupling halves.
  - ① See table "Tbl-5" for prescribed spacing.

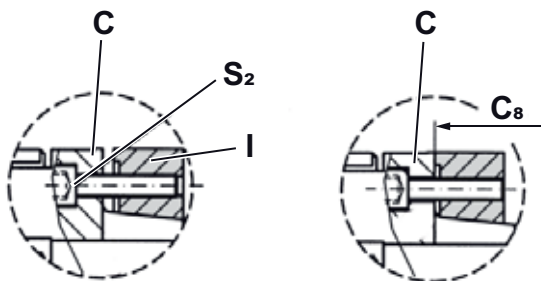
For information on **disassembly** of the coupling:

- Loosen the clamping screw [H].
- Loosen the flange screws [T] and axially pull out the complete gearbox coupling unit.

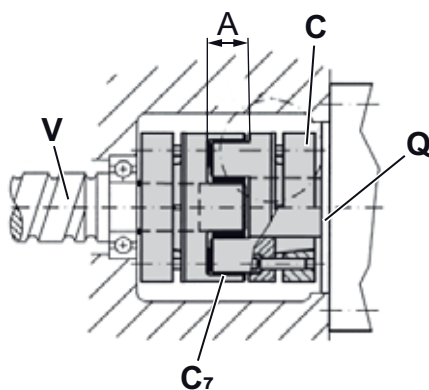
### 5.2.3 Mounting of EL6



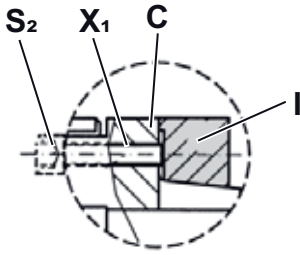
- Slide the coupling halves [C] onto the motor shaft/gear shaft stub [Q] and ball screw/load shaft stub [V] until the correct axial position is reached.
- Tighten the fastening screws [S<sub>2</sub>] as follows:
  - using the torque wrench
  - in order
  - in three circular passes with 1/3, 2/3 and the entire prescribed tightening torque
- ① The screw size and specified tightening torque can be found in chapter 9.1 "Information for mounting the coupling".
- The clamping process is completed when the tapered clamping ring [I] is in contact with the coupling half [C].



The fixed stop [C<sub>8</sub>] on the coupling half prevents excessive preload of the conical clamping ring and guarantees high true-running accuracy.



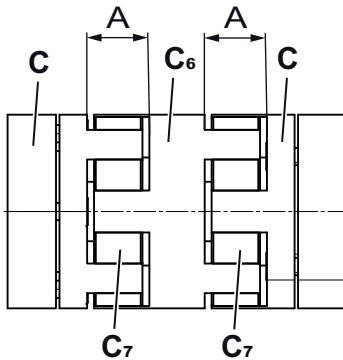
- Set the elastomer insert [C<sub>7</sub>] in one coupling half.
  - ① The compressive preload of the elastomer insert when the coupling halves are pushed together requires an axial assembly force. This force can be reduced by lightly oiling the contact surfaces. Use only PU-compatible lubricants e.g. Vaseline.
- Connect the coupling halves with each other.
- Check the spacing A of the coupling halves.
  - ① See table "Tbl-5" for prescribed spacing.



For information on **disassembly** of the coupling:

- Evenly loosen the fastening screws [S<sub>2</sub>].
- Insert the fastening screws into the threaded holes [X<sub>1</sub>] of the coupling halves [C].
- Evenly tighten the fastening screws until the tapered clamping ring [I] comes off the coupling half.
- Pull off the coupling halves.
- Loosen the fastening screws and reinsert them into the tapered clamping ring.

#### 5.2.4 Mounting of ECS



- Slide the coupling halves [C] onto the motor shaft/gear shaft stub [Q] and ball screw/load shaft stub [V] until the correct axial position is reached.
- Set the elastomer inserts [C<sub>7</sub>] into the coupling halves.
- Plug the intermediate piece [C<sub>6</sub>] into one of the coupling halves already assembled.
- Check the spacing A between the coupling half and the intermediate spacer.
  - ① See table "Tbl-5" for prescribed spacing.
- Plug the second coupling half into the intermediate piece.
- Check the spacing A between the coupling half and the intermediate spacer.
  - ① See table "Tbl-5" for prescribed spacing.

## 6 Startup and operation

- Read the general safety instructions before beginning to work (see Chapter 2.5 "General safety instructions").

#### Improper use can cause damage at the coupling.

- Make sure that the **operating temperature** is not exceeded.
  - ① Information about your coupling is available in the catalog under [www.wittenstein-alpha.de](http://www.wittenstein-alpha.de), or from our Customer Service / Sales department.
- Use the coupling only up to its maximum limits, see chapter 3.3 "Dimensions and performance data". For other conditions of use, consult our Customer Service department.
- Avoid high / very low ambient temperatures, acids, lyes and water vapor. These can lead to increased wear.

## 7 Maintenance and disposal

- Read the general safety instructions before beginning to work (see Chapter 2.5 "General safety instructions").

### 7.1 Maintenance schedule

Maintenance work	At startup	First time after 2200 operating hours	Yearly
Visual inspection	X	X	X
Checking the tightening torques	X	X	X
Checking the shaft-hub connection	X		

Tbl-7: Maintenance schedule

### 7.2 Maintenance work

#### 7.2.1 Visual inspection

- Check the coupling for external damage.

#### 7.2.2 Checking the tightening torques

- Check the tightening torque of the clamping bolt. If you discover while checking the tightening torque that the clamping bolt can be turned further, tighten it with the prescribed tightening torque.
- ① The prescribed tightening torques can be found in chapter 9.1 "Information for mounting the coupling".

#### 7.2.3 Checking the shaft-hub connection



- Check the fit tolerance of the shaft-hub connection. The fit tolerance must be between 0.01 and 0.05 mm.

### 7.3 Disposal

Additional information on disassembly of the coupling can be found in chapter 5.2 "Mounting of the coupling" or contact our customer Service.

- Dispose of the coupling at the recycling sites intended for this purpose.
- ① Observe the applicable national regulations concerning disposal.

## 8 Malfunctions

	<p style="text-align: center;"><b>NOTICE</b></p> <p><b>A changed operational behavior can be an indication for an existing damage of the coupling or cause a damage to the coupling.</b></p> <ul style="list-style-type: none"> <li>Do not put the coupling back into operation until the cause of the malfunction has been rectified.</li> </ul>
	<p><b>Rectifying of malfunctions may only be done by specially trained technicians.</b></p>

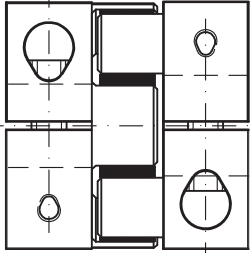
Fault	Possible cause	Solution
Operating noise	Input system overloaded	Carry out the motor mounting again.
Bellows breakage / elastomer failure	Lateral misalignment	Consult our Customer Service department.
	Angular misalignment	
	Torque overload	

Tbl-8: Malfunctions

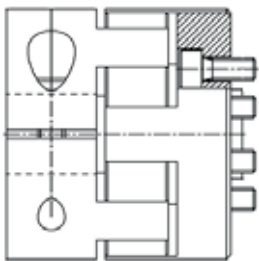


## 9 Appendix

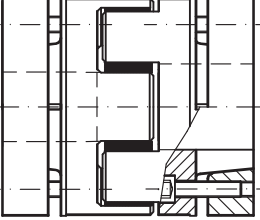
### 9.1 Information for mounting the coupling

Product type: Elastomer coupling ELC			
	Size	Screw size / Property class 12.9	Tightening torque [Nm] Standard screw ISO 4762
	2	M2	0.6
	5	M3	2
	10	M4	4
	20	M5	8
	60	M6	15
	150	M8	35
	300	M10	70
	450	M12	120
	800	M16	290

Tbl-9: Information for mounting the coupling ELC

Product type: Elastomer coupling ELT					
	Size	Clamping screw		Fastening screw	
		Screw size / Property class 12.9	Tightening torque [Nm] Standard screw ISO 4762	Screw size / Property class 12.9	Tightening torque [Nm] Standard screw ISO 4762
	20	M5 x 18	8	4 x M4 x 10	4.5
	60	M6 x 20	15	8 x M5 x 12	8.5
	150	M8 x 25	35	8 x M6 x 16	14.5
	300	M10 x 30	70	10 x M6 x 16	14.5
	450	M12 x 40	120	8 x M8 x 18	38

Tbl-10: Information for mounting the coupling ELT

<b>Product type: Elastomer coupling EL6</b>			
	<b>Size</b>	<b>Screw size / Property class 12.9</b>	<b>Tightening torque [Nm] Standard screw ISO 4762</b>
	<b>10</b>	3 x M3	2
	<b>20</b>	6 x M4	3
	<b>60</b>	4 x M5	6
	<b>150</b>	8 x M5	7
	<b>300</b>	8 x M6	12
	<b>450</b>	8 x M8	35
	<b>800</b>	8 x M10	55

Tbl-11: Information for mounting the coupling EL6

## Revision history

Revision	Date	Comment	Chapter
01	23.11.2009	New version	All
02	06.02.2019	ELP	All
03	06.12.2022	Layout; Installation instructions	All



WITTENSTEIN alpha GmbH · Walter-Wittenstein-Straße 1 · 97999 Igersheim · Germany  
Tel. +49 7931 493-0 · [info@wittenstein.de](mailto:info@wittenstein.de)

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