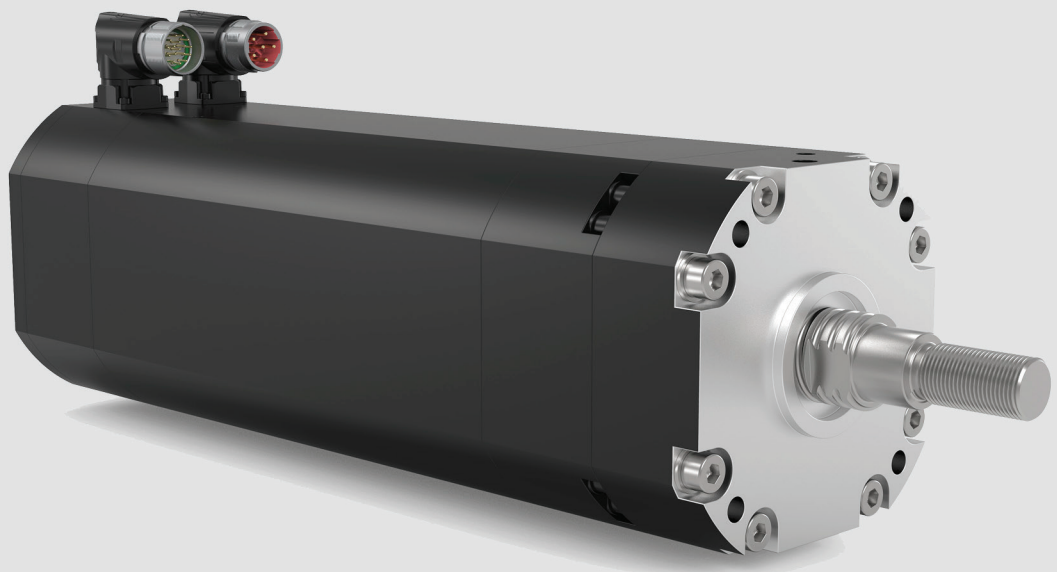


Operating Manual

cyber<sup>®</sup> force actuator  
MG / MA / WG / MA / MS / WS / AFA





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## Table of contents

Table of contents.....	B
List of tables .....	1
List of figures .....	1
1 Introduction .....	2
1.1 About this Document.....	2
1.2 Documents on cyber® force actuator MG, MA, WG, MA, MS, WS, and AFA .....	2
1.3 Typographical Conventions .....	3
1.4 Structure of Warning Notices .....	4
1.5 Abbreviations.....	4
2 Safety Instructions .....	5
2.1 Safety-oriented Systems .....	5
2.2 Qualified Personnel.....	6
2.3 Electrical Hazards.....	6
2.4 Thermal Hazards .....	6
3 Product Information .....	7
3.1 Intended Use.....	7
3.2 Manufacturer Name and Address .....	7
4 Shipment and Storage.....	8
4.1 Transport and Storage .....	8
5 Servo actuator nameplate .....	10
6 Installation .....	11
6.1 Recommended Drives.....	11
6.2 Standstill brakes.....	12
6.3 Mounting .....	12
6.4 Liquid-cooled Servo Actuators (WG, WS) .....	14
7 Electrical Interfaces.....	15
7.1 Cables, connectors, and wiring.....	15
7.2 Connector Types .....	16
8 Maintenance .....	17
9 Troubleshooting.....	19
10 Servo Actuator Disposal.....	20
10.1 What to do if repairs are required? .....	20

## List of tables

Table 1: Abbreviations.....	4
Table 2: Manufacturer name and address .....	7
Table 3: Servo actuator nameplate .....	10
Table 4: Troubleshooting .....	19

## List of figures

Figure 1:Structure of a warning notice.....	4
Figure 2: Hoisting points.....	8
Figure 3: Servo actuator nameplate.....	10
Figure 4: Mounting Detail.....	13

# 1 Introduction

## 1.1 About this Document

This document gives the safety instructions for working with WITTENSTEIN cyber® force actuator. It describes how to install, operate, and maintain the listed servo actuators.

Before any personnel start working with the servo actuator, they should have this user manual available and check it for relevant information including while working with the technology.

## 1.2 Documents on cyber® force actuator MG, MA, WG, MA, MS, WS, and AFA

In addition to this user manual, the other documents available on the listed servo actuators are:

- Installation drawing - provides information on servo actuator mounting and wiring schematics for electrical installation.
- Data sheet - provides information on technical data on a specific servo actuator size.
- Product catalogue – provides product description, technical specification, terms definition and average service life diagrams evaluating the axial load force & conditions supporting servo actuator selection and sizing.



If the information and notes provided in this documentation do not meet your requirements, please contact WITTENSTEIN s.r.o..

## 1.3 Typographical Conventions



### DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.



### WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.



### CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

### NOTICE

NOTICE indicates possible property damage.

The following table shows the structure of a warning:



### SIGNAL WORD

Type and source of hazard

Possible consequences of not avoiding the potential hazard

- How to avoid the hazardous situation

The following table shows other typographic elements:

Symbol	Explanation
	Notes about important operations and other useful information
	This is an action to be carried out
	This is a bullet list
	This identifies important information

## 1.4 Structure of Warning Notices

The warning notices in this user manual have the following structure:



Figure 1: Structure of a warning notice

### Legend

- 1 Warning symbol
- 2 Signal word
- 3 Type and source of hazard
- 4 Possible consequences of a potential hazard
- 5 Hazard prevention measures

## 1.5 Abbreviations

Abbreviation	Explanation
MA	cyber® force actuator MA series (6 poles) with integrated ball screw
MG	cyber® force actuator MG series (6 or 12 poles) with integrated ball screw
WG	cyber® force actuator MG series (6 or 12 poles) with water cooling
MS	cyber® force actuator MS series (6 poles) with integrated ball screw
WS	cyber® force actuator WS series (6 poles) with water cooling
AFA	cyber® force actuator AFA series (12 poles) with integrated ball screw
DC	Direct Current
ESD	Electro Static Discharge

Table 1: Abbreviations

## 2 Safety Instructions

Do not attempt to install, operate, maintain, or inspect the servo actuator until you have read through this user manual and the maintenance manual attached with the products carefully and can use the equipment correctly. Servo actuators of the series may only be set up and operated in conjunction with this manual.



Human safety and equipment safety must be the first considerations when performing the installation procedures for the servo actuator and drive system. When it comes to electronics in your factory or workplace, make sure both your facility and the employees in it are safe. Following are the safety instructions for working on the servo actuator.



### WARNING

Danger of high voltage and electrical shock hazard!

Danger of death, severe injury, or extensive material damage.

- ▶ It is vital that you ensure the servo actuator is safely earthed to the PE (Protective Earth). Electrical safety is impossible without a low-resistance earth connection.
- ▶ Do not unplug any connectors during operation.

### NOTICE

- ▶ Observe and adhere to the technical data, and particularly the information given on the servo actuator nameplate.
- ▶ The installation must comply with the local regulations and use of equipment and installation practices that promote electromagnetic compatibility and safety.
- ▶ Safety equipment - To protect yourself against personal injury from, for example, dropping the servo actuator, always wear suitable safety equipment, such as work shoes, when handling the servo actuator.



Use this document if you are responsible for installing or troubleshooting servo actuators. As with any electro-mechanical device, safety should be considered during the installation and operation. Throughout this manual you will see safety messages marked with the CAUTION and WARNING signal words. Follow the prescribed actions to avoid any potentially hazardous situation.

### 2.1 Safety-oriented Systems

The use of control technology in safety-oriented systems calls for special measures. When planning to use control technology in a safety-oriented system, the user should seek detailed advice in addition to referring to all the potentially available standards or guidelines on safety-engineering installations.





## 2.2 Qualified Personnel



Only qualified personnel are permitted to perform tasks such as transport, assembly, setup, and maintenance of the servo actuators.

Qualified personnel are those with required knowledge and experience, who have been trained to perform such work, and authorized to commission systems and circuits in accordance with established safety practices and standards. The qualified personnel must know and observe all relevant national and international standards and regulations.

## 2.3 Electrical Hazards

 <b>WARNING</b>	
	<p><b>Electrical Hazard!</b> Certain electrical systems must be maintained and cleaned by staff. Before they can be accessed, the systems must be disconnected from the mains to eliminate electrical hazards to operating staff.</p> <ul style="list-style-type: none"><li>▶ The servo actuator must be demonstrably disconnected from the mains.</li><li>▶ Secure the connector to avoid accidental reconnections.</li><li>▶ Verify that the system is off.</li><li>▶ Carry out grounding and short circuiting.</li><li>▶ Provide protection from adjacent live parts.</li><li>▶ Safety regulations for work on the equipment in which the servo actuator is applied must be observed.</li></ul>

## 2.4 Thermal Hazards

 <b>WARNING</b>	
	<p><b>Burn hazard!</b> The surface temperature of the servo actuator may reach up to 100 °C (212 °F) during operation, according to each servo actuator protection category.</p> <ul style="list-style-type: none"><li>▶ Do not touch hot surfaces. Measure the temperature and wait until the servo actuator has cooled below 40 °C (104 °F) before touching it.</li></ul>

<b>NOTICE</b>	
<ul style="list-style-type: none"><li>▶ Observe and adhere to the technical data, and particularly the information given on the servo actuator nameplate.</li><li>▶ The installation must comply with the local regulations and use of equipment and installation practices that promote electromagnetic compatibility and safety.</li><li>▶ Safety equipment - To protect yourself against personal injury from, for example, dropping the servo actuator, always wear suitable safety equipment, such as work shoes, when handling the servo actuator.</li></ul>	



Use this document if you are responsible for installing or troubleshooting servo actuators. As with any electro-mechanical device, safety should be considered during the installation and operation. Throughout this manual you will see safety messages marked with the CAUTION and WARNING signal words. Follow the prescribed actions to avoid any potentially hazardous situation.

### 3 Product Information

- WITTENSTEIN cyber® force actuators of MG, WG, MA, MS, WS and AFA series benefit from a brushless construction which means that they require low maintenance. The longevity of the servo actuators is limited by the life of the bearings and ball screw under specified load. There is more information about the servo actuator's longevity in the WITTENSTEIN catalogue or by contacting WITTENSTEIN engineers.
- The servo actuators respond to 2014/30/EC (Low-voltage directive) and to the harmonized standards series EN 60034-1, EN 60034-5, EN 60034-6, and EN 60034-7.
- WITTENSTEIN cyber® force actuators of MG, WG, MA, MS, WS and AFA series are designed and manufactured in accordance with strict CE standards.
- CE certified.

#### 3.1 Intended Use

The WITTENSTEIN cyber® force actuators of MG, WG, MA, MS, WS and AFA are intended exclusively for commercial systems. They comply with the applicable standards and regulations. Serious personal injury and property damage can result from:

- Improper use.
- Incorrect installation or operation.
- Unevenly distributed current into the phases.

The technical data and information on the nameplates, or in the product-specific data sheets for the servo actuators, form the basis for the proper commissioning of the servo actuators. All instructions must be followed at all times.

**Warranty and claims for defects:** For related information, please check the General Terms and Conditions of Sale and Delivery of WITTENSTEIN s.r.o..

#### 3.2 Manufacturer Name and Address

The following table shows all the information regarding the manufacturer:

Info	Description
Company	WITTENSTEIN s.r.o.
Address	Trnkova 3129/119a, 628 00 Brno - Líšeň, Czech Republic
Phone	+420 517 078 300
E-Mail	info@wittenstein.cz
Web Site	<a href="http://www.wittenstein.cz">www.wittenstein.cz</a> ; <a href="http://www.cyber-motor.wittenstein.de">www.cyber-motor.wittenstein.de</a>

Table 2: Manufacturer name and address

## 4 Shipment and Storage

Please check that the contents of each delivery are as ordered and that no damage, especially in the areas of the ball screw and connectors, has occurred during transit. Any problems should be immediately noted, including a description of the fault or damage, and sent to a WITTENSTEIN representative.

### CAUTION

#### **Danger of personal injury and damage to property!**

Failure to observe these safety procedures could result in personnel injury or equipment damage.

- ▶ Do not forget to observe the safety signs on the servo actuator.
- ▶ Do not open or attempt to open the servo actuator.

### 4.1 Transport and Storage

### WARNING



Heavy!

Potential danger during lifting and transporting!

- ▶ Improper handling, unsuitable or defective devices, tools etc. can cause injuries and/or property damage. Lifting devices, ground conveyors and lifting tackle must comply with all relevant regulations.
- ▶ The lifting eye provided should not be used for lifting the entire machine. Only the servo actuator may be safely lifted by the two lifting eyes.

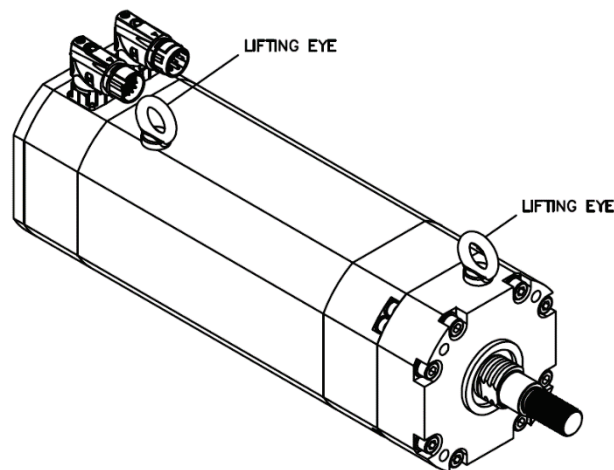


Figure 2: Hoisting points

Use suitable suspension and load devices for transportation and assembly. Use lifting eyes provided by the manufacturer. Improper handling may lead to serious injury.

When storing the servo actuator, observe the following conditions:

- Recommended ambient temperature: +15 to +25 °C (+60 to +78 °F),
- Permissible temperature: 0 to +70 °C (+32 to +158 °F), temperature fluctuation: < 10 °C (18 °F) per day.
- Relative humidity: < 65 % non-condensing is recommended, 90 % is permissible.
- Ensure there is minimal vibration and shock where servo actuators are stored.

## NOTICE

### **Damage due to dirt, moisture**

Storage outside or under the wrong climatic conditions can cause corrosion and other damage to the servo actuator. Condensation due to temperature fluctuations can result in electronic malfunctions.

## 5 Servo actuator nameplate

The WITTENSTEIN cyber® force actuators nameplate data is used for the setting of the servo drive. If you contact WITTENSTEIN concerning an issue, you must supply identification data for the servo actuator.

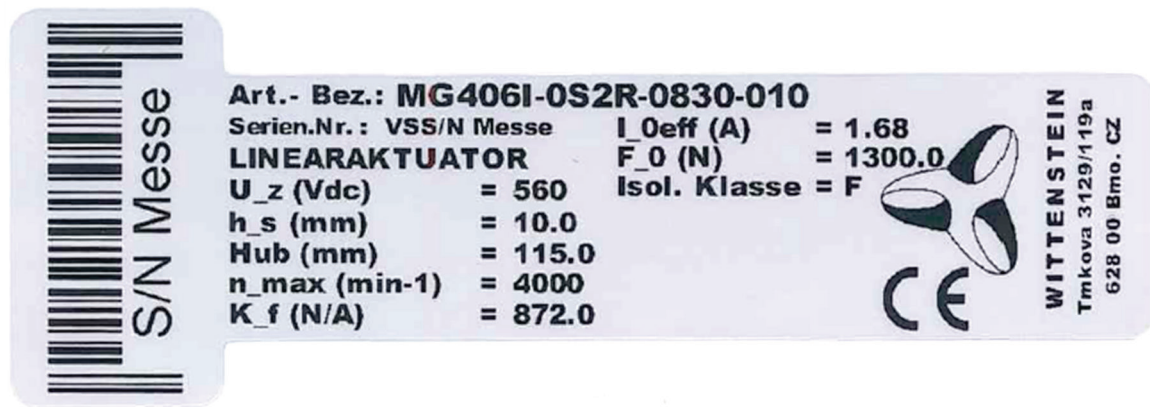


Figure 3: Servo actuator nameplate

Identification data	Description	
	Typ	Servo actuator type and servo actuator model number (ordering number)
	S/N	Serial number
Technical data	U_z (Vdc)	Rated voltage
	I_0eff (A)	Standstill current
	F_0 (N)	Standstill force
	H_s	Screw pitch
	Hub	Stroke
	n_max	Maximum speed
	K_f	Force constant
Standards	Isol. Klasse	Insulation class
	CE	Conformity certificate will be supplied upon request

Note: The force constant is defined for 20°C. The forces and currents are defined for 40°C.

Table 3: Servo actuator nameplate

## 6 Installation



### WARNING

#### Danger of personal injury!

Working with and on the actuator without the required basic electrical knowledge may cause injuries or parts may be damaged.

- ▶ The actuator is intended for installation and use by qualified personnel, familiar with electrical machines and safety requirements.
- ▶ The safety equipment necessary to prevent electrical shocks must be provided by the installer.
- ▶ Ensure that the installation drawing and data sheet are available.

The following steps must be taken while installing the actuator:

- Read the name plate, warning, and caution plates on the actuator carefully.
- Personnel must know the permissible axial loads (radial forces are forbidden).
- Screwed-in lifting eye bolts can be removed after installation.
- Refer to the installation drawing before installing.



### CAUTION



#### Electrical hazard!

WITTENSTEIN actuators may contain ESD sensitive parts.

For actuators with such parts, additional care is required.

- ▶ Do not touch the connector or pins with your bare hands.
- ▶ If the user carries out a HI pot test, then pins must be short circuited before the test is carried out. The polarity must be carefully observed. Avoid currents >4 mA in the KTY circuit

### NOTICE

#### Risk of damage

- ▶ Release the brake before starting the servo actuator by supplying proper voltage as defined by the manufacturer.
  - ▶ Do not use the holding brake to stop the actuator. It is not meant to be safely used as a working brake.
- WITTENSTEIN servo actuators are designed for even loading of all phases.



When installing and mounting the actuator, ensure that the ball screw extension is protected against impact and pressure.



Keep in mind the technical data on the labeling plates on the actuator enclosure.

### 6.1 Recommended Drives

The WITTENSTEIN motors are designed to be used together with any sinusoidal servo drive. There are no special requirements regarding the type or model of drive to use. Standard insulation system is designed for 700 Vdc. In case of need to use higher voltage of intermediate circuit (i.e 750 Vdc) or any other special requirements, please contact manufacturer.

## 6.2 Standstill brakes

Servo actuators can be equipped with a standstill brake upon request. Depending on the servo actuator type and size, spring brakes or permanent magnet brakes are used.



### WARNING

**The standstill brakes cannot be used to slow down the motion of the servo actuator.** The improper use of standstill brakes can result in serious injuries and severe material damages.

Before starting up the machine, check that the nominal braking torque level has been reached.

Make sure to open the brake before activating the servo actuator. The brake can be closed only after the servo actuator has come to a complete stop.



### CAUTION



Based on brake function principle, brake may need periodical function check. For exact procedure, refer to brake manufacturer service manual. In case of any question, please contact our representative for support.



### CAUTION



Damage due to loss of braking torque!

Brakes using permanent magnet principle, needs to be run-in during the machine commissioning.

As the brake is only used as a holding brake without dynamic load, the braking torque may drop. A new run-in (refreshment) must be done within the scope of maintenance. The maintenance interval may vary based on duty cycle, application and working conditions. Typical maintenance interval for normal industrial applications can be 4 weeks but may vary based on brake type and manufacturer. In case of any question, please contact our representative for support.

## 6.3 Mounting

- The linear actuators must be mounted according to the two flange versions (inner bolt flanges in center or standard flange). The heat dissipation of these actuators is mainly achieved through the housing. Therefore, unrestrained convection must be provided by an appropriate machine design.
- The customer must provide a torque bracket at the spindle end. Otherwise, the spindle might rotate, and generating a force is not possible. The torque must be set dependent on thrust force [N] and lead [mm] using the following formula:

$$Torque = \frac{Force}{Ball\ screw\ lead} \cdot 140$$

- Every linear actuator is equipped with internal end blocks which prevent any unintended hand-operated travel of the ball screw beyond the functional travel range.

The end blocks are not sized for stopping a ball screw travelling at nominal thrust force of the servo actuator against an internal end block. In such cases the end blocks may be destroyed, and the servo actuator might get blocked.

A servo actuator set-up (i.e., best done in an unmounted condition) with limited drive output current is strongly recommended until there is fault-free operation. Furthermore, to safely ensure set up, we recommend pacing off the maximum travel range of the ball screw by turning it in and out by hand, before adapting the load and reaching the end block.

To avoid long-term loosening or damage to the internal servo actuator components, do not allow travel against the end blocks during regular operation. For initialization movements, we recommend the use of external end blocks.

- Radial loads onto the ball screw must be avoided. If radial loads cannot be avoided, please contact the WITTENSTEIN engineers. In view of this, we strongly recommend the use of a removable rod-eye for adapting the load to the servo actuator.

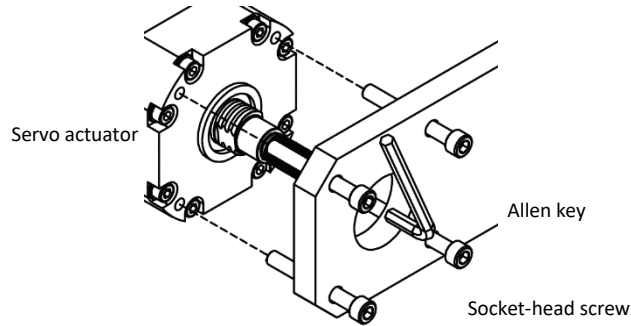


Figure 4: Mounting Detail



NOTE: The stroke of a hammer blow always exceeds the maximum permissible axial and radial forces.



## 6.4 Liquid-cooled Servo Actuators (WG, WS)

Liquid-cooled servo actuators must have a proper closed loop cooling circuit. The cooling medium must be composed of desalted and demineralized water chemically neutral and with the addition of an anti-corrosion agent. Such products must be compatible with the materials of the housings (aluminum and its alloys), with the materials of the gaskets (Viton), and with all the components of the circuit.

### NOTICE

**Do not connect the cooling system to a regular water line!**

Using regular, untreated water can cause severe damage to the cooling system. Avoid this in all circumstances.

For additional conditions, refer to the following notes:

- Maximal water inlet pressure (< 1 min)  $P_{max} = 1 \text{ MPa}$  (10 Bar).
- Rated water inlet pressure  $P_n = 0.5 \text{ MPa}$  (5 Bar) max.
- Minimal water flow and minimal pressure drop listed in the catalogue or relevant datasheet (varies according to servo actuator, size).
- PH-value: 6.5 to 7.5.
- The recommended water hardness is 0.7 mmol/l. If cooling water does not meet this parameter, use plasticizers.

The use of inhibitors to prevent corrosion in aluminum is strongly recommended. The ratio of anticorrosive agent (25%) to water (75%) should not be exceeded, otherwise a reduction in performance may occur.

Alternatively, other coolant can be used, such as water-glycol antifreeze, various coolant oils, etc. In this case, however, expect reduced performance. The specific derating is determined by calculation after consultation with the manufacturer.

A constant monitoring of cooler flow is recommended.

The inlet cooling media temperature must be between 25°C and 40°C to avoid condensation inside of the servo actuator; in any case, the inlet coolant temperature must be higher than the servo actuator frame temperature of at least 2°C

Inox pipe fittings are recommended for connecting the cooling circuit to the servo actuator. Before activating the servo actuator, make sure the cooling circuit is completely filled and leak-free.

## 7 Electrical Interfaces

For the correct connection, it is best to use the mating connectors and cable characteristics indicated by WITTENSTEIN. When using non-WITTENSTEIN components, the cable specifications must be met exactly.



### WARNING

#### **Hazardous voltage!**

The rotating servo actuators can generate high voltages.

- ▶ Always make sure that there are no exposed cables.
- ▶ Only use appropriate power cables and plugs.
- ▶ Pay attention to the pin assignment according to the servo actuator drawings and documentation.
- ▶ Secure the plug connection to avoid accidental disconnections.
- ▶ Do not disconnect any plug during operation. There is a risk of death or serious health or material damage.

Connection and disconnection of the servo actuators must be made with the controller switched off. Simply disabling the controller is not sufficient. During installation, pay special attention to the diameter of the protective earth (PE) conductor, which must be sized according to legal safety rules.

We recommend shielding power and signal cables. The shielding should be connected to the earth at both ends.

When using the standstill brake:

- Used brakes require a smoothed (non-pulsating) DC voltage.
- To ensure operation in the event of a large temperature fluctuation, supply the brake coil with constant current.

### 7.1 Cables, connectors, and wiring

The electrical connection can be performed in one of the following ways:

- Using connectors.
- Using terminal blocks.
- Using free cable ends.

For the specific wiring schematic, please check the relevant documentation or contact the manufacturer.

#### **EMC**

For compliance with Directive 2014/30/EC (EMC), and for correct system operation, the signal and power cables must be shielded (minimum cover 85%). Cable shielding must be connected to the ground on both ends using a radio frequency connection (i.e., 360°). The cables and cable shields must be connected in accordance with the EMC requirements of the used drive.

### NOTICE

Small diameter wire leads to unacceptable heating in the cable. This results in a power loss to the motor, particularly prominent when using longer cables.

## 7.2 Connector Types

WITTENSTEIN cyber® force actuators have Threaded, Speedtec and Speedtec-ready (optionally ONECLICK Technology) connectors mounted on them. The Threaded and Speedtec-ready (optionally ONECLICK Technology) connectors will have O-ring in them.

The mating connectors are of two types Threaded and Speedtec plug type (or ONECLICK fast locking system).

If a Speedtec-ready connector (or ONECLICK Technology) is used with a Threaded plug mating connector, the O-ring does not need to be removed from the motor connector, i.e., the connector can be used as is.

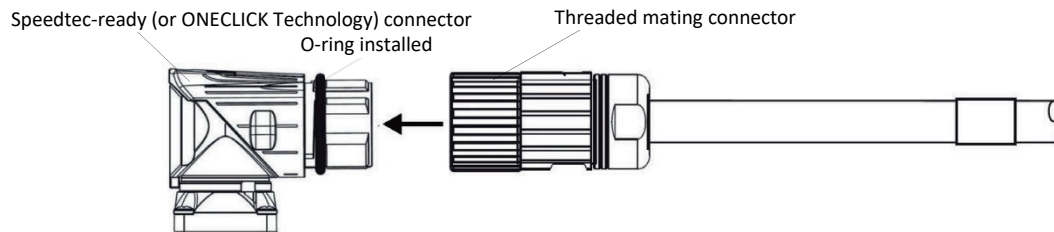


Figure 5: Speedtec-ready servo actuator connector with O-ring

If a Speedtec-ready (or ONECLICK Technology) connector is used with a Speedtec (or ONECLICK fast locking system) plug mating connector, the O-ring should be removed from the motor connector.

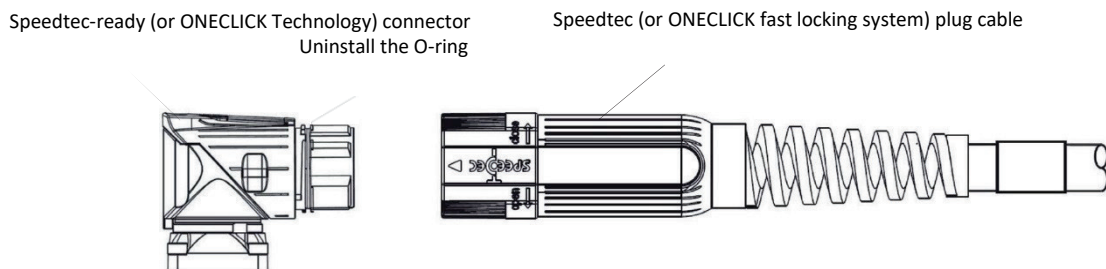


Figure 6: Speedtec-ready servo actuator connector with O-ring uninstalled

## 8 Maintenance



### WARNING

#### Risk of injury!

In case of servo actuator disassembly, make sure that all electrically powered parts of the servo actuator, windings, and any accessory device which otherwise may lead to fatal injury is safely disassembled.

### NOTICE

Because of product liability issues any servo actuator damage should be repaired by MWITTENSTEIN. Non-WITTENSTEIN staff may be unable to comply with safety rules (e.g., VDE guidelines) and WITTENSTEIN quality standards. Any unexpected mechanical rotation of parts can cause severe damage during maintenance.

### NOTICE

Each time the servo actuator is disassembled make sure that the phasing of the encoder system is done properly and by WITTENSTEIN personnel.

Observe the following prescriptions:

- Before performing any maintenance procedure make sure that the ball screw rotation and possible linear movement is locked. Make sure that the equipment connected to the ball screw cannot cause any rotation, or linear movement. If necessary, disconnect the load before performing maintenance.
- Check for bearing noise and vibrations during normal operation at regular intervals.
- Brakes should be checked at fixed regular intervals to ensure safe and trouble-free running of the servo actuator.
- Check that full engagement and disengagement works for each brake.
- Check the brake torque for holding the servo actuator. If the torque is below what is specified on the name plate, the brake may have to be serviced. For more details on this, please contact WITTENSTEIN personnel.
- Keep the servo actuator clean to ensure free ventilation flow for cooling.
- Check that the servo actuator is not noisy during operation and vibration does not exceed standard levels.
- To detect and correct any irregularities at early stages, it is recommended that you inspect the servo actuator after the first 50 to 75 hours of operation.
- For liquid cooled servo actuators, WITTENSTEIN recommends periodically cleaning and checking the cooling circuit. The use of cleaning products and/or deposit removers must be subjected to preventive verification of compatibility with the housing materials (aluminum and its alloys), with the gasket materials (Viton), and with all the components of the circuit.

Sufficiently lubricating the ball screw is essential for a long life. Greasing intervals and the quantity of grease depend on the ambient conditions. The required grease quantity is approximately 1 to 3 cm<sup>3</sup> of grease per month, injected in short intervals. The type of grease is Klüber Stabutherm GH461 or equivalent. Avoid mixing different grease brands and types.

Ensure the grease reaches the spindle nut. Every actuator is equipped with a hole which directs the grease onto the spindle via a lubrication channel. An automatic lubrication cartridge can be adapted to fit this hole (e.g., perma STAR) directly or via a tube. This cartridge automatically lubricates the nut during operation according to the chosen greasing interval.

Initial lubrication is carried out at the manufacturing stage prior to being shipped.

For any further lubrication (e.g., after repairs), WITTENSTEIN recommends the following procedure:

- Turn the ball screw completely out of the un-mounted motor.
- Put approx. 3 cm<sup>3</sup> of grease onto the ball screw close to the A-flange and dispense it radially.
- Rotate the ball screw several times to guarantee an even dispersion of grease through the nut.
- Finally, fill the lubrication hole with grease at the A-flange until it appears on the ball screw.

If using an automatic lubrication cartridge, we recommend removing any grease or sediment from the spindle, the hollow shaft, and the rear resolver area once a year to guarantee correct operation. For any other kind of lubrication, the cleaning intervals must be adjusted accordingly.

## 9 Troubleshooting

Problem	Cause	Action
Servo actuator does not start	Wrong connections	Check the connections of the servo actuator power and signal cables.
	Mechanical brake	Check that the brake is supplied with the voltage (VDC) as defined by the manufacturer.
	Mechanical failure	Check that the mechanisms coupled to the servo actuator allow free movement.
	Parameters	Check the parameter settings of the drive system.
	Overload	Reduce the load or contact application engineer for more details.
Servo actuator does not reach the rated speed	Parameters	Check the parameter settings of the drive system.
	Overload	Reduce the load or contact application engineer for more details.
Servo actuator runs in the wrong direction	Connections	Check both the power and signal connections on the servo actuator and drive side.
Servo actuator overheats	Overload	Reduce the load or contact application engineer for more details.
	Wrong bus voltage	Check if bus voltage is in line with rated voltage.
	Wrong connections	Check that no phase is incidentally open or grounded.
	Harmonic distortion	High harmonic distortion in the frequency converter output is not allowed.
	Uneven phase load	In case of high load on stroke lower than half of electrical period, the allowed force should be lowered by coefficient 1.41 or contact application engineer for more details.
Vibrations or loud noise	Bearing / ball screw failure	Contact WITTENSTEIN for repairs.
	Misalignment	Check the correct alignment of the servo actuator and load. Ignoring misalignment can cause serious damage of bearings, ball screw and mechanics.

Table 4: Troubleshooting

## 10 Servo Actuator Disposal

In accordance with directive 2012/19/EC, electronic devices are "special waste" (WEEE) and must be handled by professionals with disposal expertise.

WITTENSTEIN cyber® force actuators may contain environmentally regulated materials, such as lead solder and circuit boards. It is the user's sole responsibility to dispose of the servo actuators in accordance with specific local and national regulations. Be sure to send the material to authorized disposal facilities under controlled conditions. If it is possible to recycle the component materials, always do so with the support of authorized professionals.

### 10.1 What to do if repairs are required?

WITTENSTEIN cyber® force actuators can be repaired only by WITTENSTEIN; opening or re-work of the motor will void the warranty.

For warranty as well as post-warranty repairs please follow the procedure described below:

- In case of post-warranty repair, first consult with manufacturer possibility to repair from feasibility and commercial standpoint.
- Perform all required procedures for safely placing out of service your motor and re-send it safely packed to the address of the manufacturer (with the original packing material if available) together with serial number of affected motor and PO for warranty or post-warranty repair.
- All parts such as carriages, components of guiding system etc. not fitted by WITTENSTEIN must be removed because WITTENSTEIN cannot guarantee a correct disassembly.
- WITTENSTEIN would appreciate a detailed failure or breakdown report attached to the delivery paperwork. **"For Repair"** should be clearly stated on the delivery note.
- After the motor has been received a complete analysis will be performed by our technicians. During this process, WITTENSTEIN may request details about the operating conditions (duty cycle, loading forces, etc.) from the customer. For post-warranty repair, analysis may be charged.
- Based on the performed analysis, a repair proposal is issued, together with a price calculation based on labor and material, (if the motor is not repairable, a commercial proposal for its replacement can be issued).
- If the repair proposal is approved, the motor is repaired and sent back to the customer.
- The General Repair Conditions of WITTENSTEIN s.r.o. apply to warranty and post-warranty process.



cyber motor

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