

Assembly instructions | EN

AA3000

Bellows electric cylinder

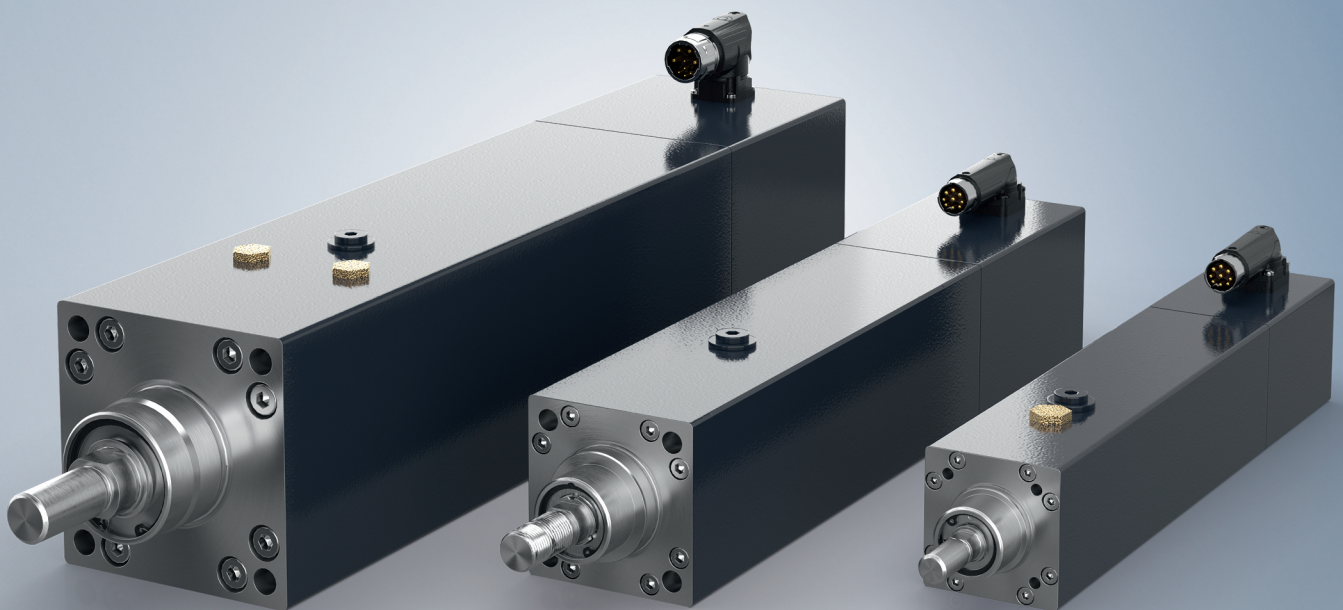


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1 Documentation notes

1.1 Disclaimer

Beckhoff products are subject to continuous further development. We reserve the right to revise the installation instructions at any time and without notice. No claims for the modification of products that have already been supplied may be made on the basis of the data, diagrams and descriptions in these installation instructions.

1.1.1 Trademarks

Beckhoff®, TwinCAT®, TwinCAT/BSD®, TC/BSD®, EtherCAT®, EtherCAT G®, EtherCAT G10®, EtherCAT P®, Safety over EtherCAT®, TwinSAFE®, XFC®, XTS® and XPlanar® are registered and licensed trademarks of Beckhoff Automation GmbH.

The use of other brand names or designations by third parties may lead to an infringement of the rights of the owners of the corresponding designations.

1.1.2 Patents

The EtherCAT technology is protected by patent rights through the following registrations and patents with corresponding applications and registrations in various other countries:

- EP1590927
- EP1789857
- EP1456722
- EP2137893
- DE102015105702



EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH.

1.1.3 Limitation of liability

All components in this product as described in the installation instructions are delivered in a specific configuration of hardware and software, depending on the application regulations. Modifications and changes to the hardware and/or software configuration that go beyond the documented options are prohibited and nullify the liability of Beckhoff Automation GmbH & Co. KG.

The following is excluded from the liability:

- Failure to follow these installation instructions
- Improper use
- Use of untrained personnel
- Use of unauthorized spare parts

1.1.4 Copyright

© Beckhoff Automation GmbH & Co. KG, Deutschland

The copying, distribution and utilization of this document as well as the communication of its contents to others without express authorization is prohibited. Offenders will be held liable for the payment of damages.

We reserve all rights in the event of registration of patents, utility models and designs.

1.2 Version numbers



Provision of revision levels

On request we can send you a list of revision levels for changes to the installation instructions.

- Send your request to: motion-documentation@beckhoff.com

Origin of the document

These installation instructions were written in German. All other languages are derived from the German original.

Product properties

The valid product properties are always those specified in the current installation instructions. Further information given on the product pages of the Beckhoff homepage, in emails or in other publications is not authoritative.

1.3 Staff qualification

These installation instructions are intended for trained control and automation specialists with knowledge of the applicable and required standards and directives.

Specialists must have knowledge of drive technology and electrical equipment as well as knowledge of safe working on electrical systems and machines. This includes knowledge of proper setup and preparation of the workplace as well as securing the working environment for other persons.

The installation instructions published at the respective time of each installation and commissioning is to be used. The products must be used in compliance with all safety requirements, including all applicable laws, regulations, provisions and standards.

Instructed person

Instructed persons have a clearly defined task area and have been informed about the work to be carried out. Instructed persons are familiar with:

- the necessary protective measures and protective devices
- the intended use and risks that can arise from use other than for the intended purpose

Trained person

Trained persons meet the requirements for instructed persons. Trained persons have additionally received training from the machine manufacturer or vendor:

- machine-specific or
- plant-specific

Trained specialists

Trained specialists have received specific technical training and have specific technical knowledge and experience. Trained specialists can:

- apply relevant standards and directives
- assess tasks that they have been assigned
- recognize possible hazards
- prepare and set up workplaces

Qualified electricians

Qualified electricians have comprehensive technical knowledge gained from a course of study, an apprenticeship or technical training. They have an understanding of control technology and automation. They are familiar with relevant standards and directives. Qualified electricians can:

- independently recognize, avoid and eliminate sources of danger
- implement specifications from the accident prevention regulations
- assess the work environment
- independently optimize and carry out their work

Customer service

Customer service personnel and service personnel are verifiably trained and authorized by Beckhoff or the machine manufacturer for the work on the machine or plant.

1.4 Safety and instruction

Read the contents that refer to the activities you have to perform with the product. Always read the chapter in the installation instructions entitled For your safety. Observe the warning notes in the chapters so that you can handle and work properly and safely with the product.

1.5 Explanation of symbols

Various symbols are used for a clear arrangement:

- ▶ The triangle indicates instructions that you should execute.
- The bullet point indicates an enumeration.
- [...] The square brackets indicate cross-references to other text passages in the document.
- [1] The number in the square brackets refers to the position in the adjacent figure.
- [+] The plus sign in square brackets indicates ordering options and accessories.

In order to make it easier for you to find text passages, pictograms and signal words are used in warning notices:

DANGER

Failure to comply will result in serious or fatal injuries.

WARNING

Failure to comply may result in serious or fatal injuries.

CAUTION

Failure to comply may result in minor or moderate injuries.

NOTICE

Notes are used for important information on the product. The possible consequences of failure to observe these include:

- Product malfunctions
- Damage to the product
- Damage to the environment



Information

This symbol indicates information, tips, and notes for handling the product or the software.



Examples

This symbol shows examples of how to use the product or software.



Required tool

This symbol indicates a tool that is required for the following steps.



Required accessories [+]

This symbol shows the accessories required for the following steps. The accessories are not included in the scope of delivery and can be ordered from Beckhoff.



Assembly material required

This symbol shows the assembly material required for the following steps. The assembly material is not included in the scope of delivery and must be purchased separately.



QR codes

This symbol shows a QR code that you can scan to watch videos or animations. Internet access is required in order to use it.

1.6 Beckhoff Services

Beckhoff and its international partner companies offer comprehensive support and service.

 www.beckhoff.com/en-en/support/global-availability/

1.6.1 Support services

The Beckhoff Support offers technical advice on the use of individual Beckhoff products and system planning. The support engineers offer you competent assistance, for comprehension questions as well as for commissioning.

 +49 5246 963-157

 support@beckhoff.com

 www.beckhoff.com/en-en/support/our-support-services/

1.6.2 Training offerings

Training in Germany takes place at the Beckhoff branches or, after consultation, at the customer's premises. Beckhoff offers both face-to-face and online training courses.

 +49 5246 963-5000

 training@beckhoff.com

 www.beckhoff.com/en-en/support/training-offerings/

1.6.3 Service offerings

The Beckhoff service experts support you worldwide in all areas of after-sales service.


 +49 5246 963-157

 service@beckhoff.com

 www.beckhoff.com/en-en/support/our-service-offerings/

1.6.4 Headquarters Germany


Beckhoff Automation GmbH & Co. KG
Hülshorstweg 20
33415 Verl, Germany

 +49 5246 963-0

 info@beckhoff.com

 www.beckhoff.com/en-en/

A detailed overview of the Beckhoff locations worldwide can be found at:

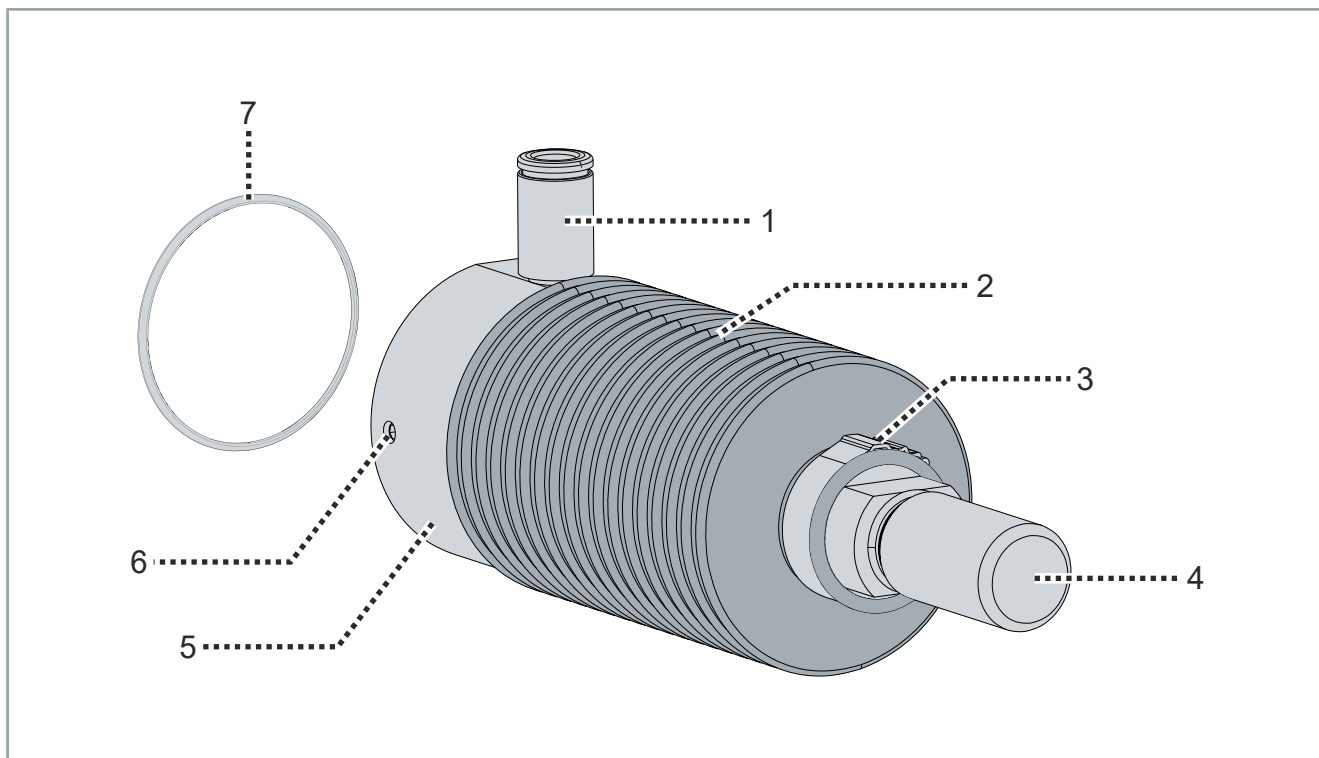
 www.beckhoff.com/en-en/company/global-presence/

1.6.5 Downloadfinder

In the Download finder you will find configuration files, technical documentation and application reports to download.

 www.beckhoff.com/documentations

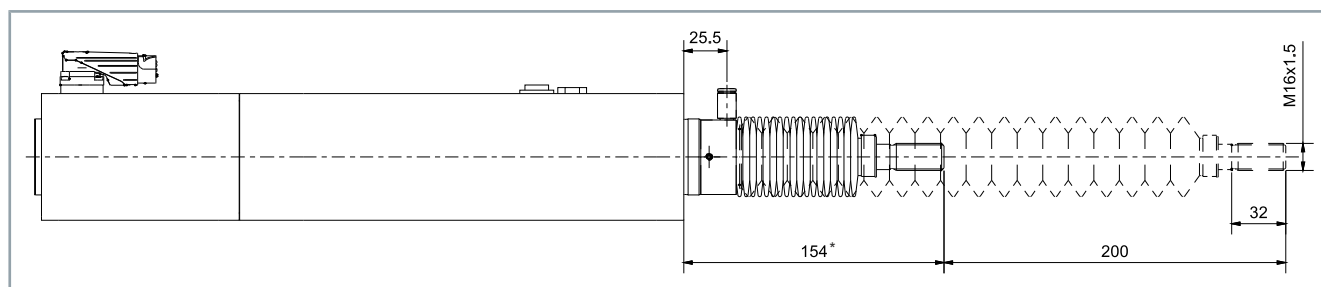
2 Product overview



Position	Explanation
1	Pneumatic push-in fitting
2	Bellows
3	Hose clamp
4	Spindle extension
5	Flange mounting
6	Set screws on both sides
7	O-ring

3 Dimensional drawing

- All figures in millimeters



* New spindle zero position after fitting the bellows kit.

4 Mounting bellows

NOTICE

Damage due to ingress of dust and moisture

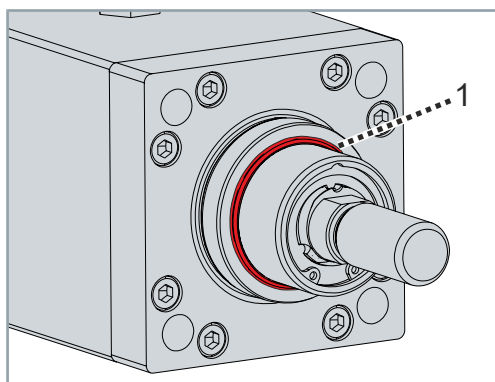
Moisture and fine dust in the immediate vicinity can get into the electric cylinder or bellows during operation. This can lead to damage to the product. If protection class IP65 is required, the electric cylinder and bellows must be connected with pneumatic hoses that prevent ingress through pressure equalization.

- Connect the pneumatic hose to the connector of the bellows and route it outside the process chamber
- Replace the pressure compensation element on the electric cylinder with a pneumatic connector. Connect the connector to a pneumatic hose and route it outside the process chamber



Tools required (not included in the scope of delivery)

- 2 x 15 mm open-end wrench
- Hex key 2 mm
- Pliers



- ▶ Place the O-ring [1] over the flange of the electric cylinder
- ▶ Push the O-ring [1] further towards the electric cylinder to the stop

NOTICE

Damage to the mechanics of the electric cylinder

Transverse forces and torques can damage the ball screw and integrated anti-twist protection of the electric cylinder.

- Avoid transverse forces and torques during assembly
- In any case, use tools to hold the spindle in position, such as a wrench

⚠ WARNING

Risk of injury due to altered zero position

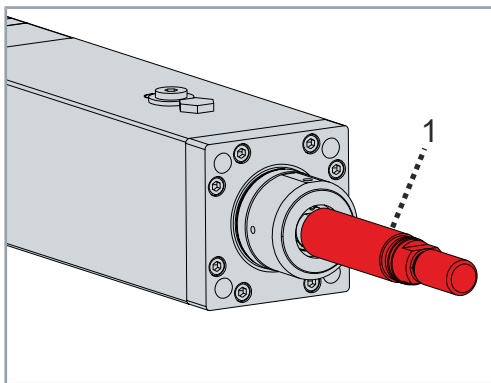
The piston rod extension changes the previously set "zero position of the spindle", [Page 14]. Failure to do so may result in serious injury and damage to the electric cylinder.

- Set the new software end positions in your project



Second 15 mm open-end wrench required

An additional 15 mm open-end wrench is required to lock the spindle end of the electric cylinder when screwing on the spindle extension.



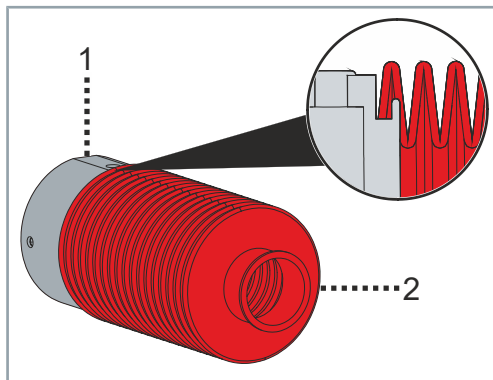
- ▶ Screw the spindle extension [1] onto the spindle end of the electric cylinder
- ▶ Tighten the spindle extension [1] with a 15 mm open-end wrench to a tightening torque of 20 Nm and secure with a threadlocker

NOTICE

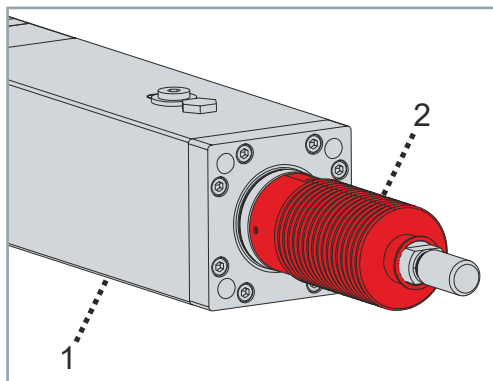
Damage due to improper assembly

If the bellows are not mounted properly, moisture and dirt can get onto the spindle of the electric cylinder. The tightness of the bellows is only guaranteed if it is correctly seated.

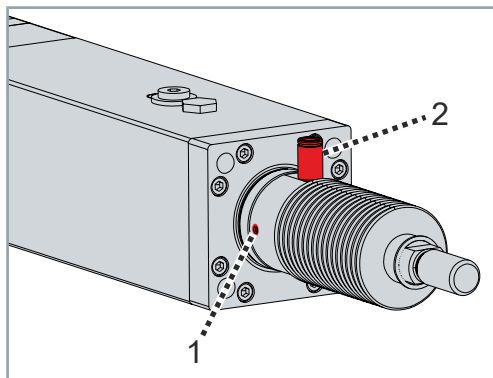
- Check that the bellows are seated correctly



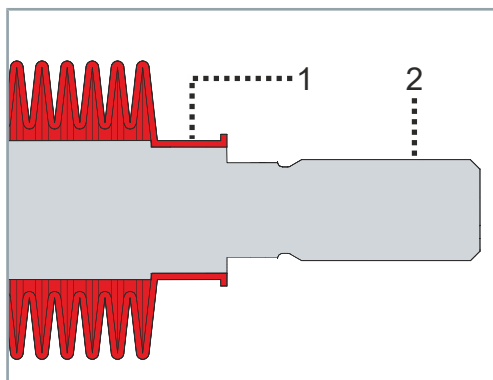
- ▶ Attach the bellows [2] to the flange fastening [1]
- ▶ For a positive connection, the end of the bellows [2] must be inserted into the groove of the flange fastening [1]



- ▶ Slide the bellows and flange fastening [2] onto the flange of the electric cylinder [1]

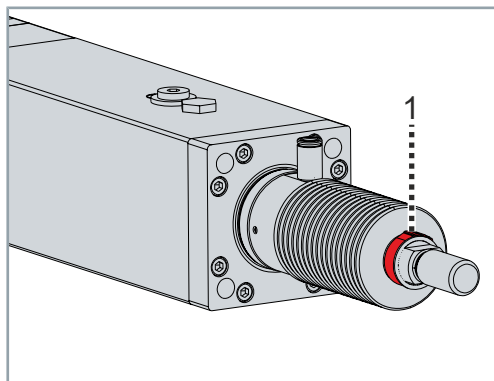


- ▶ Use a 2 mm hex key to tighten the two lateral set screws [1] of the flange fastening to a tightening torque of 1 Nm and secure with a threadlocker
- ▶ Screw the pneumatic push-in fitting [2] into the flange fastening with a tightening torque of 3 Nm



- ▶ Pull the front end of the bellows [1] over the spindle extension [2] and bring it into position

Mounting bellows



- ▶ Place the hose clamp [1] over the front end of the bellows and tighten with suitable pliers

Finishing assembly

- ▶ Check that all installed components are properly seated
- ▶ When recommissioning, note the changed mechanical end positions

More Information:
www.beckhoff.com/aa3000

Beckhoff Automation GmbH & Co. KG
Hülshorstweg 20
33415 Verl
Germany
Phone: +49 5246 9630
info@beckhoff.com
www.beckhoff.com

