

EWELLIX

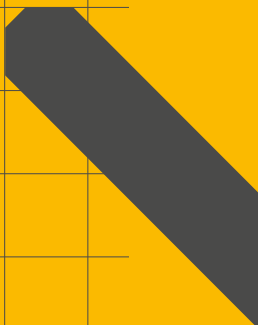
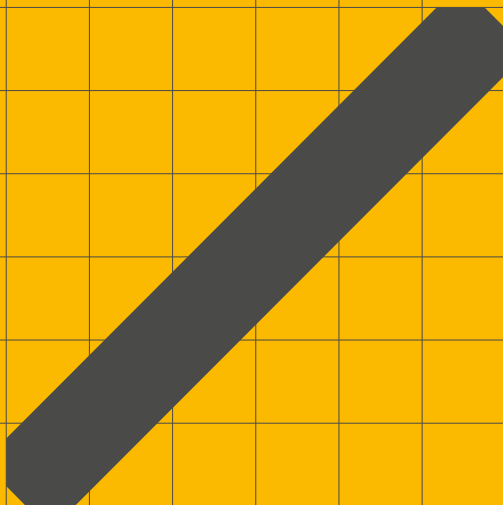
MAKERS IN MOTION

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

TFG

Telescopic pillar





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WARNING

Read this manual before installing, operating or maintaining this actuator. Failure to follow safety precautions and instructions could cause actuator failure and result in serious injury, death or property damage.

1.0 General information

1.1 Information on this manual

This manual provides information necessary for the proper and safe installation, operation, maintenance, dismantling and disposal of this pillar (also called device). It is an integral part of the equipment, and must be kept so that it is accessible to personnel.

Before doing anything with this device, personnel must read this manual thoroughly and understand its contents. Compliance with all specified safety instructions and operating instructions is vital for safe and proper use of this device.

In addition, national and local governmental accident prevention regulations and general safety instructions must be observed in the area where this device is being used.

Illustrations in this manual are intended to facilitate a basic understanding of these concepts and may differ from the actual design.

1.2 Explanation of symbols and signal words

Safety precautions

Safety precautions in this manual are identified by symbols and signal words. These signal words (shown to the right) indicate the severity of the hazard.

Adhere to these safety precautions and act cautiously in order to avoid accidents resulting in personal injuries and damage to the device and the equipment into which it has been installed.

DANGER

Indicates a dangerous situation, which will lead to death or serious personal injury, if the precautionary measures are ignored.

WARNING

Indicates a dangerous situation, which can lead to minor or moderate injury or property damage, if the precautionary measures are ignored.

CAUTION

Indicates a dangerous situation, which can lead to minor or moderate injury if the precautionary measures are ignored.

NOTICE

Indicates information considered important, but not hazard-related (e.g. messages relating to property damage).



NOTE

Emphasizes useful hints and recommendations as well as information for efficient and trouble-free operation.

1.3 Operation manual

Ewellix manufactures state-of-the-art electric actuators, control units and operating equipment.

The purpose of this operation manual is to introduce you, as the user and the entity doing the further processing, to correct utilization and safe use.

For this goal to be achieved, it is essential that you very carefully read the chapter on safety (↳ **2. Safety, page 6**) and follow the instructions in this manual.

Validity

The instructions in this manual refer to the telescopic pillar TFG with the following identification:

- Manufacturer: Ewellix
- Product name: Telescopic pillar TFG
- Type designation: TFG 1.., TFG 5.., TFG 9..
- Year of manufacture: from 2005
- CE Mark: according to technical documentation

Target audience and obligation to read

These operating instructions are intended for technical personnel and authorized users who use the telescopic pillar TFG in their products and work with it. The operating authority determines who is authorized as a user.

We distinguish between different user groups, as the requirements on the users vary, depending on the activity they perform.



NOTE

Please note: You can find definitions of user groups along with their corresponding requirements in the chapter on safety (↳ **2. Safety, page 6**). You can assume one or more of these user groups provided you meet the applicable requirements.

The organization and implementation of the operation manual takes into account the different user groups.

Summary of contents

The operation manual serves as a reference work. The information therein is organized into four task- and theme-related parts:

The **Basic Principles** section gives the basic knowledge that every user should have.

The **Normal Operation** section contains information needed for operating the product under normal conditions, i.e. uninterrupted operation for use according to its intended application.

The **Special Operations** section describes all jobs deviating from normal operation, such as installation, initial start-up, maintenance, fixing faults and doing repairs.

The **Appendix** contains information that the user has to be able to access at any time. This includes information on using the operation manual (indexes) as well as data concerning the product itself (technical data).

Aids for accessing information

This manual has access aids that make it easier for you to quickly access the desired information:

- You can most easily find all information on a given topic in the Table of Contents, as a result of the task and theme-related organization of the operation manual.
- Information on a specific activity or a special topic can be found most quickly through the Index.
- Within the chapters of the operation manual, you can orient yourself with the help of the margin notes.

1.4 Organizational measures

If you have any questions that cannot be answered through this operation manual, contact the manufacturer directly.

Location of the operation manual

The operation manual can only benefit you if you have it available at all times. For this reason, always keep the operation manual where the equipment is being used.

Manufacturer address Ewellix

Oristalstrasse 97
CH-4410 Liestal
Tel.: +41 / 61 / 925 41 11
Fax: +41 / 61 / 921 37 04
E-mail: actuators.switzerland@Ewellix.com

Contact address

Your local Ewellix representative.

2.0 Safety

This chapter targets all the users of the TFG telescopic pillar. It contains information on its safe use and optimal utilization.

2.1 Safety program

The safety program from Ewellix spells out who is entitled to use it and the responsibility of individual users.

The TFG was designed and built in accordance with the latest technical standards and accepted safety rules.

EU-conformity is documented with the technical documentation.

2.1.1 Purpose of use of the TFG

The telescopic pillar TFG has been designed and built to be operated in accordance with its intended use. If you use the TFG for any use other than that cited, the manufacturer cannot be held responsible for damage resulting from this.

The TFG has been specifically designed for the movement of patient tables, instrument carriers, instrument tables, small lifting tables and dentist's chairs.

2.1.2 Intended Use

The intended use of the TFG is:

- dynamic, compression or tension loaded stroke.



NOTE

Please note: For the operations data, please see the Appendix of this operating manual (→ page 21).

2.1.3 Unauthorized use

Any use other than the intended use without the manufacturer's written agreement or operation beyond the technical limits is considered unauthorized.

You can find the technical operating limits in the Appendix (→ page 21) of this manual and on the type plate of the TFG.



NOTE

Please note: Any unauthorized use of the TFG can cause personal injury and property damage. Always adhere to the instructions of this manual.

2.1.4 User groups

To ensure safety, we place requirements on the users of the TFG, that must be adhered to under all circumstances. Only persons who meet the requirements are entitled to use the TFG.

We refer to all persons who operate, use, commission the telescopic pillar, process it further or pass it on for further processing as user groups. As the requirements of these user groups strongly depend on their role, we distinguish between the following user groups:

The **operating authority** is the contractual partner of the person doing the further processing or the reseller. They can impose legal conditions on the operating authority when purchasing the telescopic pillar. The operating authority ensures that the user is instructed in the authorized use of the equipment.

The **processor** is the contractual partner of the reseller or the manufacturer. He assembles the telescopic pillar into a complete device. He is authorized by the manufacturer to use the telescopic pillar TFG in accordance with the regulations and has the necessary expert knowledge.

The **technician** has the professional technical training to utilize the telescopic pillar TFG according to its authorized use. Apart from the chapter on Safety, he is also familiar with the chapter on Special operating modes. He will find the required technical data in the Appendix.

The **reseller** forwards the machine.

Any other person who uses the TFG is defined as an **operator**. The operator must have read the Safety chapter in this manual before using the machine. Moreover, he must be instructed about the normal operation by the operating authority.

2.1.5 Types of operation

The telescopic pillar TFG has been designed for intermittent or short-term use (↳ **Technical data, page 22**).

2.1.6 Danger zones

We differentiate between two danger zones that must be observed, depending on user role..

The danger zone covering persons also includes, in addition to the actual user, third persons (other personnel, visitors, patients etc.). In case of injury, the operating authority is liable.

The danger zone device comes under the Processor and Technician user groups and covers the telescopic pillar TFG and any elements that have been attached.

2.1.7 Areas of responsibility

Different areas of responsibility, corresponding to the different user groups, arise.

The **Operating Authority** bears the responsibility for the danger zone covering persons and ensures that only authorized and trained users work with the TFG. He or she is responsible for the following

- Identifying the persons who are allowed to use the TFG (authorized persons)
- Instructing the user groups
- Complying with all relevant legal conditions and regulations



NOTE

Please note: The Operating Authority may only authorize persons to use the TFG who meet the requirements for the user groups.

The **processor** is responsible for the following:

- Forwarding a CE-conformant operating manual for the device in which the telescopic pillar TFG is installed
- Adherence to the safety regulations in accordance with this operating manual

The **reseller** is responsible for the following:

- Forwarding this operating manual and the telescopic pillar TFG to the processor or
- Forwarding a CE-conformant operating manual and the device in which the telescopic pillar TFG is installed to the operating authority

The **technician** is responsible for the following:

- Observing the manufacturer's instructions and the safe set-up of interfaces with other equipment.
- Installation and use of the TFG in accordance with its intended use
- Installation of optional modules and connecting cables

The **operator** ensures that nobody will be endangered when the TFG is running. He or she is, in particular, responsible for:

- Operating the TFG in normal operating conditions
- Immediate and appropriate reaction to malfunctions

2.1.8 General safety notice

The telescopic pillar is suitable for internal use only and must not be exposed to weathering, strong UV radiation or corrosive or explosive atmospheric media (see Ambient conditions, ↳ **Technical data, page 22**).

2.2 Other hazards

The manufacturer has constructively, and with protective measures, minimized the effects of existing residual hazards. Pay attention to the residual hazards and the potential countermeasures given in the following chapters

2.2.1 Residual hazards to people, objects and property

Pay attention to the following residual hazards and the possible countermeasures for dealing with them TFG:

⚠ WARNING

Warning against hand injuries caused by trapping. Do not let any object or person come into contact with the inner tube and/or the final plate while the motor is running. Hold the TFG only by the external tube

⚠ WARNING

Warning for risk of crushing and damage to the TFG caused by static and dynamic overloading of the telescopic pillar. When driving against fixed objects the impact of the force can cause personal injury. Make sure that there are no persons or fixed objects present in the danger zone during the stroke

- Note the maximum permissible operating data in the Appendix (↳ **Technical data, page 22**)
- Note the type plate of the telescopic pillar

⚠ WARNING

Warning of side-acting forces. Excessive side-acting forces destroy the pillar and pose a danger to persons. During the stroke, do not manipulate any of the elements that are connected to the TFG.

- You can find the maximum permissible values in the appendix (↳ **Technical data, page 22**)

⚠ CAUTION

Beware of electric shock due to a squashed cable. Ensure that cables cannot get pinched or damaged. Check that the mains voltage corresponds to the nominal value on the type plate. Ensure that the strain relief clamp and cabling are correct

⚠ CAUTION

Beware of damage to the TFG caused by splashing or hose-directed water. The telescopic pillar TFG is, in accordance with IP30, not protected against splashing or hose-directed water. Exposure of the TFG to splashing or hose directed water must be prevented at all times

- If required, protect your telescopic pillar with appropriate protective measures.

⚠ CAUTION

Beware of personal injury caused by the application falling off. The final plate, which is made of plastic, can break when under load. It is prohibited to operate the telescopic pillar TFG without adequate support for the fastening plate or without an adapter plate! Reinforced adapter plates are available as accessories (↳ **Accessories, page 11**).

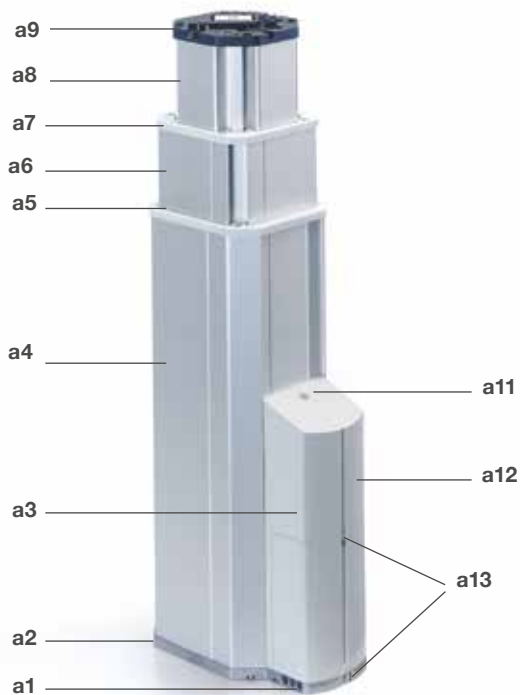
3.0 Construction and function

This chapter targets all the users of the TFG. It shows its construction and explains its function.

3.1 Construction

3.1.1 Overall view TFG

Overall view TFG 5..., TFG 9... Fig. 3

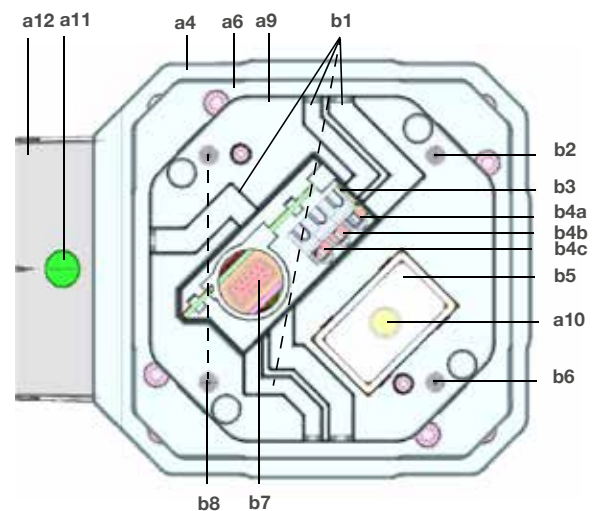


- a1** For TFG 1...: Cable with DIN 8 plug for the control unit
For TFG 5..., TFG 9...: Openings for the mains and operating element cables
- a2.** Base plate
- a3.** Cover
- a4.** Outer tube
- a5.** Outer tube rim cover
- a6.** Middle tube
- a7.** Middle tube rim cover
- a8.** Inner tube
- a9.** Final plate
- a10.** Opening for push tube fastening screw

- a11.** Only for TFG 5..., TFG 9...: Operating voltage display (green LED)
- a12.** Control unit housing
- a13.** Fastening screws for cover (a3)

Fig. 4

TFG 5..., TFG 9... Top view



- b1.** Cable conduits
- b2.** Opening for fastening screw 1
- b3.** Terminals for mains feed through (only if corresponding option selected)
- b4a.** Terminal for Pe mains cable (only if corresponding option selected)
- b4b.** Terminal for N mains cable (only if corresponding option selected)
- b4c.** Terminal for L1 mains cable (only if corresponding option selected)
- b5.** Push tube
- b6.** Opening for fastening screw 2
- b7.** Only for TFG 5..., TFG 9...: Connection for operating element (only if corresponding option selected)
- b8.** Opening for fastening screws 3 and 4

3.1.2 Operating elements

The Ewellix operating elements are available as accessories for the TFG and the Ewellix control unit. If you have any questions, please consult the corresponding operating manuals for these devices.

3.2 Function

A description of its function allows you to understand what the telescopic pillar and its individual parts do.

3.2.1 Functional principles

The functional principle of the TFG telescopic pillar is based on a pulling or pushing force for the movement of centric and excentric loads. A DC motor drives a lead screw via a worm gear. A spindle nut, which is attached to the push tube, moves up and down on the lead screw. The rotation direction is determined by the control unit and works on the reverse polarity voltage principle. The built-in brake decelerates the movement or holds the position at a standstill.

TFG 1..The telescopic pillar TFG 1.. is not equipped with a control unit and must be operated with a suitable Ewellix control unit and a Ewellix operating element.

TFG 5.., TFG 9..: The telescopic pillars TFG 5.. and/or TFG 9.. are equipped with mains connection and an integrated control unit. A suitable Ewellix operating element can be connected directly to TFG 5.., TFG 9..

Connections (a1)

TFG 1.. Equipped with a cable with a DIN8 plug for a Ewellix control unit.

TFG 5.., TFG 9.. Equipped with a mains connection and a connection for a Ewellix operating element. With the corresponding options selected, the TFG 5.., TFG 9.. can be energized (**b4a, b4b, b4c**) and operated (**b3**) via the final plate (**a9**)

Base plate (a2)

The base plate has 4 openings for one fastening screw each. Its purpose is to fasten the pillar to the application

Housing (a12)

The housing must not be removed

Cover (a3)

The cover is protected with two fastening screws (**a13**) in accordance with IP30 and must not be removed while in operation. The purpose of the cover is to protect the pillar unit and the connections.

TFG 1..: Located under the cover are the connections with the DIN 8 plug for a Ewellix control unit, and the optional mains cable and operating element feed through.

TFG 5.., TFG 9..: Located under the cover are the connections for the optional mains cable feed through. The control unit housing has openings for the corresponding cables (**a1**).

Operating voltage display (a11)

Only for **TFG 5.., TFG 9..:** With mains supply, the operating voltage display will show a green light.

Final plate (a9)

The application is fastened on the final plate. The push tube (**b5**) must also be attached permanently with a fastening screw (opening for the fastening screw visible on position a10 in **fig. 3, page 9** and **fig. 4, page 9**).

TFG 1..: The TFG 1.. can supply external devices with power with the mains cable feed through option.

TFG 5.., TFG 9..: Optionally, the mains supply and the connection for the operating element are located on the final plate.

Guide tube unit

The guide tube unit is made up of the outer tube (**a4**), the middle tube (**a6**) and the inner tube (**a8**), and its purpose is to carry centric and excentric loads.

Drive unit

The permanent magnet motor is a 24 V DC motor that drives the lead screw via the worm gear. The speed of the thrust depends on the load.

Worm gear

The worm gear drives the lead screw. It is driven via the permanent magnet motor.

Thermo-switch

TFG 1..: Thermal overload must be prevented by the control unit, as the TFG 1.. does not have a thermo-switch.

TFG 5.., TFG 9..: The thermo-switch in the control unit controls thermal and electrical overload and switches off the permanent magnet motor in an emergency. The pillar can not be operated again until the drive temperature has fallen below the switching threshold.

Switching off in case of overcurrent

TFG 1..: It must be ensured that the control unit will switch off in case of overcurrent, as the TFG 1.. does not have this switch-off facility integrated.

TFG 5.., TFG 9..: The control unit has a switch-off facility in the case of overcurrent integrated which protects the pillar from overload.

Brake

The brake is attached to the lead screw, its purpose is to decelerate the lead screw and to prevent a return movement.

3.3 Options and accessories

3.3.1 Options

Options can be recognized from the type designation on the type plate.

Pulse generator

With the Hall sensor, the pulse generator picks up impulses from a magnetic disk located on the lead screw. The pulse generator is mainly required for the synchronous running of several pillars. Suitable control units are available from Ewellix

Mains cable feed through

With the integrated mains cable feed through, external electrical appliances (e. g. microscopes, table lamps etc.) can be powered. With this option, the TFG hides mains cables which power the elements at both sides of the application.

NOTICE

Important: The mains supply must only take place from one side at a time

Operating elements feed through

With the operating elements feed through, one Ewellix operating element can be connected under the final plate (a9).

Only for **TFG 5..**, **TFG 9..**: This facilitates the option to connect and use operating elements simultaneously, at the bottom and at the top.

3.3.2 Accessories

Adapter plates

It is the purpose of the adapter plates to ensure that the fastened application is seated fully and solidly. The application must be fastened to the adapter plate with 4 fastening screws.

Mains cable

Only for TFG 5.., TFG 9..: Mains cables and plugs for specific countries can be supplied as accessories.

Control unit

Only for TFG 1..: The telescopic pillar TFG 1.. requires a Ewellix control unit to power the motor. Only use Ewellix control units.

Operating elements

The telescopic pillar TFG can be operated remotely by a Ewellix operating element on the control unit. Only use Ewellix operating elements.

Further details on accessories can be found in the appendix (↳ **Accessories, page 11**)

NOTICE

Important: Ewellix will not accept liability for any damage caused if the telescopic pillar TFG is not used with a suitable Ewellix control unit / operating element.

4.0 Normal operation

This chapter is directed at the user groups operator and operating authority. It provides all the information required for the safe and smooth operation of the telescopic pillar under normal operating conditions

4.1 Normal operation

In normal operations the telescopic pillar lifts or lowers elements which are connected to the TFG via the inner and outer tube.

4.1.1 Preconditions for operation

TFG 1..: The TFG is driven by the corresponding Ewellix control unit and the corresponding Ewellix operating element (↳ **Accessories, page 11**).

TFG 5.., TFG 9..: The control is driven via the integrated control unit and the corresponding Ewellix operating element.

4.1.2 Switching on telescopic pillar

⚠ WARNING

Warning for risk of crushing and damage to the TFG caused by static and dynamic overloading of the telescopic pillar. When driving against fixed objects the impact of the force can cause personal injury. Make sure that there are no persons or fixed objects present in the danger zone during the stroke.

- Note the maximum permissible operating data in the Appendix (↳ **Technical data, page 22**)
- Note the type plate of the telescopic pillar

⚠ WARNING

Warning of side-acting forces. Excessive side-acting forces destroy the pillar and pose a danger to persons. During the stroke, do not manipulate any of the elements that are connected to the TFG.

- You can find the maximum permissible values in the appendix (↳ **Technical data, page 22**)

⚠ CAUTION

Beware of electric shock due to a squashed cable. Ensure that cables cannot get pinched or damaged. Check that the mains voltage corresponds to the nominal value on the type plate. Ensure that the strain relief clamp and cabling are correct.

⚠ CAUTION

Beware of damage to the TFG caused by splashing or hose-directed water. The telescopic pillar TFG is, in accordance with IP30, not protected against splashing or hose-directed water. Exposure of the TFG to splashing or hose directed water must be prevented at all times.

- If required, protect your telescopic pillar with appropriate protective measures.

The Ewellix control unit must be connected to mains electricity. It is operated by a Ewellix operating element (↳ **Accessories, page 11**).



NOTE

Please note: Excessive current consumption, unusual noises or an independent downward movement indicate a damaged pillar. The TFG must not be run any more. Immediately inform the manufacturer that performs the inspection.

4.1.3 Emergency shutdown for TFG 1..

- 1 Pull the control unit mains cable from the socket.

4.1.4 Emergency shutdown for TFG 5.., TFG 9..

- 1 Pull pillar's mains cable from the socket.



NOTE

Please note: The TFG telescopic pillar does not have an on / off switch and must be disconnected from the power supply. Only this measure will de-energize the TFG.



NOTE

Please note: The entity doing the further processing must devise and install an emergency stop switch or a separation from the mains supply on all poles.

5.0 Special operations

5.1 Preparation

Good preparation is part of efficient installation and start-up. This includes, among other things, deciding on a location and having an energy source ready.

5.1.1 Transport



NOTE

Please note: Immediately after receipt, the pillar is to be examined for cracks and damage to the control unit housing and any other damage. Any transit damage is to be notified to the carrier and the manufacturer immediately and in writing.

The telescopic pillar TFG is delivered as a unit in a box or on pallets. Instruct a carrier to ship the telescopic pillar.

Return to the manufacturer

Prepare the telescopic pillar for transport as follows:

1. Dismantle the telescopic pillar as per the instructions in the chapter **Dismantling**, page 20.
2. Pack the telescopic pillar carefully.



NOTE

Please note: You will find weight, dimensions and the environmental requirements in the technical data in the appendix (Technical data, page 33).

Check items in shipment

The telescopic pillar comprises:

- a complete guide tube unit with pillar unit
- pre-assembled control unit housing
- only for TFG 1...: a cable with a DIN8 plug
-

Power supply

The telescopic pillar TFG runs solely on electricity. Observe the connection values in the appendix of this manual (↳ **Technical data**, page 22).

5.2 Installation and connections

Installing the telescopic pillar TFG on other elements (equipment carrier, etc.) involves taking into account special requirements of different applications.

The telescopic pillar TFG attaches to two elements via the final and base plate and/or, optionally, via adapter plates.

The following sections show how to set up and align the telescopic pillar, as well as the interfaces and connections TFG.

5.2.1 Set-up and adjustment

In setting up and aligning the telescopic pillar, TFG the following points must be observed. For the installation, you will require:

- 8 M6 fastening screws, property class 10.9
- 1 M10 fastening screw, property class 10.9

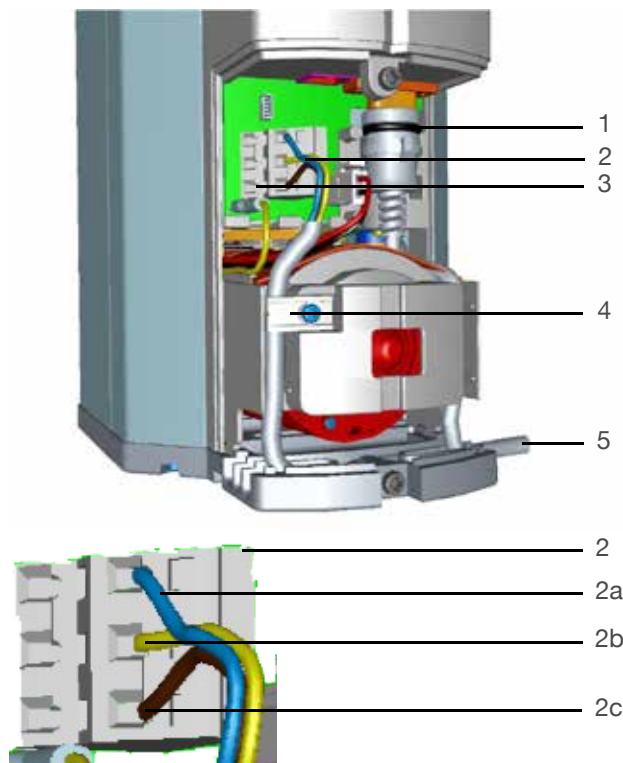
Make sure that

- the telescopic pillar TFG is attached to elements of the application on both sides,
- all attachment points are securely screwed to the application,
- the elements are fully aligned and seated at the top and at the bottom,
- the acting force does not impact the guide tubes with inadmissibly high values, as side-impacting forces that are too high can destroy the pillar,
- the actuator is not obstructed in any way in the entire lifting area.
- the cables are not pinched or caught or subject to tension stress.
- If the TFG telescopic pillar is installed in horizontal position, a maximum torque (Mb) of 500 Nm must not be exceeded at the bottom mounting plate.
- If necessary, the outer tube must be supported by suitable measures (↳ **fig. 6**, page 14).
- In the case of higher eccentric loads, please contact your local Ewellix representative (↳ **Manufacturer address**, page 5).

5.2.2 Interfaces and connections

Fig. 5

With cover opened



- 1 Only for TFG 5..., TFG 9...: Connection for operating elements
- 2 Only for TFG 5..., TFG 9...: Terminal blocks for mains cable
- 2a Only for TFG 5..., TFG 9...: Terminal for mains cable L1
- 2b Only for TFG 5..., TFG 9...: Terminal for mains cable N
- 2c Only for TFG 5..., TFG 9...: Terminal for mains cable Pe
- 3 Only if the corresponding option has been selected for TFG 5..., TFG 9...: Terminal blocks for the mains feed through
- 4 Only for TFG 5..., TFG 9...: Strain relief clamp for mains cable
- 5 For TFG 1...: Cable with DIN 8 plug for the control unit
For TFG 5..., TFG 9...: Mains cable

You can find the nominal values in appendix (↳ **Technical data, page 22**) and pin assignment for DIN 8 plug (↳ **page 23**).

- 1a Only for TFG 1...: Connect a suitable control unit (↳ **Accessories, page 11**), using the DIN 8 plug.
- 1b Only for TFG 5..., TFG 9...: Open the control unit housing with a suitable tool.
- 2 Connect the mains cable.
 - 2.1a Only for TFG 5..., TFG 9...: Connect the mains cable to the mains cable terminal blocks (see positions b4a, b4b and b4c in **fig. 4, page 9**).
 - 2.1b Only with mains cable feed through option (↳ **Accessories, page 11**): Connect the mains cable to the mains cable terminal block (see positions b4a, b4b and b4c in **fig. 4, page 9**) or, on the final plate, at the terminals for the mains feed through (b3 in **fig. 4, page 9**).

NOTICE

Important: The mains supply must only be provided from one side. The mains cable conductor wires must be stripped from the insulation for a length of 5-6 mm to ensure a reliable connection. Note the correct configuration of the stranded conductor for the mains cable, in particular, the differences between the mains cable terminal blocks in the control unit housing and the ones on the final plate.

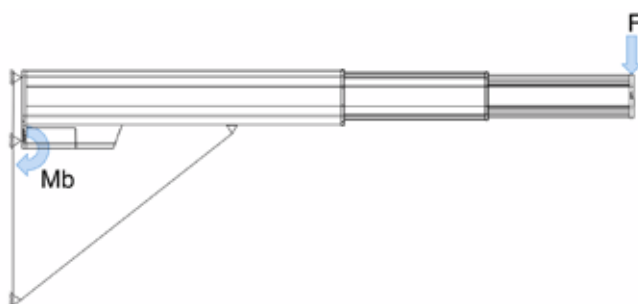
- 3* Only for TFG 5..., TFG 9...: Attach the mains cable, using the strain relief (4).
- 4a TFG 1...: Check if a suitable operating element (↳ **Accessories, page 11**) has been connected to the control unit.
- 4b TFG 5..., TFG 9...: Connect the corresponding operating element to the operation element connection (position 1 in **fig. 5** in the control unit housing and/or, if the relevant option has been selected, position b7 in **fig. 4, page 9** on the final plate).
- 5 Check that all interfaces and connections have been mounted and/or connected correctly.

NOTICE

Important: Metal fastening plates are not grounded through the TFG. If additional electrical devices are attached you must ensure that the connection meets the insulation requirements for protection class II.

Fig. 6

TFG installed in horizontal position



5.2.3 Installation

⚠ WARNING

Warning against hand injuries caused by trapping. Do not let any object or person come into contact with the inner tube and/or the final plate while the motor is running. Hold the TFG only by the external tube

Proceed as follows for installation:

1. Secure the elements that you want to connect the telescopic pillar to, so that you can place the TFG between them.

⚠ CAUTION

Beware of personal injury caused by the application falling off. The final plate, which is made of plastic, can break when under load. It is prohibited to operate the telescopic pillar TFG without adequate support for the fastening plate or without an adapter plate! Reinforced adapter plates are available as accessories (↳ **Accessories, page 11**).

NOTICE

Important: Ensure that metal fastening plates are not grounded through the TFG.
If additional electrical devices are attached you must ensure that the connection meets the insulation requirements for protection class II.

2. Connect final and base plates with one element each of the application, using 4 fastening screws (M6).

NOTICE

Important: Screw in to a maximum of 25 mm. It is vital that the screws do not protrude from the final and/or base plates.

3. Attach the push tube to the final plate, using a fastening screw (M10)

NOTICE

Important: Screw in to a maximum of 16 mm plus the thickness of the fastening plate (↳ **Connecting diagrams, page 23**). The screws must be at least property class 10.9.

4. Check that all screws are sufficiently secured against self-loosening.



NOTE

Please note: The fastening screws are not supplied. The bore dimensions can be found in the **Connecting diagrams, page 23** section. Please ensure that the connection cannot become loose unintentionally.

- 5*. **Only for TFG 1..:** Connect the telescopic pillar TFG 1.. with the corresponding control unit by connecting the DIN 8 plug of the TFG 1.. with the control unit.

- 6a **TFG 1..:** Connect the corresponding operating element to the corresponding control unit (see relevant operating instructions).

- 6b **TFG 5.., TFG 9..:** Connect the corresponding operating element to the TFG 5.., TFG 9..

NOTICE

Important: Ensure that cables cannot get pinched or damaged. Check that the mains voltage corresponds to the nominal value on the type plate.

- 7a **TFG 1..:** Connect the corresponding control unit to the mains supply (see applicable operating instructions).

- 7b **TFG 5.., TFG 9..:** Connect the control unit to the mains supply.

- 8* **Only for TFG 5.., TFG 9..:** Check the operating voltage display (green light must light up).

You can now operate the telescopic pillar, using the corresponding operating element.

NOTICE

Important: Ewellix will not accept liability for any damage caused if the telescopic pillar TFG is not used with a suitable Ewellix control unit / operating element.

Only for TFG 1..: If the telescopic pillar is used with a non Ewellix control unit, the control unit must be equipped with an overcurrent protection in order to protect the telescopic pillar against overload. The pillar must be switched off immediately, if a current of 5,1 A is exceeded for a maximum of 50 ms. To start the pillars, the overcurrent circuit breaker must be deactivated for 250 ms. The maximum permissible operation time must not be exceeded.

5.3 Initial start-up

Perform the installation check before you start up the telescopic pillar for the first time TFG.

5.3.1 Installation check

⚠ WARNING

Warning for risk of crushing and damage to the TFG caused by static and dynamic overloading of the telescopic pillar. When driving against fixed objects the impact of the force can cause personal injury. Make sure that there are no persons or fixed objects present in the danger zone during the stroke.

- Note the maximum permissible operating data in the Appendix (↳ **Technical data, page 22**)
- Note the type plate of the telescopic pillar

Check the following points before the initial start-up:

- All instruction points from the above sections of this chapter carried out
- Grounding conductor resistance and substitute leakage currents checked
- No impermissibly high side-acting forces impacting on the guide tubes
- Fastening screws secured on inner, outer and push tubes
- Entire stroke area not obstructed, so that the pillar cannot be driven onto a fixed object
- All cables secured against pinching and trapping, and properly connected
- Electrical supply secured
- Magnetic operating element connected to the control unit

5.3.2 Initial start-up

After the installation check has been completed, you can start up the telescopic pillar TFG: To do so, press the corresponding operating button of the Ewellix operating element

6.0 Maintenance, clearing malfunctions, repairs

This chapter is intended for technicians and those doing the further processing. It provides you with all the information you need for maintaining, clearing malfunctions and carrying out repairs on the telescopic pillar TFG.

6.1 Maintenance

Maintenance includes all operations which keep the telescopic pillar fully functional. These operations include inspections, replacing consumables and cleaning.

6.1.1 Maintenance plan

The telescopic pillar TFG is virtually maintenance-free for the full duration of its service life (you can find details on its service life in the appendix, Equipment and operating data, page 33). Connection cables and housing have to be checked for wear and tear at regular intervals.

In compliance with applicable regulations, safety inspections must be carried out, on location, at regular intervals.

1. Check grounding conductor resistance and substitute leakage currents annually.

6.1.2 Cleaning

⚠ CAUTION

Beware of damage to the TFG caused by splashing or hose-directed water. The telescopic pillar TFG is, in accordance with IP30, not protected against splashing or hose-directed water. Exposure of the TFG to splashing or hose directed water must be prevented at all times.

- If required, protect your telescopic pillar with appropriate protective measures.

Observe the following points when cleaning:

- Clean soiled parts immediately
- Use a damp cloth
- Wash water including added chemicals must be pH-neutral.
- Acidic or alkaline wash water can destroy metallic and synthetic parts.

Medical area

- Handwash disinfection exclusively with isopropyl alcohol



NOTE

Please note: Cleaning agents other than the ones listed, or high pressure steam cleaners will damage the telescopic pillar. Always contact the manufacturer if you want to use other cleaning agents.

6.2 Malfunctions

Any faults occurring in the telescopic pillar TFG may only be rectified by a technician authorized by the manufacturer. In this case the TFG must be removed from service (↳ **Shutting down, page 20**) and sent to Ewellix (↳ **Transport, page 13**).

In the following sections, you will find hints on how you can recognize, remedy or handle malfunctions.



NOTE

Please note: In any case, immediately inform customer service (↳ **Manufacturer address, page 5**), if the fault cannot be rectified on the basis of the following instructions.

6.2.1 Recognizing malfunctions

1 – Telescopic pillar TFG will not move.

Hypothesis 1-A

No supply voltage or absence of plug contact.

- 1a. TFG 1...: Plug the DIN 8 plug into the corresponding connection on the control unit and the mains cable connection of the control unit into a mains socket.
- 1b. TFG 5..., TFG 9...: Plug the mains cable connection into a mains socket.
2. Connect the operating element connection to the corresponding connection of the control unit.

TFG Does it move now?

Yes: ↳ **Normal operation, page 12**

No: **Hypothesis 1-B**

Hypothesis 1-B

Mains cable defective

- 1a. TFG 1...: Check the mains cable of the control unit for squeezing, tears and other damage.
- 1b. TFG 5..., TFG 9...: Check the mains cable of the control unit for squeezing, tears and other damage..

Mains cable damaged?

Yes: Report to the customer service (↳ **Manufacturer Address, page 5**)

No: **Hypothesis 1-C**

Hypothesis 1-C

Obstacle is obstructing the TFG

1. Remove all objects that impede the stroke.

TFG Does it move now?

Yes: ↳ **Normal operation, page 12**

No for TFG 1: **Hypothesis 1-D**

No for TFG 5..., TFG 9: **Hypothesis 1-E**

Hypothesis 1-D

Only for TFG 1...: Wrong control unit

1. Check the type plate of the control unit.

Is the manufacturer Ewellix and is the control unit approved for the TFG?

Yes: **Hypothesis 1-E**

No: Replace control unit

Hypothesis 1-E

Incorrect useful load

1. Check the type plate of the telescopic pillar.
2. Measure the static or dynamic load.

Has the useful load been exceeded (↳ **Technical data, page 22**)?

Yes: Reduce load, ↳ **Manufacturer address, page 5**

No: **Hypothesis 1-F**

Hypothesis 1-F

Control unit defective

- 2a. TFG 1...: Carry out the troubleshooting procedure for the Ewellix control unit.
- 1b. TFG 5..., TFG 9...: Check that the green operating voltage display lights up, if it does not, the control unit is defective.

Is the control unit faulty

Yes for TFG 1...: Replace control unit

Yes for TFG 5..., TFG 9...: ↳ **Manufacturer address, page 5**

No: **Hypothesis 1-G**

Hypothesis 1-G

Service life exceeded

Is the telescopic pillar TFG older than 10 years or has it carried out more than 20,000 double strokes at 400 mm stroke length?

Yes for TFG 1...: ↳ **Manufacturer address, page 5**

No: **Hypothesis 1-H**

Hypothesis 1-H

Thermo-switch stopped pillar

- 1a. TFG 1...: Isolate the pillar from the control unit and let the pillar cool down for approx. 20 minutes.
- 1b. TFG 5..., TFG 9...: Let the pillar cool down for approx. 20 minutes.



NOTE

Please note: The pillar can not be operated again until the pillar temperature has fallen below the switching threshold.

TFG Does it move now?

Yes: ↳ **Normal operation, page 12**

No: ↳ **Manufacturer address, page 5**

Hypothesis 1-I

The pillar cannot be made to move by any of the measures listed above

1. Contact the manufacturer immediately (↳ **Manufacturer address, page 5**).

2– Pillar cannot be operated.

Hypothesis 2-A

Ewellix operating element defective.

1. Check the type plate of the operating element

Is the manufacturer of the operating elements Ewellix and is it approved for the TFG?

Yes: ↳ **Manufacturer address, page 5**

No: **Replace operating element**

3 Load cannot be lifted

Hypothesis 3-A

Spindle nut defective.

1. Remove all objects that impede the stroke.
2. Remove all loads on the elements.

Does the pillar move normally?

Yes: ↳ **Normal operation, page 12**

No: ↳ **Manufacturer address, page 5**

4 Greatly reduced speed

Hypothesis 4-A

Motor, gears or spindle nut faulty.

1. Remove all objects that impede the stroke.
2. Remove all loads on the elements.

Is the speed normal again?

Yes: ↳ **Normal operation, page 12**

No: ↳ **Manufacturer address, page 5**

5 Greatly increased running noises

Hypothesis 5-A

Motor, gears or spindle nut faulty.

1. Remove all objects that impede the stroke.
2. Remove all loads on the elements.

Still elevated running noises?

Yes: ↳ **Manufacturer address, page 5**

No: ↳ **Normal operation, page 12**

6 Increased play in the guide system

Diagnosis 6-A

Sliding elements worn, immediately inform customer service (↳ Manufacturer address, page 5).

6.3 Repair

The telescopic pillar TFG is designed to be repairable.

Repairs must only be carried out by persons authorized by the manufacturer. In any case, contact customer service (↳ **Manufacturer address, page 5**).

7.0 Removing from service, dismantling and disposal

This chapter is intended for technicians and those doing the further processing. It provides you with all the information needed to remove the telescopic pillar TFG from service, dismantle it and dispose of it.

7.1 Shutting down

The telescopic pillar TFG is to be removed from service in the following sequence:

- 1a. TFG 1..: De-energize the TFG 1.. by unplugging the mains plug of the control unit from the power outlet.
- 1b. TFG 5.., TFG 9..: De-energize the TFG 5.., TFG 9.. by unplugging the mains plug of the control unit from the power outlet.
2. Secure the elements in such a way that there is no pulling or pushing force resting on the TFG.
- 3*. Only for TFG 1..: Pull the DIN 8 plug out of the Ewellix control unit.
4. Pull the plug of the operating element out of the connection for the operating element.

Afterwards you can dismantle or reinstall the TFG.

7.2 Dismantling

Before you start dismantling, put the telescopic pillar TFG out of operation (↳ **7.1 Shutting down**). The telescopic pillar TFG is to be dismantled in the following sequence:

1. Ensure that there is no pressure acting on the pillar and the inner tube
2. Loosen and remove the fastening screws
3. Separate the telescopic pillar from the elements

Afterwards, you can prepare the TFG for shipping (↳ **Transport, page 13**) or store or dispose of it as described in the following sections.

7.3 Storage

For storage, pack the TFG in its original packaging. Observe the following values when selecting a storage location:

- Ambient temperature: -10 °C to +40 °C
- Atmospheric humidity: 5 % to 85 %

7.4 Disposal

The pillar is primarily made from recyclable materials. Specialized companies can separate the recyclable materials and therefore minimize the quantity of materials requiring disposal.

The pillar must be disposed of in a technically correct manner in accordance with local regulations. The plastic parts are marked with material specifications on the actual parts (except some of the smallest parts).

Please find dismantling instructions and shipping requirements in the relevant sections

8.0 Appendix

Technical data

Please refer to the following document:

Telescopic pillar TFG datasheet

PUB IL-07008-EN-October 2019

For further technical information please contact Ewellix

TFG

Telemag



Benefits

- Push or pull load
- Compact design
- Fast movement
- Powerful
- Plug and play

Standards

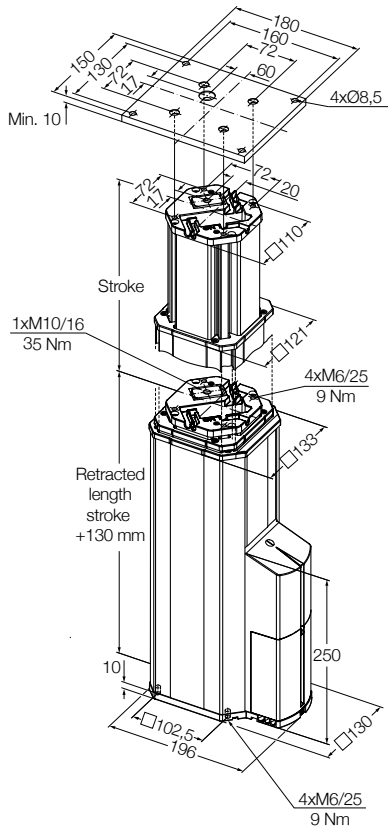
- EN/IEC 60601-1
- UL 60601-1

Technical data

	Unit	TFG 10	TFG 50	TFG 90
Rated push load	N	2 500	2 500	2 500
Rated pull load	N	2 500	2 500	2 500
Bending load	Nm	up to 500	up to 500 ¹⁾	up to 500 ¹⁾
Speed (full load to no load)	mm/s	15 to 19	15 to 19	15 to 19
Telescopic pillar version	# of section	3-section	3-section	3-section
Stroke	mm	200 to 700	200 to 700	200 to 700
Retracted length	mm	S+130	S+130	S+130
Voltage	V AC	24	120	230
Power	W	120	160	160
Current	A	5	1,8	1
Duty cycle: intermittent operation	min.	1 min./9 min.	1 min./9 min.	1 min./9 min.
Duty cycle: short-time operation	min.	3	3	3
Ambient temperature	°C	+10 to +40	+10 to +40	+10 to +40
Type of protection	IP	30	30	30
Protection class	-	SELV	I	I
Type of control	-	electrical	electrical	electrical
Weight	kg	8 to 19	8 to 19	8 to 19

¹⁾ For details, please see bending load diagrams (↳ [page 24](#))

Dimensional drawing



Note: mounting plates are not included.
To be ordered separately.

Legend:

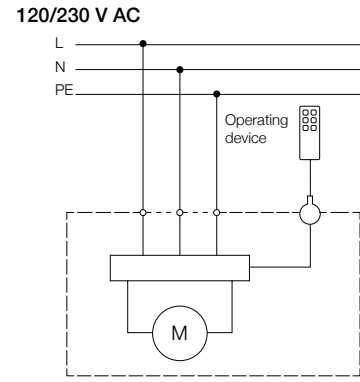
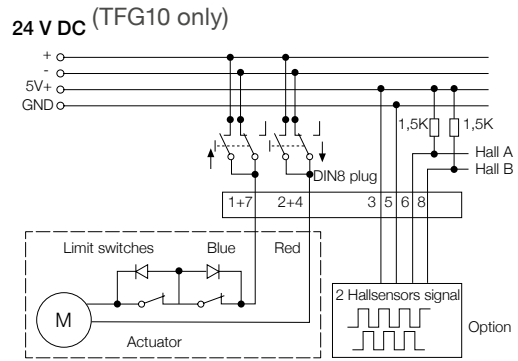
S = stroke
L = retracted length

Suitable control units and accessories

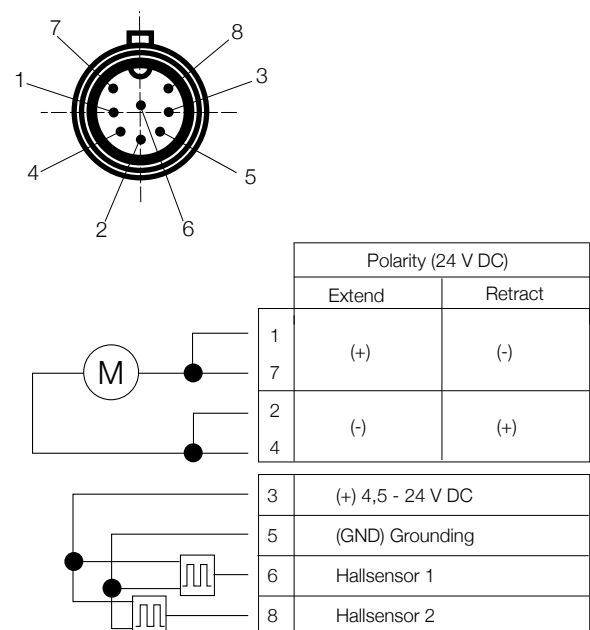
TFG1	Control units				
	SCU	VCU	BCU	COMPACT	SEM
Operating switches					
EHA 3	•	•	•	•	•
EHE	•	•	•	•	•
STJ	•	•	•	•	•
STE	•	•	•	•	•
HSM	•	•	•	•	•
HSF	•	•	•	•	•

Hand switch Foot switch Desk switch

Connecting diagrams

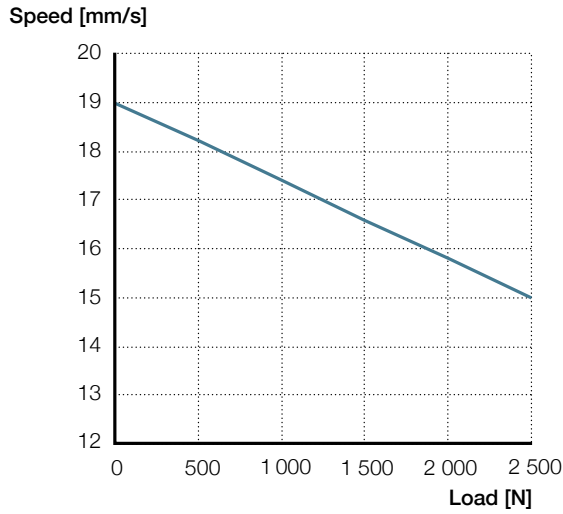


Pin assignment for DIN 8 plug

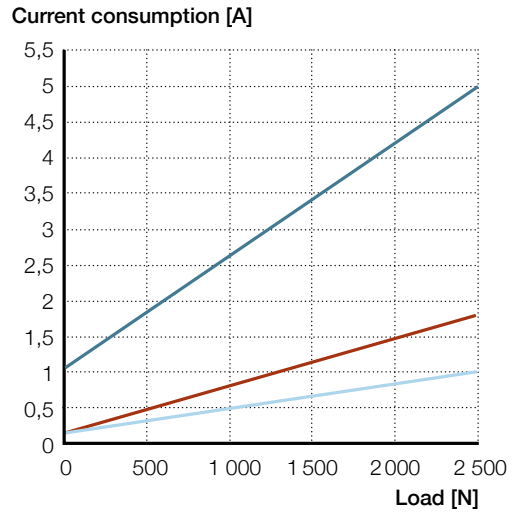


Performance diagrams

Speed-load diagram



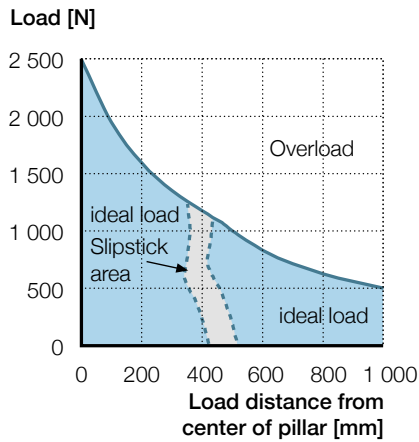
Current-load diagram



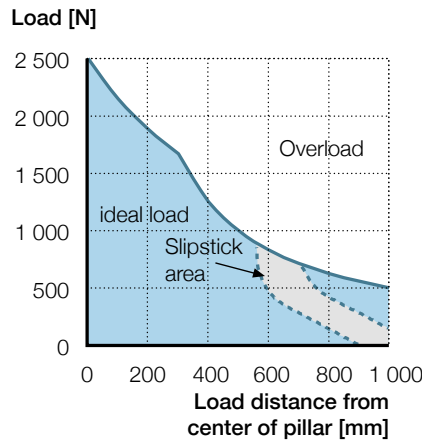
— TFG 10 — TFG 50 — TFG 90

Bending load diagrams

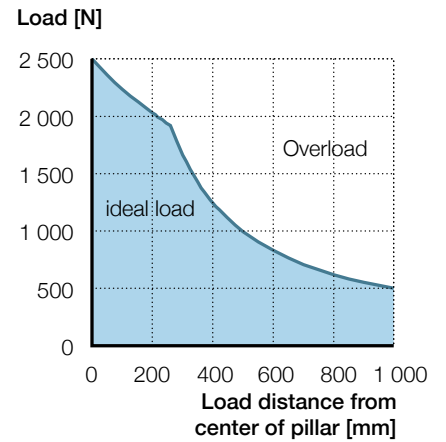
200 mm stroke



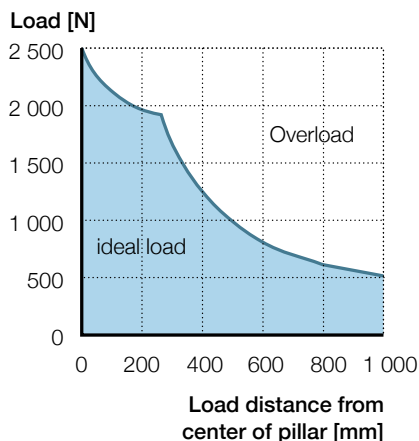
300 mm stroke



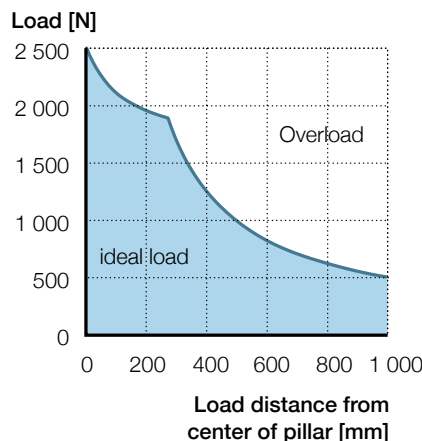
400 mm stroke



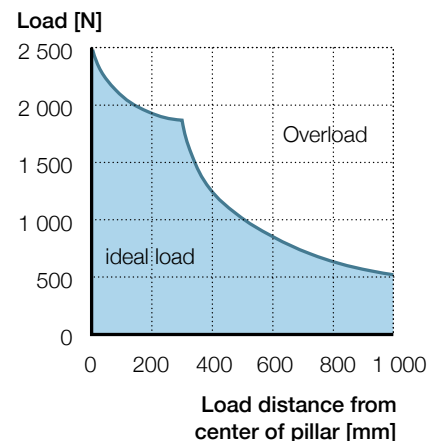
500 mm stroke



600 mm stroke



700 mm stroke



Accessories

	Designation	Order N°
Top mounting plate Bore 72 × 72 mm	ZPL-333360	0124808
Bottom mounting plate Bore 102,5 × 102,5 mm	ZPL-264363	0124814
Screw for top mounting plate M10 × 25 (1 screw required)	ZBE-510978	0125359
Screw for top mounting plate M6 × 30 (4 screws required)	ZBE-510709	0125560
Screw for bottom mounting plate M6 × 30 (4 screws required)	ZBE-510709	0125560
Mains cable SEV plug 3 000 mm, black, 3 × 0.75 mm ²	ZKA-304345-3000	0128699
Mains cable Schuko plug 3 000 mm, black, 3 × 0.75 mm ²	ZKA-304346-3000	0121729
Mains cable US plug 3 000 mm, black, 3 × 0.75 mm ²	ZKA-304347-3000	0121762
Mains cable British Standard plug 3 000 mm, black, 3 × 0.75 mm ²	ZKA-304355-3000	0121755

Ordering key

	T	F	G	0	-	2	3							-	0	0	0
Type																	
Voltage																	
24 V DC	1																
120 V AC (50/60 Hz)	5																
230 V AC (50 Hz)	9																
Stroke [S]																	
200 mm	200																
250 mm	250																
300 mm	300																
350 mm	350																
400 mm	400																
500 mm	500																
700 mm	700																
Option																	
No option	000																
With 2-Hall encoder, 14 pulses per 9 mm travel	E__																
With mains cable feedthrough (3xAWG16)	_C_																
With control cable feedthrough (10xAWG28)	__H																



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PUB NUM TC-08022-EN-May 2020