

EWELLIX

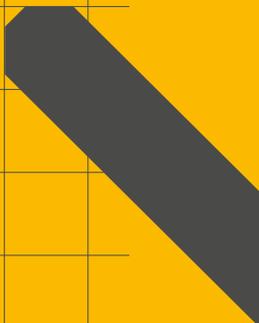
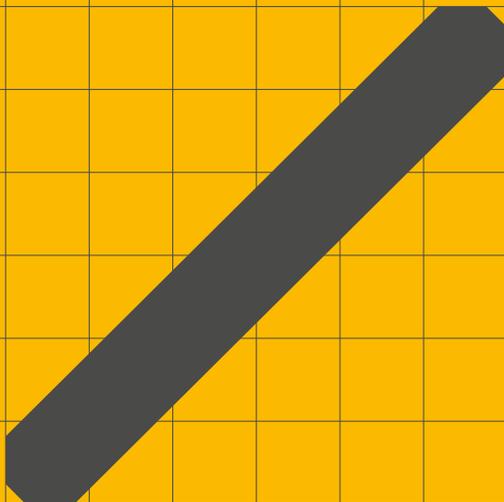
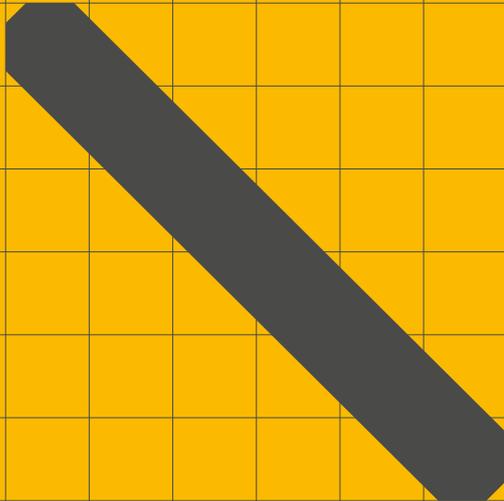
MAKERS IN MOTION

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

TLC

Telescopic pillar





Contents

| | | | |
|--|----------|---|-----------|
| 1.0 General information | 4 | 4.0 Installation and startup | 11 |
| 1.1 Information on this manual | 4 | 4.1 Scope of delivery | 11 |
| 1.2 Explanation of symbols and signal words..... | 4 | 4.1.1 Options..... | 11 |
| 1.3 Operation manual | 5 | 4.1.2 Accessories..... | 11 |
| 1.4 Organizational measures | 5 | 4.2 Connections..... | 11 |
| 2.0 Safety | 6 | 4.2.1 Connecting the power cable / control device | 12 |
| 2.1 Safety program | 6 | 4.2.2 Strain relief | 12 |
| 2.1.1 Purpose of use of the TLC | 6 | 4.3 Installation | 12 |
| 2.1.2 Intended Use..... | 6 | 4.4 Startup | 13 |
| 2.1.3 Unauthorized use..... | 6 | 5.0 Operation | 14 |
| 2.1.4 User groups | 6 | 5.1 Controlling an actuator | 14 |
| 2.1.5 Types of operation | 7 | 6.0 Maintenance and care | 15 |
| 2.1.6 Danger zones..... | 7 | 6.1 Maintenance | 15 |
| 2.1.7 Areas of responsibility | 7 | 6.2 Care 15 | |
| 2.1.8 General safety notice..... | 7 | 6.2.1 Protection from water, cleaning, disinfecting | 15 |
| 2.2 Other hazards | 8 | 6.3 Warranty..... | 15 |
| 3.0 Function | 9 | 6.4 Disposal | 15 |
| 3.1 General function | 9 | 6.5 Liability | 15 |
| 3.2 Correct use | 9 | 7.0 Appendix | 16 |
| 3.3 Ambient conditions..... | 9 | | |
| 3.3.1 Operation | 9 | | |
| 3.3.2 Storage / transport | 9 | | |
| 3.3.3 Operating mode..... | 9 | | |
| 3.4 Construction | 10 | | |
| 3.4.1 Control unit | 10 | | |
| 3.4.2 Terminal-position shutdown | 10 | | |

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 TLC with the following identification:

- Manufacturer: Ewellix
- Product name: Telescopic pillar TLC
- Type designation: TLC 12ZWAS, TLC 12ZWAK, TLC 12ZWDS, TLC 12ZWDK
- 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 TLC 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 TLC 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 TLC 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 TLC

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

The TLC 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 TLC is:

- dynamic, compression or tension loaded stroke.



NOTE

Please note: For the operations data, please see the Appendix of this operating manual (→7.0 Appendix, page 16).

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 (→7.0 Appendix, page 16) of this manual and on the type plate of the TLC.



NOTE

Please note: Any unauthorized use of the TLC 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 TLC, that must be adhered to under all circumstances. Only persons who meet the requirements are entitled to use the TLC.

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 TLC in accordance with the regulations and has the necessary expert knowledge.

The **technician** has the professional technical training to utilize the telescopic pillar TLC 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 TLC 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 TLC has been designed for intermittent or short-term use (↳ **Technical data, page 17**).

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 TLC 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 TLC. He or she is responsible for the following

- Identifying the persons who are allowed to use the TLC (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 TLC 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 TLC 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 TLC to the processor or
- Forwarding a CE-conformant operating manual and the device in which the telescopic pillar TLC 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 TLC in accordance with its intended use
- Installation of optional modules and connecting cables

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

- Operating the TLC 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 (↳ **Technical data, page 17**).

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

Residual hazards to people, objects and property

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

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 TLC only by the external tube

WARNING

Warning for risk of crushing and damage to the TLC 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 17**)
- 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 TLC.

- You can find the maximum permissible values in the appendix (↳ **Technical data, page 17**)

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 TLC caused by splashing or hose-directed water. The telescopic pillar TLC is, in accordance with IP30, not protected against splashing or hose-directed water. Exposure of the TLC 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 TLC without adequate support for the fastening plate or without an adapter plate! Reinforced adapter plates are available as accessories (↳ **4.1.2 Accessories, page 20**).

3.0 Function

3.1 General function

The TLC is an electrical linear actuator which uses virtually play-free guide tubes. It has been designed for holding and moving centric and eccentric loads.

An AC motor drives a threaded nut that is fastened in the rotor shaft. This nut then runs up and down the torsionally rigid threaded spindle, which thereby generate the feed motion. The telescopic tubes are retracted and run out depending on the direction of the motor.

The AC motor is operated as a capacitor motor on a single-phase AC voltage network.

3.2 Correct use

The TLC has been designed specifically for adjusting equipment carriers, lifting tables, chairs and office furniture which comply with standards EN 60601-1, EN 60601-1-2 and UL 2601.

The TLC should only be subjected to compressive loads. It is only suitable for indoor use and must not be subjected to the elements.

For pull applications, specially equipped pull version actuators are available.

Specify the direction of load when ordering. The unit must not be converted or modified.

⚠ CAUTION

Where eccentric loads are involved, the permissible maximum load decreases. Please observe the permissible load on the load diagram contained in the datasheet. If an eccentric overload occurs, the actuator can be damaged. The load can tip sideways.

3.3 Ambient conditions

3.3.1 Operation

- Temperature 10 °C to 40 °C
- Humidity max. 85%

3.3.2 Storage / transport

- Temperature -20 °C to 40 °C
- Humidity max. 95%

⚠ WARNING

The TLC telescopic actuator must not be operated in an explosive atmosphere.



NOTE

For transport purposes, the TLC defined for push load can be loaded with a pull force of up to 50 kg for a short period.

⚠ CAUTION

The maximum centric load specified on the data label and the permissible eccentric load specified in the transverse load diagram must not be exceeded. A push actuator must never be used to pull. The actuator may be destroyed if these instructions are not observed.

3.3.3 Operating mode

See Technical Datasheet.

The actuator has been designed for intermittent operation. If a higher duty cycle is required, contact Ewellix

⚠ CAUTION

If the duty cycle is too long, a temporary malfunction may occur.

3.4 Construction

The TLC is fitted with a thermal fuse. The thermostick integrated into the motor winding switches the actuator off if the temperature becomes excessive. After cooling down, the thermostick is reactivated automatically

⚠ CAUTION

The first failure safety of the overall system must be checked in the end product in order to rule out risks to life/limb and property.

3.4.1 Control unit

The TLC telescopic actuator is controlled by external pneumatic control devices, an electrical cable via which the motor's direction of rotation is controlled externally, or via a low-voltage interface using an electrical handswitch or footswitch.

Feeding and control of the actuator is possible at either the top or the bottom as standard. This cable feedthrough is permitted for 230 V, 6 A.

The TLC has extensive protection against faults. First failure safety cannot be ensured, however, since unpredictable faults - e.g. to a control device - can result in slow, uncontrolled movements.

3.4.2 Terminal-position shutdown

The stroke of the TLC is limited by the integrated limit switches. These switch off the actuator.

4.0 Installation and startup

4.1 Scope of delivery

The TLC consists of:

- the complete lifting column (guide tube with colourless anodised finish)
- Plug housing with socket element for connection at bottom
- Socket element for connection at top
- Closure piece

4.1.1 Options

- Low-voltage control unit
- Pull version

4.1.2 Accessories

- Handswitch, deskswitch, footswitch (Comfodesk)
- Mounting plates (colourless anodised finish)
- Fastening screws

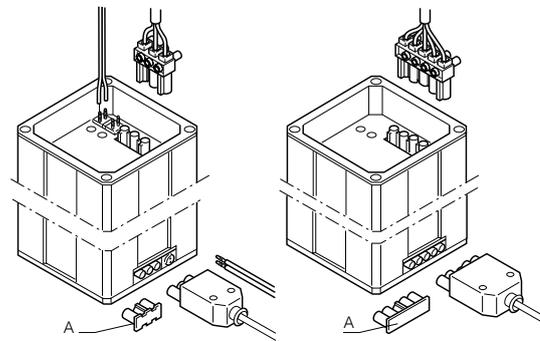
4.2 Connections



NOTE

Protection class I applies for the TLC. The external and internal aluminium tubes have a protective conductor connection.

Fig. 1



Connection for pneumatic control

Connection for electrical control unit

For top connection: Always lock the plug at the bottom using the closure piece (A), fig. 1 !

The plug socket or closure piece must click audibly into position.

The TLC has marked connections for mains + operation either at the top or at the bottom.

CAUTION

The strain relief **MUST** be fastened in the plug housing.

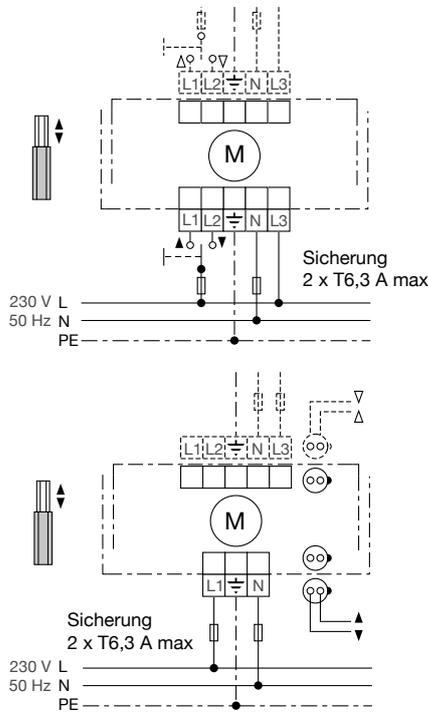
WARNING

Ensure that only one power cable is connected (either top or bottom) at any one time. Otherwise the actuator may be damaged. Risk of electric shock!

4.2.1 Connecting the power cable / control device

Connect the power cable to the connection provided as shown in fig. 2.

Fig. 2



- L 1 = "Up" phase
- L 2 = "Down" phase
- L = Phase conductor connection
- N = Neutral conductor connection
- = Protective conduction connection

CAUTION

The L1 and L2 switch contacts must both be locked in position.

CAUTION

The mains connection must be fused by the customer.

4.2.2 Strain relief

You must ensure that the configuration provides sufficient strain relief for all connected cables.

CAUTION

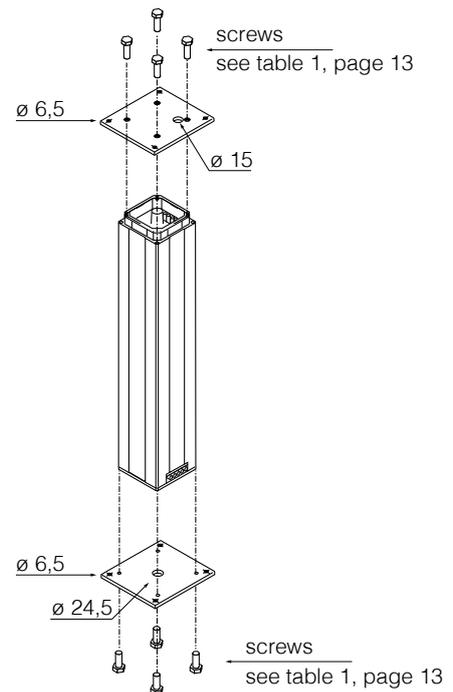
Electric cables should not be exposed to the risk of pinching, or to bending or tensile loads.

4.3 Installation

The TLC can be secured to either Ewellix mounting plates (→ 4.1.2 Accessories, page 11) or the customer's own plates.

- Remove the transportation screws (4 pcs.)
- Fasten the mounting plates onto the aluminium tubes using the four bores (auxiliary plates are fitted to the end faces of the outer tube).

Fig. 3



WARNING

Only use the screws recommended (Quality 10.9, TGC 12.9). Observe the minimum screw-in depth and the torque specified on the datasheet.

WARNING

When using your own fastening plates, you must ensure that the auxiliary plates are supported over their entire surface - this will distribute the force over the entire area. Otherwise, there is a risk of the auxiliary plates fracturing.

WARNING

During installation, ensure that no objects or parts of the body are trapped between the fastening plate of the internal tube and the outer tube during retraction. Danger of crushing!

Any subsequent fastening bores in the aluminium tubes may only be made by Ewellix.

The sides of the tubes must not be scratched, otherwise the tube guide will be damaged. This can result in malfunctions.

⚠ WARNING

When the actuator is being moved, ensure that physical objects (e.g. furniture) or parts of the body cannot become trapped.
Risk of personal injury!

⚠ WARNING

If the actuator is to be controlled directly, an encoder must always be used to prevent accidental movement of the actuator.
Risk of personal injury!

⚠ WARNING

No more than one TLC may be used for parallel operation.
Never connect multiple actuators to a single two-way contact.
The operating speed is a function of the load. Where loads are uneven, the actuators can buckle and be destroyed. When uneven speeds are used, the limit switches can also be bypassed, leading to some actuators overshooting the terminal position.

⚠ WARNING

TLC units may only be opened and worked on by the Ewellix Customer Service!

**NOTE**

Check the base plates and power cable at periodic intervals (twice yearly) for mechanical damage (cracks).

4.4 Startup

The lifting column is ready for operation once the correct electrical and mechanical connections have been made.

⚠ WARNING

Ensure that no liquids are allowed to penetrate the connections!
The actuator could be damaged by liquid entering it.
The actuator is not suitable for automatic washing systems.

Table 1

| | THC External tube inst. | THC Internal tube inst | TLC | TGC External tube inst. | TGC Internal tube inst |
|-------------------|----------------------------|---------------------------|------------|----------------------------|---------------------------|
| Screw | 4 x M6x25 | 4 x M6x20 | 4 x M10x30 | 4 x M6x22 | 4 x M5x15 |
| Screw-in depth | min. 17mm | min. 17 mm | min 25 mm | min.12 | min. 10 mm |
| Strength class | 10.9 | 10.9 | 10.9 | 10.9 | 10.9 |
| Tightening torque | 9 Nm | 9 Nm | 40 Nm | 9 Nm | 5 Nm |

5.0 Operation

The actuators can be operated with various control devices, depending on the requirements (↳ **4.1.2 Accessories, page 11**).

5.1 Controlling an actuator

The actuator is controlled in accordance with the connection diagram (↳ **4.2.1 Connecting the power cable / control device, page 12**).

The actuator moves until you release the button or have reached a terminal position.

6.0 Maintenance and care

6.1 Maintenance

The TLC has been designed for a service life of 30 000 double strokes of length 300 mm (this applies for a maximum centric load as per the data label).

The TLC requires no maintenance during this period.

In-house tests must be performed if other requirements relating to service life are specified.

6.2 Care

6.2.1 Protection from water, cleaning, disinfecting

Degree of protection IP30 is only achieved if the device is installed correctly in the end product.

If an actuator becomes dirty, it should be cleaned immediately in order to prevent the accretion of residues!

Use a damp cloth and water with a little isopropyl alcohol for manual cleaning. Washing water with chemical additives must be pH-neutral. Excessively acidic or alkaline washing water can permanently damage the metal and plastic components of the actuator.

High-pressure steam cleansing equipment must not be used.

6.3 Warranty

Assuming that the operating conditions are complied with and units have no mechanical damage resulting from incorrect handling, a warranty of 12 months from the date of delivery will apply for all mechanical and electrical components.

6.4 Disposal

Actuators may be returned to Ewellix AG, Liestal, for disposal.

6.5 Liability

In every case, the owner or operator of the unit shall be liable for its correct functioning if it has been incorrectly installed, maintained or repaired by persons who are not employed by the Ewellix Service Department or if the unit has not been used in accordance with the specified application.

Ewellix shall not be liable for any damage resulting from failure to observe these instructions. These instructions shall not be regarded as an extension of the warranty and liability terms set out in the Conditions of Sale and Supply of Ewellix.

7.0 Appendix

Technical Data Sheet

PUB IL-07010-EN-October 2019 Telescopic pillar TLC

For further technical information please contact Ewellix.

TLC

TLC telescopic pillar



Benefits

- Push or pull load
- High bending load
- Quiet
- Powerful
- Plug and play

Standards

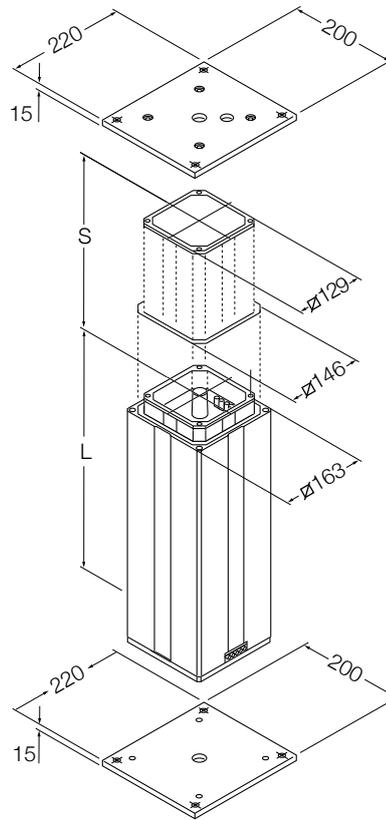
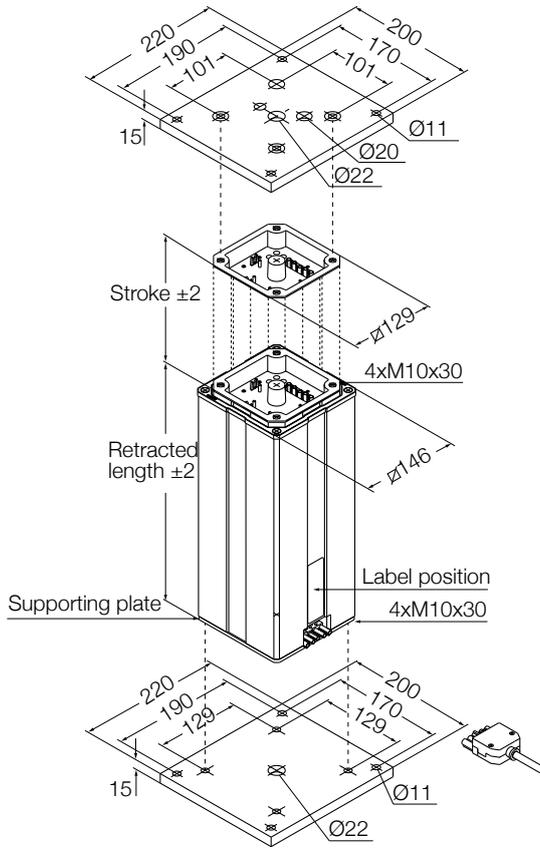
- EN/IEC 60601-1
- UL 60601-1

Technical data

| | | Unit | TLC 12ZWAS | TLC 12ZWAK | TLC 12ZWDS | TLC 12ZWDK |
|------------------------------------|----------|--------------|-------------------------|-------------------------|---------------------------|---------------------------|
| Rated push load | | N | 4 000 | 4 000 | 4 000 | 4 000 |
| Rated pull load | | N | 4 000 | 4 000 | 4 000 | 4 000 |
| Bending load | | Nm | up to 630 ¹⁾ | up to 630 ¹⁾ | up to 2 100 ¹⁾ | up to 2 100 ¹⁾ |
| Speed (full load to no load) | 120 V AC | mm/s | 16 to 22 | 16 to 22 | 16 to 22 | 16 to 22 |
| | 230 V AC | mm/s | 11 to 17 | 11 to 17 | 11 to 17 | 11 to 17 |
| Telescopic pillar version | | # of section | 2-section | 2-section | 3-section | 3-section |
| Stroke | | mm | 100 to 700 | 100 to 700 | 255 to 700 | 255 to 700 |
| Retracted length (push version) | | mm | S+175 | S+175 | S+60 | S+60 |
| Retracted length (pull version) | | mm | S+185 | S+185 | S+70 | S+70 |
| Voltage | | V AC | 120 or 230 | 120 or 230 | 120 or 230 | 120 or 230 |
| Power | 120 V AC | W | 1 200 | 1 200 | 1 200 | 1 200 |
| | 230 V AC | W | 890 | 890 | 890 | 890 |
| Current | 120 V AC | A | 10 | 10 | 10 | 10 |
| | 230 V AC | A | 4,1 | 4,1 | 4,1 | 4,1 |
| Duty cycle: intermittent operation | 120 V AC | min. | 0,8 min./37 min. | 0,8 min./37 min. | 0,8 min./37 min. | 0,8 min./37 min. |
| | 230 V AC | min. | 1 min./37 min. | 1 min./37 min. | 1 min./37 min. | 1 min./37 min. |
| Duty cycle: short-time operation | 120 V AC | min. | 1,2 | 1,2 | 1,2 | 1,2 |
| | 230 V AC | min. | 2 | 2 | 2 | 2 |
| Ambient temperature | | °C | +10 to +40 | +10 to +40 | +10 to +40 | +10 to +40 |
| Type of protection | | IP | 20/30 | 20/30 | 20/30 | 20/30 |
| Protection class | | – | I | I | I | I |
| Type of control | | – | electrical | pneumatic | electrical | pneumatic |
| Weight | | kg | 15,2-24,5 | 15,2-24,5 | 18,3-30,5 | 18,3-30,5 |

¹⁾ For details, please see bending load diagrams (→ page 19)

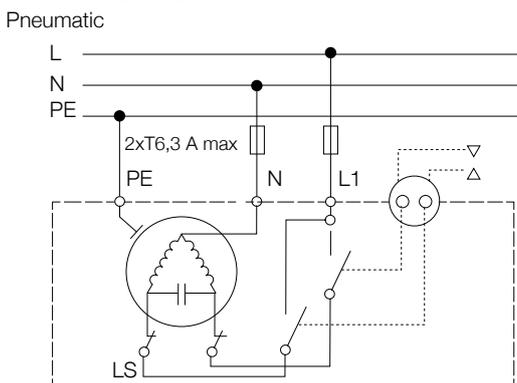
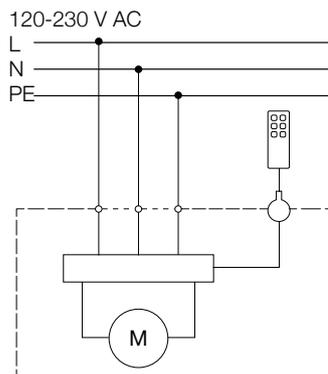
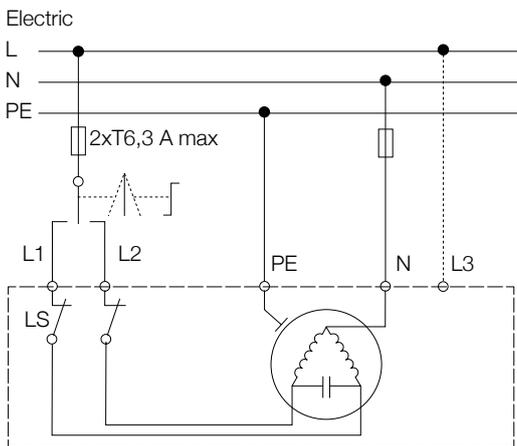
Dimensional drawing



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

Legend:
S = stroke
L = retracted length

Connecting diagrams



Suitable control units and accessories



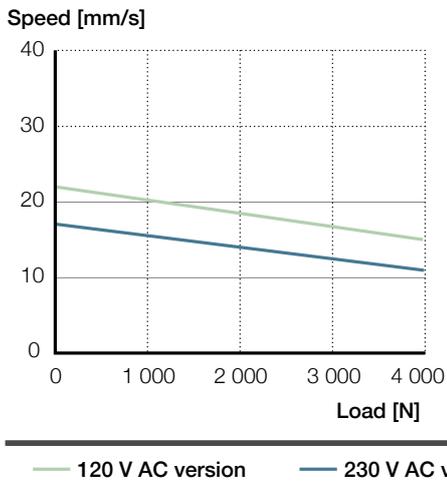
TLC pneumatic*

* Integrated control unit

- Hand switch
- Foot switch
- Desk switch

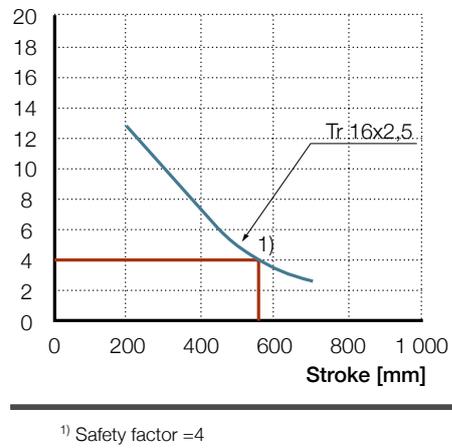
Performance diagram

Speed-load diagram



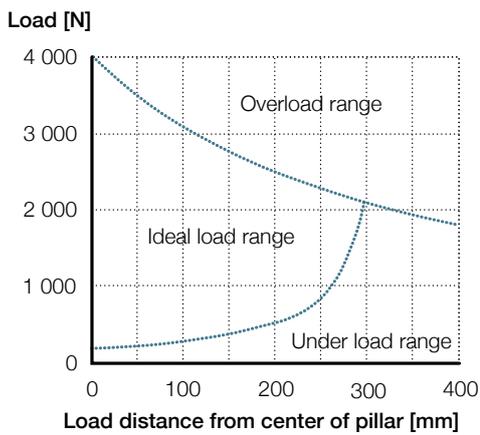
Safety factor load conditions

Safety factor [screw buckling]

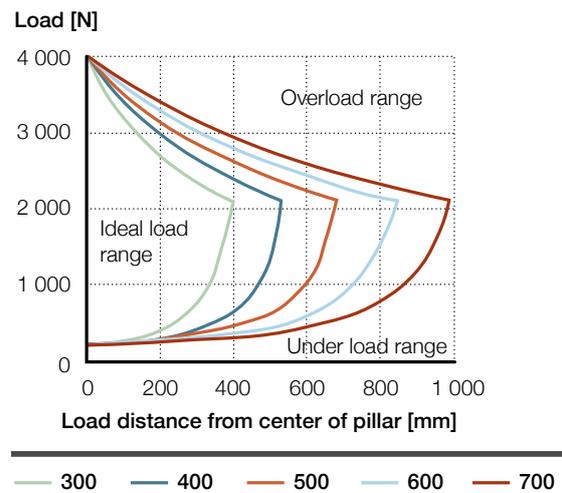


Bending load diagrams

Bending load diagram 2-section



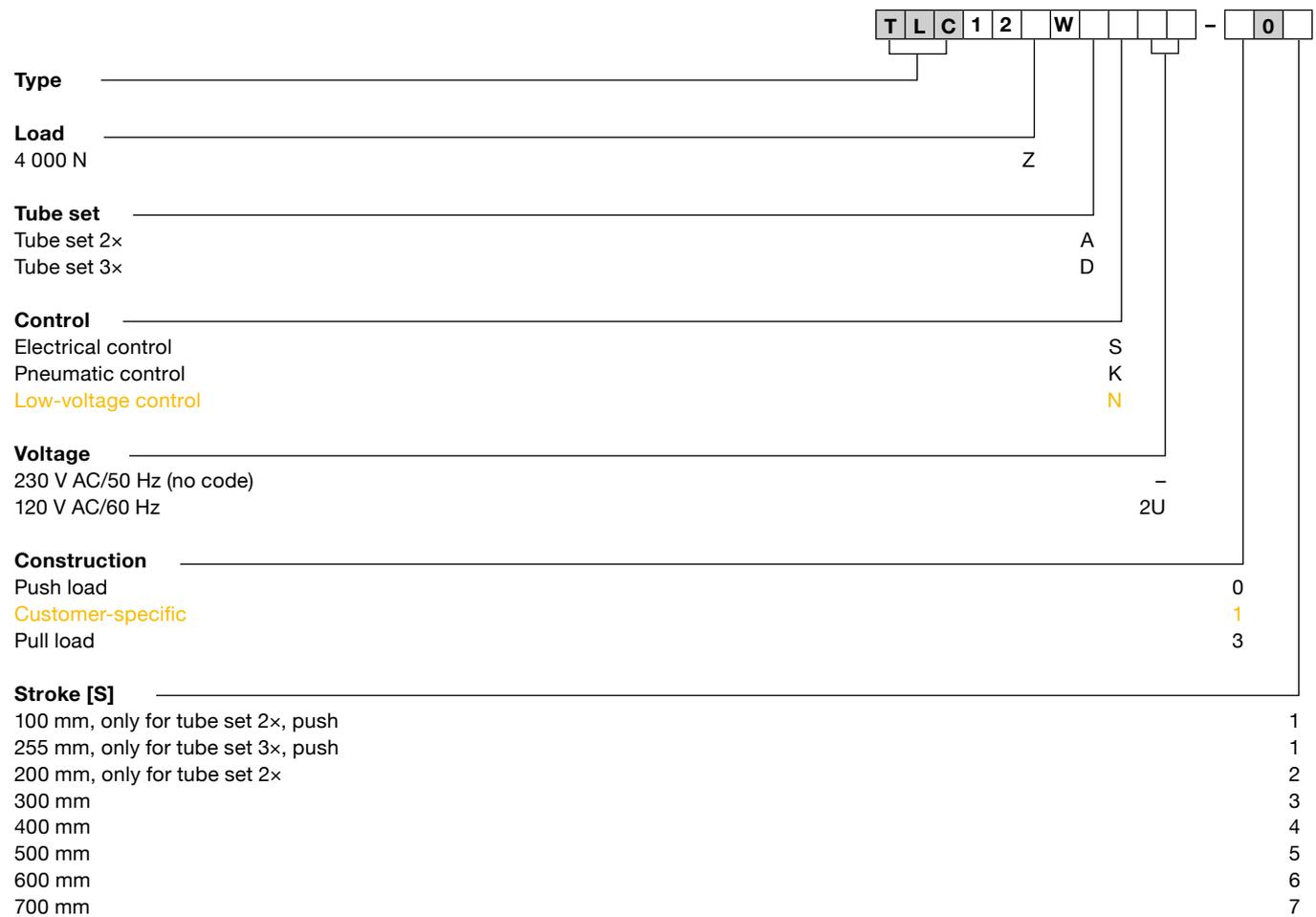
Bending load diagram 3-section



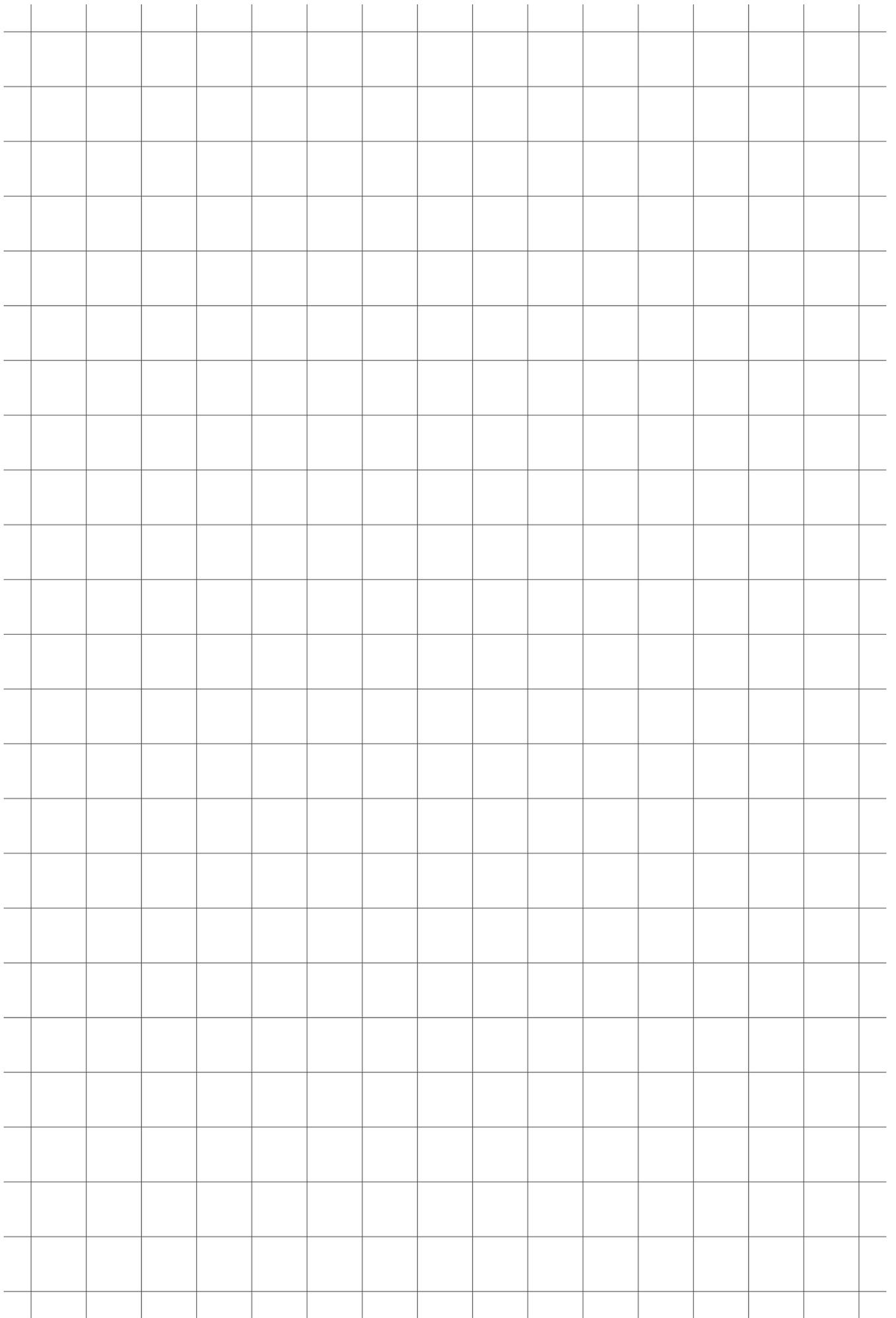
Accessories

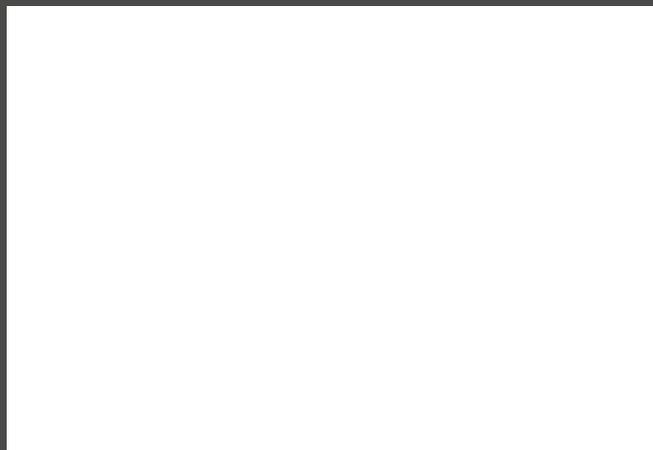
| | Designation | Order number |
|---------------------------------------|-------------|--------------|
| Top mounting plate for 2x tube set | ZPL-290268 | 0125624 |
| Bottom mounting plate for 2x tube set | ZPL-290351 | 0125625 |
| Top mounting plate for 3x tube set | ZPL-290268 | 0125624 |
| Bottom mounting plate for 3x tube set | ZPL-290265 | 0125623 |
| Screw (4/plate) for mounting plate | ZBE-510707 | 0125360 |
| Plug AC TLC 3 pin | ZEL-265518 | 0124866 |
| Plug AC TLC 5 pin | ZEL-265519 | 0124864 |

Ordering key



Options written in yellow are only available on demand. Contact Ewellix for more information on minimum quantities and additional costs.





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