

# Installation and operating instructions

## Barriers T 3000 - T 3500 Part 1 Installation



Translation of original installation and operating instructions

**D-ID: V1\_0 – 02.15**

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# **1 Preface**

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## **1.1 General notes**

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These operating instructions must be available on site at all times. It should be read thoroughly by all persons who use, or service the appliances. Improper usage or servicing or ignoring the operating instructions can be a source of danger for persons, or result in material damage. If the meaning of any part of these instructions isn't clear, then please contact ELKA-Torantriebe GmbH u. Co. Betriebs KG before you use the appliance.

This applies to all setup procedures, fault finding, disposal of material, care and servicing of the appliance. The accident prevention regulations and applicable technical regulations (e.g. safety or electrical) and environment protection regulations of the country in which the appliance is used also apply. All repairs on the appliances must be carried out by qualified persons. ELKA-Torantriebe GmbH u. Co. Betriebs KG accepts no liability for damage which is caused by using the appliance for purposes other than those for which it is built.

ELKA-Torantriebe GmbH u. Co. Betriebs KG cannot recognise every possible source of danger in advance. If the appliance is used other than in the recommended manner, the user must ascertain that no danger for himself or others will result from this use. He should also ascertain that the planned use will have no detrimental effect on the appliance itself. The appliance should only be used when all safety equipment is available and in working order. All faults which could be a source of danger to the user or to third persons must be eliminated immediately. All warning and safety notices on the appliances must be kept legible.

All electrical periphery equipment which is connected to the appliance must have a CE Mark, which ensures that it conforms to the relevant EEC regulations. Neither mechanical nor electrical alterations to the appliance, without explicit agreement of the manufacturer, are allowed. All alterations or extensions to the appliance must be carried out with parts which ELKA-Torantriebe GmbH u. Co. Betriebs KG have defined as suitable for such alterations, and be carried out by qualified personnel. Please note that with any alteration of the product, no matter whether mechanical or electrical, the warranty expires and the conformity is revoked. Only the use of ELKA accessories and original ELKA spare parts is allowed. In case of any contravention ELKA disclaims liability of any kind.



### **INFORMATION!**

The operation of the system within CEN countries must also be conformant with the European safety-relevant directives and standards.

*We reserve the right to make technical improvements without prior notice.*

### 1.1.1 Symbol explanation

---

Remarks regarding the safety of persons and the gate opener itself are marked by special symbols. These remarks have to be absolutely observed in order to avoid accidents and material damage.

**DANGER!**

...points to an imminent dangerous situation, which can cause death or serious injuries if it is not avoided.

**WARNING!**

...points to a potentially dangerous situation, which can cause death or serious injuries if it is not avoided.

**ATTENTION!**

...points to a potentially dangerous situation, which can cause minor or slight injuries if it is not avoided.

**ATTENTION!**

...points to a potentially dangerous situation, which can cause property damage if it is not avoided.

**REMARK!**

Important notice for installation or functioning.

### 1.2 Copyright

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The operating manual and the contained text, drawings, pictures, and other depictions are protected by copyright. Reproduction of any kind – even in extracts – as well as the utilization and/or communication of the content without written release certificate are prohibited. Violators will be held liable for damages. We reserve the right to make further claims.

### 1.3 Information regarding installation instruction

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This document is to be used as installation instruction for partly completed machinery (according to machinery directive 2006/42/EG, article 13, (2)).

## **2 Safety**

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### **2.1 General notes on safety**

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The valid regulations and standards have to be observed during installation and operation, e.g. DIN EN 13241-1, DIN EN 12445, DIN EN 12453 etc. Only the use of spare parts made by the original manufacturer is allowed.

Do not put a defective barrier into operation.

After set-up (installation) every user of the equipment has to be instructed about the operation and function of the barrier.

In order to reduce the risk potential related to the movement of the barrier boom, additional optical and/or acoustical warning devices should be installed.

### **2.2 Notes on safety for the operation**

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Children and not instructed persons are not allowed to operate the barrier.

No persons, objects, or animals are allowed within the range of the barrier movement during opening or closing.

Never reach into moving parts of the barrier.

Drive through the barrier only after complete opening.

The barrier has to be secured depending on the type of usage, corresponding to the valid standards and regulations.

The safety devices have to be checked regularly for functioning according to the standards and regulations, at least twice a year.

### **2.3 Notes on safety for the operation with radio remote control**

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The radio remote control should only be used, if the area of movement of the barrier is always completely visible by the operator and thus it is assured, that no person, object, or animal is present within this range of movement.

The radio remote control transmitters have to be carefully kept, so that an unintentional use is impossible.

Radio remote controls should not be operated at radio-technical sensitive locations, like airports or hospitals.

Interferences by other (properly operated) radio communication installations, which are used within the same frequency range, cannot be ruled out.

## 2.4 Intended use – Vehicle traffic

The operational safety can only be ensured when the barrier is used as intended.

After installation, the barriers of the series T 3000-3500 serve as passage control of vehicle paths.



### **CAUTION!**

#### **Danger of impact and crushing!**

With inadequate safety measures the movement of the barrier boom can result in impact or crushing points between the boom and solid objects within the movement area.

- In order to reduce the potential danger during the barrier boom movement, additional optical and/or acoustic warning devices should be installed.

The controller is a product component and serves to control the barrier.

**Any use above and beyond the above mentioned use is prohibited and constitutes improper use.**

## 2.5 Danger, which could emanate from the site of operation

The barriers T 3000-3500 operate with moving parts.



### **WARNING!**

#### **Rotating and/or linear movable components can cause serious injuries.**

Do not reach into moving parts or handle any moving components during operation.

- Turn the appliance off before any maintenance work, repair work or other work and secure it against unintentional restarting.

## 2.6 Non-factory technical alterations and extensions

Non-factory technical alterations and/or extensions may result in hazards as well as interfere with the function of the barrier.



### **DANGER!**

#### **Danger through voltage!**

Risk of death by electric shock!

- Technical alterations may only be performed by skilled personnel and only according to the manufacturer's instructions.



### **CAUTION!**

#### **Danger of injury through defective components!**

Mechanical and electrical alterations can influence the functioning of the barrier!

- Technical alterations may only be performed by skilled personnel and only according to the manufacturer's instructions.

**CAUTION!****Malfunctioning of the barrier!**

Mechanical and electrical alterations can influence the functioning of the barrier!

- Technical alterations may only be performed by skilled personnel and only according to the manufacturer's instructions.

## 2.7 Personnel requirements – professional skills, knowledge and qualifications

**WARNING!****Risk of injury through inadequate qualification!**

Improper handling during installation, maintenance, repair work or dismantling can result in personal injury and/or property damage.

- Work during installation, maintenance, repair and dismantling must be performed by skilled personnel only.

**Specialist** - is a person with suitable professional training, knowledge and experience, who can recognize and avoid danger.

**Instructed person** - is a person, which was instructed in the operation and use of the barrier.

## 2.8 Personal protective equipment

During installation, maintenance, repair work and dismantling of the barrier suitable personal protective equipment must be worn.

**CAUTION!****Bruising/jamming/driving over (e.g. by material handling equipment, industrial trucks) the feet, contusion by falling heavy objects, cutting injuries by stepping into pointed/sharp objects.**

Foot injuries

- Wearing of suitable safety shoes during the installation, maintenance, repair work and dismantling protects against serious foot injuries with long-lasting consequences.

**CAUTION!****Falling heavy objects hitting the head**

Head injuries

- Wearing of a suitable safety helmet during the installation, maintenance, repair work and dismantling protects against serious head injuries with long-lasting consequences.

**CAUTION!****Cutting injuries resulting from pointed/sharp objects**

Hand injuries

- Wearing of suitable safety gloves during the installation, maintenance, repair work and dismantling protects against serious hand injuries with long-lasting consequences.



**CAUTION!****Injuries resulting from drilling chips or saw dust**

Eye injuries

- Wearing of suitable safety goggles during the installation and repair work protects against serious eye injuries with long-lasting consequences.

### 3 Transportation and storing

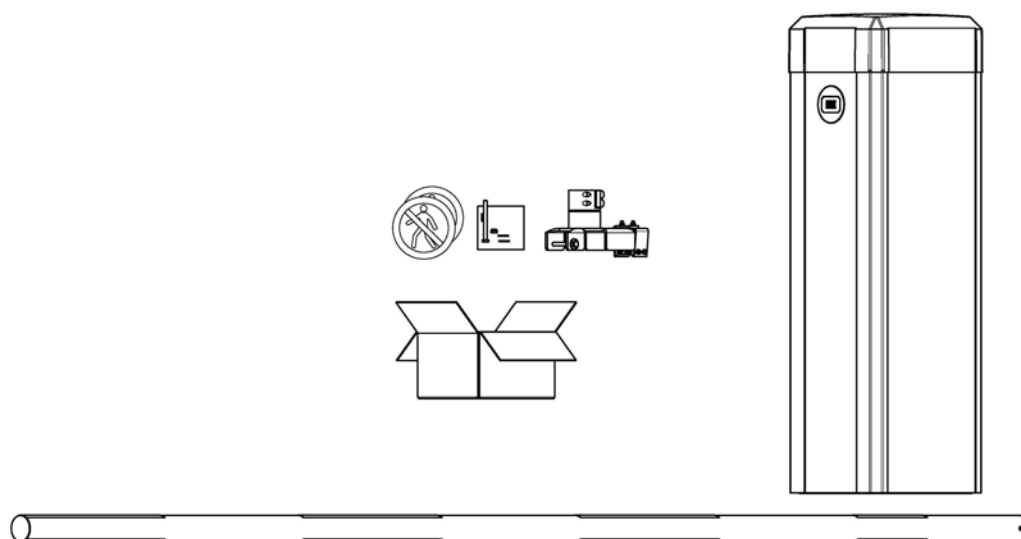
#### 3.1 Transportation inspection

The shipment has to be inspected for transportation damage immediately after receipt. In case of any damage record the type and extent on the delivery receipt or refuse acceptance.

Inform ELKA-Torantriebe immediately in the event of damage.

In case the above points are not observed claims will be denied due to insurance regulations.

#### 3.2 Scope of delivery T 3000-3500



Drawing 1

Scope of delivery:

- 1x barrier model T 3000-3500
- 1x barrier boom
- 2x keys (in a pouch) for the access panel
- 1x accessory box with:
  - 2x warning signs "No passage for pedestrians"
  - 1x steel screw incl. washers and nut for the boom connection
  - 1x boom connector incl. fastening screws

#### 3.3 Storing

The barrier has to be stored as follows:



**CAUTION!**

**Do not expose the barrier to aggressive substances.**



**CAUTION!**

**Do not expose the barrier to heat sources.**

**CAUTION!**

Storage temperature -30°C to +70°C / -22°F to +158°F.

### 3.4 Lifting heavy loads

**WARNING!****Risk of injury by lifting heavy loads!**

Lifting heavy loads may cause serious injuries.

- Never lift the barrier single-handedly.
- To lift the barrier, use a suitable lifting device.
- Wear suitable safety shoes.

Barrier model	Weight barrier without boom [kg]	Weight round boom [kg]	Total [kg]
T 3000	58	2.4	60.4
T 3500	58	2.8	60.8

Table 1

## 4 Declaration of incorporation



**Declaration of incorporation  
for the installation of a partly completed machinery  
according to EC Machinery Directive 2006/42/EC, annex II part 1 B**

The manufacturer ELKA-Torantriebe GmbH u. Co. Betriebs KG  
Dithmarscher Str. 9  
25832 Tönning, Germany

We herewith declare that the partly completed machinery

Product description: Barrier  
Function: Barrier for passage control of traffic ways  
Type designation: T 3000, T 3500  
Serial number: 814103001150101 to 814103003155299 for T 3000  
814103500150101 to 814103503155299 for T 3500

Year of manufacture: 2015

complies with the essential requirements of the following directive, as far as possible with the scope of delivery (see attachment for information regarding which requirements are met)

2006/42/EG	Machinery Directive
2006/95/EG	Low Voltage Directive
2004/108/EG	EMC-Directive

The following harmonized standards are applied:

EN ISO 12100-2:2004	Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles
EN 60204-1: 2007	Safety of machinery - Electrical equipment of machines - Part 1: General requirements
EN 60335-1: 2002, +A11 (2004) +A1 (2004) +A12 (2006) +A2 (2006) +A13 (2008) +A14 (2010)	Safety of household and similar electrical appliances, part 1 General requirements, resultant:
EN 61000-3-2: 2006, +A1 (2009) +A2 (2009)	Limits for harmonic current emissions
EN 61000-3-3: 2008	Limits - Limitation of voltage changes, voltage fluctuations and flicker
EN 61000-4-2: 2009	Electrostatic discharge immunity test
EN 61000-4-3: 2006, +A1 (2008) +A2 (2010)	Electromagnetic field immunity test
EN 61000-4-4: 2004, +A1 (2010)	Electrical fast transient/burst immunity test
EN 61000-4-5: 2006	Surge immunity test
EN 61000-4-6: 2009	Immunity to conducted disturbances, induced by radio-frequency fields
EN 61000-4-11: 2004	Voltage dips, short interruptions and voltage variations immunity tests
EN 61000-4-13: 2002, +A1 (2009)	Harmonics and interharmonics including mains signalling at a.c. power port, low frequency immunity tests
EN 61000-6-2: 2005	Generic standards - Immunity for industrial environments
EN 61000-6-3:2007, +A1 (2011)	Generic standards - Emission standard for residential, commercial and light-industrial environments

EN ISO 13849-1:2008 Safety of machinery. Safety related parts of control systems

Further we declare that the special technical documentation for this partly completed machinery is compiled in accordance with annex VII part B, and we undertake to transmit relevant information to the market surveillance authorities upon request.

The partly completed machinery must not be put into service until it is incorporated into a machinery, which has been declared in conformity with the provisions of the EC Machinery Directive and for which an EC declaration of conformity according to annex II A was issued.

Empowered to draw up the declaration:

ELKA-Torantriebe GmbH u. Co. Betriebs KG, Dithmarscher Str. 9, 25832 Tönning, Germany

Tönning, 02.01.2015

*i.V. Guido Christiansen*  
i.V. Guido Christiansen  
Dipl.-Ing. (FH)  
Chief Engineer

### Attachment

Requirements of annex I of 2006/42/EG which are met. The numbers relate to the chapters of annex I:

1.1.2., 1.1.3., 1.1.5., 1.1.6., 1.2.1., 1.2.3., 1.2.4., 1.2.6., 1.3.1., 1.3.2., 1.3.4., 1.3.8., 1.3.9., 1.5.1., 1.5.6., 1.5.11., 1.6.1., 1.6.3., 1.7.1. (partially), 1.7.2., 1.7.3., 1.7.4. (partially)

Drawing 2

## 4.1 Installation information for partly completed machinery

The partly completed machinery must not be put into service until the final machinery into which it has to be incorporated has been declared in conformity with the provisions of the machinery directive.



The safety functions of the controller comply with EN ISO 13849-1:2008 Kat.2 PLc.



According to EC Directive 2006/42/EG the mains supply has to be equipped with an all-pole circuit breaker.



### **WARNING!**

#### **Danger through voltage!**

Danger of an electric shock.

- Only certified electricians (VDE 0100) should connect the controller to the mains supply.



According to DIN EN 12453, for an application with passenger traffic, depending on the type of use and type of activation, suitable safety devices have to be installed additionally, in order to provide the minimum level of protection.

## 4.2 Declaration of conformity

After the installation an EG- declaration of conformity according to EC- machinery directive 2006/42/EG for the complete system has to be issued by the person responsible for the integration (according to product standard DIN EN 13241-1).

## 4.3 Name plate

The name plate of the barrier is attached at the inside front of the barrier housing.

## 5 Function description

Barriers serve as passage control of vehicle paths. By raising and lowering of the barrier boom the passage is granted or obstructed.

The controller offers the possibility to activate the barrier by radio remote control.

The controller is able to observe the max. permitted force which was set before in the learning sequence. If during the closing movement more force is needed, the barrier reverses. Additionally several different safety features, e.g. photoelectric barriers, can be connected.



### **CAUTION!**

#### **Danger of impact and crushing!**

With inadequate safety measures the movement of the barrier boom can result in impact or crushing points between the boom and solid objects within the movement area.

- In order to reduce the risk potential related to the movement of the barrier boom, additional optical and / or acoustic warning devices should be installed.

## 6 Technical data T 3000-3500

Range of application	
Application for...	<ul style="list-style-type: none"> <li>• Toll-station</li> </ul>
Drive pulse from...	<ul style="list-style-type: none"> <li>• TCP/IP</li> <li>• RS485</li> <li>• Push button, card reader, desktop panel etc.</li> <li>• Induction loops</li> </ul>
Safety	<ul style="list-style-type: none"> <li>• Force monitoring for barrier CLOSE</li> <li>• Emergency release / vandalism protection</li> <li>• Internal evaluation for safety contact profile (8.2kOhm)</li> <li>• Connection of external safety systems</li> </ul>

Table 2

General data	
Supply voltage	88~264VAC 47~63Hz
Power consumption	Max. 1.4A (230VAC) Max. 2.8A (115VAC)
Duty cycle	100%
Temperature range	-30°C to +70°C / -22°F to +158°F
Controller	MO 24
Housing dimensions (L/W/H)	360x300x1.100mm
Foundation (frost-free)	550x500x800mm
Boom connector	Left or right
Housing	Aluminium
Mechanics	Steel, galvanized
Sound pressure level (distance 1m)	≤ 60 dB(A)
Degree of protection	IP 54

Table 3

<b>Model-related data</b>	<b>T 3000</b>	<b>T 3500</b>
Power consumption, max. [W]	210	180
Running time - standard, ca. [s]	0.9	1.3
Running time - fast, ca. [s]	0.6	0.9
Max. boom length [mm]	3,240	3,740
Effective boom length [mm]	3,000	3,500
Power reversal	yes	yes

*Table 4*



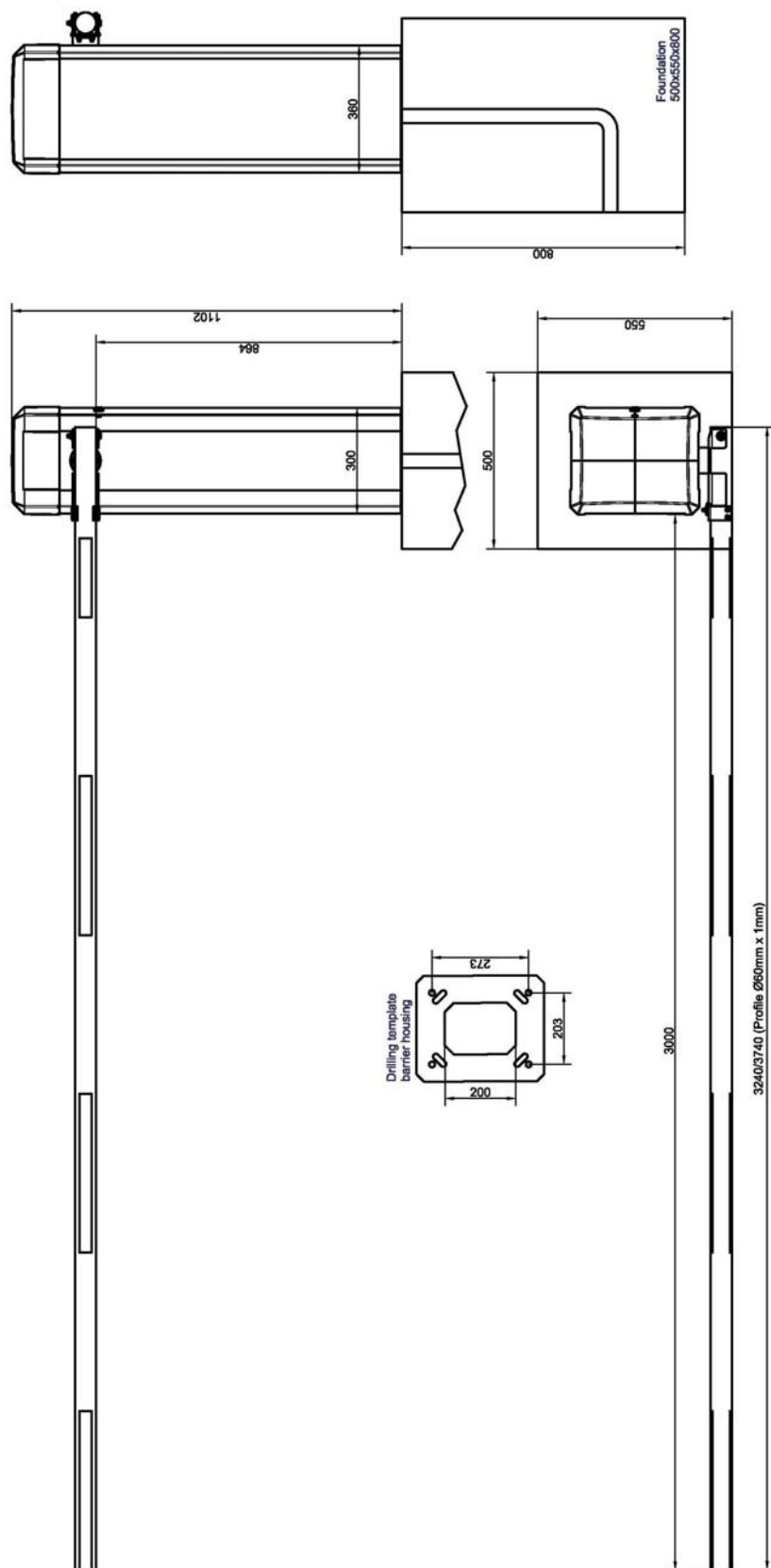
## 7 Installation T 3000-3500

### 7.1 Tools

Quantity	Description	
2	Open-end wrench	13mm
1	Open-end wrench	16mm
1	Open-end wrench	17mm
1	Open-end wrench	18mm
1	Open-end wrench	19mm
1	Allen key	6mm
1	Torque wrench (0-120Nm)	3/4"-square head
1	Bit	3/4", 10mm, Length 100mm
1	Bit	3/4", 19mm, Length 100mm
1	Right-angle screwdriver for hexagon socket screws	4mm, long model
1	Right-angle screwdriver for hexagon socket screws	6mm, long model
1	Screwdriver	0,6 x 3,5mm
1	Screwdriver	PH2 x 100
1	Cutter knife	18mm

Table 5

## 7.2 Mounting dimensions

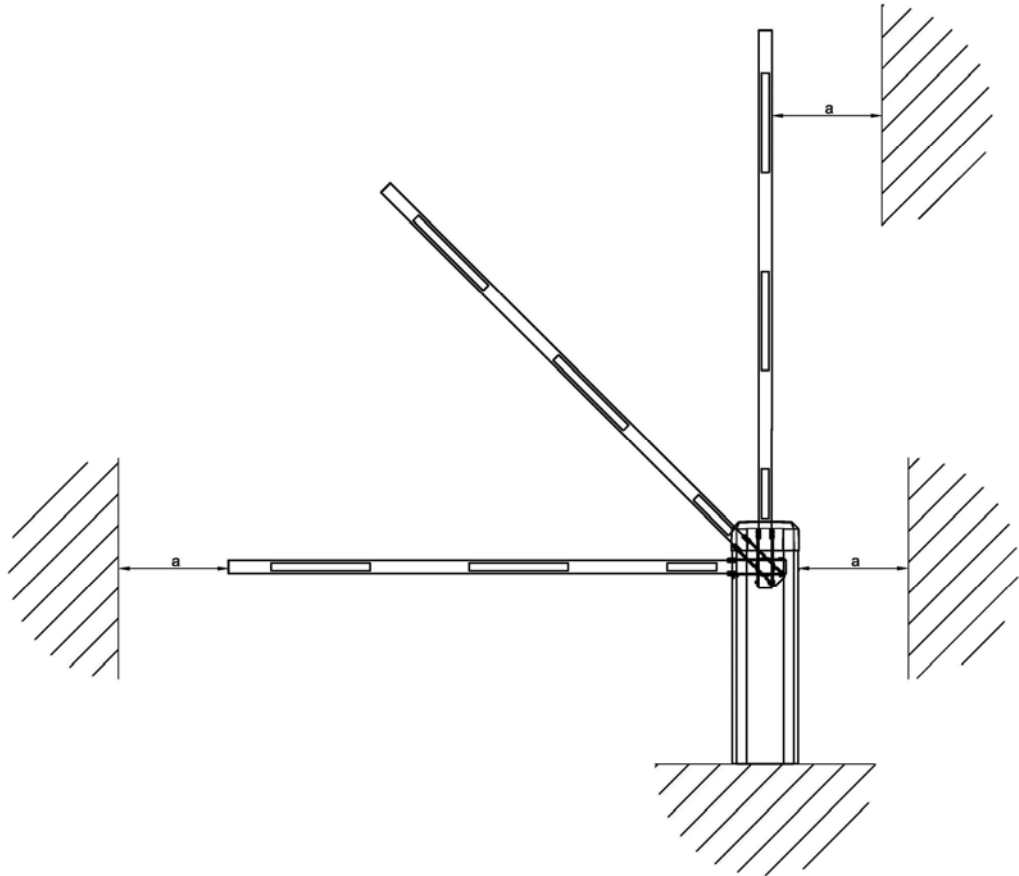


Drawing 3

## 7.3 Foundation

### Basic requirements

- Keep a safety distance of min. 500mm between all moving barrier parts and surrounding objects like walls, fences etc. Please check the following drawing.

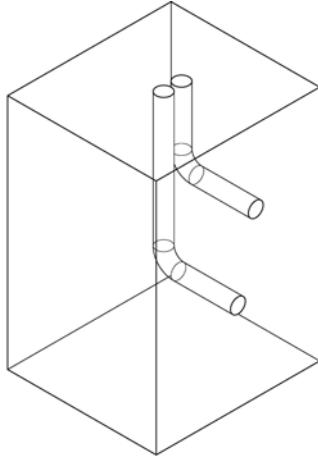


*Drawing 4*

a = min. 500mm

**Empty conduits**

- Use separate conduits for the power line and the control leads.
- Use an additional (separate) conduit for each induction loop.
- The distance between the conduits should be as large as possible.

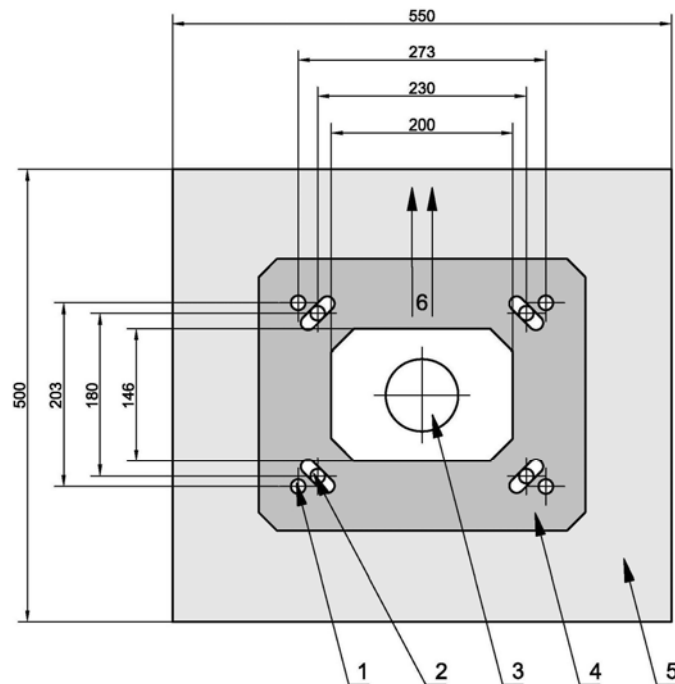
*Drawing 5***Requirements regarding the foundation**

- A minimum concrete strength class of C20/25 (or higher)
- The use of heavy duty anchor bolts (M12).
- Observe the foundation dimensions quoted in this manual. The installation distance between the barrier housing and the foundation edge has to be approx. 100mm.

**WARNING!****Risk of injury by insufficient fastening!**

Tilting barrier housings can result in severe injuries.

- Before installation ensure a safe stand of the barrier housing.
- Do not lean the barrier boom against a wall or similar before installation. Store the boom horizontally only.
- Install the barrier housing as specified.
- Use the recommended heavy duty anchor bolts M12, at least M10 is required.
- During maintenance check the housing for correct fastening on the foundation.



Drawing 6

- 1 Fastening point (273 x 203mm)
- 2 Fastening point, re-adjustable (230 x 180mm)
- 3 Clearance for cable entry (empty conduits) (200x146mm)
- 4 Drilling template
- 5 Foundation
- 6 Direction roadway

**WARNING!**

**Danger of injury by incorrect fixation of the barrier housing on the foundation!**

Loosening of the anchor bolts from the foundation.

- During the fastening of the barrier obey the minimum distance of the heavy duty anchor to the edge of the foundation.

## 7.4 Opening / closing the housing

**WARNING!**

**Rotating and/or linear movable components can cause serious injuries.**

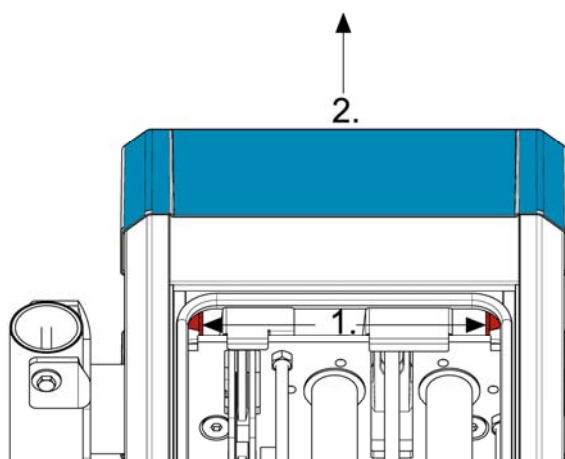
Do not reach into moving parts or handle any moving components during operation.

- Turn the appliance off before any maintenance work, repair work or other work and secure it against unintentional restarting.



Open the housing with the access panel key. The key is located in the accessory box.

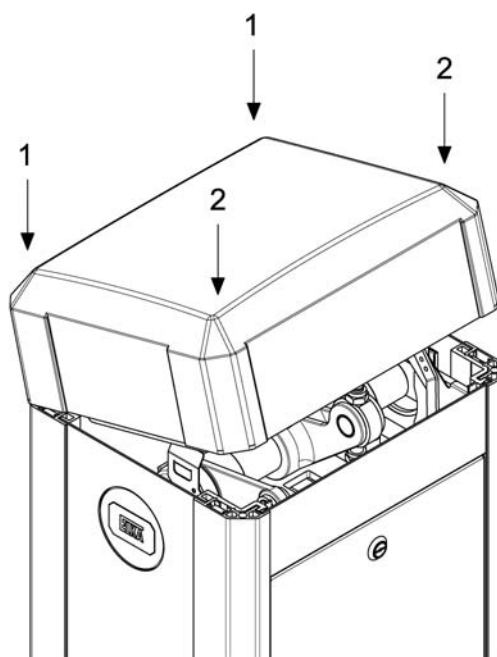
*Removing the housing hood:*



*Drawing 7*

1. Remove the hood by pressing the release levers to the outside (1). The hood raises itself.
2. Now take the hood off upwards - using both hands (2).

*Installing the hood:*

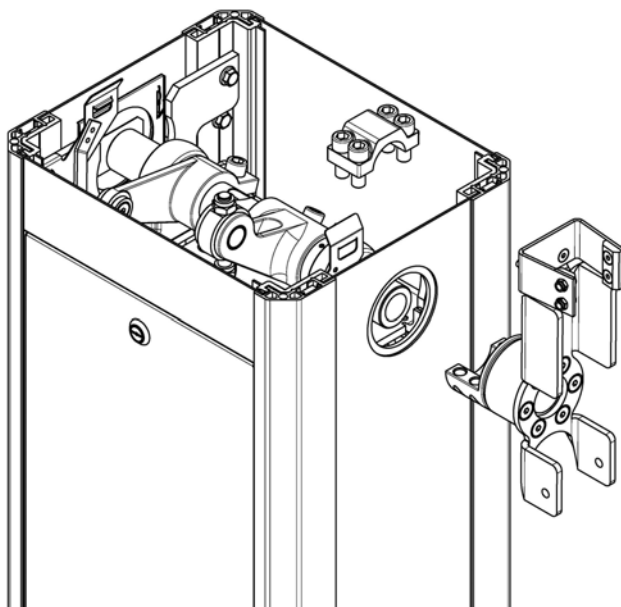


*Drawing 8*

1. Using both hands place the hood on the housing by first pressing the rear guidance points (1), then the front guidance points (2).
2. The hood snaps into place with an audible click.

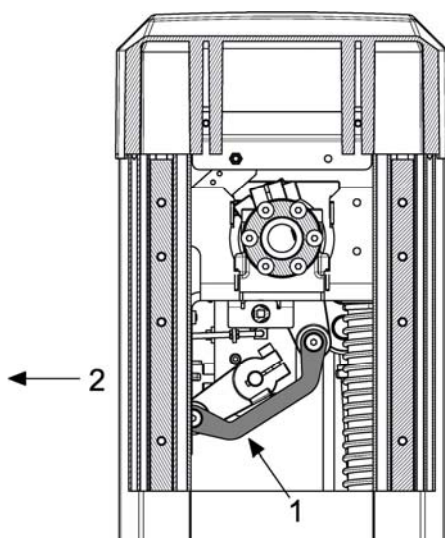
## 7.5 Boom connector

1. The boom connector can be mounted left or right (factory setting is right). To fasten the boom connector, plug it without the clamping piece on the main shaft. Pay attention to a perfect fit of the shaft seal at the housing. Now connect the clamping piece using the four screws (M12x30 ISO4762). Tighten the screws only so far that an alignment of the boom connector on the main shaft is still possible.



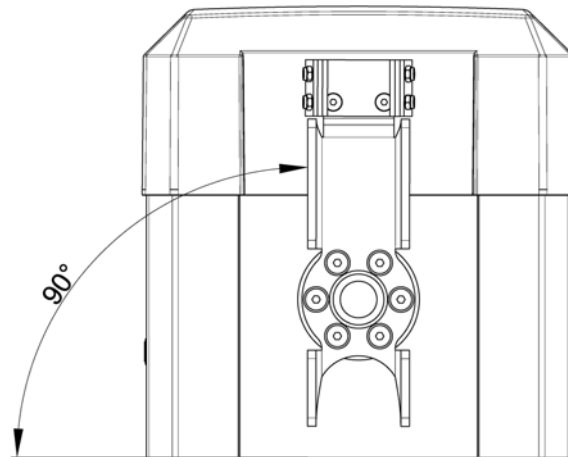
Drawing 9

2. The barrier mechanics is preset at the factory so that the barrier boom can perform a 90° - movement from the vertical to the horizontal position. The barrier is delivered in open (vertical) position. The drive lever is over the dead center at the mechanical stop (see drawing below). If necessary, correct the position by pulling the drive lever (1) in direction OPEN - towards roadway (arrow 2).



Drawing 10

3. Adjust the boom connector vertically using a water-level.



Drawing 11

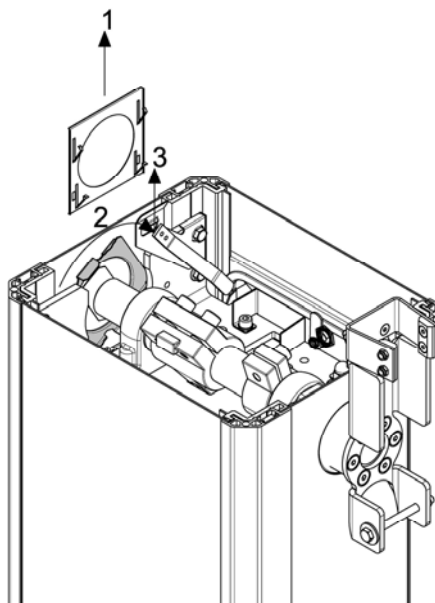
4. Now retighten the four screws (M12x30 ISO 4762) at the clamping piece with 120Nm.

### 7.5.1 Installation – Boom connector left side

The barrier models T 3000 – T 3500 are prepared at the factory to mount the boom on the right side. At the left side a cap is mounted to cover the main shaft opening.

Converting from barrier boom right to barrier boom left:

1. Remove the barrier hood.
2. Detach the cover cap at the left housing side as described in the following drawing. First pull the spring sheet upwards (1), then turn the cover cap approx. 60° (2) and pull it upwards (3).



Drawing 12

3. Disconnect the boom connector from the right side, if already mounted. Connect it to the left side.
4. Mount the cover cap and the spring sheet at the right housing side.

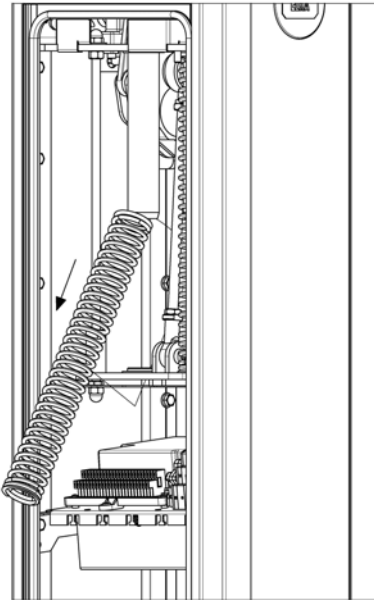




All drawings, tables and descriptions in this installation manual refer to the factory-set (pre-) mounting of the boom holder at the right side.

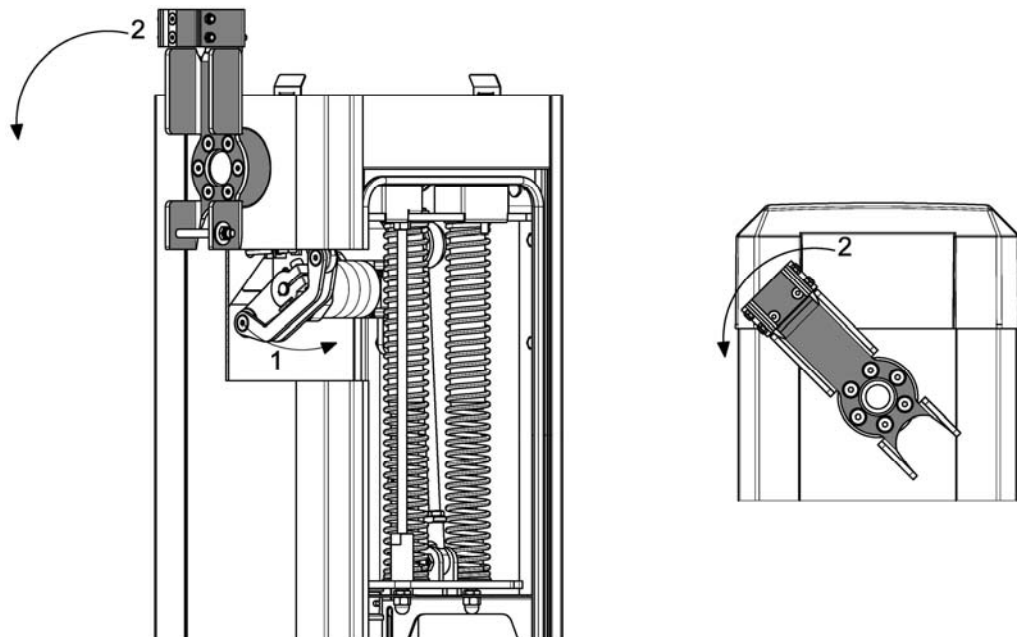
## 7.6 Barrier boom

1. Remove all balancing springs from the spring assembly (see below drawing).



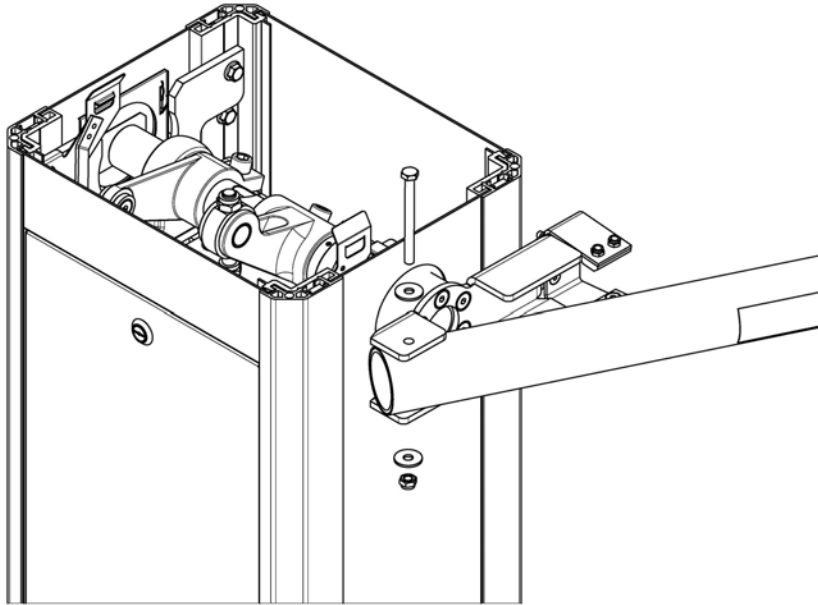
Drawing 13

2. Turn the barrier mechanics (at the boom connector) into position CLOSED (2). If necessary support the movement by pushing the drive lever in direction CLOSED (1).



Drawing 14

3. Position the barrier boom at the boom connector.



Drawing 15

4. Connect the barrier boom to the boom connector using the screw M8x90. Tighten the fastening nut with a max. torque of 20Nm.
5. Push the boom into the clips.



Emergency release during current failure etc.

## 7.7 Balancing springs

1. Place the barrier boom manually in position OPEN.
2. Mount the number of balancing springs according to the boom length (see table below).

	Boom length [mm]			
Model	2,000	2,500	3,000	3,500
T 3000	2x F1.1	2x F1.1	2x F1.1	---
T 3500	2x F1.1	2x F1.1	2x F1.1	3x F1.1

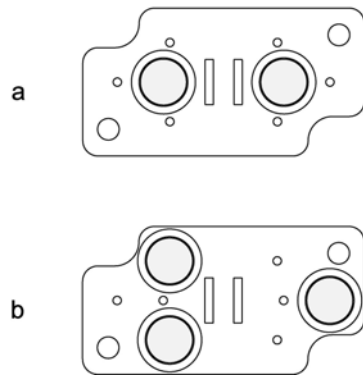
Table6

Pressure spring type F1.1 = Balancing spring

Wire diameter 5mm

For barriers up to 3,500mm boom length

3. During installation of the balancing springs please observe the correct positioning in the spring assembly (see drawing below – positions of the pressure springs on the support plate).



*Drawing 16*

a = 2 springs

b = 3 springs



**It is not permitted to operate the barrier with only one spring mounted!**

4. Spring tension: In position OPEN the pressure springs should be without pre-tightening but also without play between the spring plate and the pressure spring. If necessary, correct the boom position by tightening/loosening of the spring tension.

### Adjusting the spring tension:



#### **WARNING!**

##### **Danger of impact and crushing!**

During the barrier movement, energy is saved in the springs. The springs are not tight and thus energy-free only in barrier position OPEN.

- Mount and dismount the springs in barrier position OPEN only. If necessary move the barrier manually into position OPEN.

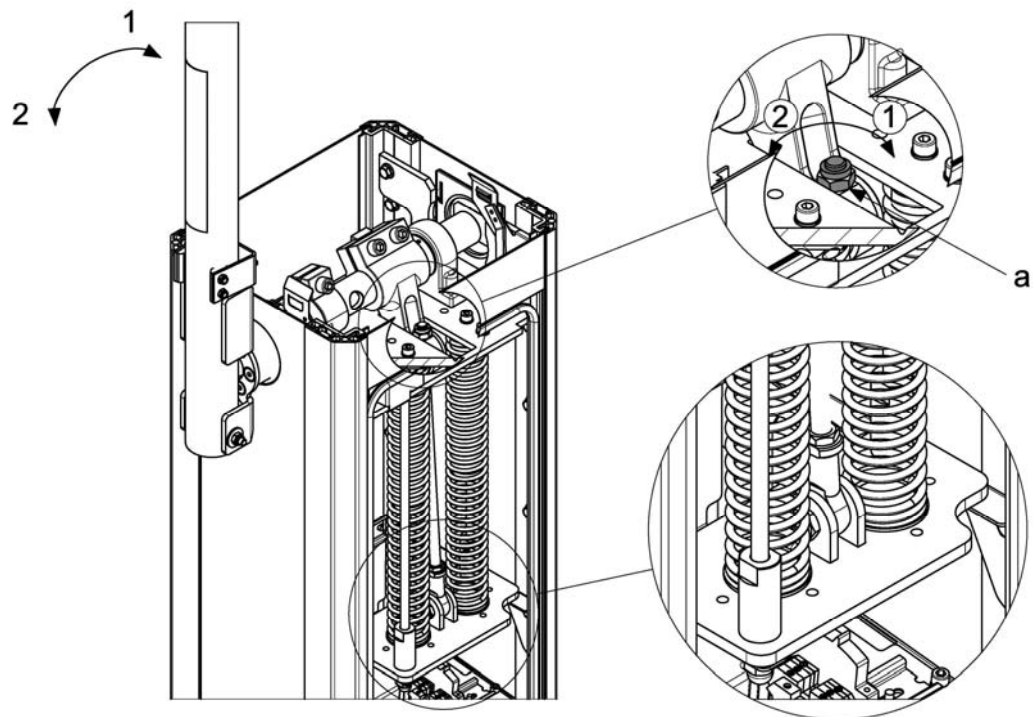


#### **WARNING!**

##### **Risk of crushing**

During the barrier movement crushing points arise at many points of the barrier mechanics.

- Before installation, maintenance or repair work at the barrier mechanics turn the power supply off and secure it against unintentional restarting.



Drawing 17

Tightening the spring tension: Turn the clamping nut (a) clockwise (1). The boom moves in direction (1).

Loosening the spring tension: Turn the clamping nut (a) anti-clockwise (2). The boom moves in direction (2).

## 7.8 Opening and closing times



The opening and closing times of the barriers are factory-set to standard values based on the model:

- T 3000 = approx. 0.9 seconds
- T 3500 = approx. 1.3 seconds



The opening and closing times of the barriers can be changed in the learning sequence of the controller MO 24 under sequence point P101.

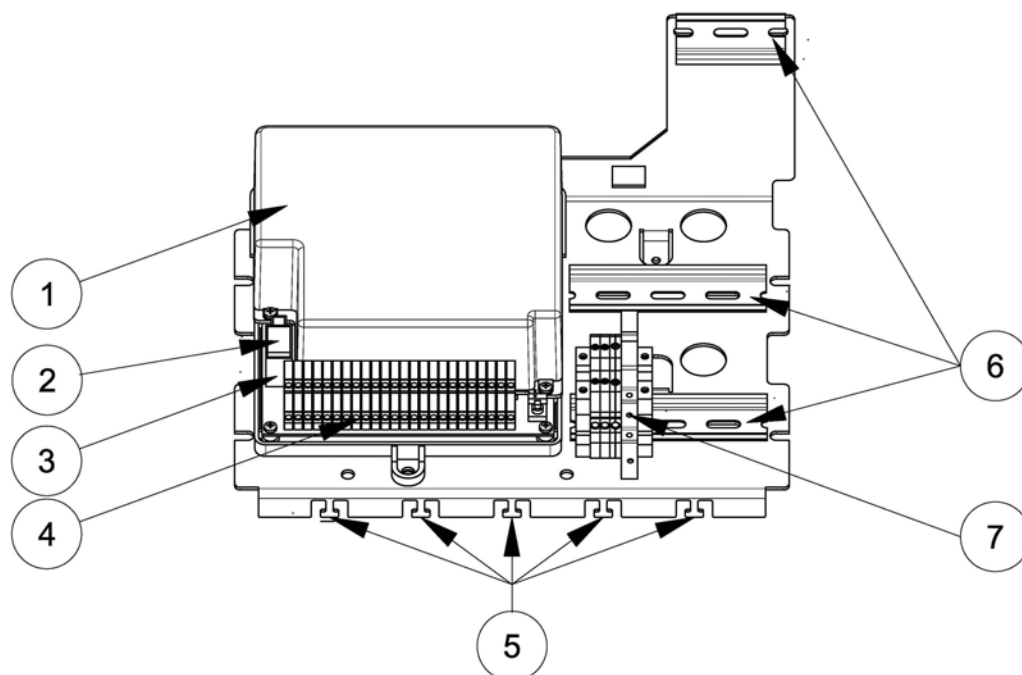
- Sequence point P101 = 0 = fast
- Sequence point P101 = 1 = standard (factory setting)

Model-related data	T 3000	T 3500
Running time –standard [s]	approx. 0.9	approx. 1.3
Running time –fast [s]	approx. 0.6	approx. 0.9

Table 7

## 8 Terminal row

### 8.1 Interior view



Drawing 18

Pos.	Description
1	Controller MO 24 (with housing and cover)
2	Supply voltage 24VDC
3	Motor connection
4	Terminal row
5	Fixing clamp for power- and signal lines
6	Top hat rail for accessories (optional or on-site)
7	Power supply with on-off switch

Table 8

### 8.2 Mains connection

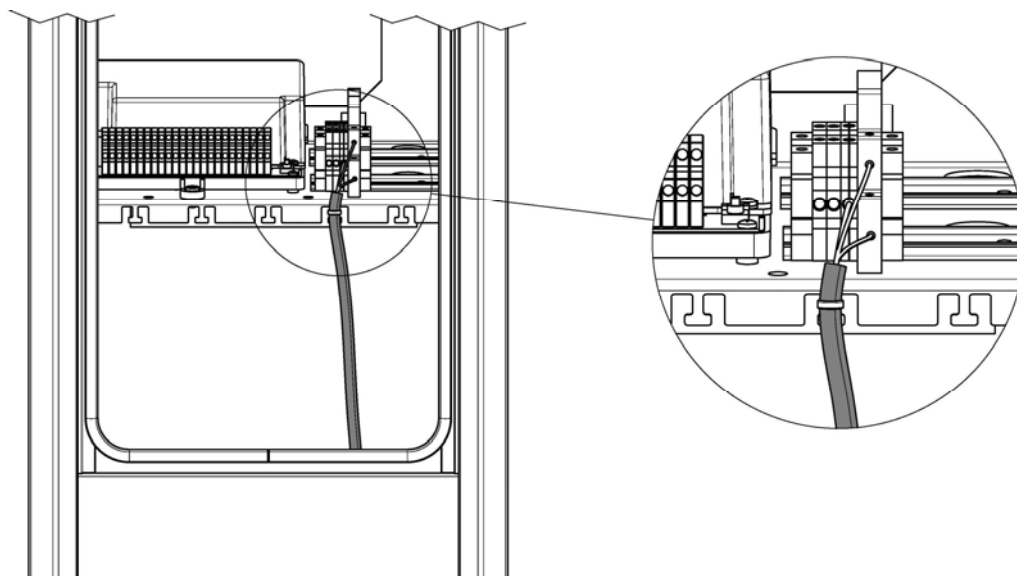


#### **WARNING!**

#### **Danger through voltage!**

Danger of an electric shock.

- Only certified electricians (VDE 0100) should connect the controller to the mains supply.

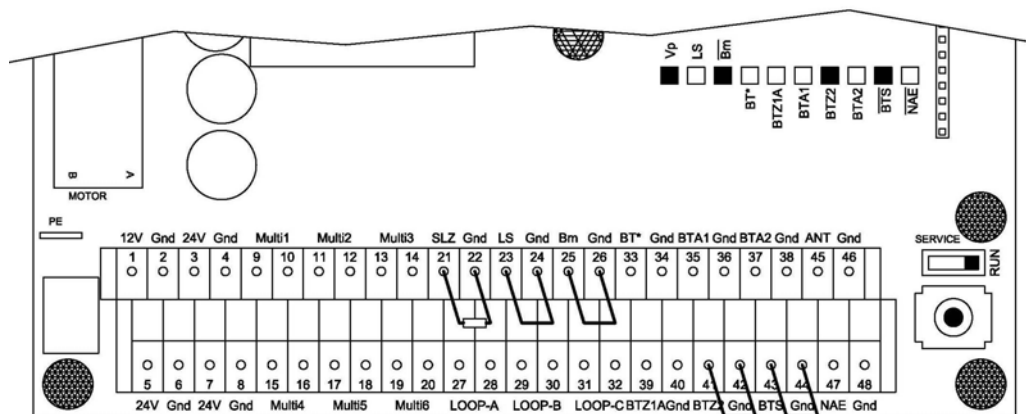


Drawing 19

Connecting the power line:

1. Lay the power line via the shortest possible way to the main switch. Make sure the power line does not have contact with any movable mechanical parts.
2. Connect the power line to the main switch and to the earth lead terminal.
3. Fasten/secure the power line by cable ties at the provided tabs.

### 8.3 Controller terminal row



Drawing 20

The following control inputs have to be bridged or occupied with contact (NC) for operation:

1.	Terminals 23 + 24	Photoelectric barrier (LS)	NC contact or bridge
2.	Terminals 25 + 26	Boom missing contact (Bm)	NC contact or bridge
3.	Terminals 41 + 42	Push button CLOSE (BTZ2)	NC contact or bridge
4.	Terminals 43 + 44	Push button STOP (BTS)	NC contact or bridge

5.	Terminals 21 + 22	Safety contact profile CLOSE (SLZ)	8.2kOhm resistor
----	----------------------	------------------------------------	---------------------

Table 9

After installing and connecting all the equipment, the following LEDs have to light:

1.	Vp	Is lit, when the supply voltage is switched on.
2.	BTZ2	Is lit, when contact BTZ2 is closed.
3.	BTS	Is lit, when contact BTS is closed.
4.	Bm.	Is lit, when the boom-missing contact is closed.

Table 10

Plug	Socket label	Function
1	12V	Uext 12V, max. 500mA
2	Gnd	Ground
3	24V	Uext 24V, in total with terminal 5 and 7 max. 1500mA
4	Gnd	Ground
5	24V	Uext 24V, in total with terminal 3 and 7 max. 1500mA
6	Gnd	Ground
7	24V	Uext 24V, in total with terminal 3 and 5 max. 1500mA
8	Gnd	Ground
9	Multi1	Multi-functional relay 1, potential-free, max. 24VDC/1A
10		
11	Multi2	Multi-functional relay 2, potential-free, max. 24VDC/1A
12		
13	Multi3	Multi-functional relay 3, potential-free, max. 24VDC/1A
14		
15	Multi4	Multi-functional relay 4, potential-free, max. 24VDC/1A
16		
17	Multi5	Multi-functional relay 5, potential-free, max. 24VDC/1A
18		
19	Multi6	Multi-functional relay 6, potential-free, max. 24VDC/1A
20		
21	SLZ	Safety contact profile CLOSE, 8.2kOhm
22	Gnd	Ground
23	LS	Photoelectric barrier (NC contact)

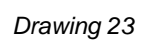


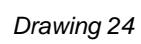
Plug	Socket label	Function
24	Gnd	Ground
25	Bm	Boom-missing contact
26	Gnd	Ground
27	LOOP-A	Induction loop A
28		
29	LOOP-B	Induction loop B
30		
31	LOOP-C	Induction loop C
32		
33	BT*	Configurable input: BT or BTA3 or BTZ1B (NO contact)
34	Gnd	Ground
35	BTA1	Push button OPEN 1 (NO contact)
36	Gnd	Ground
37	BTA2	Push button OPEN 2 (NO contact)
38	Gnd	Ground
39	BTZ1A	Push button CLOSE 1A (NO contact)
40	Gnd	Ground
41	BTZ2	Push button CLOSE 2 (NC contact)
42	Gnd	Ground
43	BTS	Push button STOP (NC contact)
44	Gnd	Ground
45	ANT	Antenna
46	Gnd	Ground
47	NAE	Power failure detection (ANAE)
48	Gnd	Ground

Table 11

*Drawing 21*

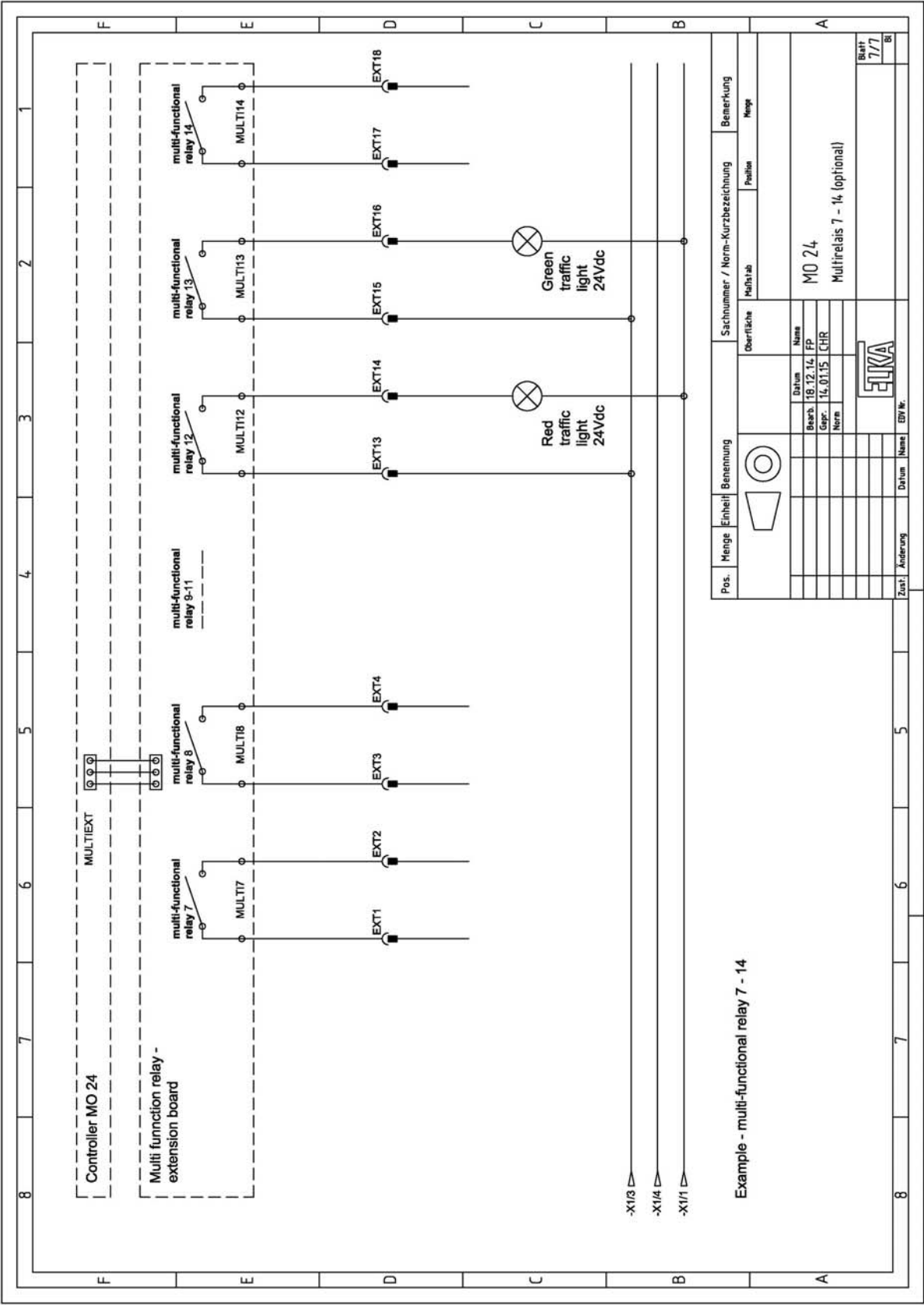












Drawing 27



## 9 Barrier maintenance



### **WARNING!**

**Rotating and/or linear movable components can cause serious injuries.**

Do not reach into moving parts or handle any moving components during operation.

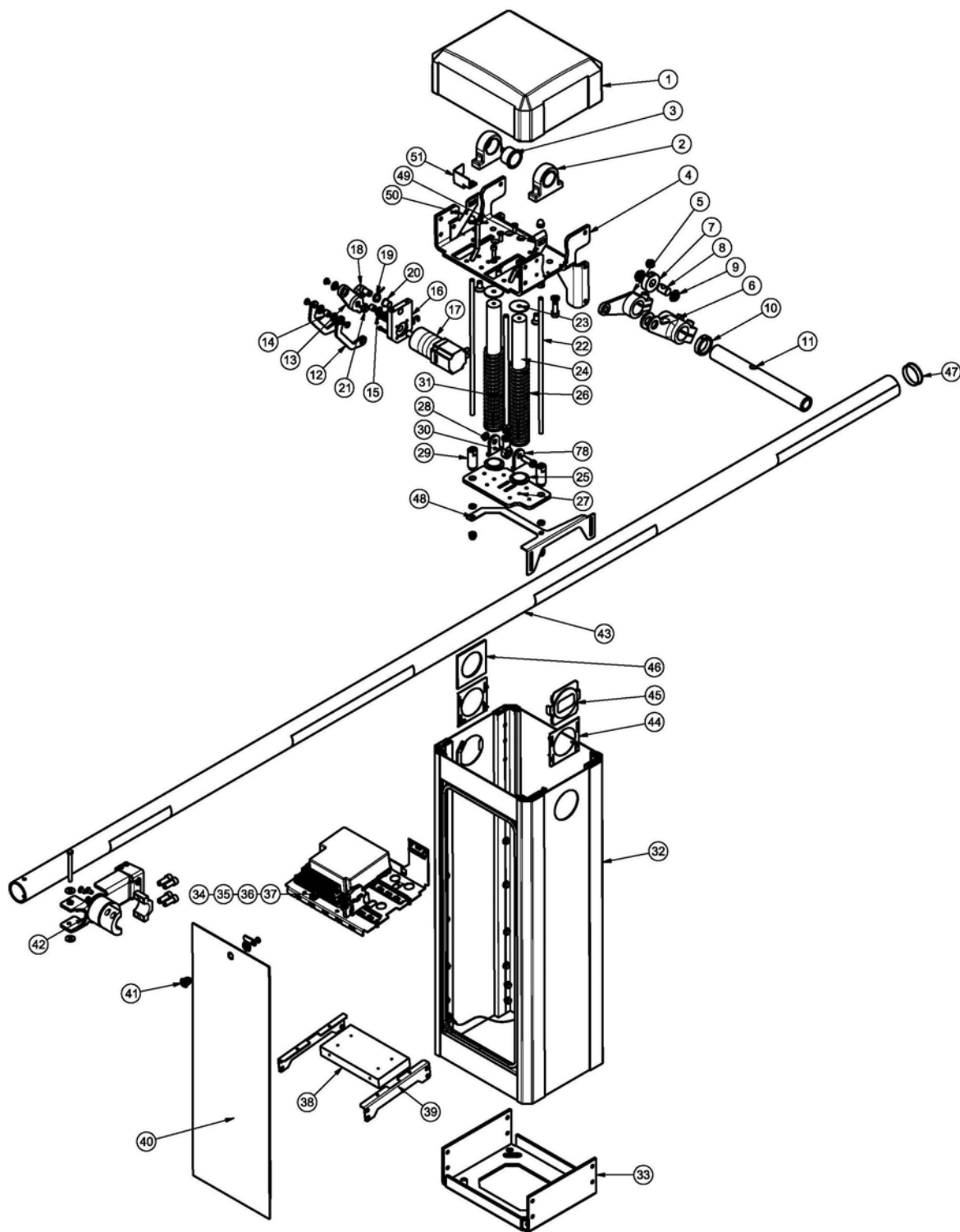
- Turn the appliance off before any maintenance work, repair work or other work and secure it against unintentional restarting.

### **Maintenance T 3000-3500**

The maintenance intervals must be decided individually as they are dependent on the application and the frequency of use. We recommend maintenance at least once every six months.

1. Check the balancing springs. In case of a faulty spring, all springs must be replaced simultaneously.
2. Check that the boom is perfectly balanced by the springs (see page 25).
3. Check barrier housing and boom for accidents and damage and replace where necessary.
4. Ensure that the potential earthing cable is still connected to the housing and to the door.
5. Check that the operating instructions are complete.
6. Check that all safety equipment works properly (induction loops, photoelectric barriers, power reversal,...).
7. Check that the barrier is still secure on the foundation.
8. Perform a visual inspection and tighten screws where necessary.
9. Grease the guide bars using multi-purpose grease (temperature range - 30°C to +70° C). Remove excess grease.

# 10 Layout (exploded drawing)



Drawing 28

Pos.	Qty.	Part name
1	1	Hood
2	2	Pillow block
3	2	Plain bearing, main shaft
4	1	Main plate
5	1	Drive lever M
6	1	Drive lever F
7	1	Tension lever - holder T1
8	1	Tension lever - holder T2
9	2	Plain bearing, spring holder
10	1	Distance ring
11	1	Main shaft
12	2	Connecting lever
13	1	Gearbox shaft
14	2	Cylinder bolt, mechanics
15	4	Plain bearing, mechanics
16	1	Bearing plate
17	1	BLDC-Motor / planetary gear
18	1	Eccentric tappet, releasing device
19	1	Spring, releasing device
20	1	Plain bearing, eccentric tappet (releasing device)
21	1	Plain bearing, gearbox
22	2	Guide bar
23	2	Spring plate
24	2	Spring guide
25	2	Spring holder
26	1	Pressure spring (F1.1)
27	2	Support plate P
28	1	Pull plate P
29	1	Plain bearing, flange bearing
30	1	Joint head 12R
31	1	Tension lever
32	1	Housing
33	1	Base plate
34	1	Controller MO 24, board
35	1	Mounting plate
36	1	Top had rail with on-off switch and terminals
37	1	Controller MO 24, housing

Pos.	Qty.	Part name
38	1	Power-supply unit
39	1	Bracket, mounting plate
40	1	Access panel
41	1	Lock cylinder with nut and lock bolt
42	1	Boom holder
43	1	Boom
44	1	Supporting plate for seal or sealing cap
45	1	Sealing cap, housing
46	1	Felt seal
47	2	Boom end cap
48	1	Bracket, spring assembly
49	1	Hood sheet, housing, right
50	1	Hood sheet, housing, left
51	2	Hood sheet, lever

Table 12

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