

Operating manual

Swing gate openers ZENIT-S 300/302 – ZENIT-S 450/452 - Standard arm -



ELKA

Translation of original operating manual

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1 Preface

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.



REMARK!

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 Information regarding the operating manual

This operating manual serves the purpose to enable the user to install, start-up, and operate the gate opener appropriately.

The operating manual, especially the chapter safety, must be read and understood completely before beginning any work with the gate opener. The instructions of the operating manual, especially the notes on safety, as well as the accident prevention regulations adequate for the type of application must absolutely be kept.

The operating manual describes gate openers with one wing but also applies to systems with 2 wings. Variations will be pointed out explicitly.

1.2 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.

1.3 Copyright

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.

2 Safety

2.1 General notes of safety

The valid regulations and standards, like DIN EN 13241-1, DIN EN 12445, DIN EN 12453 etc., have to be observed during installation.

Do not put a damaged gate opener into operation.

After set-up (installation) every user of the equipment has to be instructed about the operation and function of the swing gate opener. Only the use of spare parts made by the original manufacturer is allowed.

2.2 Notes on safety for the operation

Children and not instructed persons are not allowed to operate the gate system.

No persons, objects, or animals are allowed within the range of the gate movement during opening or closing. Never reach into moving parts of the gate opener or the gate itself. Drive or walk through the gate system only after complete opening.

The gate system has to be secured depending on the type of usage, corresponding to the valid standards and regulations (e.g. safety at the main and secondary closing edges).

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

2.3 Notes on safety for the operation with radio remote control

The radio remote control should only be used, if the area of movement of the gate 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 installations, which are used within the same frequency range, cannot be ruled out.

2.4 Intended usage

The operating safety is only guaranteed with the intended use of the gate opener.

The swing gate openers of the series ZENIT-S 300 / ZENIT-S 450 after installation serve the opening and closing of not wind-resisting, horizontally moving gates with a max. weight of 300kg or 450kg per wing and a max. wing length of 3,000mm or 4,500mm respectively.

The controller MO 36 is a component part and controls the swing gate opener ZENIT.

Any usage beyond this and/or any different application of the equipment is prohibited and is considered as not according to regulations.

2.5 Danger, which could emanate from the site of operation

The swing gate opener ZENIT operates with movable parts.



WARNING!

Risk of injury!

Rotating and/or linear movable components can cause serious injuries. Während des Betriebs nicht in laufende Teile eingreifen oder an sich bewegenden Bauteilen hantieren.

Turn the appliance off before beginning repair work, maintenance work, or other work and secure against restarting.

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 Storing

The swing gate opener has to be stored as follows:

1. Do not expose the gate opener to aggressive substances
2. Do not expose the gate opener to heat sources.
3. Storage temperature -20°C to +70°C

4 Declaration of incorporation



Declaration of incorporation

according to EC - Machinery Directive 2006/42/EG

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

herewith declares, that for the following product

Product description: Swing gate opener
Function: Swing gate opener to open and close swing gates
Type designation: ZENIT-S 300/302, ZENIT-S 450/452
Serial number: 80002881001001 to 80002881052999 for ZENIT-S 300
80002891001001 to 80002891052999 for ZENIT-S 302
80002901001001 to 80002901052999 for ZENIT-S 450
80002911001001 to 80002911052999 for ZENIT-S 452

Year of manufacture: 2010

- the essential safety and health protection requirements in accordance with Annex I of the above directive are applied and fulfilled.
- the special technical documentation is compiled in accordance with Annex VII.
- the regulations of the following other directives are applied:

2006/95/EG	Low voltage directive
2004/108/EG	EMC directive
2001/95/EG	Product safety directive

The following harmonised standards are applied:

EN 12453: 2005	Industrial, commercial and garage doors and gates – Safety in use of power operated doors – Requirements
EN 12445: 2005	Industrial, commercial and garage doors and gates – Safety in use of power operated doors – Test methods
EN 60335-1: 2002	Household and similar electrical appliances – Safety – Part 1: General requirements
EN 61508: 2001	Functional safety of electrical/electronic/programmable electronic safety-related systems – Requirements to SIL2

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

Empowered to draw up the declaration:
ELKA-Torantriebe GmbH u. Co. Betriebs KG, Dithmarscher Str. 9, 25832 Tönning, Germany

Tönning, 01.01.2010

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

Drawing 1

4.1 Declaration of conformity

After installation of the gate opener, the person responsible for the installation (in accordance with DIN EN 13241-1) has to issue - according to the directive 2006/42/EEC- a declaration of conformity for the gate system (gate plus swing gate opener).

4.2 Nameplate

The nameplate of the swing gate opener is fitted on the fixing bracket under the hood.

5 Technical data

	ZENIT-S 300/302 Gates with 1 wing / 2 wings	ZENIT-S 450/452 Gates with 1 wing / 2 wings
Max. length of wing with max. 50% wind resistance	3.000mm / wing	4.500mm / wing
Max. surface area of wing with max. 50% wind resistance	7,50m ²	10,00m ²
Max. weight of wing	300kg	450kg
Requires electromagnetic bolt / motor lock *	no	yes
Emergency release	yes	yes
Running time for 90° (per wing) **	approx. 12s	approx. 12s
Max. opening angle **	120°	120°
Internal stops	yes	yes
External stops required for gate OPEN ***	no	no
External stops required for gate CLOSED ***	recommended	yes
Power supply	230V / 50Hz	230V / 50Hz
Motor voltage	24Vdc	24Vdc
Duty cycle	50%	50%
Controller, separate (lxhxw)	MO 36 (175x260x100mm)	MO 36 (175x260x100mm)
Weight incl. MO 36	approx. 17,0kg / 32,0kg	approx. 17,5kg / 33,0kg
Degree of protection – gate opener	IP 44	IP 44
Degree of protection – controller	IP 44	IP 44
Temperature range	-20°C to +70°C	-20°C to +70°C
Maintenance intervals	According to the applicable regulations and standards (but at least once a year)	

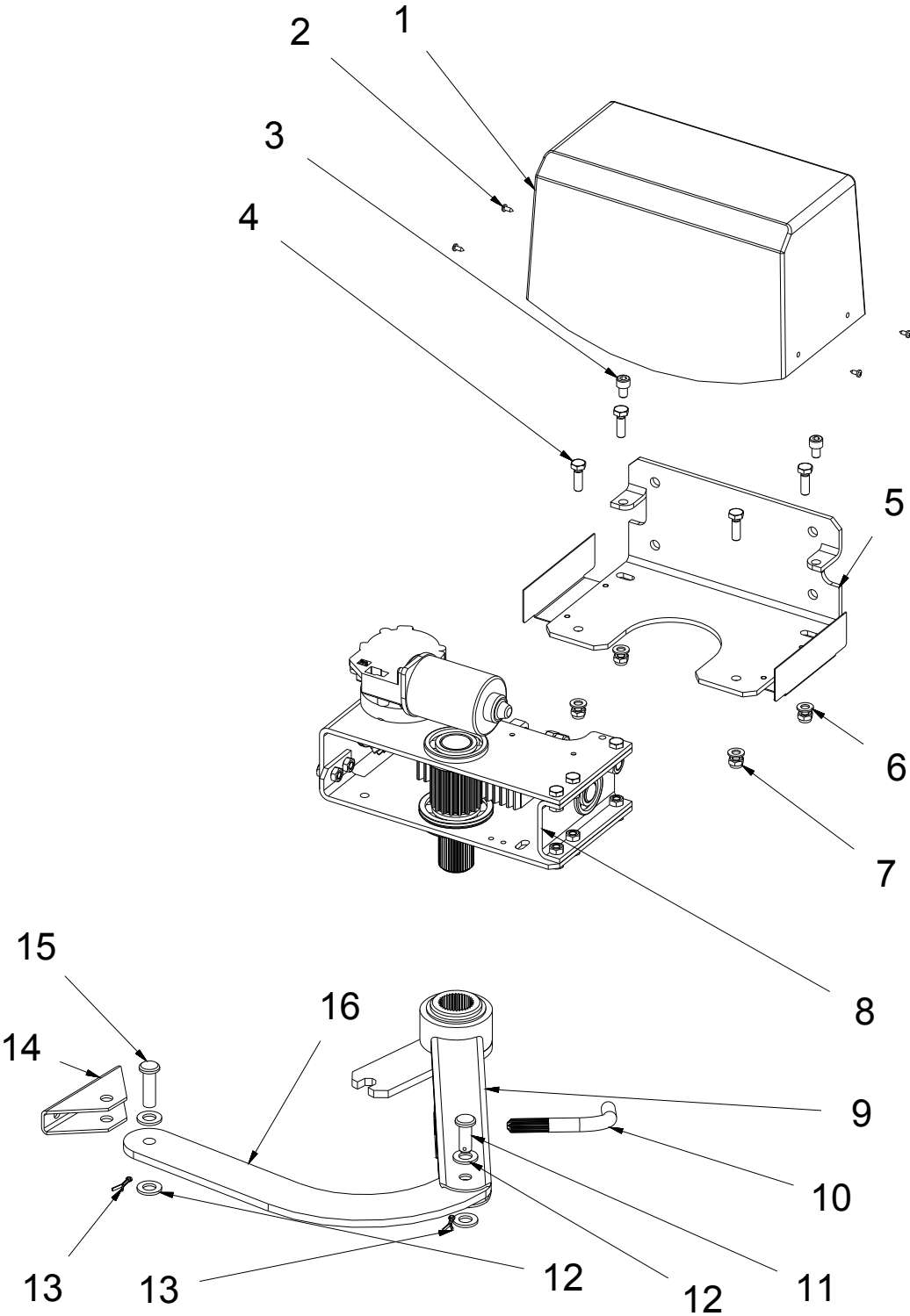
Table 1

* mandatory for 3,000mm and longer

** depending on the mounting dimensions

*** A perfect fixation of the gate in position OPEN and CLOSED is only possible with external stops.

6 Configuration



Drawing 2

No	Quantity	Name or Part
1	1	Hood
2	4	Sheet metal screw ST3,5 x 9,5
3	2	Cylinder head bolt DIN 912 – M8 x 12
4	4	Hexagon head screw DIN 933 – M8 x 25
5	1	Fixing bracket
6	4	Washer DIN 125 – A 8,4
7	4	Hexagon nut DIN 985 – M8
8	1	Operator unit
9	1	Driving lever
10	1	Emergency release lever
11	1	Bolt 12 x 32
12	4	Washer DIN 125 – A 13
13	2	Eyebolt DIN 94 – 3,2 x 18
14	1	Gate support
15	1	Bolt 12 x 40
16	1	Push rod

Table 2

7 Function description

The bending and straightening of the articulated arm effects the opening and closing of the gate. The end positions are programmed in the learning sequence. During operation the gate opener shuts down at these end positions and the mandatory mechanical end stops.

For gate wings of 3,000mm length and longer we stipulate the use of an electromagnetic bolt / motor lock for additional blocking.

The controller MO 36 offers the possibility to activate the gate wings 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 gate movement more force is needed, the gate openers reverse. Additionally several different safety features, e.g. photoelectric barriers and safety contact profiles, can be connected. The safety contact profile detection (8,2kOhm) for both directions of motion is integrated in the controller.

8 Mechanical installation

8.1 Notes of safety



ATTENTION!

The controller and/or motor need to be disconnected from the gate while electric welding is performed!

Welding can damage the controller and the motor.

Remove the controller and the gate opener from the gate/gatepost when welding work is planned there.



REMARK!

Make sure the gate wing / wings are smooth-running and that the rotation axes are vertical. Check if enough room for the gate opener remains, when the gate is in the end positions.



REMARK!

Remove any interlocking system (plunger blocks etc.) or make it inoperable before the installation of the gate.



REMARK!

All cables of the gate opener have to be laid in (protective) empty conduit according to the application.

8.2 Required tools

Drill machine

Drill bit (stone) 12mm

Drill bit (metal) 6.8mm (8.5mm for clearance hole)

Die M8

Water level

Allen key 6mm

Flat-headed screwdriver 3mm

Crosstip screwdriver PH1

Combination wrench SW 10, SW 13, SW 17, SW 19

Measuring tape / Folding meter

8.3 Protective equipment

Safety goggles

Welding goggles

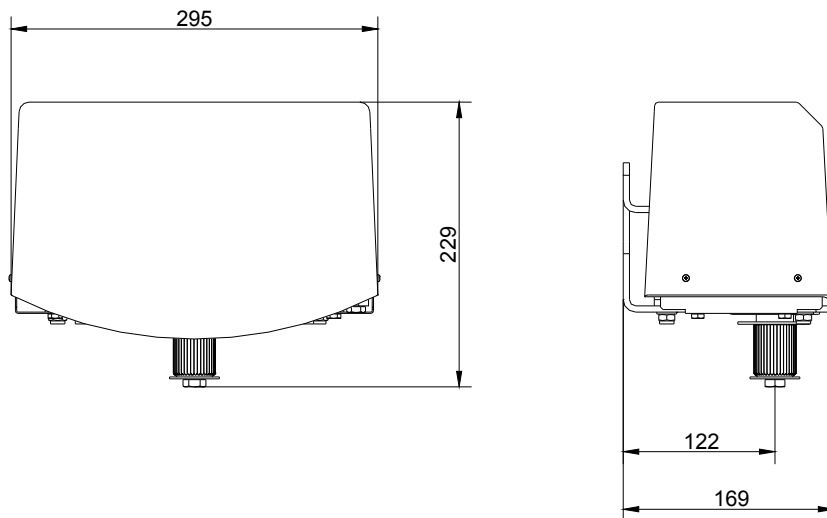
Work gloves

8.4 Scope of delivery

The scope of delivery can vary depending on the model and accessories. Please check the scope of delivery before installation.

	Openers for 1 wing	Openers for 2 wings
Opener unit	1x	2x
Hood	1x	2x
Controller MO 36	1x	1x
Operating manual	1x	1x
Articulated arm	1x	2x
Emergency release key	1x	2x
Push rod	1x	2x
Gate support	1x	2x

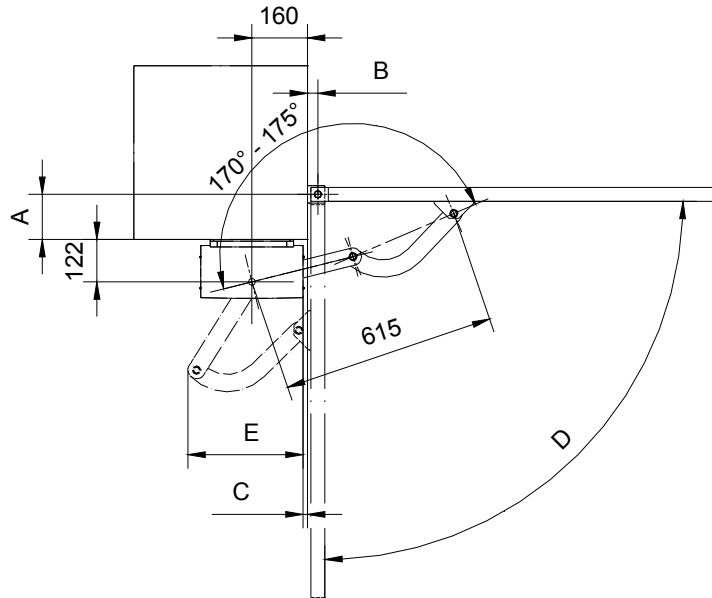
8.5 Dimensions



Drawing 3

Drawing 3 shows the housing dimensions of the gate opener.

8.6 Installation dimensions



Drawing 4



REMARK!

All measurements are stated in millimetre. The gate openers are for left and right gate wings (without alteration).

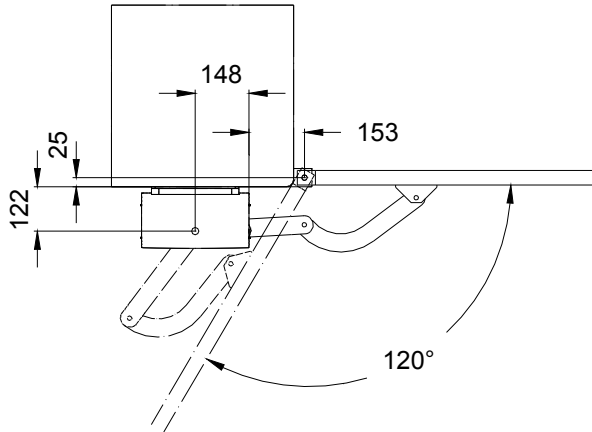
	Permitted installation dimensions
A	35 to 220mm
B	max. 45mm if $A \geq 180\text{mm}$
B	up to 80mm if $A \leq 180\text{mm}$
C	$C = 0\text{mm}$ if $0^\circ \leq D \leq 90^\circ$
C	C up to max. 100mm if $90^\circ \leq D \leq 120^\circ$
E	up to max. 500mm (depending on the gate)

Table 3

Definitions:

- A, B The distances “A” and “B” are related to the pivot point of the gate.
- C Only when the opening angle exceeds 90°, the measurement “C” changes from 0mm up to 100mm (depending on the gate).
- D Opening angle
- E Required space for the articulated arm (position gate OPEN)

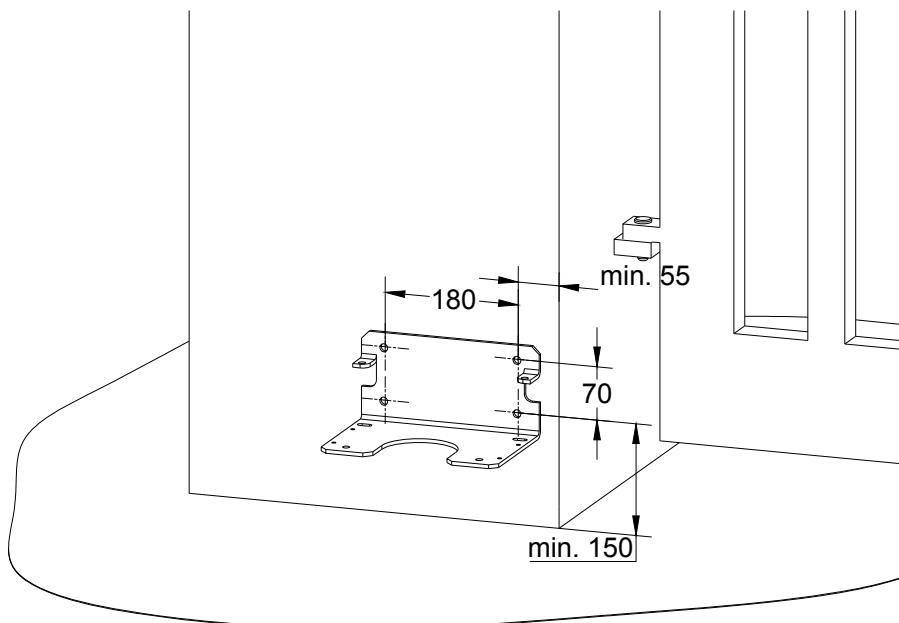
8.7 Max. opening angle



Drawing 5

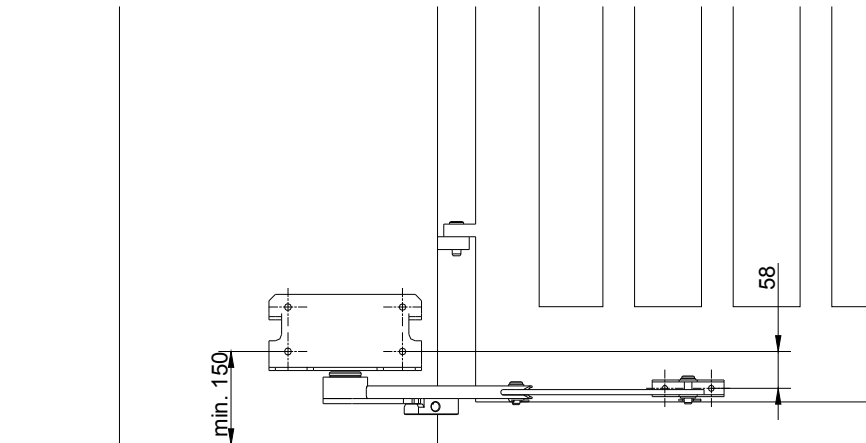
Drawing 5 shows the installation dimensions for the max. opening angle.

8.8 Installation at the gatepost



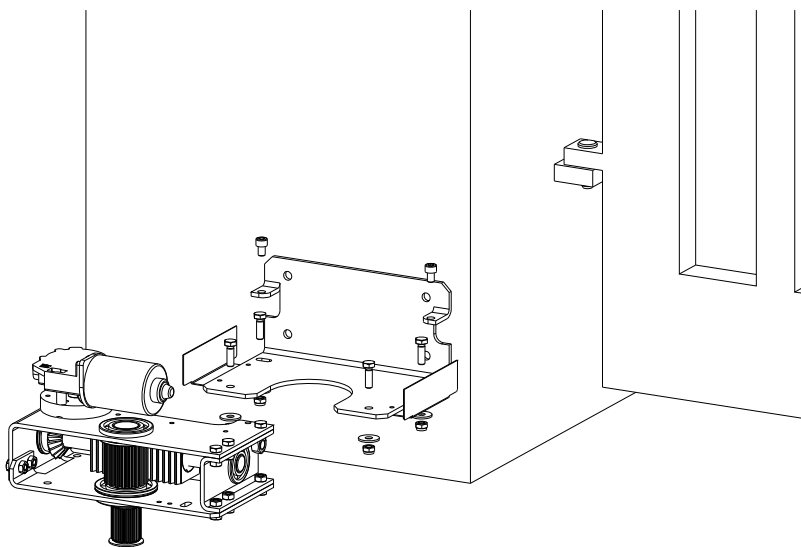
Drawing 6

Move the gate into position CLOSED.
 Connect the mounting plate at the gate post using **four** connection bolts (10mm diameter).
 In case the gate post is made of bricks we recommend the use of special anchor bolts.



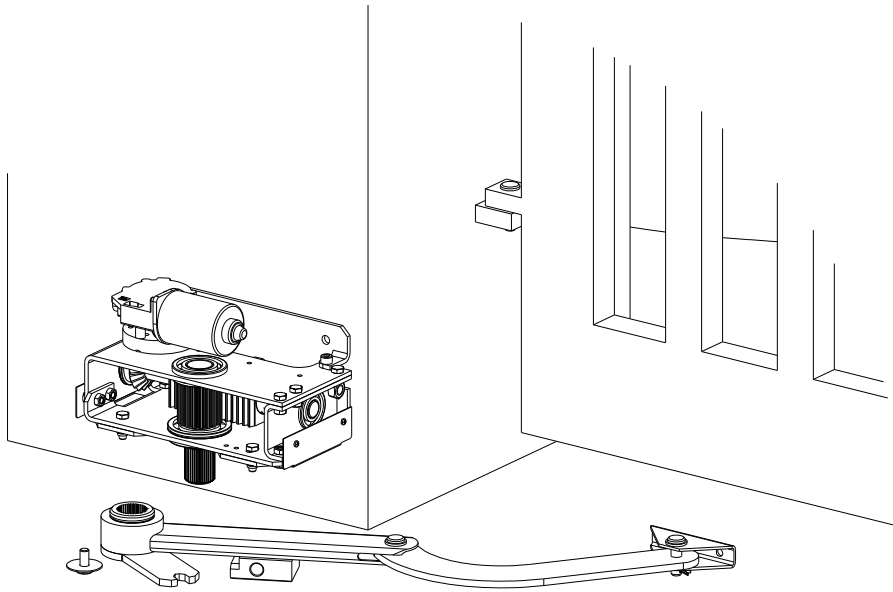
Drawing 7

Check if with the desired installation height of the mounting plate a safe and stable installation of the gate support at the gate leaf/ gate frame is possible. If necessary correct the installation height upwards/downwards (see also Drawing 12).



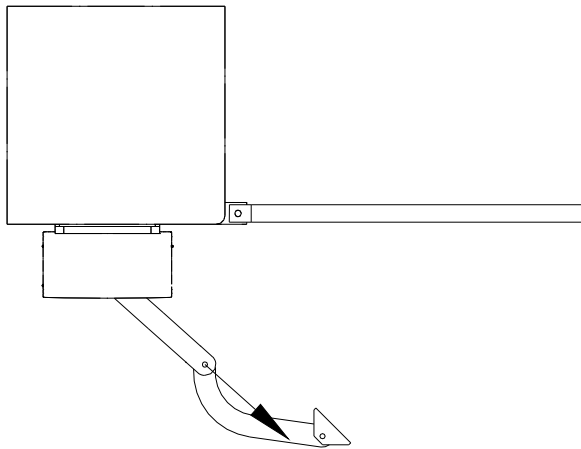
Drawing 8

First fasten the mounting plate to the gatepost and then the operator unit onto the mounting plate.



Drawing 9

Mount the articulated arm on the drive shaft of the operator unit. The push rod has to point towards the gate opening (approx.45° - see Drawing 10).



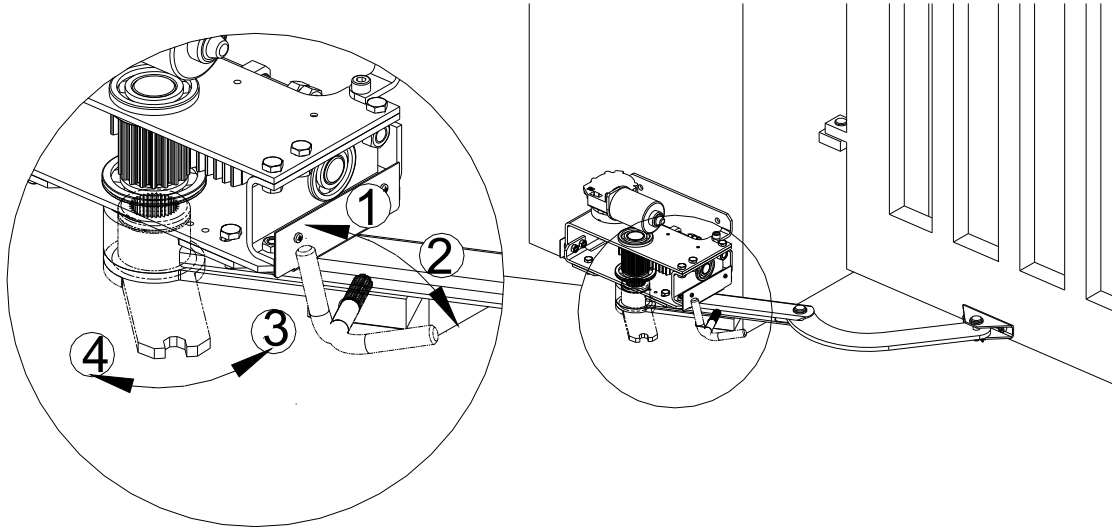
Drawing 10



WARNING!

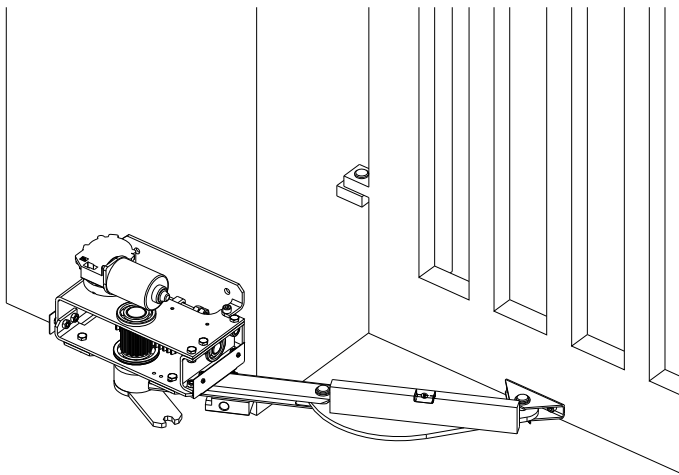
Risk of crushing on protruding parts!

Body parts can be jammed between the upper and lower halves of the articulated arm.
Do not reach into the shear zone between the upper and lower halves of the articulated arm.



Drawing 11

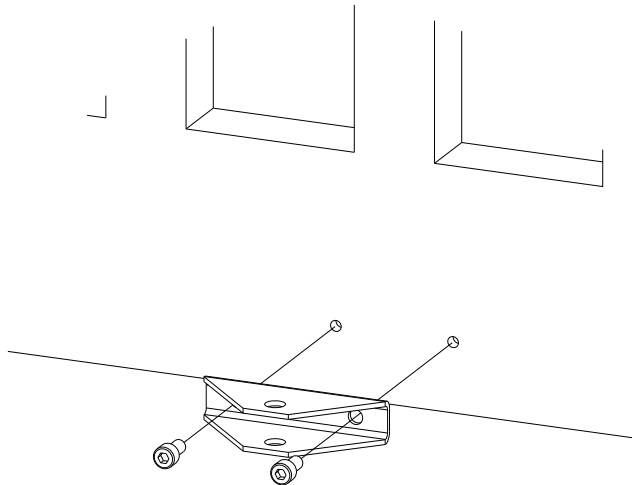
Disengage the articulated arm using the emergency release key (see Drawing 11). To do so move the emergency release key from position 1 to position 2. Then turn the articulated arm into the direction of position 3, the driving lever divides itself into one upper and one lower half.



Drawing 12

Close the gate completely. Turn the articulated arm towards the gate. Align the articulated arm horizontally.

The distance between the pivot point of the drive shaft and the pivot point of the gate support has to be **615mm** (see also page 14, Drawing 4).



Drawing 13

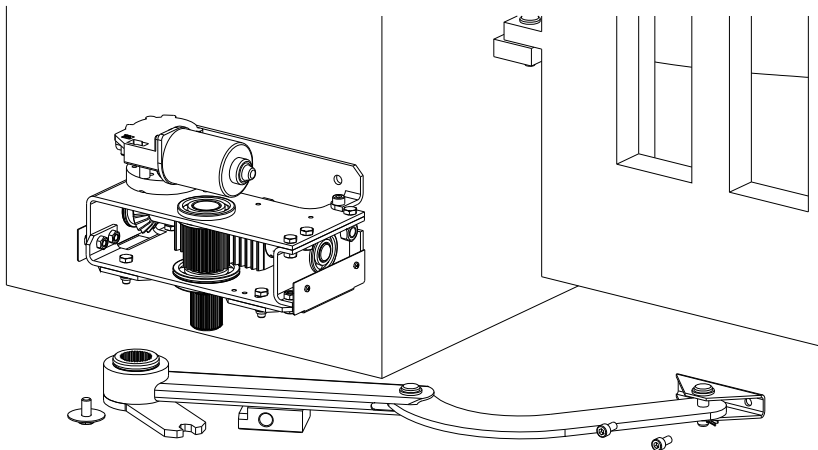


REMARK!

For fastening drill and cut two M8-threads into the gate beam. Fasten the gate support with two screws M8 x 16 (e.g. cylinder-head bolts DIN 912).

Should the material thickness not be sufficient, drill clearance holes through the gate beam and use cylinder-head bolts in a suitable length and self-locking hexagon nuts on the opposite gate side.

Fasten the gate support at the determined position. Then fix the articulated arm at the gate support.



Drawing 14

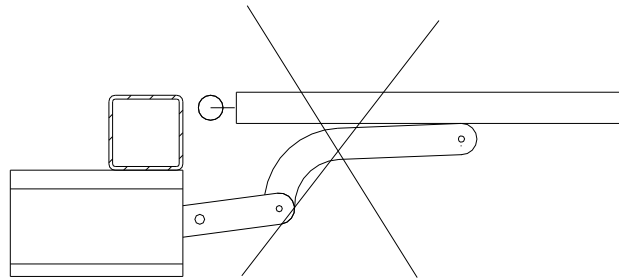


WARNING!

Risk of crushing!

In case the articulated arm is mounted incorrectly, the upper and lower halves can form a shear point or crushing point.

Therefore ensure a correct installation of the articulated arm.



Drawing 15



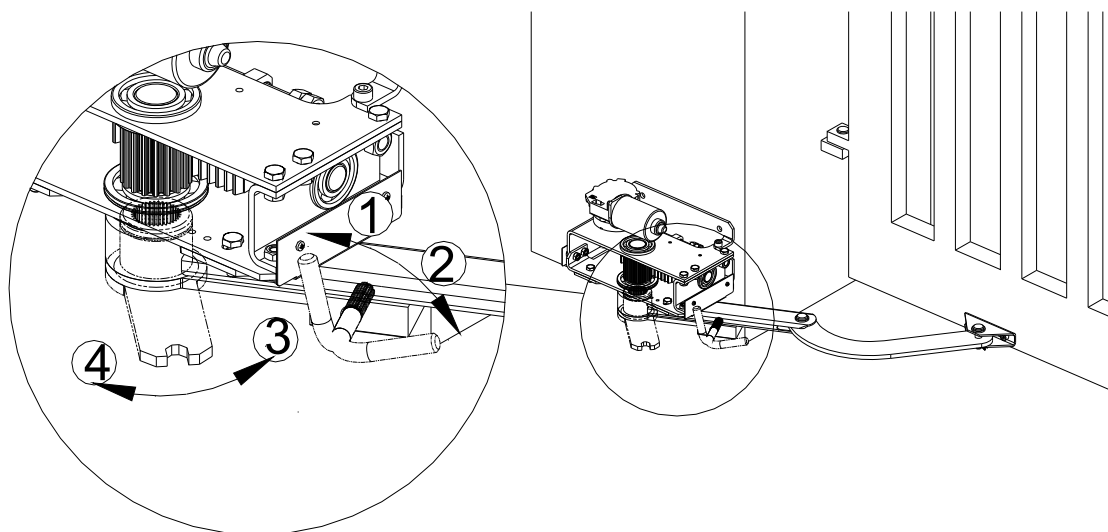
WARNING!

Risk of crushing!

Do not leave the emergency release key in the emergency release. It can form an additional crushing point.

Remove the emergency release key after each use.

Connect the gate opener to the controller MO 36 (see also chapter 10. - Controller MO 36).



Drawing 16

Engage the gate opener by placing both halves of the driving lever on top of each other (turn the upper driving lever towards position 4). Then engage the emergency release by turning the emergency release key from position 2 towards position 1.

8.9 Adjusting the internal stops



ATTENTION!

Risk of crushing!

During the next steps the gate will be moved electrically. During the adjustment the safety devices can react differently from normal operation.

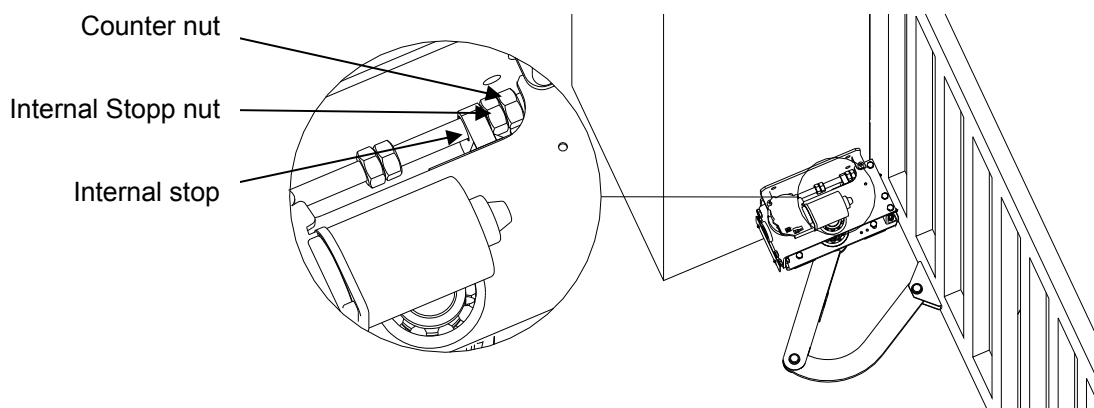
Make sure that the range of movement is free of obstacles.



REMARK!

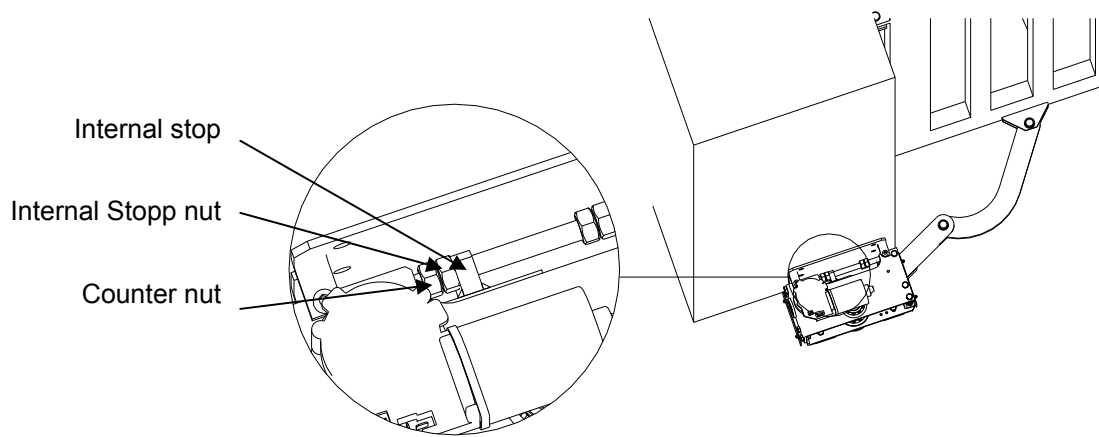
For additional information regarding the controller see chapter 10.

- a. Press the button **LERN** on the controller for approx. 2 seconds. The display shows **P i**.
- b. Press the button **LERN** again. The display now shows **iF**. Using the button **BT** chose between gates with one wing (**iF**) and gates with two wings (**2F**). Confirm the choice using button **LERN**. The display now shows **HR**.
- c. Now you can move the gate wing into the end positions in slow mode. The gate wing moves into direction OPEN only as long as button **BT** or **BTG** is pressed. Push button **BT** or **BTG** again and the wing moves into direction CLOSED.
- d. Using the button **BT** move the gate wing (for gates with one wing – for gates with two wings move the main wing) into the end position OPEN. Turn the internal stop nut OPEN against the internal stop. Fasten the internal stop nut using the counter nut.



Drawing 17

- e. Using the button **BT** move the gate wing into the end position CLOSED. Turn the internal stop nut CLOSED against the internal stop. Fasten the internal stop nut using the counter nut.



Drawing 18

- f. For gates with two wings move the pedestrian wing using the button **BTG** into the end positions OPEN and CLOSED. Turn the internal stop nut against the internal stop and fasten them using the counter nuts.
- g. Proceed with chapter 9.4.d.

9 Electrical installation

9.1 Notes of safety



REMARK!

According to DIN EN 12453 the mains supply has to be equipped with an all-pole circuit breaker.



ATTENTION!

Danger of short circuit or destruction by ingress of water.

Due to improper installation water can enter the controller housing.

Always install the controller housing upright, with the cable entry point on the bottom. Use only the provided fixing points. No additional boreholes at the backside of the housing are allowed. The cover must be mounted distortion-free. Insert the cable through the cable entry points only.



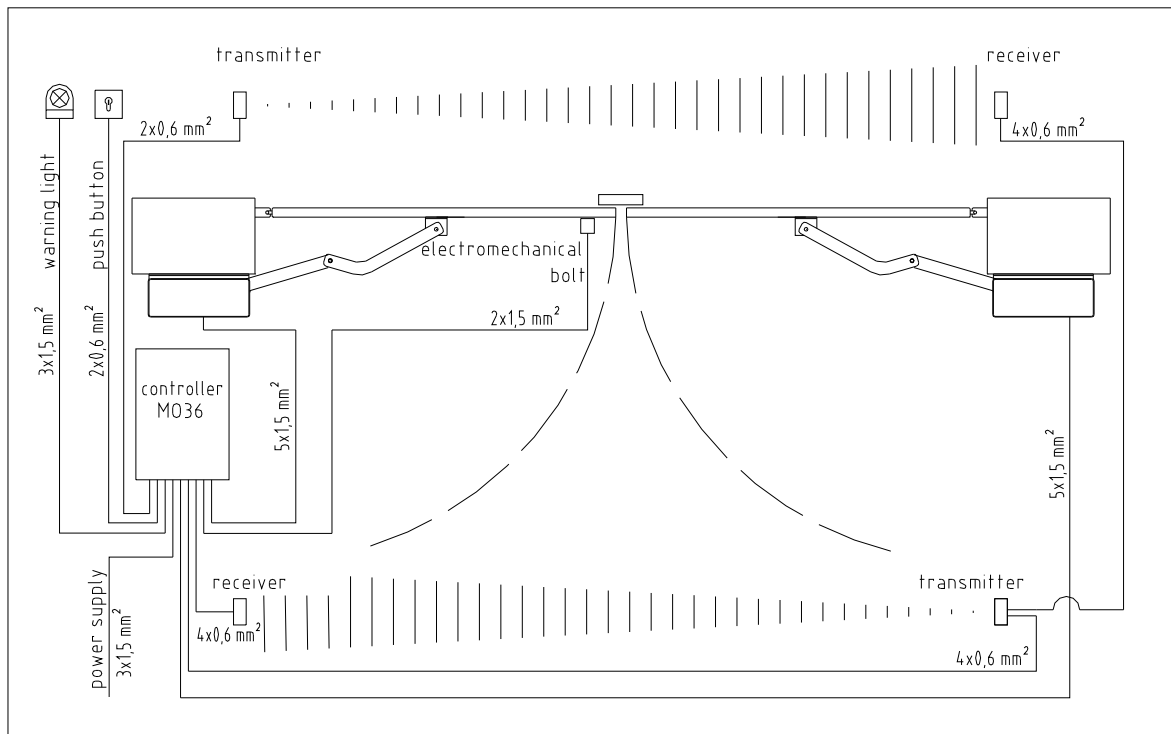
WARNING!

Danger through voltage.

Danger of an electric shock.

Only certified electricians (VDE 0100) should connect the controller to the mains supply (230Vac).

9.2 Installation example



Drawing 19

9.3 Cable connections


REMARK!

For systems with radio remote control the controller should be installed as close as possible to the gate.


REMARK!

Connection only by fixed wiring and main switch (on site) or flexible wiring with cable stress relief conforming to standards. Insert the cable only from below.


REMARK!

Please observe the minimum necessary cable cross-section [mm²], generated from the cable length between the gate opener and the controller. A smaller gauge will have adverse effect on the motor performance.

For the gate opener (with controller MO 36) the following cable dimensions are requested:

Cross-section: 5 x 1.5mm² up to max. 15m distance

Cross-section: 5 x 2.5mm² up to max. 20m distance

Power supply for the controller: 230Vac, 50Hz, single phase.

Connect the motor cable of the gate openers to the motor terminals (GEH and FAHR) of the controller.


REMARK!

Please use a suitable cable, possibly with a mechanical protection (conduit), for the connection gate opener – controller. The motor cable (enclosed in shipment) is only suited for the shortest way to the connection box. Here also allow for a mechanical protection.


REMARK!

To avoid mistakes please use marked or numbered leads within the 5-leads cable.


REMARK!

For the connection of the motor lead to the controller MO 36 use solely leads with flexible conductors, like e.g. ÖLFLEX ROBUST 210.

Description	Terminals at the MO 36
1	GND
2	IMP
3	I+
4	M-
5	M+

Table 4

Switch the main connection on.

9.4 Programming the gate opener



WARNING!

During the next steps the gate will be moved electrically!

During the programming the safety devices can react differently from normal operation. Make sure that the range of movement is free of obstacles.

- a. Press the button LERN on the controller for approx. 2 seconds. The display shows **P I**.
- b. Press the button LERN again. The display now shows **IF**.
- c. Choose between gates with one wing (**IF**) or gates with two wings (**2F**) using BT. Confirm the choice using button LERN. The display shows **HA**.
- d. During the following step the controller learns the running distance of the gate wings. Press the button LERN. The controller moves the gate wings into direction OPEN until it reaches the end stop and then back into direction CLOSED until it reaches the end stop (display shows **P2**).



REMARK!

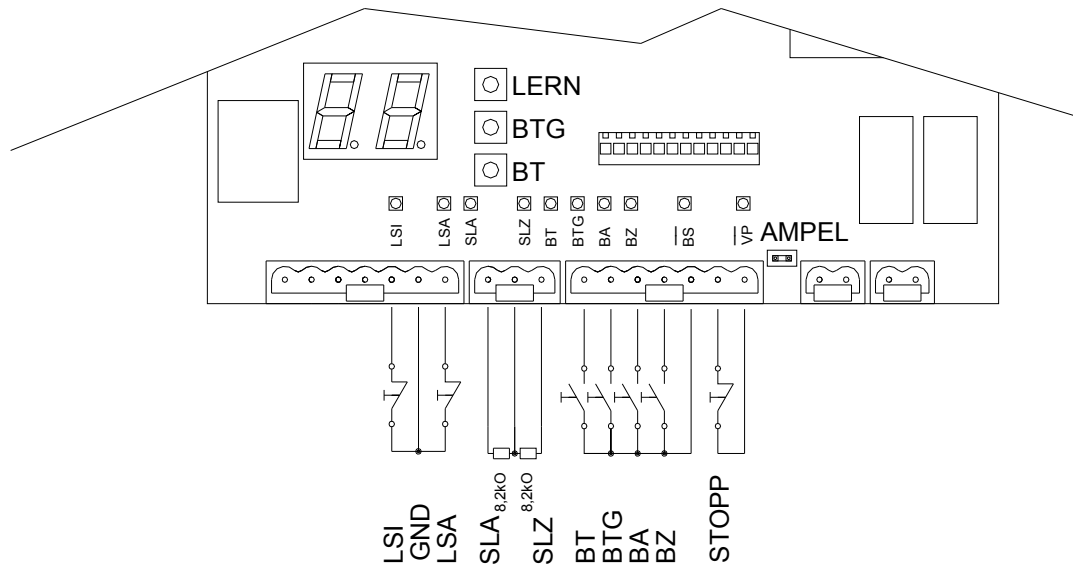
The gate is now in position CLOSED. If this is not the case then the leads 4 and 5 of the motor cable of the corresponding gate opener/s have to be interchanged at the terminals.

Then press button **BTG** (display shows **P I**), press button **LERN** 3 times (display shows **IF** or **2F**, **HA** and **AU**), repeat point d.

- e. Push button BT repeatedly until **PP** is displayed. Then confirm using button LERN.

10 Controller MO 36

10.1 Input terminals of the controller

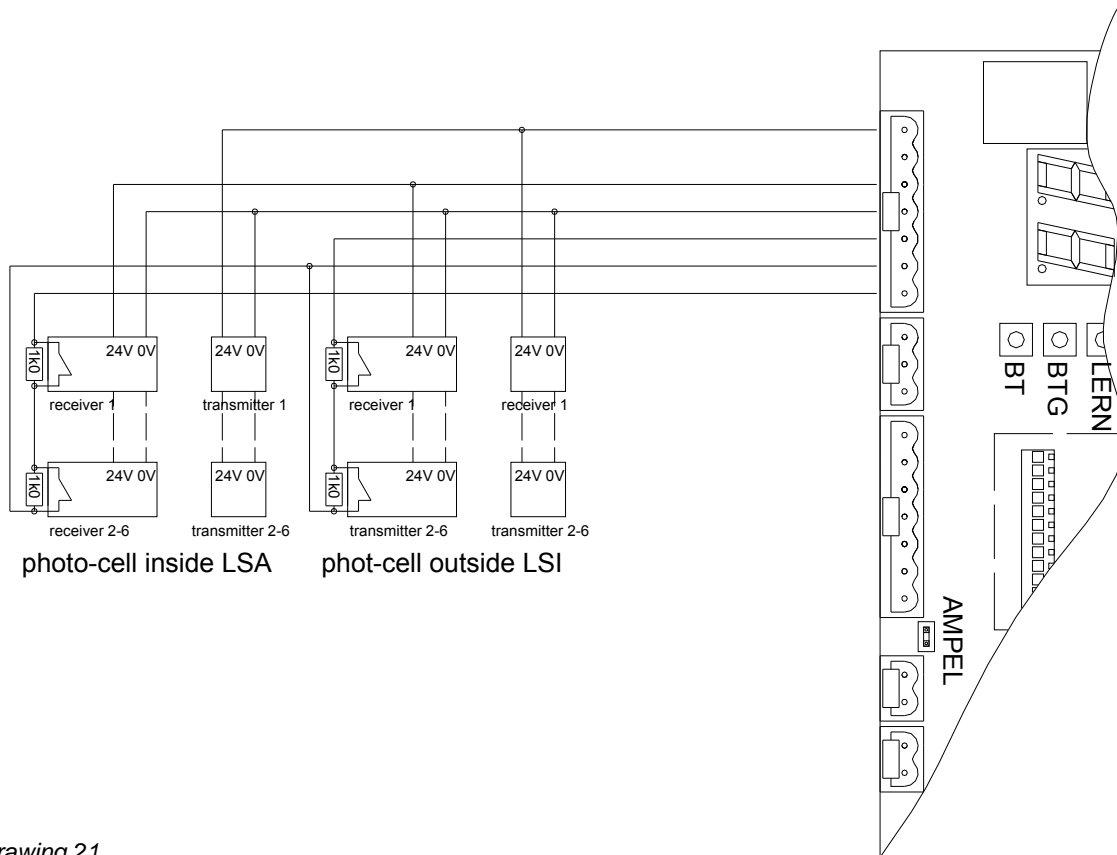


Drawing 20

Mark	Connection	Function
LSI	LSI + GND	Photoelectric barrier contact INSIDE
	GND	Mutual ground for LSI and LSA
LSA	LSA + GND	Photoelectric barrier contact OUTSIDE
SLA	SLA + GND	Safety contact profile OUTSIDE (8.2kOhm-resistance)
SLI	SLI + GND	Safety contact profile INSIDE (8.2kOhm-resistance)
BT	BT + GND	Push button for complete opening
BTG	BTG + GND	Push button for partial opening
BA	BA + GND	Push button OPEN
BZ	BZ + GND	Push button CLOSE
GND		Mutual ground for BT, BTG, BA, and BZ
GND		Ground for BS
BS	BS + GND	Push button STOP

Table 5

10.1.1 Photoelectric barrier connection



Drawing 21



REMARK!

In case the inputs LSA, LSI, or BS are not required, they have to be linked to a jumper.



REMARK!

The direct current supply 24Vdc and 12Vdc can be used for a total of max. 300mA.

The controller provides two inputs for photoelectric barriers for optical protection. Connect the photoelectric barriers for outside of the gate to the LSA, and for inside of the gate to LSI. The green LEDs **LSI** and **LSA** show the status of the photoelectric barriers. When a photoelectric barrier is interrupted, the corresponding LED lights.

10.1.2 Safety contact profile



REMARK!

Each safety contact profile terminal SLA and SLZ which is not used has to be linked to an 8.2kOhm resistor.



REMARK!

In case a safety function leads to switching-off, with a system with two wings always both motors switch off.

The controller is equipped with two integrated detectors (with testing function according to EN954-1 category 2) for safety contact profiles with resistance detection to secure the closing edges in direction OPEN and CLOSED.

The red LEDs **SLA** and **SLZ** show the status of the safety contact profiles. When the safety contact profile is activated, the corresponding LED lights.

Direction of	Action of SLA	Action of SLZ
Stop, gate shall open	Gate can only open in emergency	-
Stop, gate shall close	-	Gate can only close in emergency mode
Gate wing opens	Stop and reversing for a short distance	-
Gate wing closes	-	Stop and reversing

Table 6



REMARK!

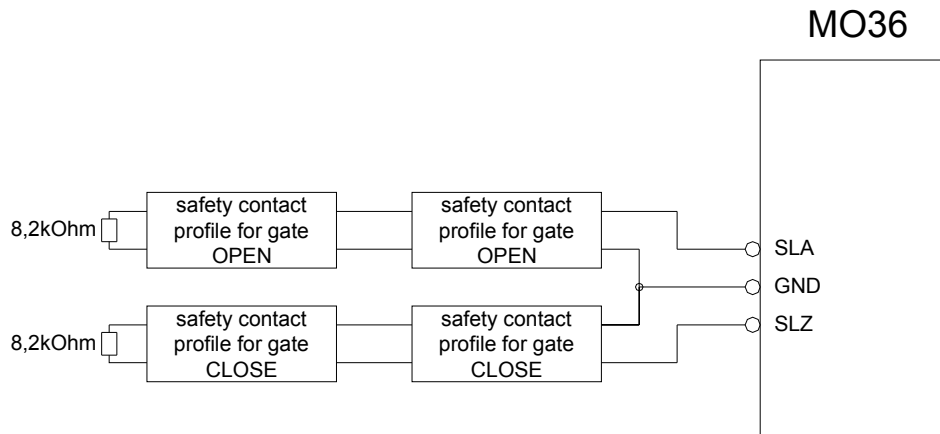
Counting function:

When the gate makes contact with an obstacle and the safety contact strip SLZ activates the reversing function, the gate opens.

In case the automatic closure is activated and the obstacle does not get removed, a constant closing by automatic closure and reversing by the obstacle could occur.

To prevent this, a **counting function** is provided. After 2 tries to close by automatic closure only a reversing for a short distance occurs. The counter is cleared when the gate is operated manually.

Connection plan:



Drawing 22



REMARK!

Several safety contact profiles with 8.2kOhm load resistance can be set-up in serial connection. The safety category remains the same.



REMARK!

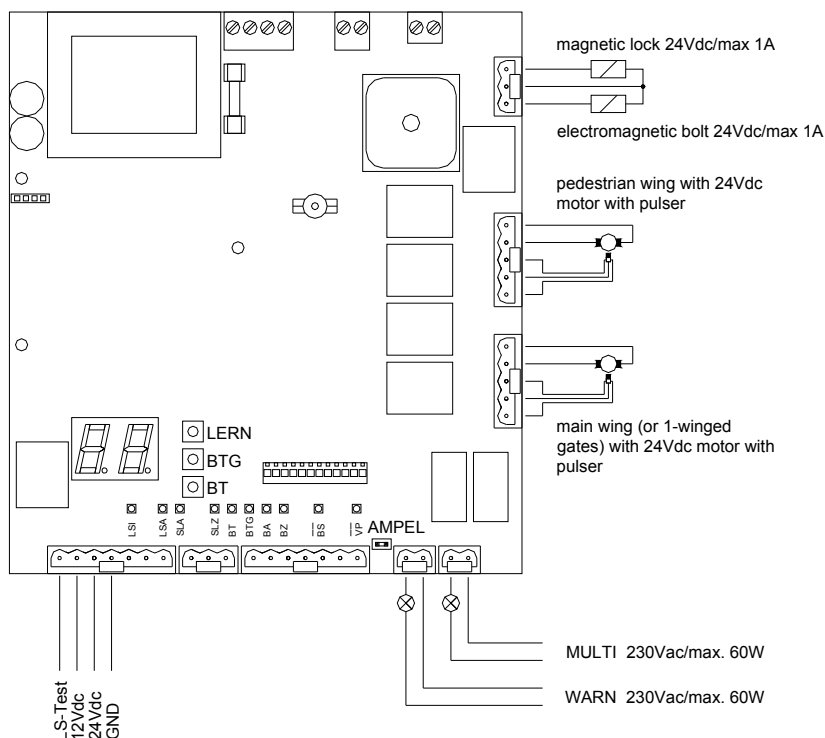
Make sure to check the function of the safety contact profiles by activating each single one manually. The corresponding LED (SLZ or SLA) has to light red.



REMARK!

Observe the effective direction of the safety contact profiles. The profiles which react in direction CLOSE have to be connected to the input terminal SLZ. The profiles which react in direction OPEN have to be connected to the input terminal SLA.

10.2 Output terminals of the controller



Drawing 23

Mark	Connection	Function
SCHL	SCHL + GND	Connection for magnetic clamp (24Vdc, max. 1A)
GND		Mutual ground for magnetic clamp and electromagnetic bolt
SCHL	SCHL + GND	Connection for electromagnetic bolt (24Vdc, max. 1A)
GEH:	5-polig	Motor connection pedestrian wing
FAHR:	5-polig	Motor connection main wing
MULTI	2-polig	Potential-free contact for multi-functional relay (230Vac, max.
WARN	2-polig	Potential-free contact for warning light (230Vac, max. 60W)
GND		Mutual ground 12V, 24V, and LS-TST
24V	24V + GND	24Vdc, stabilised (altogether with 12Vdc max. 300mA)
12V	12V + GND	12Vdc, stabilised (altogether with 24Vdc max. 300mA)
LS-TST	LS-TST + GND	Photoelectric barrier testing (24Vdc for transmitter)

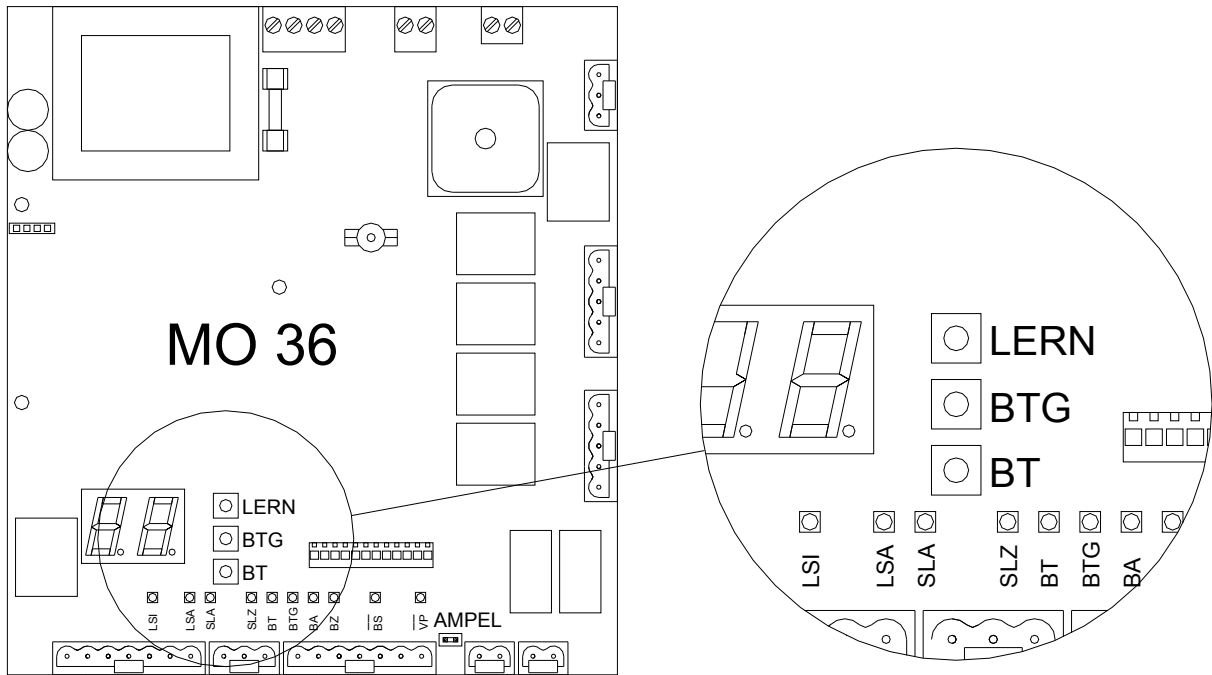
Table 7



REMARK!

The ground of the direct current supply 24Vdc/12Vdc is connected to the controller ground.

10.3 Buttons on the controller

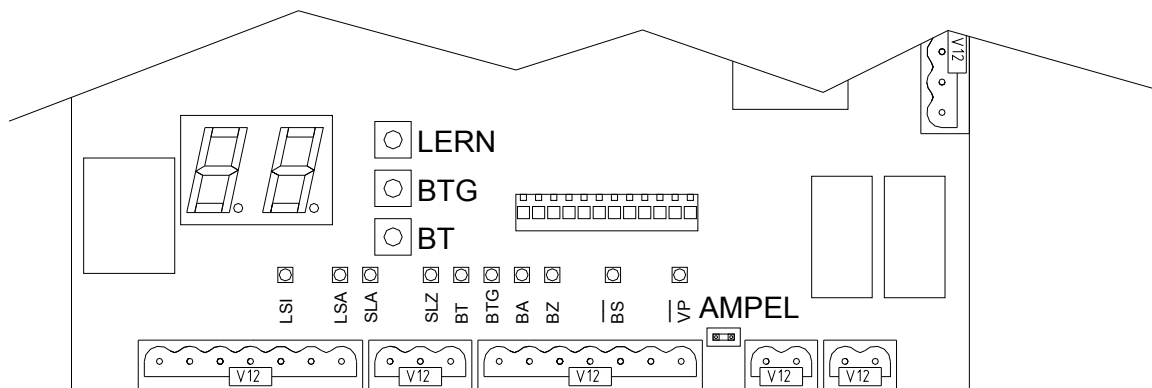


Drawing 24

Mark	Function	Remark
BT	Button for complete opening	Same function as external button BT
BTG	Button for partial opening	Same function as external button BTG
LERN	Learn button	

Table 8

10.4 LEDs on the controller



Drawing 25


Mark	Colour	Function	Normal
LSI	green	Lights when photoelectric barrier INSIDE is interrupted	OFF
LSA	green	Lights when photoelectric barrier OUTSIDE is interrupted	OFF
SLA	red	Lights when safety contact profile OPEN is activated	OFF
SLZ	red	Lights when safety contact profile CLOSED is activated	OFF
BT	green	Lights when button BT (internal or external) is activated	OFF
BTG	green	Lights when button BT (internal or external) is activated	OFF
BA	green	Lights when button BA is activated	OFF
BZ	green	Lights when button BZ is activated	OFF
BS	green	Lights when button BS is NOT activated (BS-contact n.c.)	ON
Vp	yellow	Lights when connected to supply voltage	ON
Display	red	2 x 7-segment display ()	OFF

Table 9

10.5 Clip-on module

10.5.1 Clip-on timer module ASU2 (optional)

The controller provides a socket for the timer module ASU2.

The timer has the following function:

When the timer is activated it works like an OPEN command. The gate cannot be closed as long as the timer is activated.

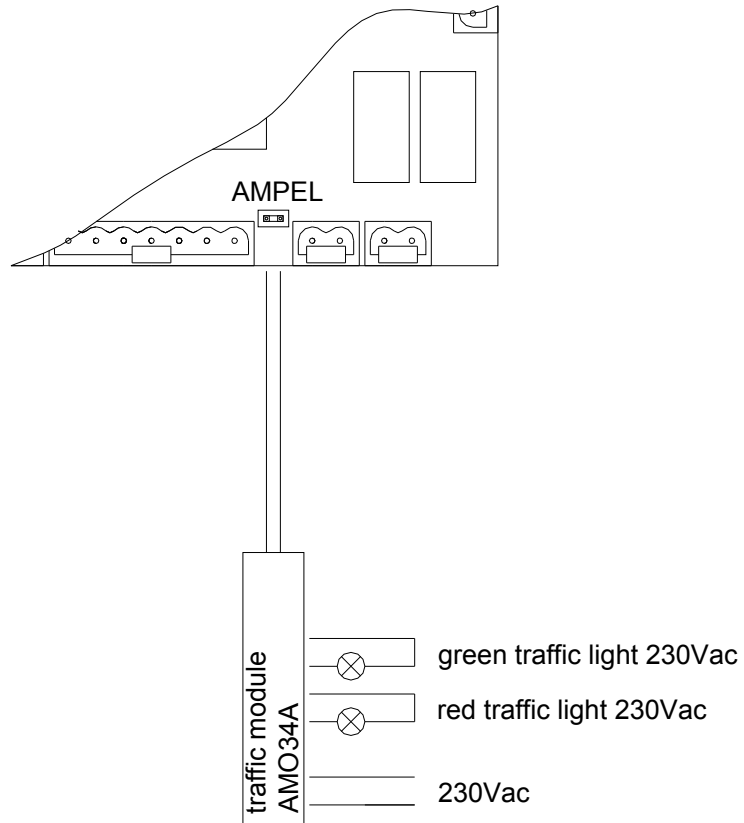
When the timer is deactivated it works like a CLOSE signal. When the timer sends the CLOSE command, the gate is closed immediately even when automatic closure is activated.



REMARK!

Do not connect anything but the optional module ASU2 at the terminal ASU2 on the controller MO 36.

10.5.2 Traffic light module AMO34A (optional)



Drawing 26

Status	Red traffic light	Green traffic light
Gate is completely open	Off	On
Gate is moving OR Gate is in an intermediate position OR Gate is closed	On	Off

Table 10



REMARK!

Do not connect anything but the optional module AMO34A at the terminal AMPEL on the controller MO 36.

10.6 Programmin controller MO 36



WARNING!

During the programming the safety devices can react differently from normal operation. Make sure that no person is present within the danger zone during programming.



REMARK!

At least the following sequences have to be learned as basic configuration:

- P1** - Learning of running distance
- P2** - Adjusting of force and speed
- PP** - Saving of data



REMARK!

In the learning sequence the swing gate opener can be adjusted according to the requirements, e.g. to the type of use.

- To program the controller and to set the parameters the controller provides a two-digit 7-segment-display and the buttons BT, BTG, and LERN.
- During normal operation the display is off. **The learning sequence is activated by pushing the button LERN for approx. 2s.** The display shows **P 1**. The sequence 1 is preset.
- With the button **BT** you can move on to the next sequence **P 2**, **P 3** etc. With the button **BTG** you can move back to the last sequence.
- When the required sequence is displayed, it has to be activated by button **LERN**.
- When the sequence **PP** is selected and confirmed by button **LERN**, the parameters are saved and then returned to regular mode.

The learning sequence	
Sequence	Function
<i>P 1</i>	Selecting one wing operation / two wings operation Adjusting of end stops Learning of safety contact profiles and photoelectric barriers connected Learning the running distance
<i>P 2</i>	Adjusting of force and speed
<i>P 3</i>	Adjusting of time lag of the pedestrian wing after the main wing during closing.
<i>P 4</i>	Adjusting of time lag of the main wing after the pedestrian wing during opening.
<i>P 5</i>	Learning the radio remote control codes for BT, BTG, and MULTI Deleting the radio remote control codes for BT, BTG, and MULTI
<i>P 6</i>	Activating / deactivating automatic closure for both wings, changing stay-open time.
<i>P 7</i>	Activating / deactivating automatic closure for pedestrian wing, changing stay-open time.
<i>P 8</i>	Selecting of warning prior to opening and closing
<i>P 9</i>	Selecting of photoelectric barrier function
<i>P A</i>	Activating / deactivating photoelectric barrier testing
<i>P b</i>	Activating / deactivating lockage function for photoelectric barrier
<i>P C</i>	Selecting pressure relief of electromagnetic bolt
<i>P d</i>	Selecting wind blast suppression
<i>P E</i>	Selecting mode of multi-functional relay
<i>P F</i>	Return to original settings
<i>P P</i>	Saving of data and returning to regular mode

Table 11

10.6.1 Sequence **P** !: Learning the running distance

Selecting system with 1 wing / system with 2 wings	
Display	Function
1F	To operate gates with one wing.
2F	To operate gates with two wings.

Tabelle 1

Confirm the selection with button **LERN**.

Then **HA** (manual operation) is displayed. The gate wings now can be operated in manual operation to adjust the internal mechanical end stops inside the gate openers. Button **BT** is used for the main wing and **BTG** for the pedestrian wing in dead man's mode. The first direction is always OPEN.



REMARK!

After adjustment of the end stops the wings should not be in either end position but at least 50cm away, because the first movement goes into direction OPEN.



WARNING!

Risk of crushing by an automatic movement of the gate wings!

Individuals or objects within the danger area of the gate could get injured or damaged respectively by the gate movement.

Ensure that no individuals or objects reside or are present within the danger area during the learning process.



REMARK!

After the next confirmation by button LERN the gate moves automatically.

Confirm the adjustment of the end stops using the button **LERN**.

Then **AU** (automatic mode) is displayed. The controller tests the safety contact strips and the photoelectric barriers. Then the gate moves automatically and learns the running time.



REMARK!

Only when this photoelectric barrier testing was successful, additional tests can be carried out during future operation.

Gates with one wing: During learning of the running time the wing first opens and then closes. The wing stops at the end stop by force control.

Gates with two wings: During learning of the running time the pedestrian wing opens first, then the main wing opens, the main wing closes, and at last the pedestrian wing closes. The wings stop at the end stops by force control.



REMARK!

During the learning of the running time the pressure relief of the electromagnetic bolt is not in function. During learning of the distance the electromagnetic bolt is being activated during each wing movement. Then returning to the main sequence follows automatically.

10.6.2 Sequence P2: Adjusting of force and speed

The force and speed can be adjusted for each wing and for opening and closing separately. When sequence P2 is activated by button **LERN** an additional selection menu for force values and speed values (F 1, F 2, etc.) opens. Use button **BT** to move to the next selection menu point.

Selection	Selection menu points for force and speed
Sub-sequence	Function
F 1	Force to open the main wing
F 2	Force to close the main wing
F 3	Force to open the pedestrian wing. No function with gates with one wing.
F 4	Force to close the pedestrian wing. No function with gates with one wing.
S 1	Speed to open the main wing
S 2	Speed to close the main wing
S 3	Speed to open the pedestrian wing. No function with gates with one wing.
S 4	Speed to close the pedestrian wing. No function with gates with one wing.

Table 12

User button **LERN** to activate the desired selection menu point. The present value for force (f for force) or speed (S for speed) is displayed. Possible values are 0 1 (for minimum force) up to 9 9 (for maximum force) or 0 1 (for minimum speed) up to 0 8 (for maximum speed). With button **BT** the values may be increased, with button **BTG** they can be decreased. Confirm the current selection and return to the selection menu or to the main learning sequence using button **LERN**.



WARNING!

In the learning sequence a force value (F 1 – F 4) for the motor current is selected. Therefore the operator is responsible that only a permitted force value is set (see Table 14).

Gate opener	Setting range in the learning sequence
ZENIT-S 300 / 302	F 1 – F 4 = max. 55
ZENIT-S 450 / 452	F 1 – F 4 = max. 65

Table 13

10.6.3 Sequence **P 3**: Time lag of the pedestrian wing during closing

When sequence **P 3** is activated by button **LERN**, the present value for the time lag of the pedestrian wing during **closing** is displayed.

Possible values are **00** (for 0 seconds) up to **09** (for seconds).

The value can be **increased** using button **BT**, and **decreased** using button **BTG**. To return to the learning sequence use button **LERN**.



REMARK!

When a time lag is selected for gates with one wing, it will not be in effect.

10.6.4 Sequence **P 4**: Time lag of the main wing during opening

When sequence **P 4** is activated by button **LERN**, the present value for the time lag of the main wing during **opening** is displayed.

Possible values are **00** (for 0 seconds) up to **09** (for seconds).

The value can be **increased** using button **BT**, and **decreased** using button **BTG**. To return to the learning sequence use button **LERN**.



REMARK!

When a time lag is selected for gates with one wing, it will not be in effect.

10.6.5 Sequence P5: Learning and deleting of radio remote control codes

When sequence p5 is activated by button **LERN**, a selection menu is displayed to select the radio remote control code. Use button **BT** to move to the next selection menu point.

Selection	Selection menu points for radio remote control
Sub-sequence	Function
[1	Radio remote control code for BT can be learned or deleted.
[2	Radio remote control code for BTG can be learned or deleted.
[3	Radio remote control code for MULTI can be learned or deleted.
	Return to (main) learning sequence

Table 14

The desired sub-sequence is activated by button **LERN**. The display shows:

Display	Corresponds to
--	The code for the selected radio remote control channel is deleted and another can be learned.
00	The code for the selected radio remote control channel is already stored and can be overwritten or deleted.

Table 15

To learn a radio remote control code the (already coded) transmitter has to be operated. Then the code will be stored and return to the sub-sequence follows.

Deleting radio remote control code:

To delete the radio remote control code, press and hold the button **BT** and additionally push the button **LERN**. The radio remote control code is deleted and return to the sub-sequence follows.

If only the button LERN is pushed, then return to the sub-sequence follows without changing the code.

Radio remote control display:

The decimal dot at the ones-column on the display is lit, when a stored code signal is received.

10.6.6 Sequence $P\bar{E}$: Automatic closure for complete opening

When using automatic closure both wings close automatically after the learned stay-open time has elapsed.

The stay-open time starts elapsing when the last wing has reached the position OPEN.

When sequence $P\bar{E}$ is activated by button **LERN**, the present value for stay-open time for complete opening is displayed. The display shows - - when automatic closure is deactivated.

Using button **BT** automatic closure can be **activated** and the value can be **increased**. To **decrease** the value and to **deactivate** automatic closure use button **BTG**.

The stay-open time can be set from 1s up to 299s. The decimal dots of the display are each equal to 100s. The right decimal dot stands for 100s, the left one for 200s.

Example	Correspond to
- -	Automatic closure is not activated.
$\bar{2}3$	Automatic closure is activated. The stay-open time is 23 seconds.
$\bar{2}3.$	Automatic closure is activated. The stay-open time is 123 seconds.
$\bar{2}.3.$	Automatic closure is activated. The stay-open time is 223 seconds.

Table 16



REMARK!

Counting function:

When the gate makes contact with an obstacle and the safety contact strip SLZ activates the reversing function, the gate opens.

In case the automatic closure is activated and the obstacle does not get removed, a constant closing by automatic closure and reversing by the obstacle could occur.

To prevent this, a **counting function** is provided. After 2 tries to close by automatic closure only a reversing for a short distance occurs. The counter is cleared when the gate is operated manually.

- When the stay-open time has elapsed and the safety contact profile SLZ is activated, the gate remains open. The elapsed stay-open time will not be repeated. When the safety contact profile SLZ is not activated anymore and the stay-open time has elapsed, the warning time prior to closing starts.
- When **BS** is activated, the automatic closure function is blocked and no automatic closure occurs.
- A blocked automatic closure is unblocked by an open command.
- When the lockage function is active, the automatic closure is blocked as long as an obstacle is present between the photoelectric barriers.

10.6.7 Sequence **P 7**: Automatic closure for pedestrian wing

When using automatic closure the pedestrian wing closes automatically after the learned stay-open time has elapsed.

The stay-open time starts elapsing when the wing has reached the position OPEN.

When sequence **P 7** is activated by button **LERN**, the present value for stay-open time for the pedestrian wing is displayed. The display shows - - when automatic closure is deactivated.

Using button **BT** automatic closure can be **activated** and the value can be **increased**. To **decrease** the value and to **deactivate** automatic closure use button **BTG**.

The stay-open time can be set from 1s up to 299s. The decimal dots of the display are each equal to 100s. The right decimal dot stands for 100s, the left one for 200s.

Example	Corresponds to
- -	Automatic closure is not activated.
23	Automatic closure is activated. The stay-open time is 23 seconds.
23.	Automatic closure is activated. The stay-open time is 123 seconds.
2.3.	Automatic closure is activated. The stay-open time is 223 seconds.

Table 17



REMARK!

Counting function:

When the gate makes contact with an obstacle and the safety contact strip SLZ activates the reversing function, the gate opens.

In case the automatic closure is activated and the obstacle does not get removed, a constant closing by automatic closure and reversing by the obstacle could occur.

To prevent this, a **counting function** is provided. After 2 tries to close by automatic closure only a reversing for a short distance occurs. The counter is cleared when the gate is operated manually.

- When the stay-open time has elapsed and the safety contact profile SLZ is activated, the gate remains open. The elapsed stay-open time will not be repeated. When the safety contact profile SLZ is not activated anymore and the stay-open time has elapsed, the warning time prior to closing starts.
- When **BS** is activated, the automatic closure function is blocked and no automatic closure occurs.
- A blocked automatic closure is unblocked by an open command.
- When the lockage function is active, the automatic closure is blocked as long as an obstacle is present between the photoelectric barriers.

10.6.8 Sequence **P8**: Pre-warning

The **warning light** is only active, when a gate wing is moving or during warning prior to opening and closing. Otherwise the warning light is not active.

Display	Pre-warning before opening	Pre-warning before closing
00	No warning time	No warning time
04	No warning time	4 seconds warning time
40	4 seconds warning time	No warning time
44	4 seconds warning time	4 seconds warning time

Table 18



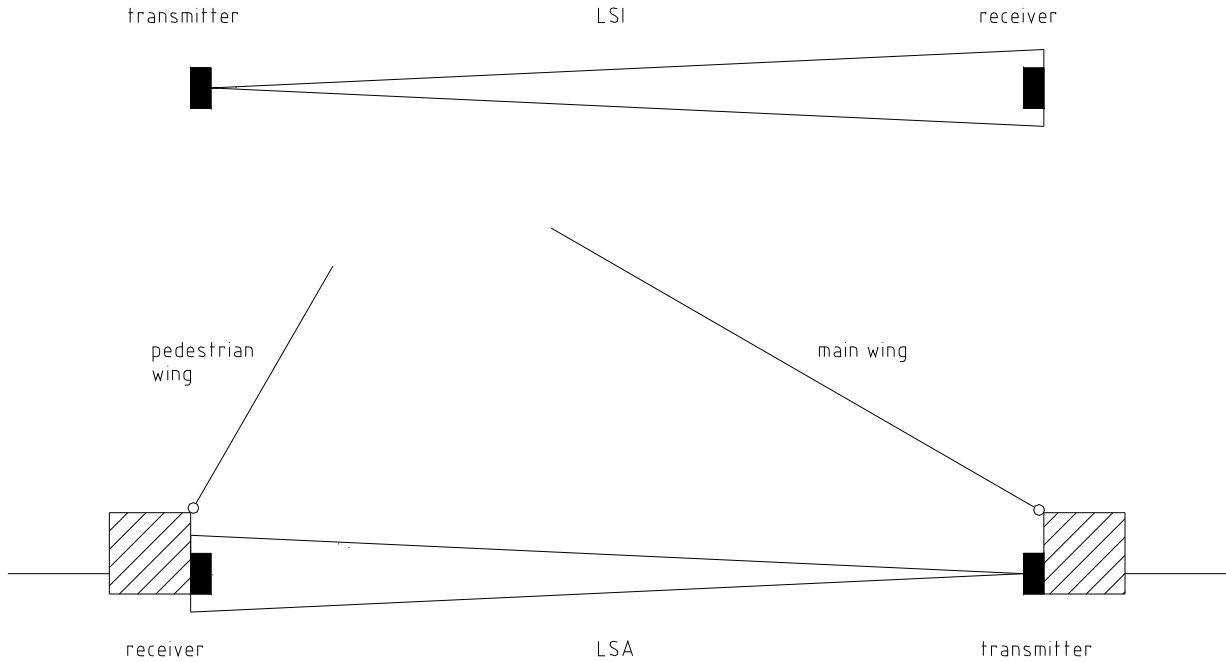
REMARK!

When using the gate opener in connection with the electromagnetic bolt E 205, motor lock M315, or with a magnetic clamp (on site) the pre-warning time must be activated.

10.6.9 Sequence P9: Photoelectric barrier function

When sequence **p9** is activated by button **LERN**, the present value for photoelectric barrier function is displayed. Using button **BT** the desired operating mode can be selected.

To confirm the selection and to return to the learning sequence use button **LERN**.



Drawing 27

LS-Function	Photoelectric barrier	Gate not moving	Gate opens	Gate closes
L1	LSI	Remains not moving	Stops, opens when free again	Stop, opens when free again
	LSA	Remains not moving	Stop, opens when free again	Stop, opens when free again
L2	LSI	Remains not moving	Stop, opens when free again	Stop, opens when free again
	LSA	Remains not moving	Stop, opens when free again	Stop, opens when free again
L3	LSI	Only closing allowed	Stop, opens when free again	No effect
	LSA	Only opening allowed	No effect	Stops and opens immediately

Table 19

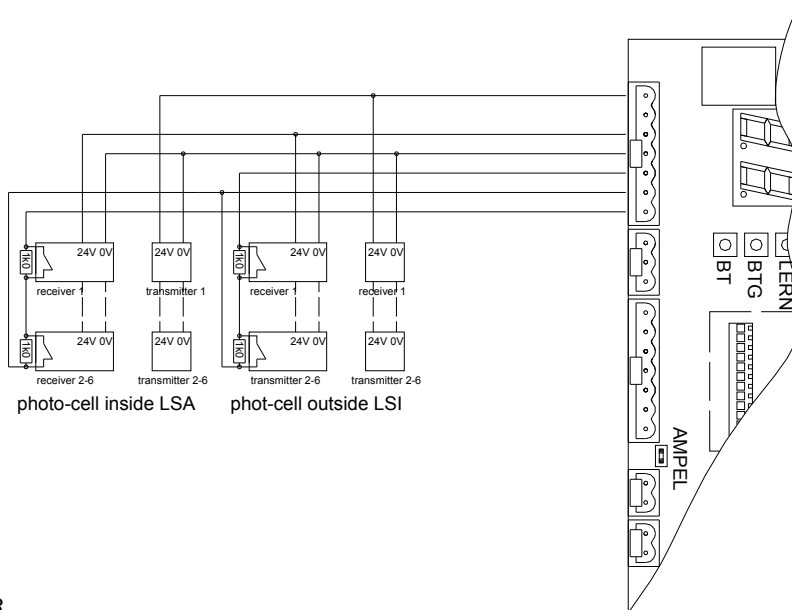
10.6.10 Sequence *PA*: Photoelectric barrier testing

When sequence *pa* is activated by button **LERN**, the present operating mode is displayed. Using button **BT** the desired operating mode can be selected. To return to the learning sequence use button **LERN**.

Display	Corresponds to
<i>0F</i>	Photoelectric barrier testing not activated.
<i>0n</i>	Photoelectric barriers, which have passed the test during the programming of the running distances for the wings, are also being tested during normal operation.

Table 20

Prior to every gate movement a photoelectric barrier test may be performed. The test consists of two phases. During the first phase the supply of the transmitters is switched off. The controller waits for the receiver to report an obstacle within the next 2.5s. No the second phase begins. During the second phase the supply of the transmitter is switched on again. The controller expects the receiver to report no obstacle anymore. Only after this procedure the gate starts to move. If an error occurs during the first phase, the photoelectric barrier is faulty. An error message is issued. If an error occurs during the second phase, the controller interprets this as a real obstacle and the gate will not move. No error message is issued. You can connect and test 6 photoelectric barriers each for LSA and LSI with the controller MO 36. All relay outputs of the receivers are switched in serial connection. Parallel to the relay contacts of each receiver you **must** add a **1kOhm +/- 5%** resistor.



Drawing 28



REMARK!

During the learning of the running distances the controller performs a photoelectric barrier testing and learns if and how many photoelectric barriers are connected. If the photoelectric barrier testing as successful, tests can also be done later during normal operation. In case the test during the leaning phase was not successful, no photocell testing will occur later during normal operation.



REMARK!

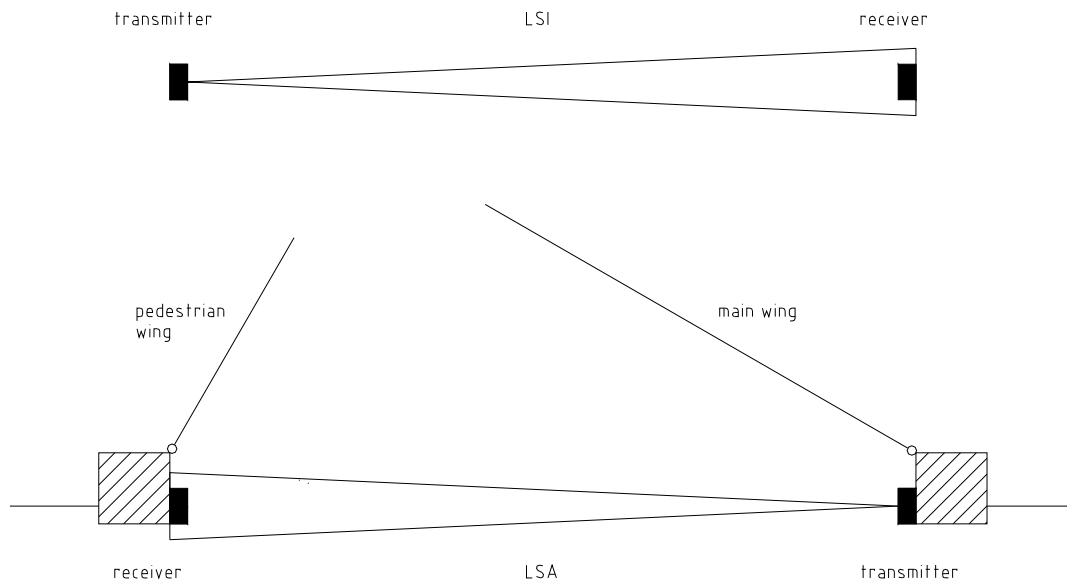
After the learning the operator has to check each photoelectric barrier for functioning.



REMARK!

When a faulty photoelectric barrier is detected during the testing or when an obstacle is present within the photoelectric barrier, the gate can be opened and closed in emergency mode.

10.6.11 Sequence *Pb* : Lockage function of the photoelectric barriers



Drawing 29

A lockage function by photoelectric barriers is possible in connection with the automatic closure. To activate this function use the learning sequence.

The lockage function is only activated when the gate is open.

When the gate reaches the end position OPEN, the lockage function is initialised, which means it is in its initial state "Automatic closure by lockage function approved".

When a vehicle first passes the photoelectric barrier LSA and then the photoelectric barrier LSI, then the interruption of LSA blocks the automatic closure and the interruption of LSI unblocks it and starts the stay-open time. When driving in the opposite direction, the blocking and unblocking occur accordingly.

When sequence *Pb* is activated by button **LERN**, the present selection is displayed. With button **BT** the desired value can be selected. To return to the learning sequence use button **LERN**.

Display	Corresponds to
0F	Lockage function ist deactivated.
0n	Lockage function is activated. When automatic closure is activated, a closing of the gate wing / wings is only possible, after an incoming or outgoing vehicle has passed <u>both</u> (LSA and LSI) photoelectric barriers.

Table 21

10.6.12 Sequence P_C : Pressure relief for electromagnetic bolt

When sequence P_C is activated by button **LERN**, the present selection is displayed. With button **BT** the desired value can be selected. To return to the learning sequence use button **LERN**.

Display	Corresponds to
51	Pressure relief for electromagnetic bolt is deactivated.
52	The gate wing pushes in slow mode min. 500ms, but max. 1.000ms, against the end stop, until the selected force value is passed.
53	The gate wing pushes in slow mode min. 500ms, but max. 2.000ms, against the end stop, until the selected force value is passed.
54	The gate wing pushes in slow mode min. 500ms, but max. 90s, against the end stop, until the selected force value is passed.

Table 22

10.6.13 Sequence P_d : Wind blast suppression



WARNING!

Risk of crushing!

Activation of the wind blast suppression results in a delayed reaction on obstacle.

Use the wind blast suppression only, when additional devices like photoelectric barriers or safety contact profiles are installed at the gate.

It can be chosen to either reverse on obstacle immediately, or to reverse after the selected threshold value is exceeded for a preset time. A short wind blast or a swinging gate wing do not result in a reversing.



REMARK!

The selected wind blast suppression time has no effect at the end position.

When sequence P_d is activated by button **LERN**, the present selection is displayed. With button **BT** the desired value can be selected. To return to the learning sequence use button **LERN**.

Display	Corresponds to
U-	No wind blast suppression. The controller immediately reacts on obstacle.
U1 up to U9	The wind blast suppression is equal to 1s (for U1) up to 9s (for U9). The controller reacts on obstacle only, if detected longer than 1s (for U1) up to 9s (for U9).

Table 23

10.6.14 Sequence PE : Multi-function relay

The multi-functional relay on the controller is suitable for different modes. For the selection use the learning sequence.

When sequence PE is activated by button LERN, the present selection is displayed. With button BT the desired selection can be chosen. To return to the learning sequence use button LERN.



REMARK!

During the learning function of the controller the relay is inactive.

Display	Corresponds to
r 1	Push button mode: The relay is active, as long as the radio remote control code MULTI is received.
r 2	Toggle mode: The relay alternates between active and inactive with each received radio remote control code MULTI.
r 3	Light pulse mode: The relay is active for 1 second, when BT, Funk BT, BTG, Funk BTG, BA, or BZ are pushed.
r 4	3-minute-light: The relay is active for 180 second, when BT, Funk BT, BTG, Funk BTG, BA, or BZ are pushed.

Table 24

10.6.15 Sequence PF : Return to original setting

When sequence pf is activated by button LERN, r E. is displayed.

To **return to original settings** press and hold button BT and push button LERN.

If only button LERN is pushed, you return to the learning sequence without changing any values. After returning to original settings the running distance has to be relearned.

10.6.16 Sequence PP : Storing of data

When sequence pp is activated by button LERN, the implemented selections and changes are saved power-failure-safe.

Automatic return from learning sequence to normal operation follows. The display turns off.

11 Normal operation

Gate movement OPEN

1. The electromagnetic bolt is activated (magnetic clamp is deactivated). If pressure relief for electromagnetic bolt is activated, the gate moves against the end stop, to relief the pressure.
2. Then the gate wing accelerates continuously until the selected end speed is reached. With this speed the gate wing moves until a short distance before the end position OPEN. There the speed is decelerated and the gate wing moves in slow mode against the end stop.
3. The electromagnetic bolt is deactivated (magnetic clamp is activated).

Gate movement CLOSED

1. The electromagnetic bolt is activated (magnetic clamp is deactivated). If pressure relief for electromagnetic bolt is activated, the gate moves against the end stop, to relief the pressure.
2. Then the gate wing accelerates continuously until the selected end speed is reached. With this speed the gate wing moves until a short distance before the end position CLOSED. There the speed is decelerated and the gate wing moves in slow mode against the end stop.
3. The electromagnetic bolt is deactivated (magnetic clamp is activated).

Stop and restarting in an intermediate position

1. The gate stops and the electromagnetic bolt is deactivated (magnetic clamp is activated).
2. The opening and closing from an intermediate position proceeds similar to the normal opening and closing, only without pressure relief of the electromagnetic bolt.

11.1 Operation with push button

1. BA is for function OPEN. As long as BA is pushed, the gate cannot close.
2. BZ is for function CLOSE.
3. BS is for function STOP. As long as BS is pushed (contact BS is interrupted), no gate movement is possible. Automatic closure is disabled by BS. When BS is released, a new operating command has to be given.
4. BT (internal, external, or Funk-BT) is for function OPEN-STOP-CLOSE-STOP, depending on the present gate position or gate movement. For gates with 1 wing the main wing, for gates with 2 wings the main and the pedestrian wing are activated.
5. BTG (internal, external, or Funk-BTG) is for function OPEN-STOP-CLOSE-STOP, depending on the present gate position or gate movement. For gates with 2 wings the pedestrian wing is activated. For gates with 1 wing the button BTG has no function during normal mode.

11.2 Operation with push button and automatic closure for both wings

1. BT (internal, external, or Funk-BT) is for function OPEN. During gate movement BT is without function. In position OPEN BT is for function CLOSE.
2. BTG (internal, external, or Funk-BTG) is for function OPEN-STOP-CLOSE-STOP for the pedestrian wing.
3. BA is for function OPEN. As long as BA is pushed, the gate cannot close.
4. BZ is for function CLOSE.
5. As long as BS is pushed (contact BS is interrupted), no gate movement is possible. Automatic closure is disabled by BS. When BS is released, a new operating command has to be given.

11.3 Operation with push button and automatic closure for the pedestrian wing

1. BTG (internal, external, or Funk-BT) is for function OPEN for the pedestrian wing. During the gate movement BTG is without function. In position OPEN BTG is for function CLOSE.
2. BS is for function STOP. As long as BS is pushed (contact BS is interrupted), no gate movement is possible. Automatic closure is disabled by BS. When BS is released, a new operating command has to be given.

11.4 Emergency release during power failure



REMARK!

Use the emergency release only to mechanically disengage the gate from the gate opener in case of power failure.

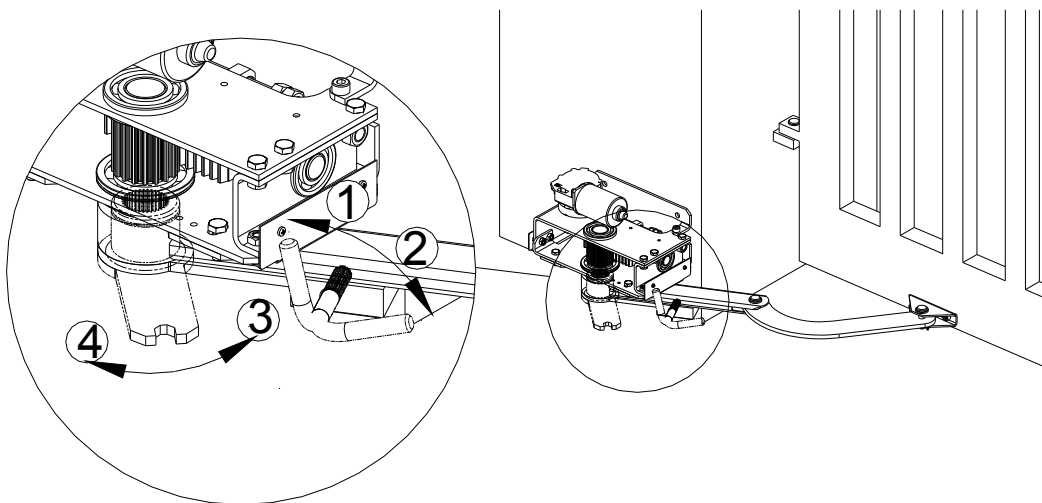
11.4.1 Disengaging the gate opener



WARNING!

Risk of crushing on protruding parts!

Body parts can be crushed between upper and lower half of the articulated arm.
Do not reach between or onto the upper or lower half of the articulated arm.



Drawing 30

Now disengage the articulated arm using the emergency release key (see Drawing 29). To do so move the emergency release key from position 1 to position 2. Then turn the articulated arm towards position 3; the driving lever is divided in an upper and a lower part.

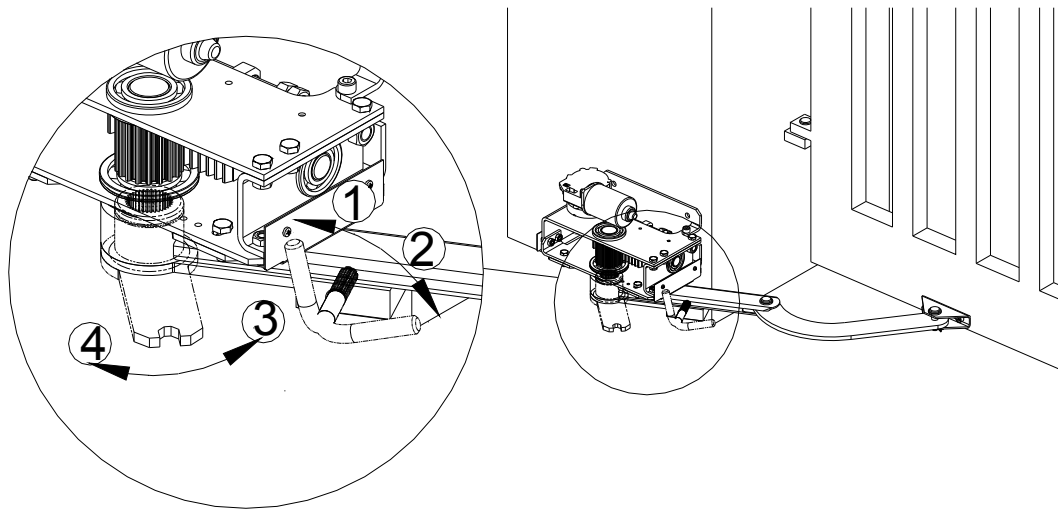


WARNING!

Risk of crushing!

Do not leave the emergency release key in the keyhole. It could form another crushing point. Remove the emergency release key after each use.

11.4.2 Engaging the gate opener



Drawing 31

Engage the gate opener by moving both parts of the push rod back one upon the other (turn the upper part towards position 4). Then engage the emergency release by turning the emergency release key from position 2 to position 1.

11.5 Power failure

After the power supply is switched on and after each power failure the current position of the gate wings is unknown. The controller first operates in a starting mode, and the gate openers move in slow mode.

When the gate stops in the end position CLOSED (The main wing for gates with one wing also in the end position OPEN), the gate position is known and the controller switches to normal mode.

Before every movement a pressure relief for the electromagnetic bolt occurs and the wings close one after the other. During starting mode using the emergency mode is possible.

11.6 Emergency mode

In case a safety device LSA, LSI, SLA, or SLZ is faulty, emergency mode is possible. After a warning time of 10 seconds, the gate can be moved in an emergency mode by using BA or BZ (dead man's function). During the warning time as well as during the emergency mode the warning light is flashing.

Emergency mode by radio remote control (BT or BTG) is not possible due to safety reasons.

After the power is switched on the gate position is not known, Emergency mode is possible during starting mode after power is switched on but only the slow mode is available and the gate wings close one after the other.



WARNING!

Risk of crushing!

Even when a safety device is faulty the gate can be moved using BA and BZ.

The buttons BA and BZ therefore have to be installed in such a way, that the gate can be seen during movement.



WARNING!

Risk of crushing!

In case the multi-functional relay is used for an additional radio remote control channel connected to BA or BZ, the emergency mode can be started by radio remote control.

In this case only fixed transmitters should be used in such a way, that the gate can be seen during movement from the location of the transmitter.



WARNING!

Risk of crushing!

Are external devices, which give a constant signal, connected to BA or BZ, these devices can start the emergency mode and move the gate when a safety device is faulty or activated.

12 Fault diagnosis

An fault is shown on the display as a code, when detected by the controller. The following faults are recognised and displayed.

Display	Fault description	Procedure
<i>E 1</i>	Photo-cell testing LSI failed.	Check the connected photoelectric barriers for the interior area for function. Make sure the 1kOhm resistor is connected to the photoelectric barrier receiver.
<i>E 2</i>	Photo-cell testing LSA failed.	Check the connected photoelectric barriers for the exterior area for function. Make sure the 1kOhm resistor is connected to the photoelectric barrier receiver.
<i>E 3</i>	Testing safety contact profile SLA failed.	Check the connected safety contact profiles for direction OPEN for function. Make sure the 8.2kOhm resistor is connected as terminating resistor.
<i>E 4</i>	Testing safety contact profile SLZ failed.	Check the connected safety contact profiles for direction CLOSED for function. Make sure the 8.2kOhm resistor is connected as terminating resistor.
<i>E 5</i>	Running distance exceeded (gate was stopped).	Check end stoppers and relearn the running distance.
<i>E 6</i>	The power supply limit for the external equipment 12Vdc has been reached. The power source load is too high. The controller is blocked.	Check the connected load at the terminals 12Vdc and GND (observe the max. current drain). Check the input leads for short circuit.
<i>E 7</i>	The power supply limit for the external equipment 24Vdc has been reached. The power source load is too high. The controller is blocked.	Check the connected load at the terminals 24Vdc and GND (observe the max. current drain). Check the input leads for short circuit.
<i>E 8</i>	The memory data has been lost / is faulty.	The controller has to be re-learned.
<i>E 9</i>	Error in storing of data on memory. Controller is faulty.	Return for repairs.
<i>E A</i>	Error in the redundant detection of BS. Controller is faulty.	Return for repairs.
<i>E b</i>	The controller detects one of motor relays is faulty.	Return for repairs.
<i>E C</i>	Measuring amplifier faulty.	Return for repairs.

<i>E d</i>	The main wing pulser is faulty. OR The main wing is blocked.	Check the wiring between the opener and controller. OR Check the mechanics.
<i>E E</i>	The pedestrian wing pulser is faulty. OR The pedestrian wing is blocked.	Check the wiring between the opener and controller. OR Check the mechanics.
<i>E F</i>	Power supply Uext has a short cut.	Check the connection.

Table 25

13 Care and maintenance

13.1 Care instructions



WARNING!

Risk of crushing!

Unforeseen movements of the gate can be activated during care and maintenance work by automatic signals or radio remote control.

Therefore switch off the power supply of the gate opener and secure it against unintentional restart.



ATTENTION!

Danger of short circuit by ingress of water.

Ingress of water can result in a short circuit or in damage to the electrical equipment.

Never hose down the controller or gate opener with a high-pressure cleaner or a water hose.

- Do not use any aggressive cleaners (acids or bases) to clean the gate opener or the controller

13.2 Service instructions

**WARNING!****Risk of crushing!**

Unforeseen movements of the gate can be activated during care and maintenance work by automatic signals or radio remote control.

Therefore switch off the power supply of the gate opener and secure it against unintentional restart.

- Check the controller for dampness. If necessary dry the controller using a hot-air blower and make sure that the cover is positioned correctly on the controller housing.
- Check the controller and the swing gate opener for any mechanical damage.
- Control the tight fit of all fastening screws of the gate opener and tighten them if necessary.
- Check the emergency release function and grease it regularly using penetrating oil.
- According to the standards and regulations the safety devices have to be checked regularly for correct functioning, at least once a year.

13.3 Demounting the gate opener

**WARNING!****Danger through voltage.**

Danger of an electric shock.

Only certified electricians (VDE 0100) should disconnect the mains supply (230Vac).

- Disconnect the mains supply.
- Emergency release the gate opener and save the gate against movements.
- Demount the gate opener.
- Dispose of the gate opener appropriately according to the international and national regulations.

14 Technical data controller MO 36

14.1 Constant values

Parameter	Value
Restart interlock after deactivating the motor	500ms
Reversing for a short distance on obstacle	500ms
Time lag before reversing	200ms
Max. running time limit during programming	500s
Running time reserve during normal mode	10s
Warning time prior to emergency mode	10s

Table 26

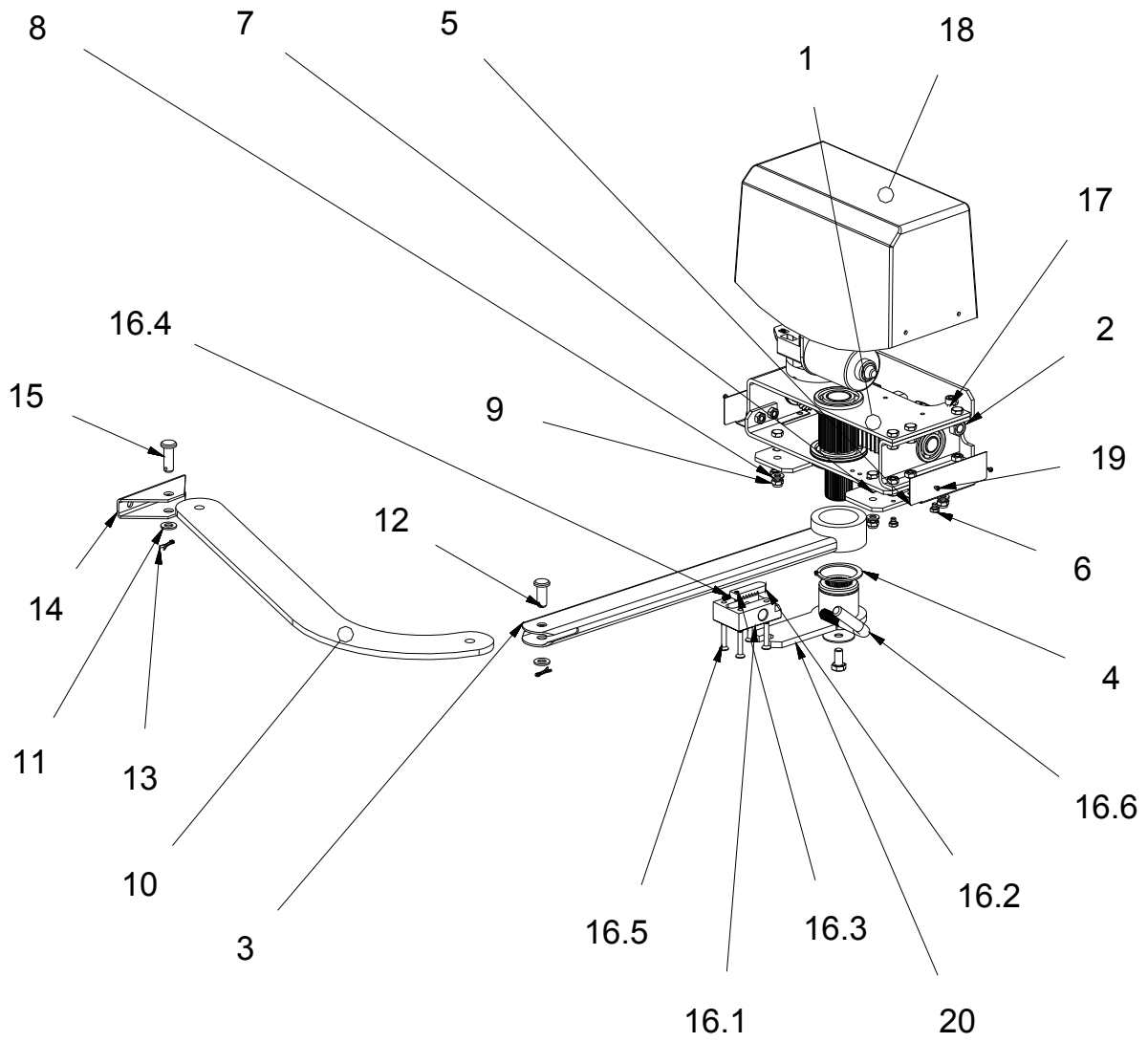
14.2 Changeable values and factory setting

Parameter	Adjustment range	Factory setting
Running distance	max. 32,000 impulses	3,000 impulses
Force	1 to 99	30
Speed	1 to 8	8
Time lag during opening	0s up to 9s	2s
Time lag during closing	0s up to 9s	5s
Stay-open time for both wings	1s up to 299s / OFF	OFF
Stay-open time for pedestrian wing	1s up to 299s / OFF	OFF
Wind blast suppression	0s up to 9s	0s
Warning prior to opening	0s or 4s	0s
Warning prior to closing	0s or 4s	0s
Pressure relief of electromagnetic bolt	0s or 1s or 2s or 90s	0s
Multi-functional relay	Funk-Tast or Funk-Toggle or light pulse	Funk-Tast
Lockage function	ON / OFF	OFF
Photoelectric barrier function	L1 or L2 or L3	L1
Number of wings	Gates with 1- or 2-wings	Gates with 1 wing
Photoelectric barrier	ON / OFF	OFF
Radio remote control code BT	X-coding	- + - + - + -
Radio remote control code BTG	X-coding	deleted
Radio remote control code MULTI	X-coding	deleted

Table 27

15 Drawings

15.1 Drawing – Swing gate opener incl. operator unit

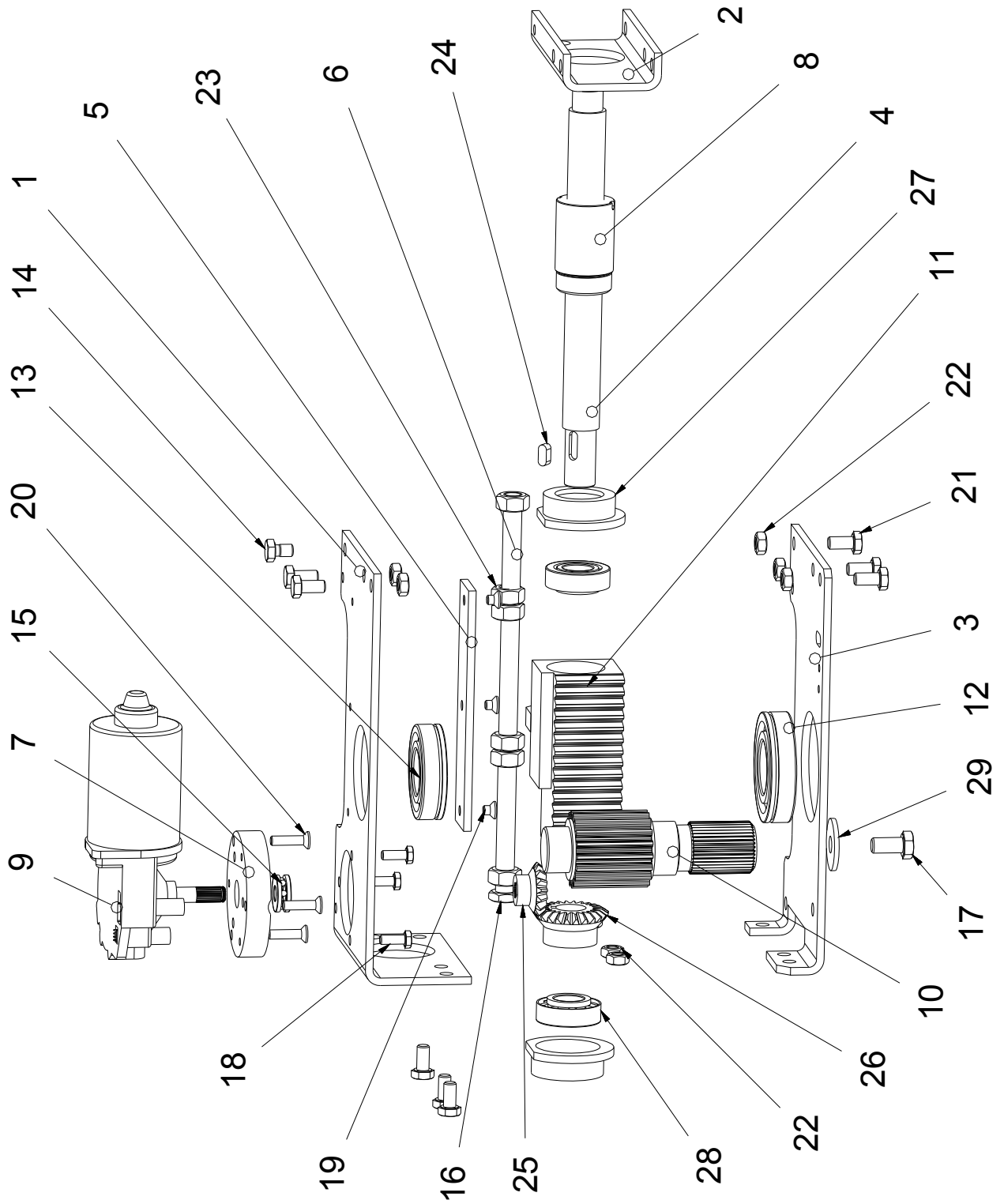


Drawing 32

No	Quantity	Name or part	
1	1	Operator unit	
2	1	Fixing bracket	
3	1	Driving lever	
4	1	Locking ring	DIN 471-50x2
5	2	Hood support	
6	4	Hexagon head screw	DIN 933-M6x6
7	4	Hexagon head screw	DIN 933-M8x20
8	4	Washer	DIN 125-A8,4
9	4	Hexagon nut	DIN 985-M8
10	1	Push rod	
11	2	Washer	DIN 125-A10,5
12	1	Bolt	ISO 2341-12x30
13	2	Eyebolt	DIN 94-3,2x18
14	1	Gate support	
15	1	Bolt	ISO 2341-12x35
16.1	1	Emergency release – guide	
16.2	1	Emergency release – latch	
16.3	1	Locking pin	ISO 8752-5x12
16.4	1	Spring	
16.5	4	Hex socket head screw	ISO 10642-M6x35
16.6	1	Emergency release lever	
17	2	Cylinder-head screw	DIN 912-M8x12)
18	1	Hood	
19	4	Sheet metal screw	ISO 7049-2,9x6,5
20	1	Actuator	

Table 28

15.2 Drawing – Operator unit



Drawing 33

No	Quantity	Name or part	
1	1	Spindle support 1	
2	1	Spindle support 2	
3	1	Spindle support cover	
4	1	Recirculating ballscrew	
5	1	Paddle plate	
6	1	Thread rod M12	
7	1	Motor support	
8	1	Recirculating ball nut	
9	1	Motor	ZENIT-S 300: Motor 404.854 ZENIT-S 450: Motor 404.885
10	1	Output shaft	
11	1	Toothed rack	
12	1	Deep groove ball bearing	DIN 625 SKF – SKF 6207 N
13	1	Deep groove ball bearing	DIN 625 SKF – SKF 6206 N
14	1	Hexagon head screw	DIN 933-M8 x 12
15	1	Deep groove ball thrust bearing	DIN 711-511 00 – 10 x 24 x 9
16	1	Hexagon nut	ISO 4035-M12
17	1	Hexagon head screw	ISO 4017-M10 x 20
18	1	Hexagon head screw	ISO 4017-M6 x 16
19	3	Hex socket head screw, counter sunk	ISO 10642-M6 x 8
20	3	Hex socket head screw, counter sunk	ISO 10642-M6 x 25
21	8	Hexagon head screw	ISO 4017-M8 x 16
22	8	Hexagon nut	DIN 934-M8
23	6	Hexagon nut	DIN 934-M12
24	1	Fitted key	DIN 6885-A6 x 6 x 14
25	1	Bevel pinion 1	16 Zähne
26	1	Bevel pinion 2	24 Zähne
27	2	Bevel pinion bearing carrier	
28	2	Bevel pinion bearing	DIN 720 – 32004X – 20 x 42 x 15
29	1	Washer	DIN 440 – M10

Tabelle 2

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