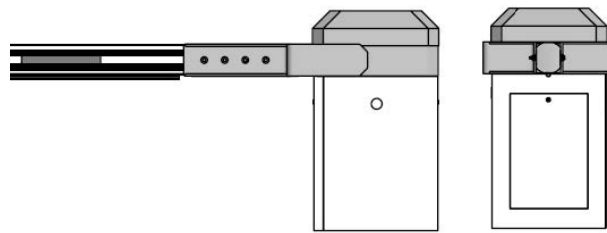


Installation and operating instructions

Barriers KOLOSS 60 – 120



Translation of original installation and operating instructions

D-ID: V3_0 – 12.12

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1 Preface

1.1 General notes

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

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

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

2.1 General notes on safety

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 gate opener / barrier into operation.

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

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

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

Never reach into moving parts of the gate operator, gate or barrier.

Drive through the gate system /barrier only after complete opening.

The gate system / barrier 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 Safety notes for the operation with radio remote control

The radio remote control should only be used, if the area of movement of the gate / 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

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

After installation, the barriers of the series KOLOSS 60 – 120 serve as passage control of vehicle paths.

The controller is a component part of the product 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 KOLOSS 60 – 120 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.

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 barrier has to be stored as follows:



Do not expose the barrier to aggressive substances.



Do not expose the barrier to heat sources.



Storage temperature -20°C to +70°C.

3.3 Lifting heavy loads



WARNING!

Risk of injury by lifting heavy loads!

Lifting heavy loads may cause serious injuries.

- To lift the barrier use a suitable lifting device.
- Wear suitable safety shoes.

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: KOLOSS 60, KOLOSS 90, KOLOSS 120
Serial number: 804800001201001 to 8048099991252999 for KOLOSS 60
8048200001201001 to 8048299991252999 for KOLOSS 90
8048400001201001 to 8048499991252999 for KOLOSS 120
Year of manufacture: 2012

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, 25.01.2012

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 1

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.

For a boom length of 6,000mm and longer we recommend the use of a fixed or swinging support, for a boom length of 9,000mm and longer the use of a fixed or swinging support is mandatory.

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.



ATTENTION!

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.

6 Technical Data KOLOSS 60 – 120

Operative range	
Application for ...	<ul style="list-style-type: none"> • Company entrance • Safety area • Industrial entrance • etc.
Drive pulse from ...	<ul style="list-style-type: none"> • Push-button, card reader, desk-top panel • Radio remote control transmitter • Hands-free - data-capture • Induction loop
Safety	<ul style="list-style-type: none"> • Emergency release / Vandalism protection through friction clutch • Connection of external safety systems

Table 1

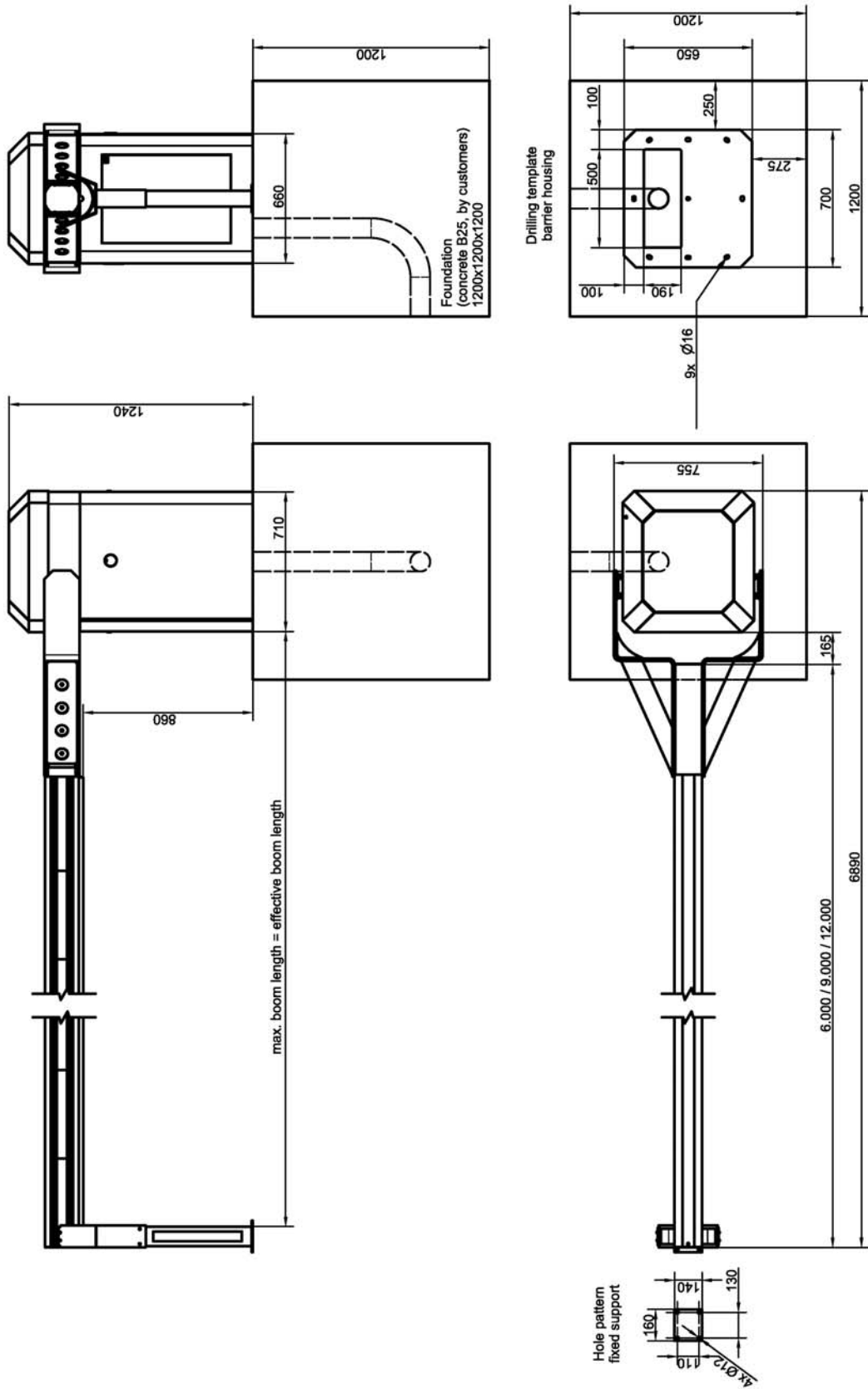
General data	
Mains supply	230V / 50Hz
Max. current	10A (max.)
Duty cycle	100%
Temperature range	-10°C to +70°C
Controller	MO 63
Measurements (w/l/h)	656x720x1250mm
Foundation (frost-proofed)	1200x1200x1200mm
Boom connector	central
Housing	aluminium
Mechanical parts	steel, zinc coated
v	≤ 60 dB(A)
Degree of protection	IP 44

Table 2

Typical Data	KOLOSS 60	KOLOSS 90	KOLOSS 120
Drawn power [kW]	0,55	0,55	1,1
Running time [s]	approx. 6	approx. 9	approx. 12
Max. boom length [mm]	6.000	9.000	12.000
Effective length [mm]	6.000	9.000	12.000
Fixed support / swinging support	optional	required	required
Reversing on obstacle	selectable	selectable	selectable
Boom weight [kg]	27	58	71,5
Barrier weight [kg]	approx. 425	approx. 450	approx. 475
Totalweight [kg]	452	508	547

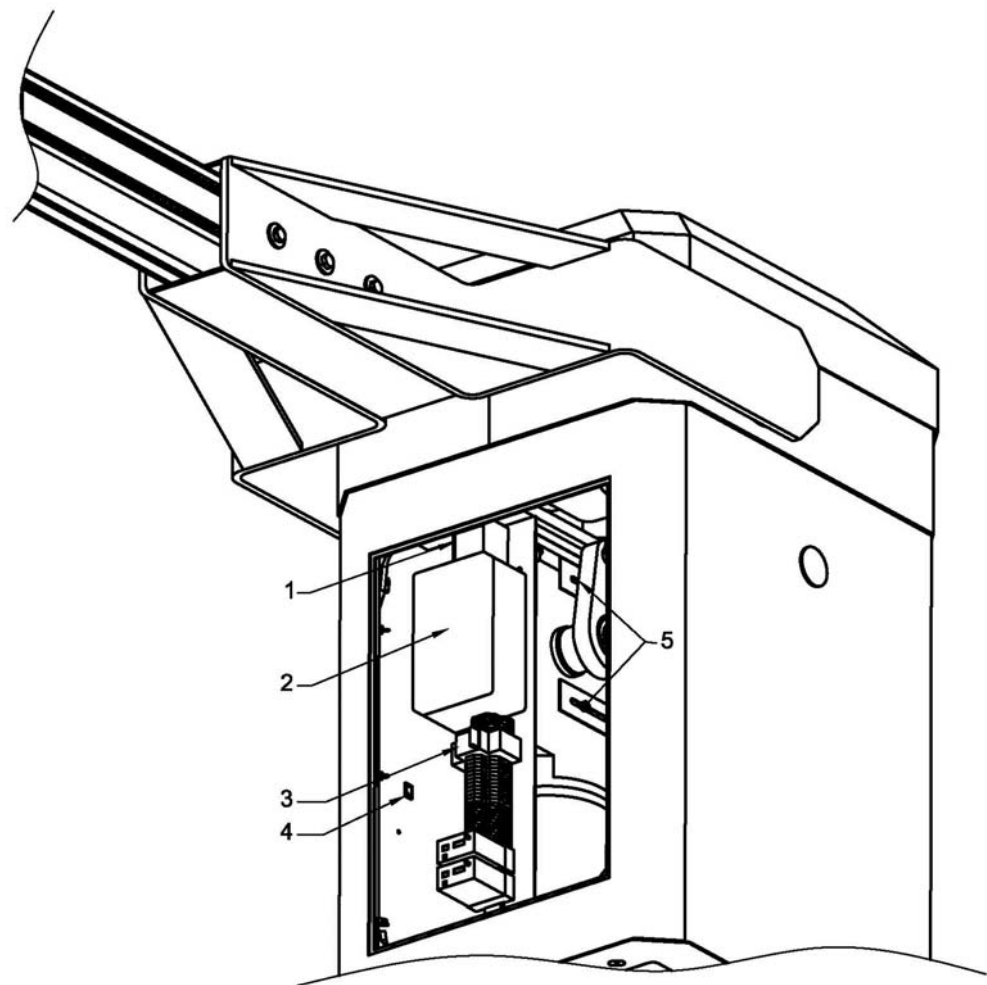
Table 3

7 Installation KOLOSS 60 – 120



Drawing 2

Interior view



Drawing 3

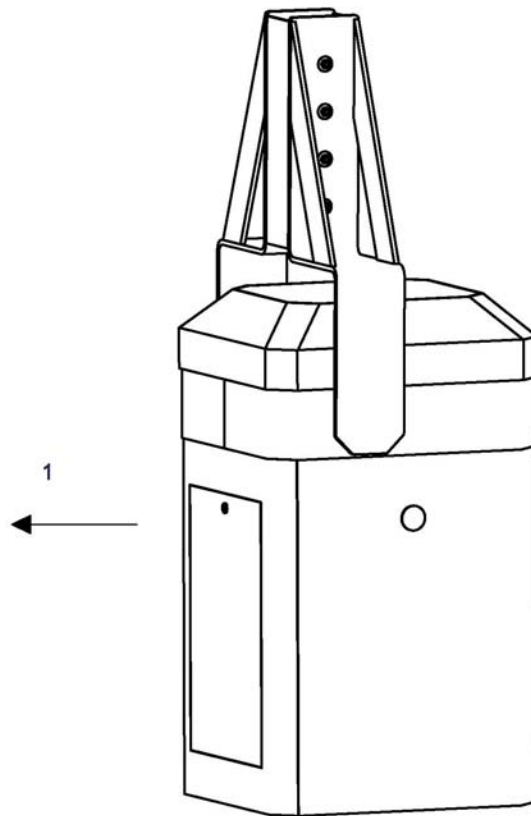
- 1 Mains power outlet
- 2 Controller
- 3 On/Off switch
- 4 OPEN/CLOSE switch
- 5 Limit switch



REMARK!

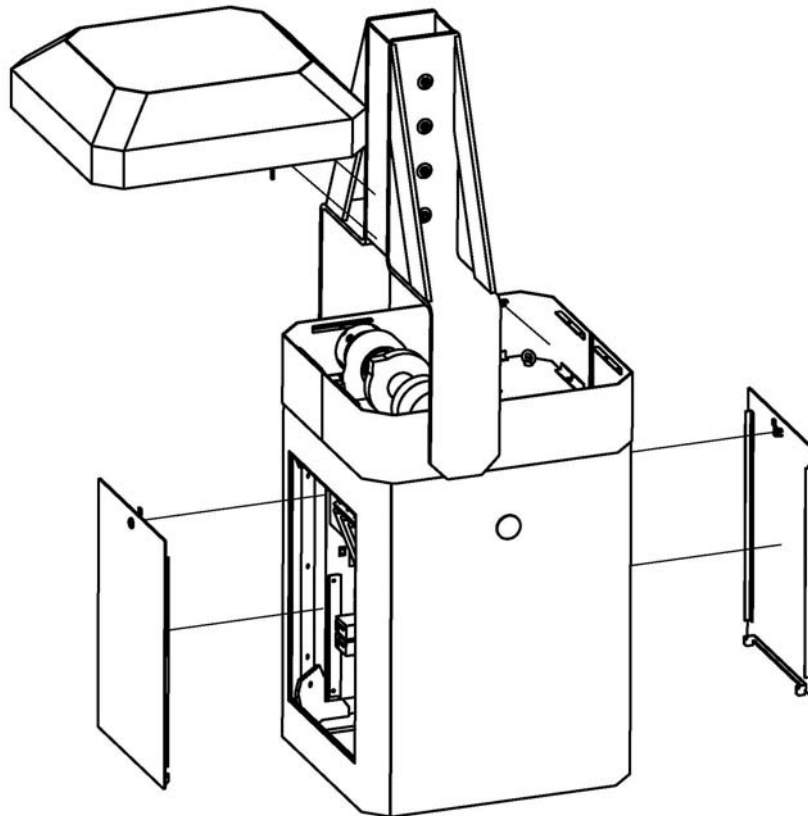
For the barrier foundation we recommend a concrete strength class of C20/25 (or higher) and the use of chemical dowels (M16).

1. Prepare a foundation with the measurements 1,200 x 1,200mm. The foundation has to be frost free and with a horizontal surface, which must be a least 30mm higher than the surrounding surface. Before preparing the foundation lay enough cable or a plastic cable conduit for later cable installation. Thereby observe the cable entry points in the barrier.
2. Prepare on the foundation the fixation for the barrier using the drilling template. Use heavy-duty dowels or chemical fixings ($\varnothing 16\text{mm}$).
3. Remove the packing and prepare the barrier for the installation to the provided foundation.
4. Remove both doors using the supplied key and the hood using the internal butterfly nut.



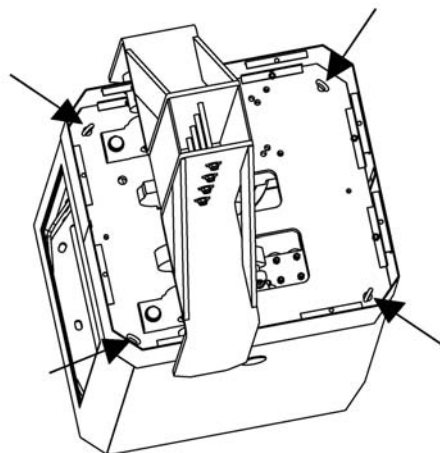
Drawing 4

1 Road



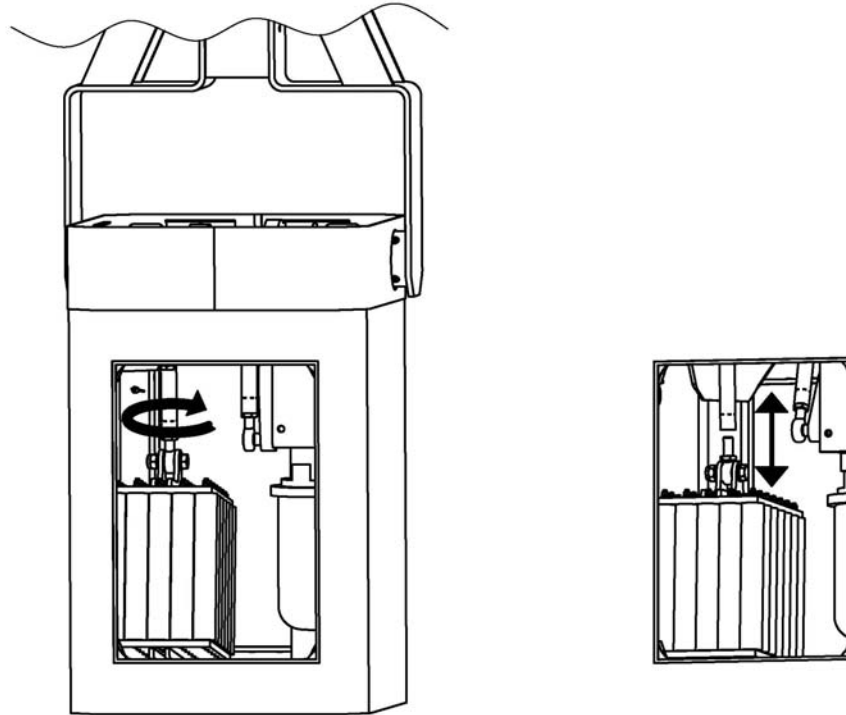
drawing 5

5. Connect sufficiently dimensioned ropes or belts (see weight - 6 Technical Data KOLOSS 60 – 120 page 11) at the four eyebolts at the ground plate, to lift the barrier by crane or hoisting device onto the foundation.



Drawing 6

6. After the barrier has been connected to the foundation at the nine arranged points, loosen the spanner nut of the spring assembly completely, so that the barrier mechanism is without mechanical connection to the spring assembly.

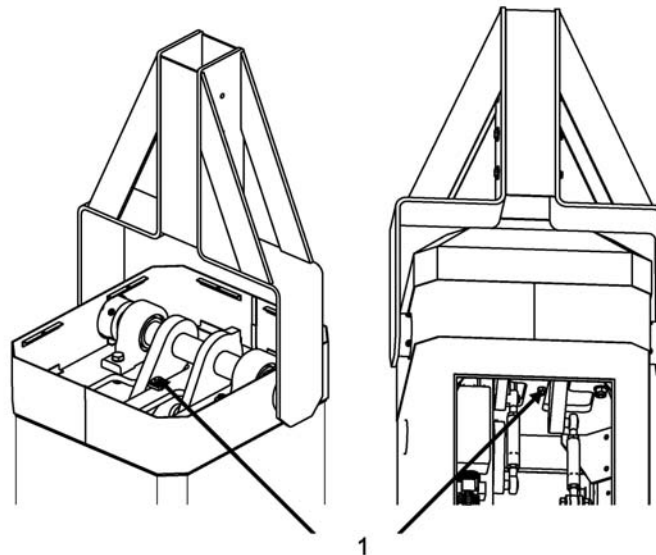


Drawing 7

**ATTENTION!**

During the next step the mechanism is moved electrically. Make sure that the range of movement is free from obstacles.

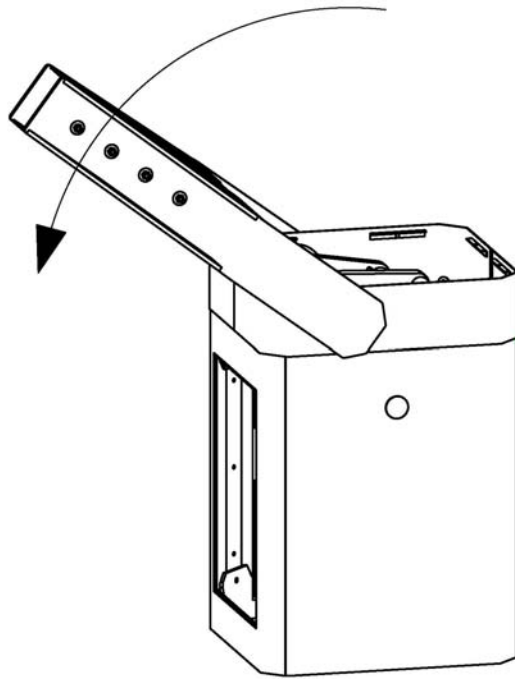
7. Remove the red security screw from the barrier mechanism.



Drawing 8

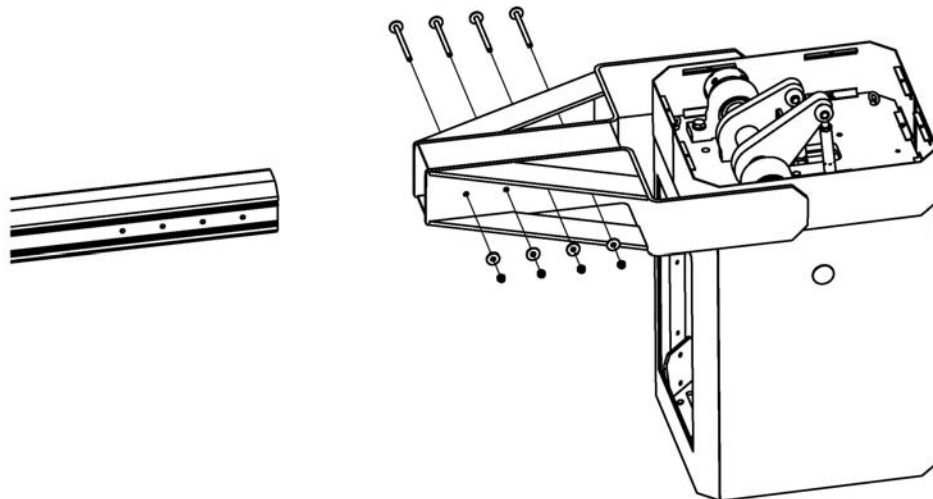
- 1 red security screw

8. Make the electrical connection and move the barrier into position „CLOSED“ using the on/off switch.



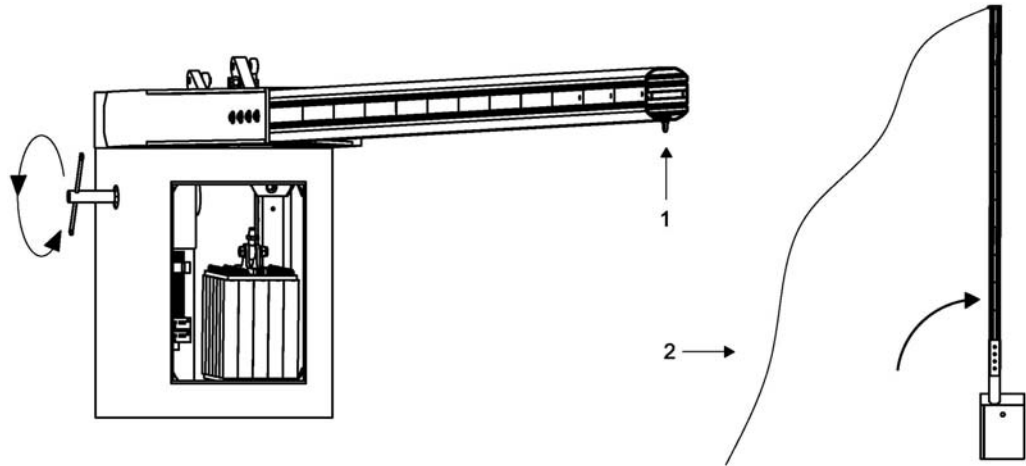
Drawing 9

9. Switch the barrier off using the on/off switch (main switch). Insert the boom (with KOLOSS 90-120 observe the label „Boom 1“.) into the boom assembly and fasten it with the four bolts M12x180.



Drawing 10

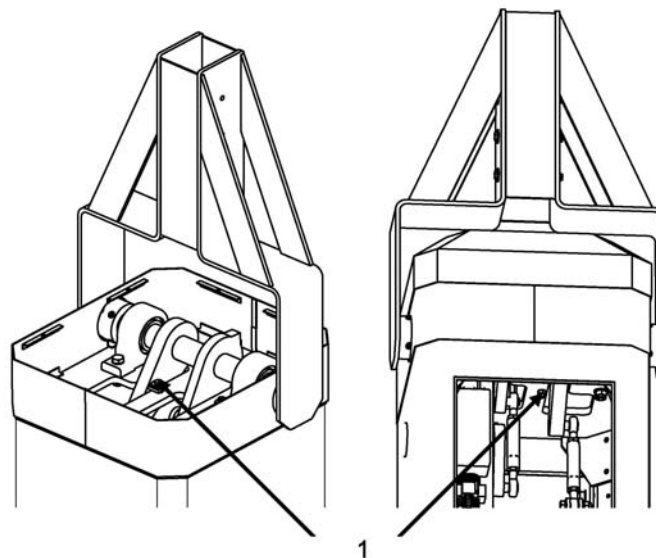
10. Insert the installation aid (1) into the boom notch. Connect a rope of at least 10m length as installation aid to the boom, to pull the barrier boom later again into position "OPEN".
11. Now release the barrier (using the emergency release key) at the left housing side and push the barrier up until it is in the vertical position.



Drawing 11

- 1 installation aid
- 2 rope (on site)

12. Engage the barrier again and secure the mechanism with the red screw through the ground plate.

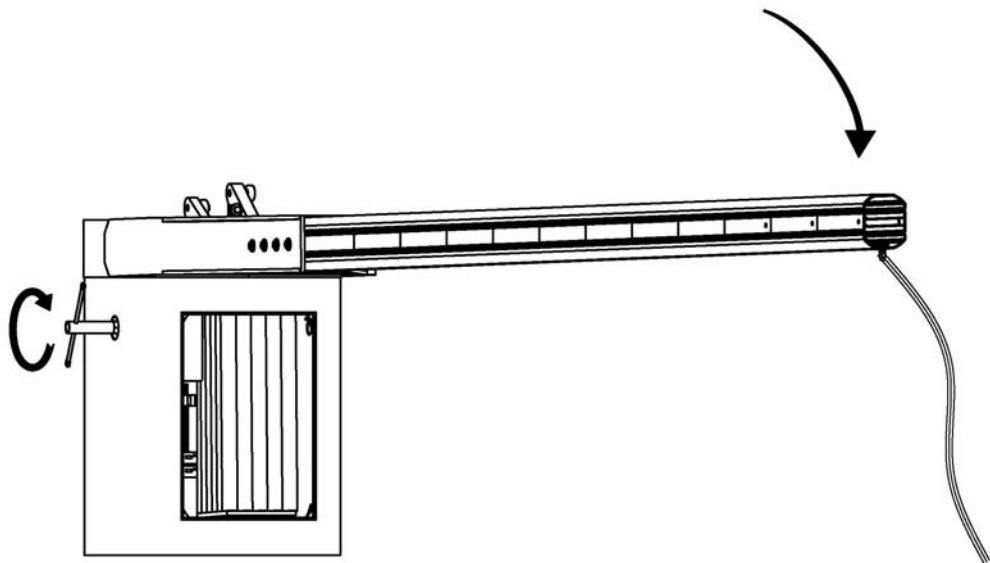


Drawing 12

- 1 red security screw

13. Now connect the spring assembly to the mechanism again, using the spanner nut. Do not pretension the springs! Remove the red security screw.
14. Loosen the friction clutch (anti-clockwise). Pull the barrier boom against the spring force into position "CLOSED". Secure the boom using suitable

measures (e.g. a weight of min. 75kg) in this position und engage the friction clutch (clockwise). The springs are now tightened.



Drawing 13



ATTENTION!

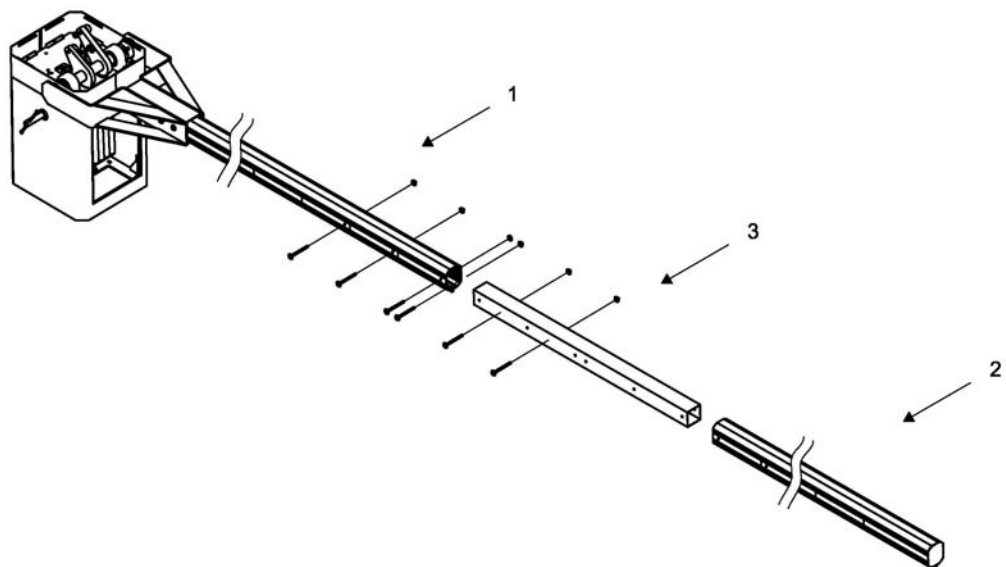
The boom must be secured (e.g. with a weight of min. 75kg)!



REMARK!

For **KOLOSS 60** continue at point 15

15. Remove the installation aid. Now mount the connection profile and the „boom 2“ using the six bolts M12 x 160.



Drawing 14

16. Release the barrier by loosening the friction clutch and adjust the initial tension of the springs through the spanner nut. The barrier boom should now open independently to 30-45°. Adjust the friction clutch according to the table below.
17. Tighten the friction clutch with the nut manually, then retighten the nut using the number of revolutions as specified in the table below (by torque wrench).

	KOLOSS 60	KOLOSS 90	KOLOSS 120
releasing	approx. 2	approx. 2 1/4	approx. 1 1/4
engaging	approx. 2 (40Nm)	approx. 2 1/4 (45Nm)	approx. 1 1/4 (65Nm)

Table 4



REMARK!

The above specifications are only values for orientation and might have to be corrected individually.



REMARK!

Remove from the barrier all tools and supports used for installation.

18. Start the programming mode – as described in 8.6.1 - Running time and automatic closure.

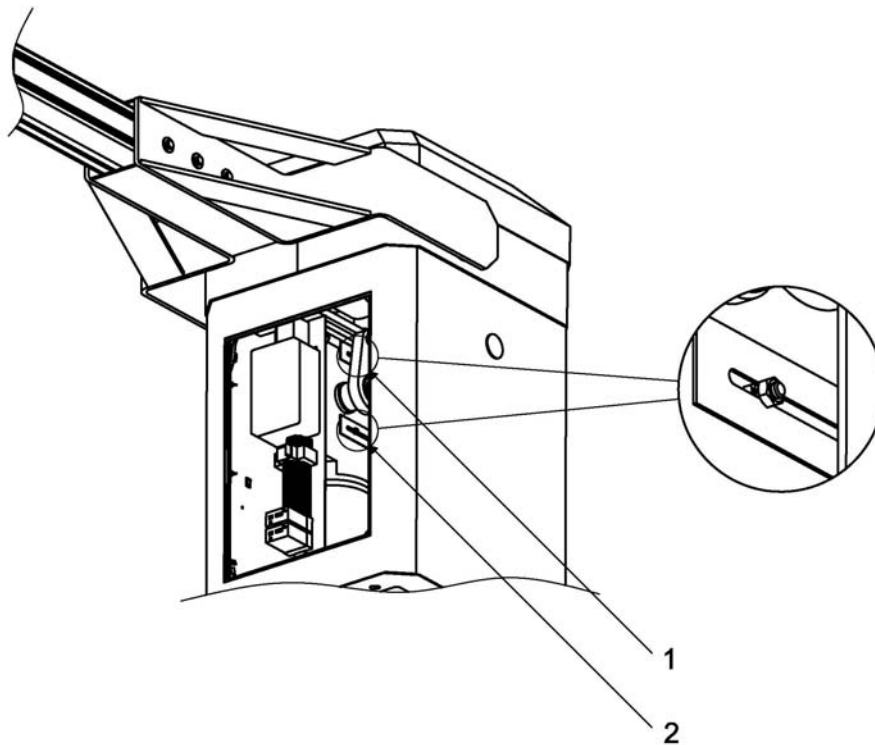


During start-up of the barrier check that the rotating direction is correct. If necessary change the direction of motor rotation by swapping the motor connections X1/20 und X1/22.



The controller is connected via plugs to the terminal row (X1) in the barrier and to all the micro-switches in the barrier head. All electrical connections are carried out at the terminal row (X1).

7.1 Adjusting the limit switches



Drawing 15

- 1 Limit switch CLOSE
- 2 Limit switch OPEN

The position boom UP and boom DOWN are factory pre-adjusted by the limit switches.

After installation the end positions should be checked and, if necessary, be adjusted. For adjusting loosen slightly the front counter nut of the corresponding limit switch. Make sure that the limit switch does not turn. Move the limit switch into the desired direction. Tighten the counter nut. Check the new adjustment in a test run. If necessary repeat the adjustment.



ATTENTION!

Now again check during operation, that the rotating direction is correct.

- If the drive lever moves in direction to the road, then swap the motor connector cable X1/19 and X1/21.

7.2 Emergency release / Friction clutch

The vandalism protection for the barriers KOLOSS 60 – 90 – 120 consists of an internal friction clutch, which can be operated by a rating nut, accessible from the outside. Is the barrier boom forced upwards, the clutch slides through when a certain force is applied. The barrier boom is still connected mechanically with the motor-gearbox-unit. After the vandalism protection was activated, no parts of the barrier need to be exchanged. The gearbox suffers no damage.

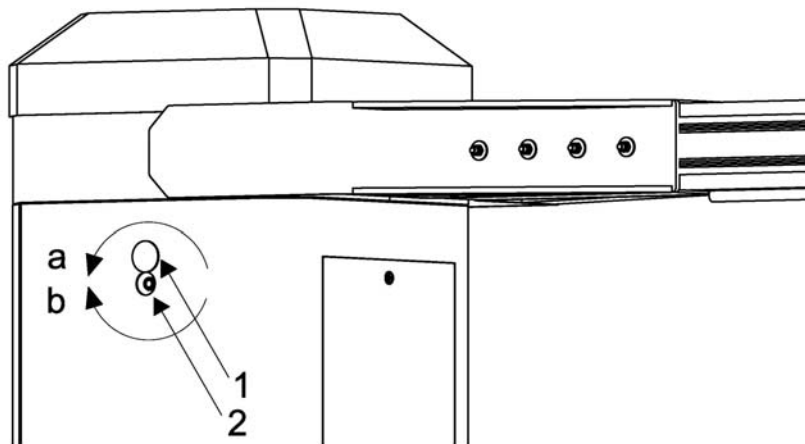
Adjusting the friction clutch:

Releasing:

Loosen the rating nut of the friction clutch located behind the emergency release cover (anti-clockwise, direction a) using the supplied key SW 27/32. Do not remove the rating nut completely. The barrier opens through the spring tension to approx. 30-45°, when the rating nut was loosened sufficiently.

Engaging:

Tighten the rating nut of the friction clutch located behind the emergency release cover (clockwise, direction b, see Table 4).



Drawing 16

- 1 Emergency release cover
- 2 Rating nut
- a direction a - releasing
- b direction b - engaging

The friction clutch is factory adjusted to the correct torque. During setting up of the barrier it is absolutely necessary to release the clutch. When engaging make sure the same torque is adjusted again, since otherwise problems during operation could arise. Tighten the friction clutch with the nut manually then retighten the nut using the number of revolutions (Nm) as specified in the table 4.

7.3 Spring assembly

The spring assembly has to be adjusted according to the length of the boom and the mounted accessories as shown in Table 5.

Boom length	Accessories		Springs
[mm]		[kg/m]	100.000 movements
3.000	-	-	2
6.000	-	-	8
9.000	-	-	23
12.000	-	-	35
3.000	HG75	1,5	3
6.000	HG75	1,5	10
9.000	HG75	1,5	28
3.000	HG150	4,9	4
6.000	HG150	4,9	15
3.000	SG150	4,0	4
6.000	SG150	4,0	14

Table 5

HG75	=	Hanging skirt 75	approved up to 9,000mm
HG150	=	Hanging skirt 150	approved up to 6,000mm
SG150	=	Top and bottom skirt	approved up to 6,000mm



REMARK!

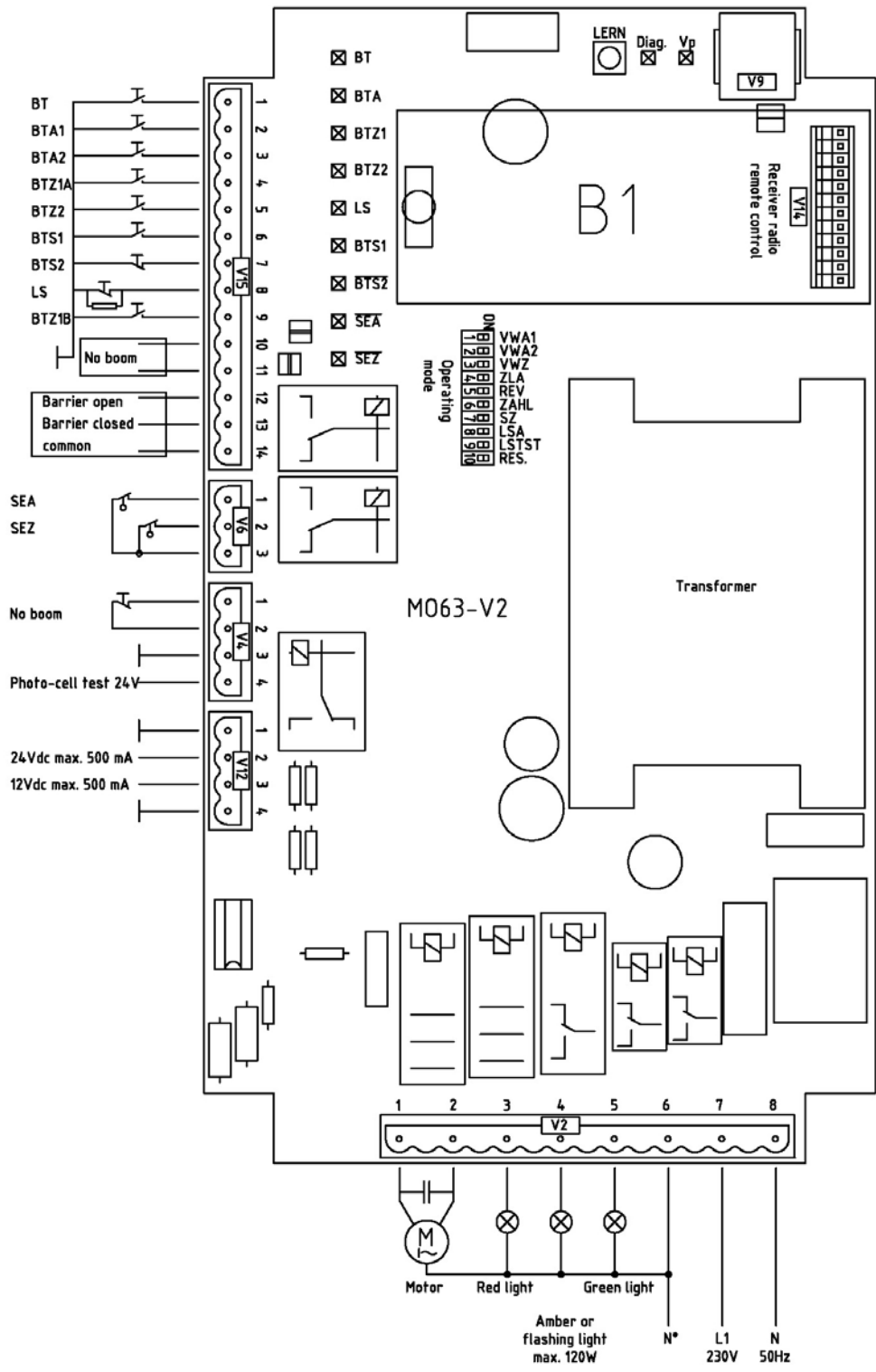
During installing / replacement of the springs make sure they are aligned as much as possible symmetrically within the assembly.



REMARK!

The boom must be levelled off between 30-45°, otherwise the initial tension of the spring assembly has to be changed using the spanner.

8 Controller MO 63



Drawing 17

8.1 Connections

BT	Single push button	(n.o. – V15.1 – X1/5t)	<p>With the serial switching BT the barrier can be opened and closed. Additional functions of BT depend on setting of the dip switches for automatic closure (S4) and the counter settings (S6). When the automatic closure is activated, or the counter is deactivated, then the barrier can be closed by BT – otherwise the barrier will be opened. When the automatic closure is blocked (e.g. by a stop signal), and the counter is activated, then BT can only open the barrier. Which means that closing by BT is not possible.</p>
BTA1 BTA2	Push button OPEN 1 and 2	(n.o. – V15.2 – X1/6t and V15.3 – X1/6b)	<p>When one of the contacts BTA1 or BTA2 is open and the other is closing, the barrier opens. When the barrier is open and BTA1 or BTA2 is being closed, then the barrier cannot be closed (constant open).</p>
BTZ1A	Push button CLOSE 1A and 1B	(n.o. – V15.4 – X1/7t and V15.9 – X1/10b)	<p>When BTZ1A closes while BTZ1B is open, or BTZ1B closes while BTZ1A is open, the barrier closes. When the barrier is closed and at least one contact is closed, the barrier cannot be opened (constant closed).</p>
BTZ2	Push button CLOSE 2	(n.o. – V15.5 – X1/7b)	<p>When the contact BTZ2 is opening, the order 'close' is given.</p>
BTS1	Push button STOP1	(n.o. – V15.6 – X1/4t)	<p>When the contact BTS1 is closed the barrier stops. Stored signals are erased. Automatic closure is blocked until the next signal.</p>
BTS2	Push button STOP2	(n.c. – V15.6 – X1/8b)	<p>When the contact BTS2 is open the barrier stops. Stored signals are erased. Automatic closure is blocked until the next signal.</p>
LS	Photo-cell	(n.c. – V15.8 – X1/9b)	<p>When the photo-cell reports an obstacle the barrier cannot be closed. During the opening of the barrier an existing obstacle is not report. When an obstacle is reported during closing, the barrier stops and reverses. Additional functions of the photo-cell depend on operating mode, photo-cell closing automatic, and photo-cell test.</p>

8.2 Further connections

Photo-cell	V4.4	X1/26b	Power supply for photo-cell transmitter + 24V (only for photo-cell test).
------------	------	--------	--

Photo-cell transmitter Gnd	V12.1	X1/26t	Ground for photo-cell transmitter OV (only for photo-cell test).
Uext +24V	V12.2	X1/1b	24Vdc stabilised, for external equipment max. 500mA.
Uext +12V	V12.3	X1/3b	12Vdc stabilised, for external equipment max. 500mA.
Gnd	V12.4	X1/2b	Ground for external equipment
Display 'barrier open'	V15.12	X1/11t	Display 'barrier open'. The contact V15.12 is connected with the contact V15.14 when the barrier is open. The contact will be closed when the green light is lit. Maximum permissible: 24V / 1A.
Display 'barrier closed'	V15.13	X1/12t	Display 'barrier closed'. The contact V15.13 is connected with the contact V15.14 when the barrier is open. The contact will be closed when the red light is lit. Maximal admissible: 24V / 1A.
	V15.14	X1/11b	Common terminal for display 'barrier open' and 'barrier closed'.
Motor OPEN	V2.1	X1/20	Motor OPEN
Motor CLOSE	V2.2	X1/22	Motor CLOSE
Red traffic light	V2.3	X1/13t	The red traffic light is on when the barrier is closed. The red traffic light is also on during the time 'warning prior to opening' (max. 230V/120W).
Amber or flashing light	V2.4	X1/14t	The contact for the Amber or the flashing light is closed when the barrier is moving and during the time 'warning prior movement' (max. 230V/120W).
Green traffic light	V2.5	X1/15t	The green traffic light is on when the barrier is open. During the time 'warning before closing' the green traffic light is out (max. 230V/120W).
L1	V2.6	X1/14b	N*
L1	V2.7	X1/17b	L1, power supply 230V 50Hz
N	V2.8	X1/19b	N, power supply 230V 50Hz

8.3 Visual indication

LED	Colour	Function
BT	green	LED is lit when contact BT is closed or the receiver of the radio remote control receives a signal.
BTA	green	LED is lit when contact BTA1 or BTA2 is closed.
BTZ1	green	LED is lit when contact BTZ1A or BTZ1B is closed.
BTZ2	green	LED is lit when contact BTZ2 is closed.
BTS1	green	LED is lit when contact BTS1 is closed.
BTS2	green	LED is lit when contact BTS2 is closed.
LS	green	LED is lit when the photo-cell is activated.
SEA	green	LED is lit when contact SEA is closed.
SEZ	green	LED is lit when contact SEZ is closed.
Vp	yellow	LED is lit when the main power is on.
Diag	rot	Error code and display for radio remote control.

Table 6

8.4 Operating mode controller



Switch off the mains supply before altering the operating mode dip switches 1 - 9!

8.4.1 Pre-warning before opening (VWA)

The warning light (flashing or amber light) illuminates right after a signal to open, if pre-warning time before opening is activated. The barrier opens after the pre-warning time has elapsed.

S1 off and S2 off:	No pre-warning time
S1 off and S2 on:	1.5s pre-warning time before opening
S1 on and S2 off:	4.0s pre-warning time before opening

8.4.2 Pre-warning before closing (VWZ)

The warning light (flashing or amber light) goes on right after a signal to close, if pre-warning time before closing is activated. The barrier closes after the pre-warning time has elapsed.

S3 off:	No pre-warning time before closing
S3 on:	4.0s pre-warning time before closing

8.4.3 Automatic closure (ZLA)

The open barrier closes automatically after the programmed 'stay open time' has elapsed. An earlier closing of the barrier is possible by BT or BTZ. Is a stop signal given during the stay open time, then the automatic closure is blocked and is only released again by a new signal. BTA1, BZA2, or LS keep the barrier in the end-position 'open' even after the stay open time has

elapsed. The barrier closes immediately when a signal BTA1, BTA2, or LS is removed.

S4 off:	No automatic closure
S4 on:	The barrier closes after the time which was saved during the setup (0s up to 300s).

8.4.4 Reversal on hitting obstacles (REV)

When learning the running time during the setup the torque power for the reversing on obstruction is determined. When the barrier boom hits an obstacle during closing and blocks, the controller stops the movement or gives an 'open' signal.

S5 off:	The closing boom stops when it hits an obstacle and re-opens immediately.
S5 on:	The closing boom stops when it hits an obstacle and only moves when a new signal is received.

8.4.5 Counting (ZÄHL)

The signals 'open' and 'close' are counted by the controller.

S6 off:	No counting. The barrier closes after one signal to close, even after two signals to open.
S6 on:	Counting is activated. The barrier closes after two signals to close if there were two consecutive opening signals.

8.4.6 Reversal during opening (SZ)

When a 'close' signal is received during opening, the barrier will either open completely and then close or the barrier closes immediately.

S7 off:	The barrier always opens completely before reacting to a signal to close.
S7 on:	The opening barrier reverses immediately when it receives a signal to close.

8.4.7 Automatic closure by photo-cell (LSA)

The photo-cell always gives a signal to close, when the obstacle is not longer present.

S8 off:	Automatic closure by photo-cell is not activated. The closing function by loop B3/2 is not applicable.
S8 on:	When an obstacle is not longer present the barrier closes.

8.4.8 Photo-cell test (LSTST)

Before each closing of the barrier, the photo-cells may be tested.

S9 off:	Photo-cell test is not activated.
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S9 on:

A photo-cell test occurs before each closing.
Attention: The photo-cell test has to be learnt when programming the controller.

8.5 Photo-cell test

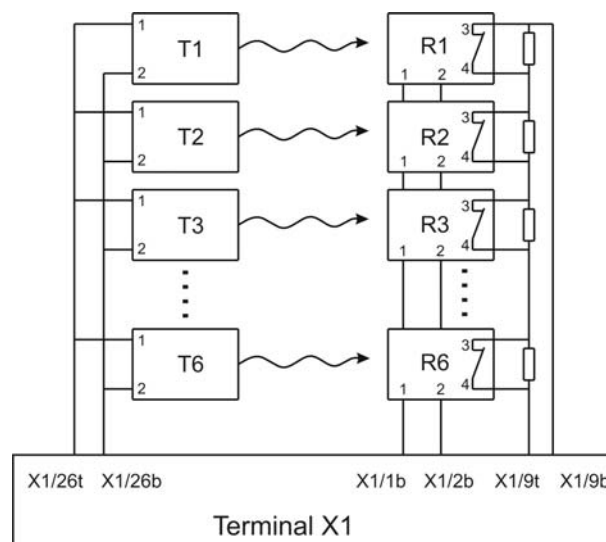
Before the closing of the barrier, the photo-cells may be tested. The photo-cell test consists of two parts.

Part one: The transmitter is taken off the power supply and then the receiver has to report an obstacle (within max. 2.5 seconds).

Part two: The transmitter is connected to the power supply again and then the receiver has to report that no obstacle is present.

If during part one the receiver does not report an obstacle, the photo-cell is faulty and an error code is shown on the Diag.-LED (flashes 6 times). If during part two the obstacle is still being reported (the controller assumes a real obstacle being present), the barrier will not close. No error code is shown.

Max. 6 photo-cells can be connected to the controller MO63 and be tested. For the testing of more than one photo-cell the relay connections of the receivers have to be connected in series. Parallel to the relay connections a resistor of **1kOhm** each has to be connected.



Drawing 18



For the photo-cell test the controller MO 63 has to learn the quantity of photo-cells which are connected, by activating the dip switch S9 = on and learning the running time again.

8.6 Programming

The controller has to learn the following parameters:

- Running time for opening and closing
- Torque power for reversal on hitting an obstruction
- Quantity of photo-cells when the photo-cell test is activated
- Time to stay open for automatic closure
- Personal code for radio remote control

8.6.1 Running time and automatic closure

1. Push the learn button approx. 3 seconds – the red Diag.-LED starts flashing.
2. Push the learn button again. When the photo-cell test is activated (S9=on) the controller learns how many photo-cells are connected. During learning the Diag.-LED flashes at 1 second intervals, then the learning of the running time starts automatically. When the photo-cell test is not activated (S9=off) the learning of the running time starts immediately.
3. The Diag.-LED is lit during the learning of the running time. The barrier closes if it is not closed already. If it is closed then it opens and learns the running time for opening. Then the Diag.-LED flashes at 1 second intervals and the controller learns the stay open time.
4. After the required stay open time push the learn button again. The barrier closes automatically and learns the running time for closing and the torque power for the reversing on obstruction. The learnt values are stored even if power failure occurs and the Diag.-LED turns off.

8.6.2 Personal code for radio remote

8.6.2.1 Setting personal code for radio remote

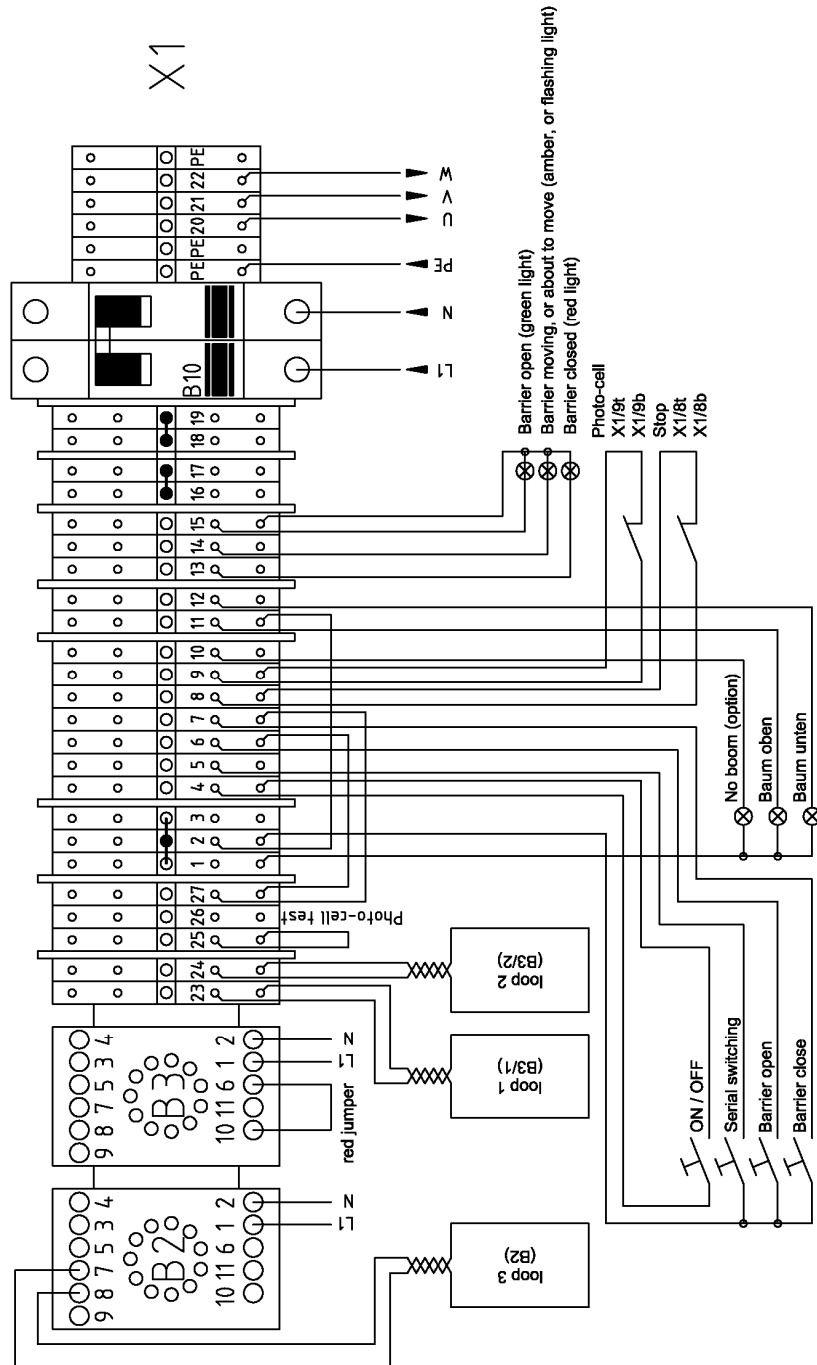
Push the learn button approx. 3 seconds – the red Diag.-LED starts flashing. Push the corresponding button on your transmitter. The controller learns the code - the red Diag.-LED is lit while a signal is received. Release the button. The code is stored even if power failure occurs and the Diag.-LED turns off.

8.6.2.2 Cancel personal code

Push the learn button approx. 3 seconds – the red Diag.-LED starts flashing. Keep the learn button pushed for approx. 10 seconds. The red Diag.-LED lights for 2 seconds – the personal code is erased and the learning is finished.

9 External connections

For the power supply of the external equipment (e.g. photo-cells, induction-loops....) the controller provides stabilised 24Vdc and 12Vdc. Max. 500mA can be drawn from the 12V source and the 24V source, but together max. 700mA. The supply of the photo-cell transmitter during photo-cell test comes from the 24V source and has to be considered.



Drawing 19

**Important instructions when using loops for safety and closing**

When using a loop-detector for safety remove the **red jumper** between contacts 6 and 10 on the socket B3. The socket B3 is always for the loop under the barrier boom, and is prewired for safety and for closing when leaving the loop. When B3 is equipped with a 2-channel-detector, the second channel may be used for an opening loop or a loop detecting that a vehicle is present. The socket B2 is prewired for an opening loop in connection with a 1-channel-detector. Please see chapter “Examples for use of loop detectors”.

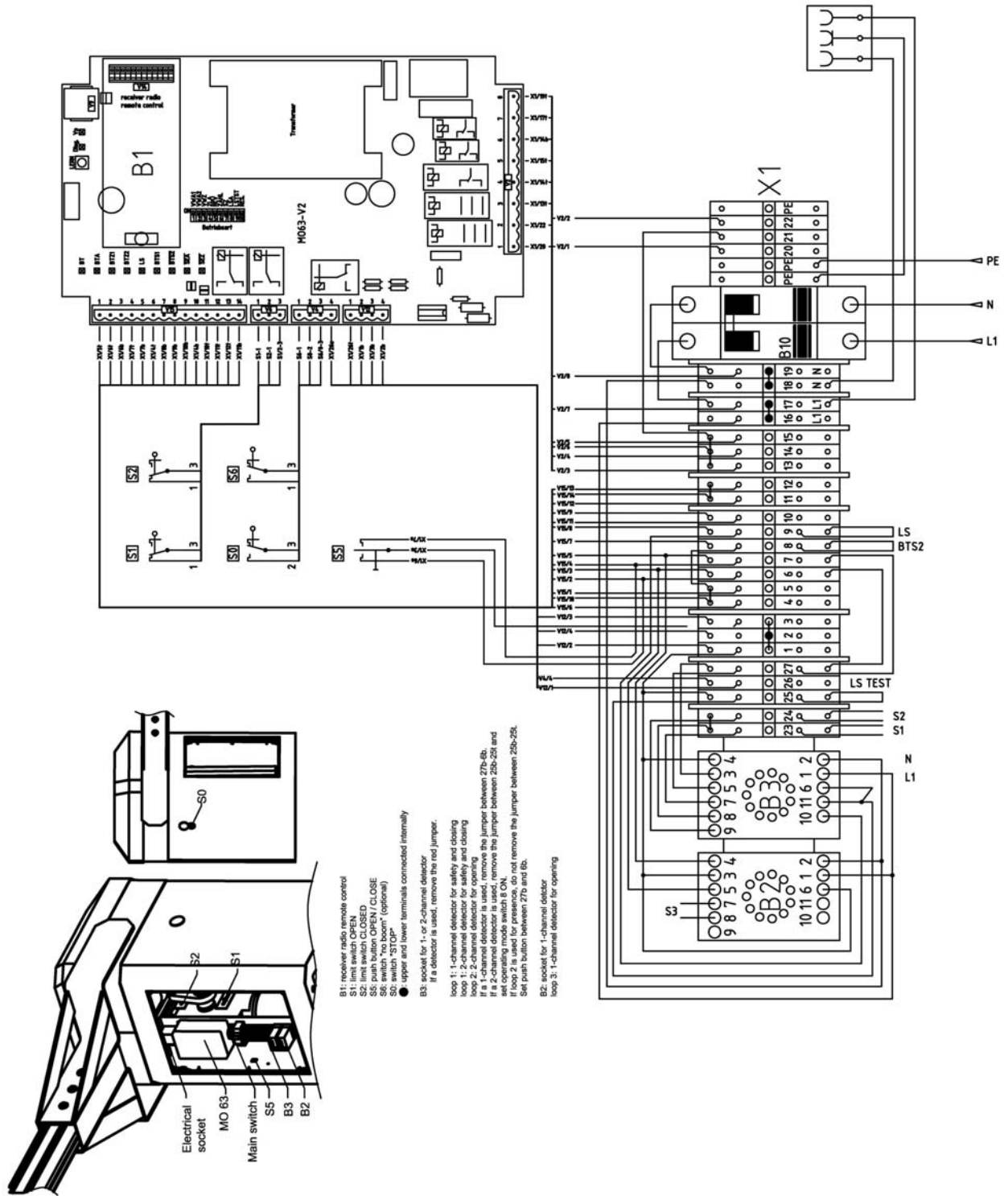
When all connections are completed and the barrier is closed, only the following LEDs should be lit: the yellow LED Vp for main power, the green LED SEA and the green LED BTS2. If is not the case then see chapter “Fault finding”.

**WARNING!**

The reversal by obstruction can only work when the rod always moves to the rear of the housing, never to the door.

- Please check the direction of rotation of the transmission lever of the gearbox.

10 Layout in the barrier



Drawing 20

11 Fault finding

11.1 The closed barrier doesn't react to a signal to open

Symptom	Possible cause	Possible solution
The yellow power LED is out.	No mains supply.	Check the mains lead and the fuses.
The red diagnostic LED flashes non-stop.	Programming is started.	Carry it out to the end.
The green LED BTS1 is lit.	The controller is switched off.	Switch On/Off switch (X1/4 top and X1/4 bottom off).
The green LED BTS2 is out.	1. The stop button is pressed.	Release the button (X1/8 top and bottom).
	2. Emergency release in use.	Lock the shaft.
	3. Wiring fault.	Check the wiring.
The green LED SEA is out and the red Diag.-LED flashes 4 times – then a break.	1. Faulty limit switch 'open'.	Replace the limit switch.
	2. Wiring faulty	Check the wiring to the limit switch and plug V6 on the controller.
The green LED BTZ1 is lit.	There is a permanent signal to close.	Check the button (X1/2 bottom/top and 7 top).

When the controller gives an error code through the red Diag.-LED see the chapter 'Error code'



ATTENTION! With the barrier type KOLOSS the LED BTS2 is not lit when the emergency release key is attached at the gearbox or when the emergency release flap is open.

11.2 The open barrier doesn't react to signals to close

Symptom	Possible cause	Possible solution
The yellow power LED is out.	No mains supply.	Check the mains lead and the fuses.
The red diagnostic LED flashes non-stop.	Programming is started.	Carry it out to the end.
The green LED LS is lit.	1. Loop detector is activated.	Check the detector in socket B3.
	2. The red jumper is removed from the terminals 6 and 10 in socket B3, but the loop detector hasn't been inserted.	Plug the detector into the socket B3 or replace the red jumper.
	3. The photo-cell is activated.	Check it (X1/9 top and X1/9 bottom).
The green LED LS is lit when the photo-cell is free, and not lit when an obstacle is present	The photo-cell is connected as normally open.	Connect the photo-cell as normally closed.
The green LED BTA is lit.	There is a permanent signal to open.	1. Check the 'open' button (X1/2 bottom and X1/6 top)
		2. Check the loop detector in socket B2
The green LED SEZ is out and the red diagnostic LED flashes 4 times – then a break.	1. Faulty limit switch 'closed'.	Replace the limit switch.
	2. Wiring fault.	Check the wiring and plug V6 in the control box.
The green LED BTZ2 is lit.	There is a permanent signal to the terminals BTZ2.	Check the button (X1/7 bottom and X1/2 bottom/top).

Table 7

When the controller gives an error code through the red Diag.-LED see the chapter 'Error code'.

11.3 Fault finding continued

Symptom	Possible cause	Possible solution
Delay before opening.	Warning is active.	Operating mode switch 1+2 off.
Delay before closing.	Warning is active.	Operating mode switch 3 off.
The barrier does the following when it hits an obstacle ...		
...switches off.	Reversing is not activated.	Operating mode switch 5 off.
...tries to carry on closing.	Torque setting is wrong.	Adjust it.
The boom isn't vertical when the barrier is open ...		
The green LED SEA is out.	Limit switch 'open' maladjusted, but still switches.	Re-adjust it and the corresponding mechanical stopper.
The green LED SEA is lit. The red diagnostic LED flashes twice then a break.	1. Faulty limit switch 'open'.	Replace it.
	2. The limit switch 'open' is maladjusted and doesn't switch.	Re-adjust it and the corresponding mechanical stopper.
The boom isn't horizontal when the barrier is closed...		
The green LED SEZ is out.	Limit switch 'closed' maladjusted, but still switches.	Re-adjust it and the corresponding mechanical stopper.
The green LED SEZ is lit. The red diagnostic LED flashes three times – then a break.	1. Faulty limit switch 'closed'.	Replace the limit switch.
	2. The limit switch 'closed' is maladjusted and doesn't switch.	Re-adjust the limit switch and the corresponding mechanical stopper.

Table 8

11.4 Error code

The red Diag.-LED serves as a status indicator. During regular, fault free operation the LED is only lit, when a radio remote signal is received. An error code is given, when the controller detects a fault. the Diag.-LED flashes max. 12 times, then a break, then repeats the flashing code.

error code	Cause/solution
2 x flashing	Limit switch "OPEN" did not open after the learnt running time. The limit switch has a short circuit.
3 x flashing	Limit switch "CLOSE" did not open after the learnt running time. The limit switch has a short circuit.
4 x flashing	Both limit switches signal at the same time. While SEA and SEZ signal at the same time, the controller is blocked.
5 x flashing	The power supply limit for the external equipment 12V and/or 24V has been reached. The power source load is too high. The controller is blocked. Check the connected equipment.
6 x flashing	Photo-cell error. The following error occurred during the photo-cell test. The transmitter is inactive but the receiver does not signal an obstacle.
7 x flashing	An error occurred during learning of the torque power for the reversing on obstacle. Either the controller, the motor, or the capacitor of the motor are faulty. Check the above and repeat the learning of the running time. If the error still exists the controller is faulty.
8 x flashing	The EEPROM has lost the data. Repeat the learning of the running time. If the error still exists the controller is faulty.
9 x flashing	The EEPROM is faulty.
10 x flashing	The controller has detected a fault in the redundant detection of the "stop" contact. The controller is faulty.
11 x flashing	One of the motor relays has not switched off. The controller is faulty.
12 x flashing	The controller detects that the "Triac" has not switched off. The controller is faulty.

Table 9



Attention:

You may use the service device ZS701 to read the error memory of the controller.

12 Examples for use of loop detectors

B3/2 This loop may be used for opening or for detecting that a vehicle is present (connected to socket B3 by contacts X1/24 top und X1/24 bottom).

B3/1 This loop is for the safety only and is placed under the barrier boom (connected to socket B3 by contacts X1/23 top und X1/23 bottom).

B2 This loop is for opening only (connected directly to socket B2 – contacts 7 and 8).



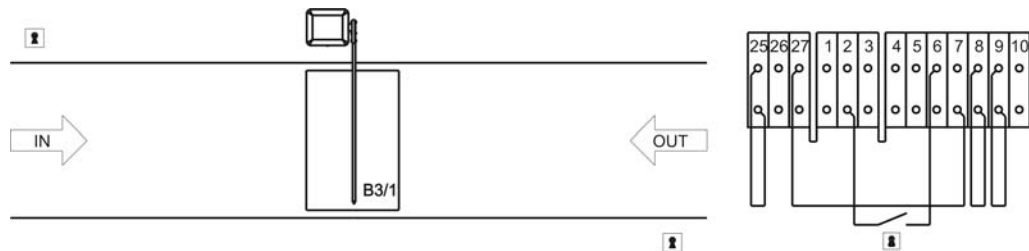
Push button, key switch, card reader, coin selector, etc.



Photo-cell

Example 1 – (for 1-channel loop detector on socket B3)

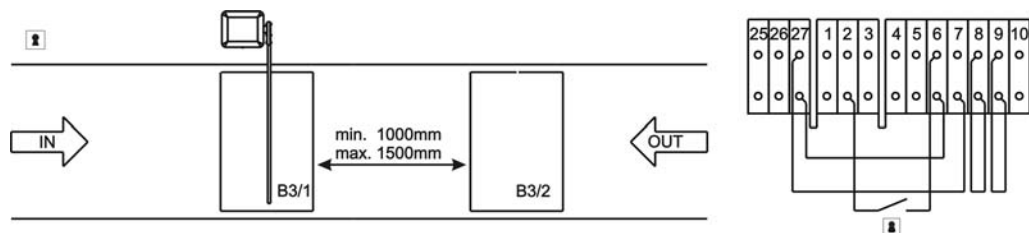
Entrance and Exit – opening with push button. Safety and closing with loop detector on socket B3/1 (all jumpers at default settings). Remove red jumper of socket B3 and jumper between the terminals 27 bottom and 6 bottom.



Drawing 21

Example 2 – (for 2-channel loop detector on socket B3)

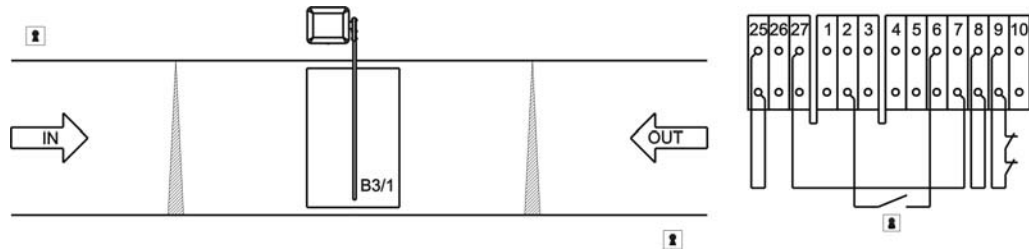
Entrance – opening with a key switch. Safety and closing with both loops B3/1 and B3/2. Exit - opening with loop B3/2. Safety and closing with both loops (all jumpers at default settings). Remove red jumper of socket B3 and jumper between the terminals 25 top and 25 bottom. DIP S8 = 'on'.



Drawing 22

Example 3 – (for 1-channel loop detector on socket B3)

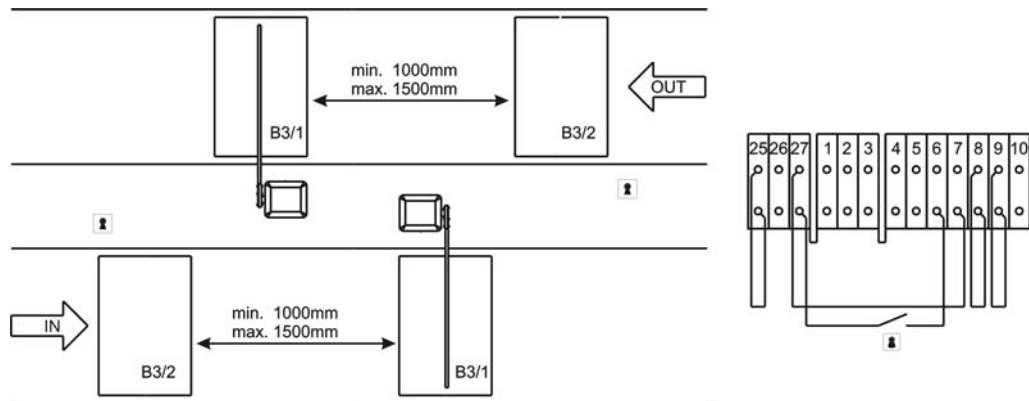
Entrance and Exit – opening with a coin selector. Safety with photo-cells and loop B3/1. Automatic closure when the time to stay open has elapsed. Remove the jumper between 9 top and 9 bottom and connect the safety contact of the photo-cells to them (all jumpers at default settings). Remove red jumper of socket B3 and jumper between the terminals 27 bottom and 6 bottom.



Drawing 23

Example 4 – (for 2-channel loop detector on socket B3)

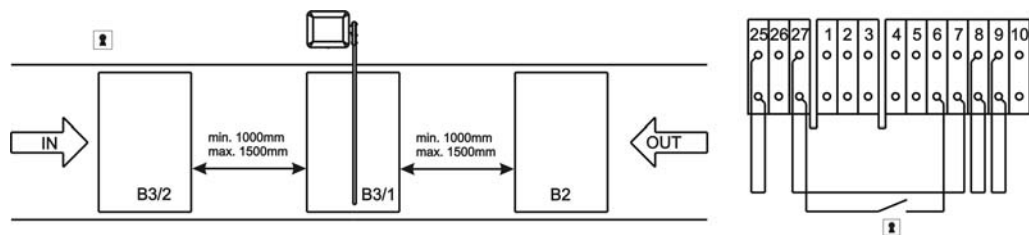
Entrance and Exit - with card reader. The loop B3/2 allows use of the card reader only when a vehicle is on the loop. The loop B3/1 is for safety and closing when a vehicle leaves the loop. The jumpers are at the default settings. Remove the jumper between terminals 6 bottom and 27 bottom and connect the contact from the card reader here. Remove the red jumper of socket B3 (between terminals 6 and 10).



Drawing 24

Example 5 – (for 1-channel loop detector on socket B2 and 2-channel loop detector on socket B3)

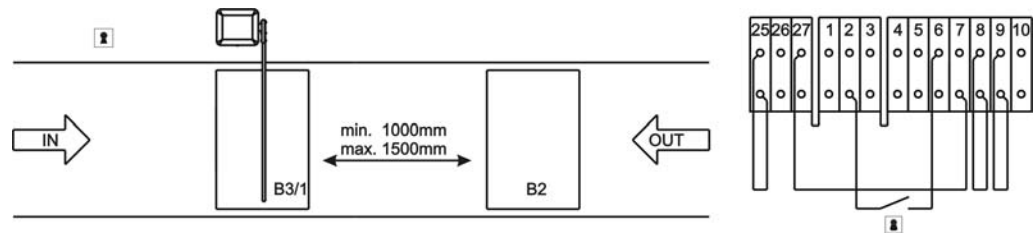
Entrance – with card reader. The loop B3/2 allows use of the card reader only when a vehicle is on the loop. Remove the jumper between terminals 6 bottom and 27 bottom and connect the contact from the card reader here. Safety with loop B3/1, opening with loop B2, closing with B3/1 or B2. Remove the red jumper of socket B3 and set DIP-switch S8 'on'.



Drawing 25

Example 6 – (for 2 x 1-channel loop detector on socket B2 and socket B3)

Entrance – opening with key switch. Safety with loop B3/1, closing with both loops B3/1 or B2. Exit – opening with loop B2, safety and closing with B3/1. Remove red jumper of socket B3 and jumper between the terminals 27 bottom and 6 bottom.

*Drawing 26*

13 Maintenance

Maintenance KOLOSS 60 – 120

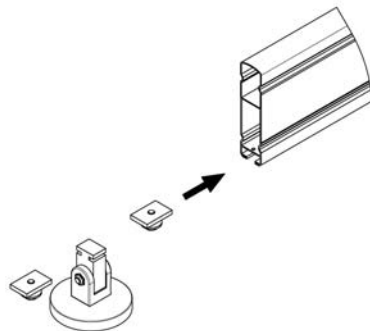
The maintenance intervals depend on the application and the frequency of operation. Suggested maintenance is every 3 months. The springs are designed for approx. 100,000 movements.

1. Check the spring assembly. After more than 100.000 movements or if one or more springs are broken, all springs have to be replaced completely.
2. Make sure the boom is well balanced by the springs; if necessary adjust the spring tension.
3. Check barrier housing, boom assembly, boom connector and boom for accidents or other damage; replace if necessary.
4. Check the horizontal and vertical position of the boom; adjust the limit switches if necessary.
5. Make a visual inspection, and retighten all screws if necessary.
6. Check the potential equalisation for door and housing (PE-connection present).
7. Check if installation and operating instructions are still complete.
8. Check the safety devices and safety functions (induction loop, photo cell, reversing function etc).
9. Check the barrier anchorage in the foundation.
10. Grease the pillow block bearings and swivel heads with bearing grease (min. -25°C to $+125^{\circ}\text{C}$).
11. Spray the mechanics and the joint head with spray oil.
12. Check if the screws and nuts for fastening boom connector have the required rating (screw M12x180 rating 8.8 and nut M12 rating 8).

14 Extra equipment

14.1 Fixed support with electromagnet

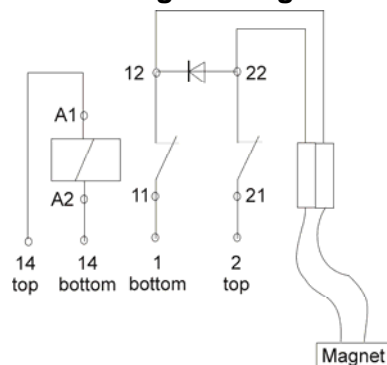
1. Connect the flexible lead from the magnet to the cable from the barrier. There is enough room in the lower part of the support for a junction box.
2. Fit the forked part onto the foot and secure it in the required height.
3. Remove the rubber tube from the boom at the point at which the anchor plate is to be secured.
4. Push one of the securing pieces, followed by the anchor plate, into the slot of the boom until the plate is immediately above the magnet.



Drawing 27

5. Push the second securing piece up to the magnet.
6. Push the securing pieces from both sides against the anchor plate and secure them with the screws.

Connecting the magnet in the barrier:



Drawing 28

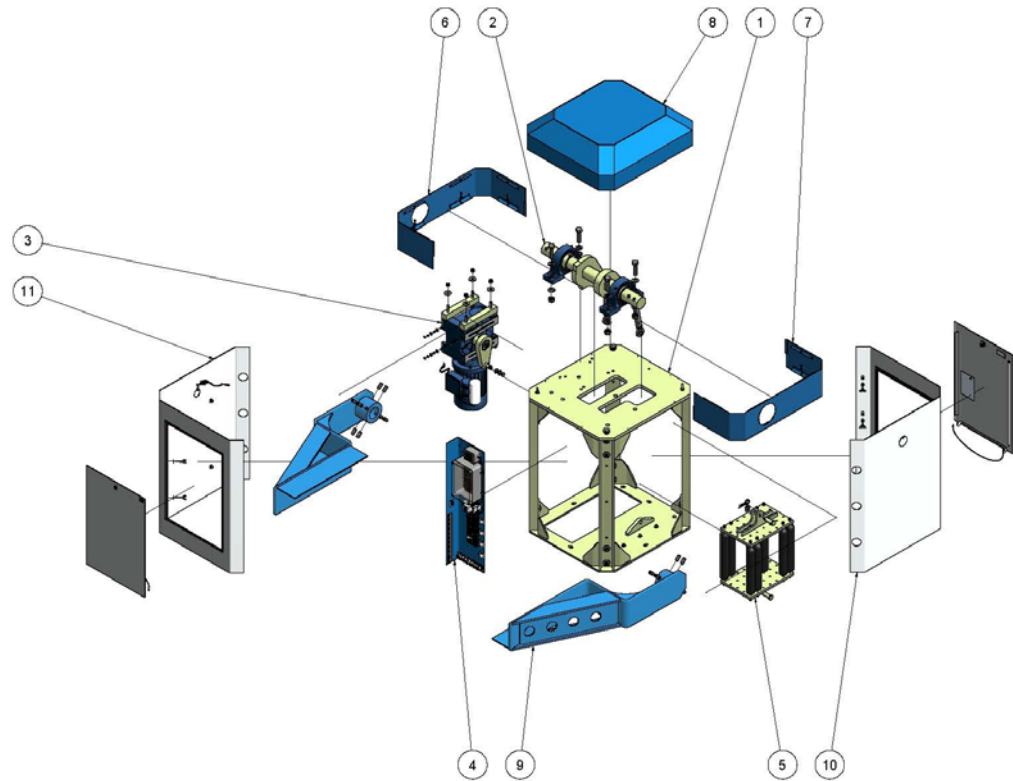
1. The 1.5 seconds warning before opening must be activated. Switch 2 on the logic board.
2. The coil of the relay must be connected to the terminals '14 top' and '14 bottom' in the terminal block.
3. Connect contact 11 of the relay to '1 bottom' in the terminal block.
4. Connect contact 21 of the relay to '2 top' in the terminal block.
5. The leads to the magnet come from the contacts 12 and 22 of the relay.

OPERATION:

1. The relay switches off on receipt of a signal to open. The magnet loses it's residual magnetism during the 1.5 seconds warning time.
2. The barrier opens after the 1.5 seconds.
3. The magnet switches on again when the barrier reaches the limit switch at the closed position.

15 Layout KOLOSS 60-120

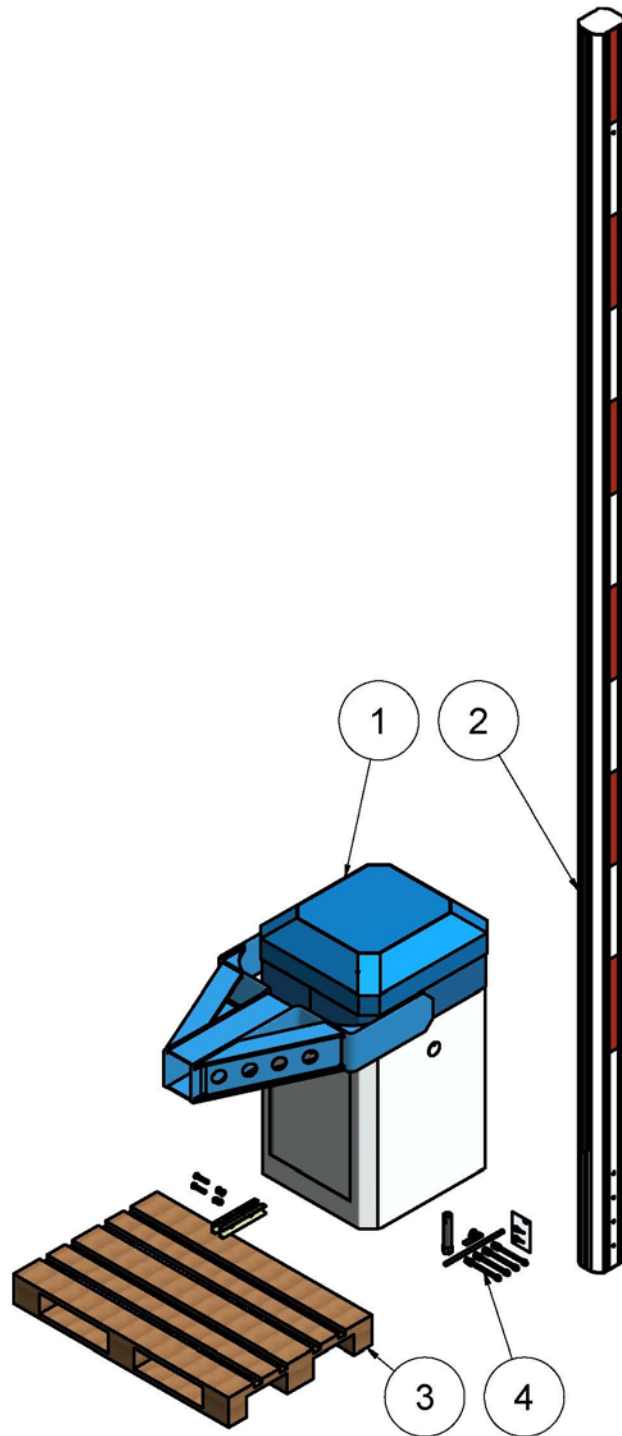
15.1 Layout KOLOSS 60



Drawing 29

Pos.	Qty.	Part name
1	1	Base frame
2	1	Main shaft
3	1	Motor+gearbox KOLOSS 60
4	1	Mounting plate
5	1	Spring assembly KOLOSS 60
6	1	Cover frame, right
7	1	Cover frame, left
8	1	Hood
9	2	Boom holder support
10	1	Cover with door
11	1	Cover with door

Table 10

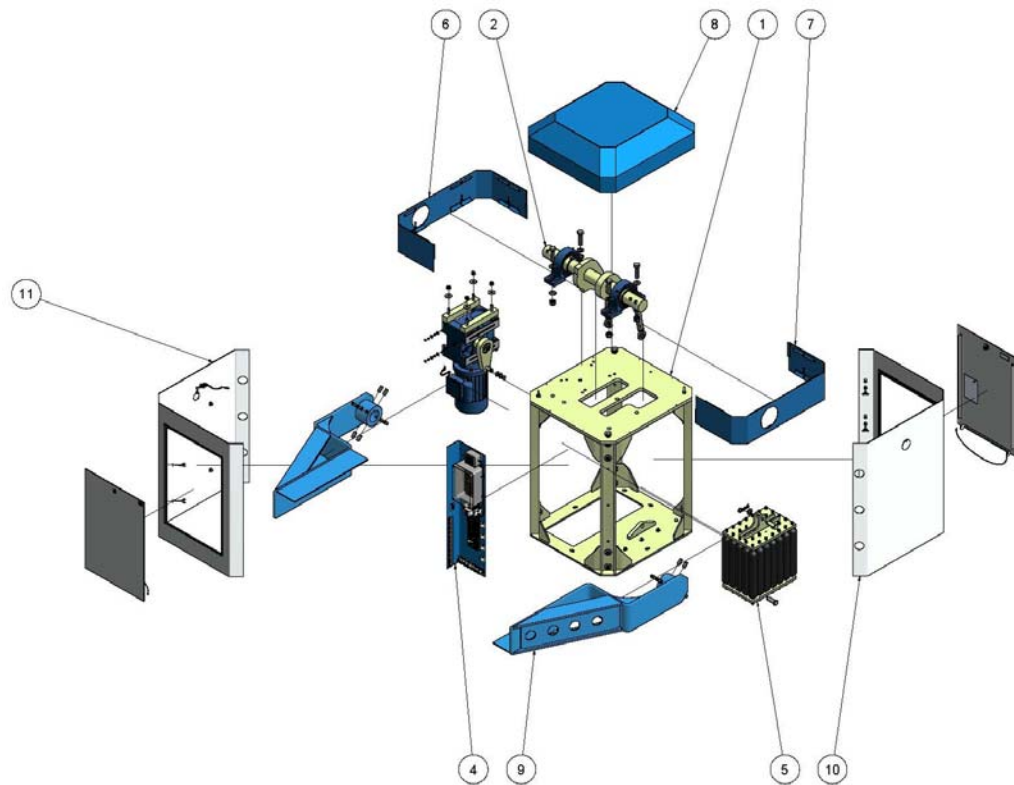


Drawing 30

Pos.	Stck.	Part name
1	1	KOLOSS 60
2	1	Boom, 6m
3	1	Packing
4	1	Accessories KOLOSS 60

Table 11

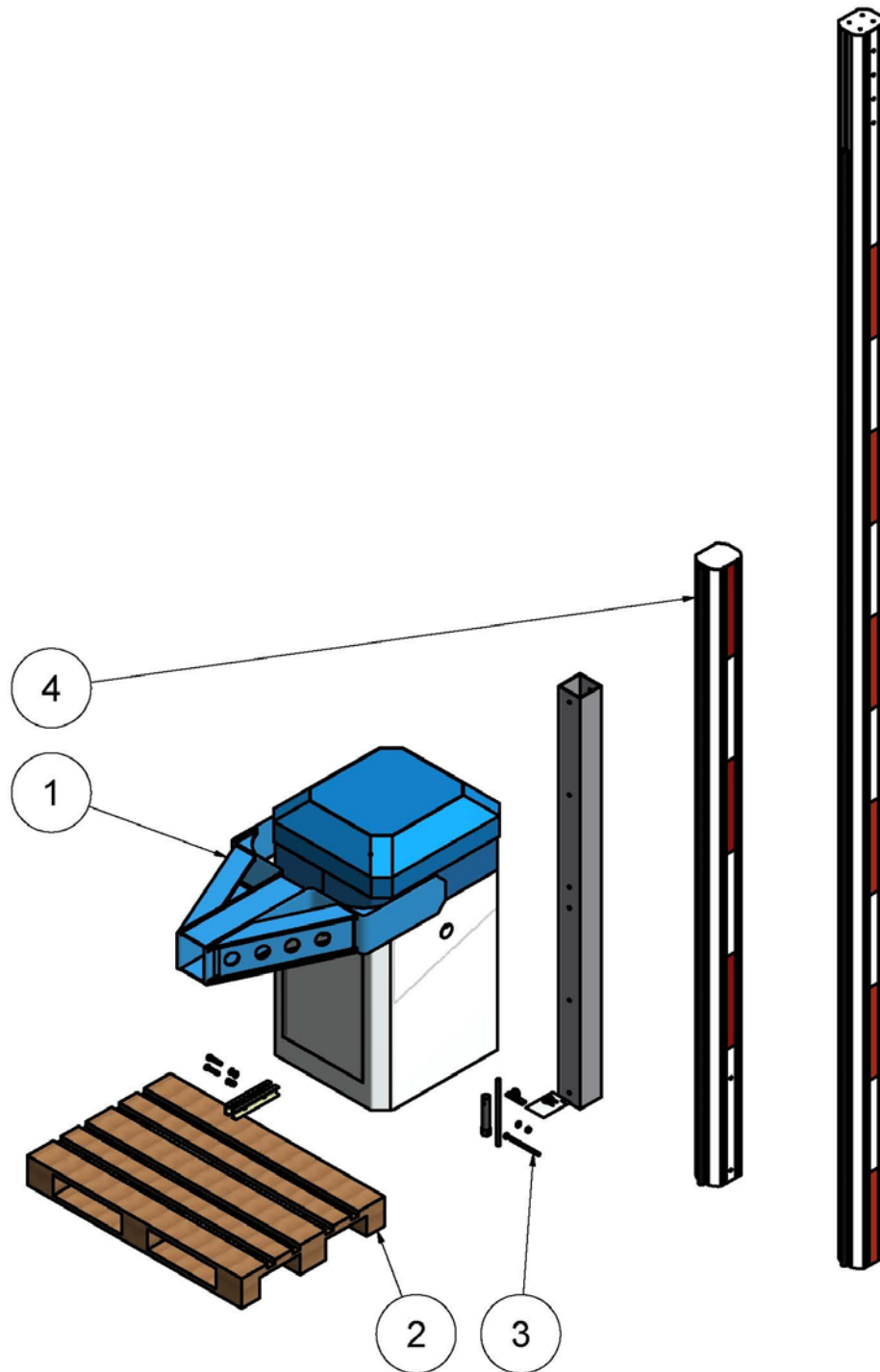
15.2 Layout KOLOSS 90



Drawing 31

Pos.	Qty.	Part name
1	1	Base frame
2	1	Main shaft
3	1	Motor+Gearbox KOLOSS 90
4	1	Mounting plate
5	1	Spring assembly KOLOSS 90
6	1	Cover frame, right
7	1	Cover frame, left
8	1	Hood
9	2	Boom holder support
10	1	Cover with door
11	1	Cover with door

Table 12

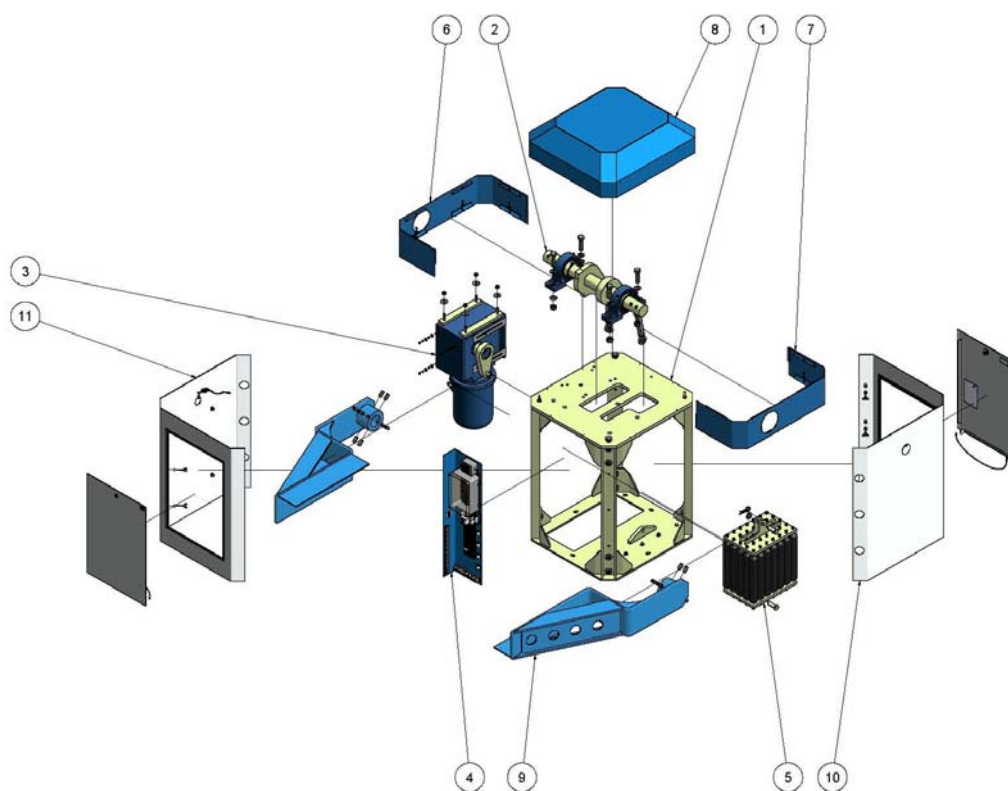


Drawing 32

Pos.	Qty.	Part name
1	1	KOLOSS 90
2	1	Packing
3	1	Accessories KOLOSS 90
4	1	Boom, 9m

Table 13

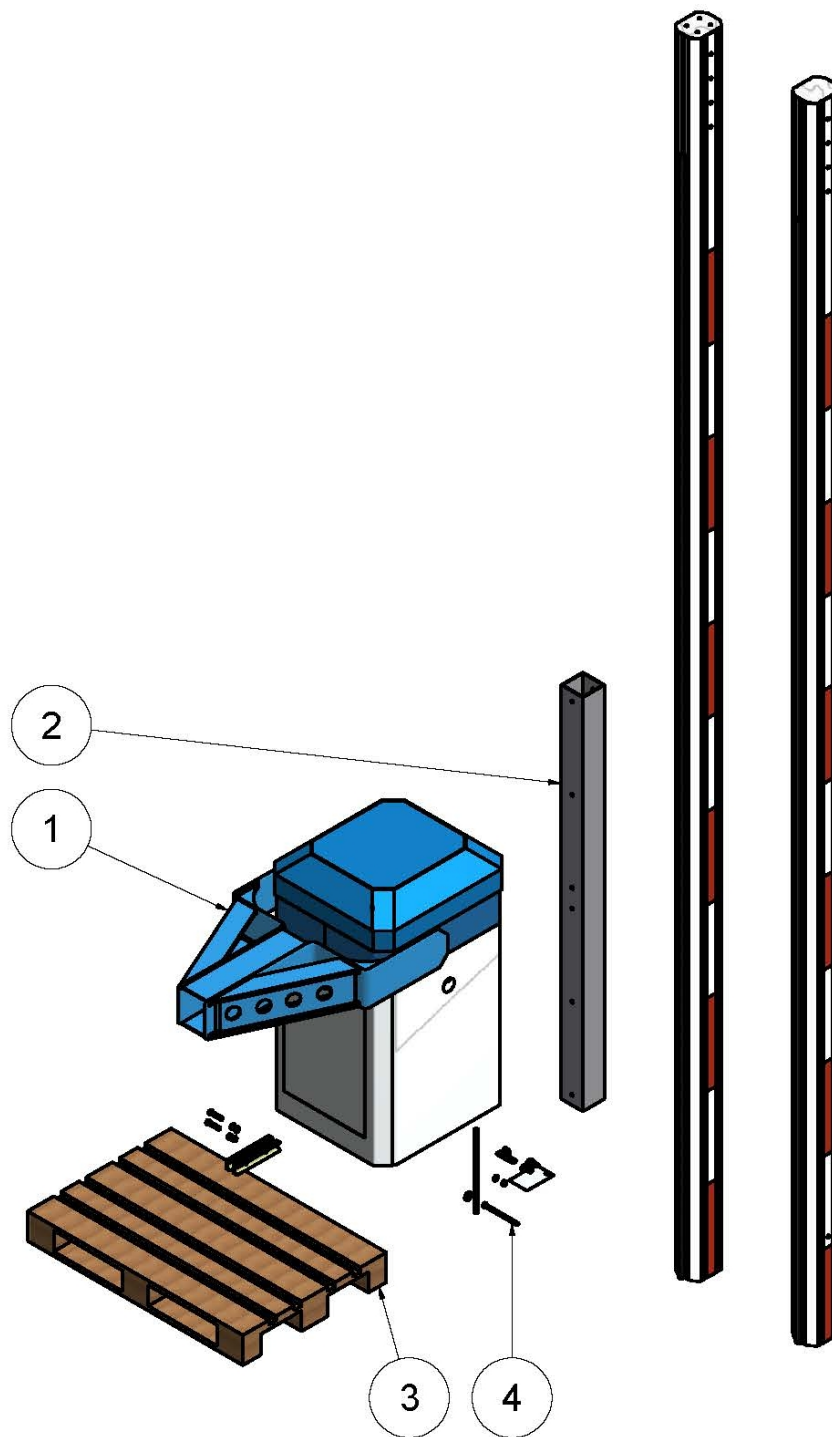
15.3 Layout KOLOSS 120



Drawing 33

Pos.	Qty.	Part name
1	1	Base frame
2	1	Main shaft
3	1	Motor+Gearbox KOLOSS 120
4	1	Mounting plate
5	1	Spring assembly KOLOSS 120
6	1	Cover frame, right
7	1	Cover frame, left
8	1	Hood
9	2	Boom holder support
10	1	Cover with door
11	1	Cover with door

Table 14



Drawing 34

Pos.	Qty.	Part name
1	1	KOLOSS 120
2	1	Boom, 12m
3	1	Packing
4	1	Accessories KOLOSS 120

Table 15