dormakaba

Boom Barrier

Operating Manual

Original document

EN

Table of contents

1 About this document

1.1 Validity

These instructions are valid for the Boom barrier unit.

1.2 Target group

The target group for this document comprises the unit operator and qualified technical personnel.

1.3 Content and purpose

These operating instructions describe the assemblyand installation as well as the operation and maintenance of the unit.

1.4 Document storage

This manual is to be stored by the operator together with the supplementary documentation for the entire service life of the unit.

1.5 Abbreviations

Companies/organizations

DKI	**Dormakaba**, (India)

Product names

BB	**B**oom **B**arrier

Unit-specific terms

FFl	**F**inished **F**loor **L**evel
OPL	**O**perating **P**anel
SFL	**S**ub **F**loor **L**evel
MCBF	**M**ean **C**ycles **B**etween **F**ailures

1.6 Danger categories

DANGER

Describes an imminent danger resulting in serious injury or death.

WARNING

Describes a potentially dangerous situation that may result in serious injury or death.

CAUTION

Describes a potentially dangerous situation that may result in minor injury.

NOTICE

Describes a potentially damaging situation in which the product or something in its vicinity may be damaged or that could result in malfunction.

1.7 Symbols used

Application tips, useful information

2 Safety

2.1 General notes

- Valid regulations and standards must be observed during installation and operation.
- Only the use of spare parts manufactured by the original manufacturer is permitted.
- Do not put a defective barrier or gate into operation.
- After set-up (installation) every user of the equipment has to be instructed about the operation and function of the barrier.
- 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 Basic safety instructions

Risk of death by electrocution

WARNING – incorrect connection of the unit may result in lethal electrocution (power supply = 240 V AC).

- All safety notes and warning information on the product and in the product documentation must be observed.
- The connection must be made correctly and in compliance with the applicable regulations.
- Only have installation, repairs, and maintenance carried out by technical personnel.
- Observe maintenance intervals.
- Observe the accident prevention regulations and the approved safety regulations.

Risk of death in case of inadequate escape route equipment

There is a risk of death if the escape route equipment of units situated on escape routes is inadequate.

- Units must be equipped with an emergency stop button or escape route switch.
- A central control system must be implemented in conjunction with a smoke detector, for example.
- Units situated in escape routes are approved in accordance with international and regional requirements and/or are labeled accordingly.
- Individual approval must be granted by the highest authority on building supervision. This authority checks whether the applicable requirements regarding the escape route concept are met for the building or the construction section.

Risk of injury due to inadequate protection equipment

User group (e.g., age, health, instruction in the use of the unit) Protection equipment/ sensors (low or high safety level)

Prior to placing an order, a project risk assessment must be completed, and the Risk of injury through modifications to the unit.

CAUTION – modifications to the unit may give rise to new, previously unforeseen risks.

- Modifications to hardware and software or to the mechanical components must only be carried out in consultation with dormakaba

Risk of injury following change of use

CAUTION - Changes of use or modifications to the unit's environment may give rise to new, previously unforeseen risks.

- In this case, a new project risk assessment must be completed and the required safety equipment/sensors determined on this basis.

Risk of injury due to incorrect unit settings

CAUTION – incorrect unit settings may result in injuries due to impact or crushing, for example.

- The unit must be set up correctly and in compliance with the applicable regulations.
- Repairs and maintenance must only be carried out by specialist personnel.

2.2.1.1 Testing the protective equipment

2.2.1.2 Expert inspection and test book

An expert inspection must be carried out every year within the scope of ASR A1.7 and DIN 18650. We recommend that this inspection be conducted as part of regular technical maintenance. To safeguard the safe operation of the unit throughout its useful life, DORMAKABA also requires an expert inspection to be performed outside of the aforementioned scope. The country-specific standards and guidelines must be observed outside the scope of the specified application.

Expert inspections must only be carried out by experts. The initial expert inspection, known as the first inspection, is carried out when the unit is commissioned. The results of this and all other inspections are documented in the test book.

Definition of an expert

An expert is someone who, on the basis of his/her specialist training and experience, has acquired extensive knowledge of the safe operation of automatic door systems as well as of the national and international regulations for personal safety, and continues to refresh or update this knowledge to reflect the state of the art.

Experts must be objective in their assessment of the operating safety of the door system.

Expert training

Expert training must be carried out in line with the guidelines, whereby prospective experts must attend and pass a course with a final written exam. This course can be completed at Dormakaba or at any other training facility recognized.

Carrying out an expert inspection

1. Check the unit in accordance with the expert inspection checklist.
2. Enter the findings in the expert inspection checklist.
3. Fill in the **Recurring inspection and maintenance** table in the test book. The **First inspection prior to commissioning** the table must be completed during the first inspection.

Observe the following during the expert inspection

- The expert must fill in an expert inspection checklist for each inspection and sign it.
- The operator must countersign the expert inspection checklist. The signed expert inspection checklist serves as a record for the expert that the expert inspection was accepted.
- The operator must make a copy of the signed expert inspection checklist and retain it together with the test book.

The expert inspection checklist must be stored for at least one year

Observe the following when documenting the expert inspection in the test book

- The **First inspection prior to the commissioning** table in the test book must be completed during the first inspection.
- The operator also has to sign the test book.
- The test book serves as a record of the expert inspections and maintenance.
- The expert inspection can be carried out as part of regular maintenance.
- The operator must retain the test book for the entire service life of the unit.
- Authorities must be able to view the test book at any time.

Identification of defects or deviations from the current state-of-the-art

If defects or deviations from the current state of the art are identified during the expert inspection, the following measures must be taken:

- The expert instructs the operator to rectify the defects or deviations.
- The operator requests an estimate from the relevant partner of dormakaba.

2.2.1.3 In the event of serious defects, a note must be entered in the test book recommending that the unit be de-commissioned. The unit must not be Project risk assessment

For every project, the operator must complete or commission a project risk assessment prior to ordering the unit. Details on project risk assessment can be found in section.

3 Declaration of Conformity

EC Declaration of Conformity

Manufacturer	:	**M/s. Dormakaba India Private Limited** Mahindra World City, Plot No. 48/3 8th Avenue Anjur Village, Chengalpattu Taluk, Kanchipuram District, Tamil Nadu – 603 004

We hereby declare that this declaration of conformity is issued under our sole responsibility and applies to the following product:

Product Nomenclature	:	Boom Barrier
Models	:	DKB-2500, DKB-3000, DKB-3500, DKB-4000, DKB-4500, DKB-5000
Ratings	:	230 V AC, 3 A
TCF No	:	DIPL/CE/TCF/BB/01

The above-mentioned product has been designed to meet the essential health and safety requirements of the following EU Directive(s):

Machinery Directive	:	2006/42/EC
Low Voltage Directive	:	2014/35/EU
EMC Directive	:	2014/30/EU

The following harmonised standard(s) have been applied:

EN ISO 12100:2010	:	Safety of machinery - General principles for design - Risk assessment and risk reduction
EN 60204-1:2018	:	Safety of machinery – Electrical equipment of machines - Part 1: General requirements
EN 61000-6-1:2007	:	Electromagnetic compatibility (EMC) – Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments
EN 61000-6-3:2007/A1:2011	:	Electromagnetic compatibility (EMC) – Part 6-3: Generic standards - Emission standard for residential, commercial and light industrial environments

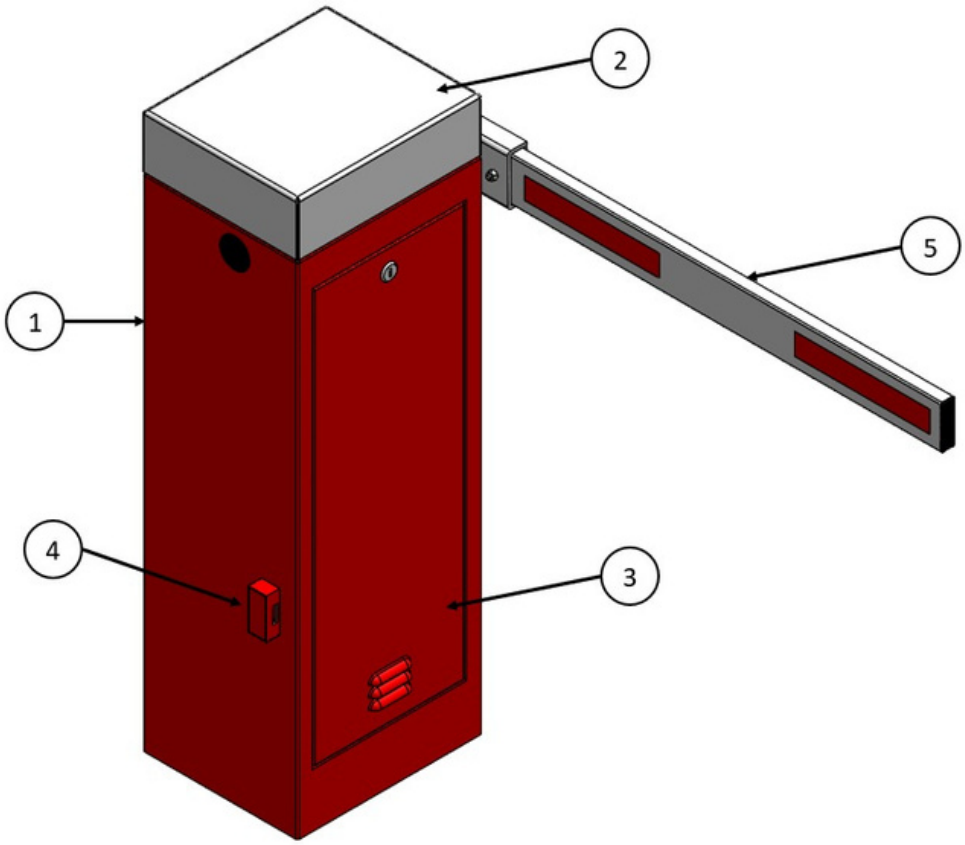
This declaration will lose its validity if this product is altered without our consent.

The Technical File is kept at the manufacturer's address.

Chennai	18-01-2023	
Place of Issue	Date of Issue	P. Muthukrishnan Sr.Manager - App.Engineering Operations

4 Product description

4.1 Overall view



1	Housing	2	Top COver
3	Door	4	Safety Sensor
7	Boom (Optional 2.5 m to 5 m)		

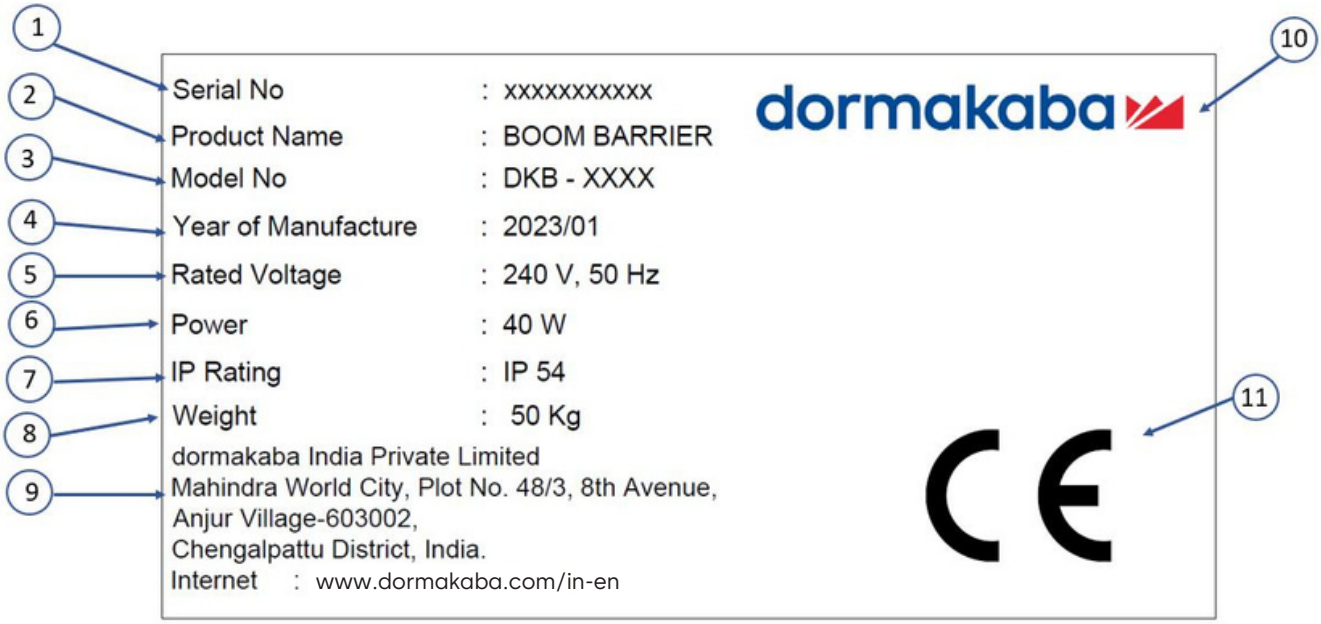
4.2 Use of the product

Boom Barrier are used to access controls and to ensure that vehicle pass individually. Access authorization can be controlled in conjunction with an access control system.

4.3 Liability

- Modifications to hardware and software or to the mechanical components must only be carried out in consultation with dormakaba.
- dormakaba accepts no liability for damage resulting from subsequent modifications. The operator carries full responsibility in this case.

4.4 Labelling



Identification Plate

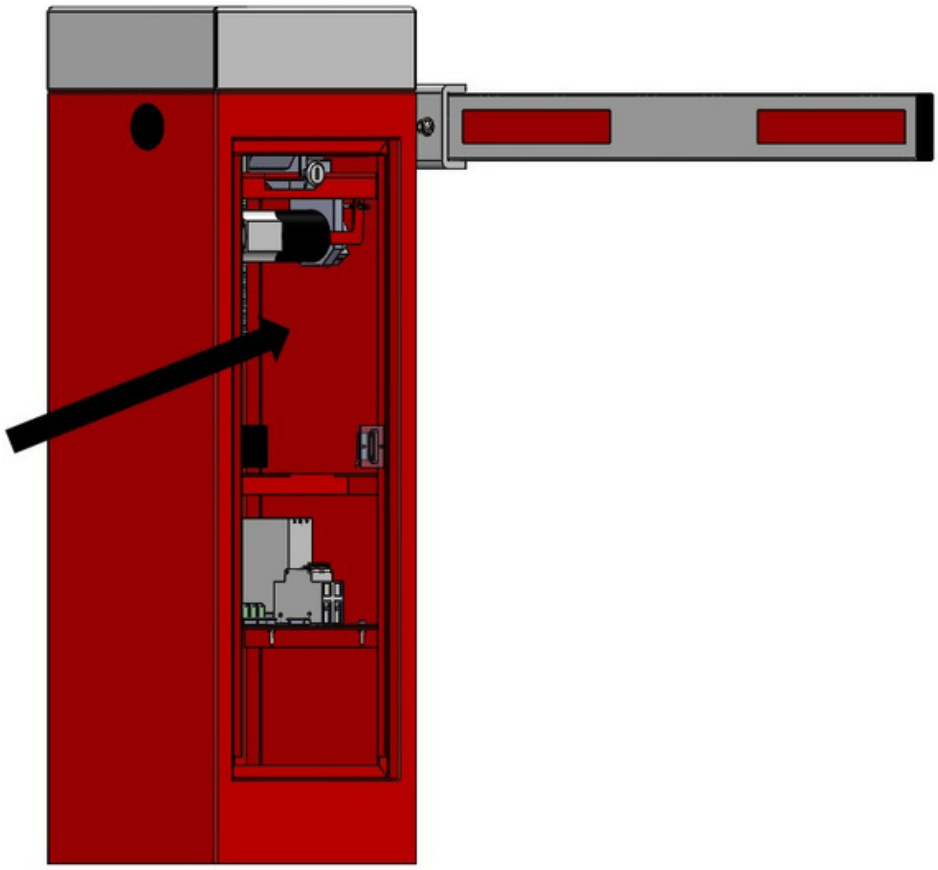
1	Serial number	2	Product name
3	Model number	4	Production Year and month
5	Supply voltage	6	Rated watts
7	Protection class	8	Mass of barrier
9	Manufacturer's address in full	10	Logo
11	CE marking		

Every unit has an identification plate. If not fitted by the manufacturer, the identification plate will be affixed by the assembling technician following installation.

The stickers on the unit and the individual components, e.g. the control,must not be removed or damaged.

The identification plate is affixed in three places:

- Packing list
- Shipping papers
- Unit: see the graphic below

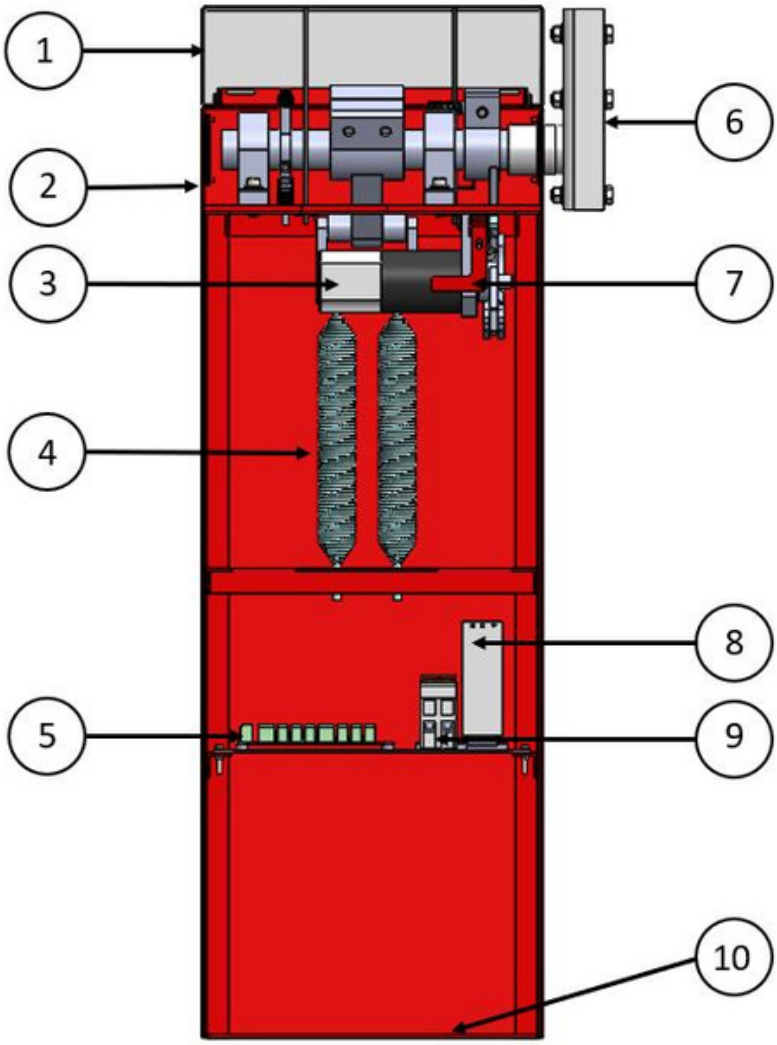


Location of identification plate

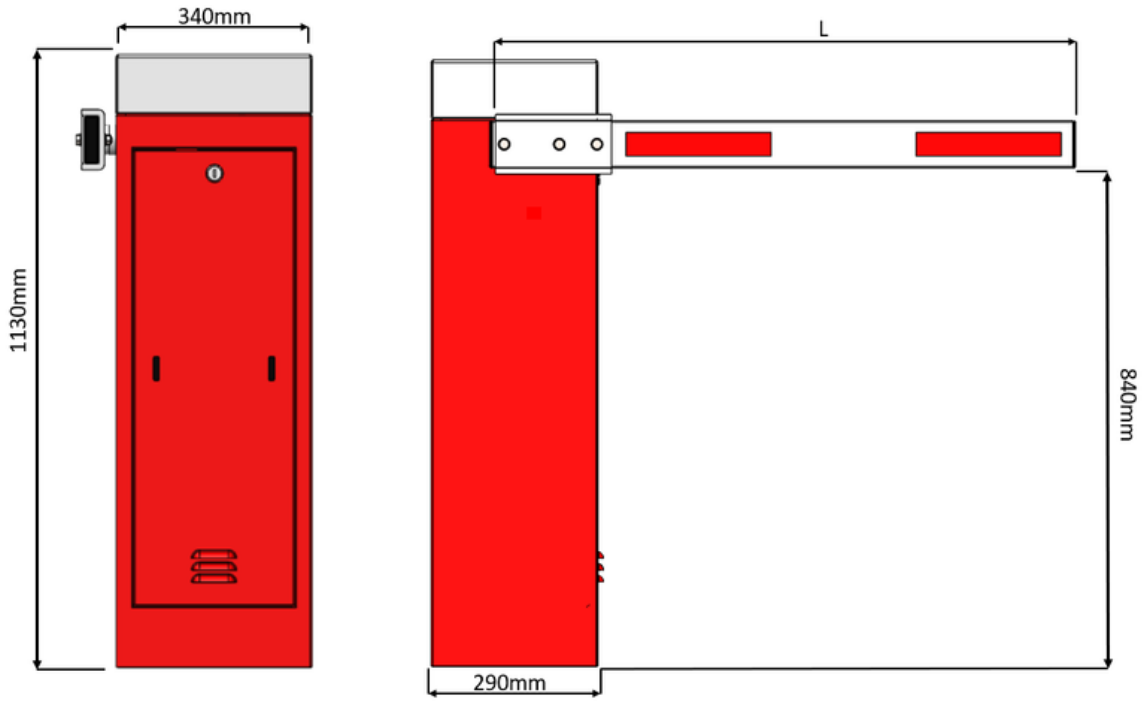
4.5 Technical Data

Standard Units	**DKB2500**	**DKB3000**	**DKB3500**	**DKB4000**	**DKB4500**	**DKB5000**	**DKB6000**
Boom Length in mm	2500	3000	3500	4000	4500	5000	6000
Mechanism	Automatic						
Drive	24V BLDC Motor						
Opening Closing Time	1.5 - 5 sec						
Power Supply	230 V AC						
Power Consumption	40 W						
Frequency	50-60 Hz						
Duty Cycle	100%						
Control Unit	Microprocessor Based						
Housing Dimension in mm	340 x 290 x 1030 mm						
Housing	Galvanized steel with powder coating Housing RED and Top WHITE						
Degree of Protection	IP 54						
Operative Option	Push Button, Remote Control, Loop detector (Single and Multi-channel), Photoelectric sensor, illumination strip red/ green and Radio Frequency Identification (RFID)						
In case Of Power Failure	Open / Close option with Mechanical Option						
Certification	CE certificate						
MCBF	5 million Cycles						
Temperature	-30 to +55 °C						
Weight in Kg	60	61	61.5	62	62.5	63	65

4.6 Technical Details



1	Top cover	2	Housing
3	BLDC 24V DC Motor	4	Spring for balancing boom
5	Control board	6	Boom holding plate
7	Emergency brake lever	8	SMPS
9	MCB 6A		Floor fixing SS 304 plate



Boom length

SL NO	Model	Length(mm)
1	DKB-2500	2500
2	DKB-3000	3000
3	DKB-3500	3500
4	DKB-4000	4000
5	DKB-4500	4500
6	DKB-5000	5000
7	DKB-6000	6000

5 Function Description

- Boom Barriers serve as control a vehicle traffic. By raising and lowering of the barrier boom the passage is granted or obstructed.
- For a boom length of 4,000mm we recommend the use of a fixed or swinging support.
- 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. Safety devices (photoelectric barriers, light curtains, etc.) must be installed on-site. The safety devices and induction loops must ensure that the barrier danger area is clear before the barrier closes.

6 Installation

Installation must be carried out by expert qualified personnel and in full observance of regulations in force.

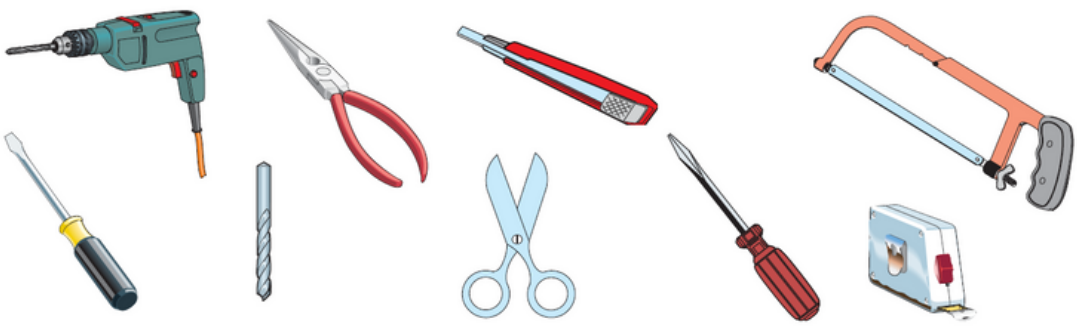
6.1 Preliminary checks

Before proceeding with the installation, it is necessary to:

- Make sure the area selected for the mounting of the base and for the unit itself presents no hazards.
- Provide for suitable omnipolar disconnection device with more than 3 mm between contacts to section power supply.
- Connections inside the case made for protection circuit continuity are allowed as long as they include additional insulation with respect to other internal drive parts.
- Install suitable tubes and ducts for electric cable passage to guarantee protection against mechanical damage.

6.2 Tools and materials

Make sure all tools and materials necessary are within reach to install the edge in maximum safety, according to regulations in force. The following figure illustrates the minimum equipment for the installer.



6.3 Tools

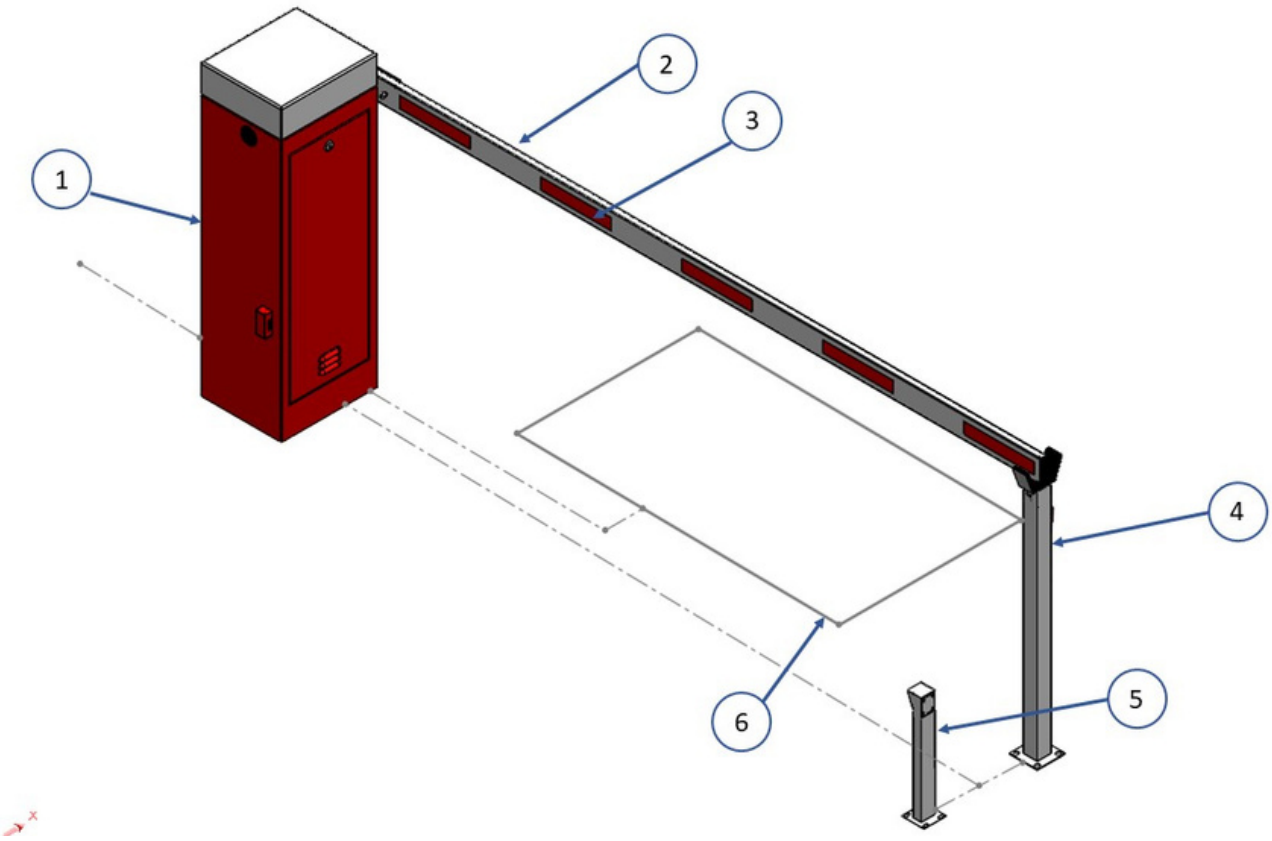
6.3.1 Standard tools

- Screwdriver (crosshead)
- Screwdriver (slotted): electrical connection
- Allen wrench key set with extension
- Hexagon socket screw key set
- Wire stripper
- Crimping tool for wire sleeve and tube terminals

6.3.2 Installation tools

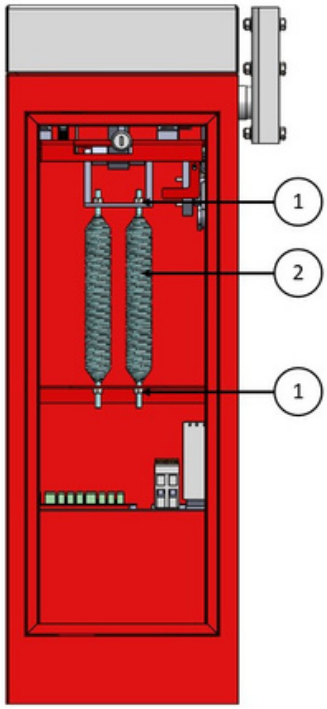
- Percussion drill
- Stone drill Ø 8mm + 12 mm
- Spirit level
- Measuring tape 5m
- Drilling machine with agitator
- Knife

6.4 Standard installation



1	Barrier	2	Boom
3	Reflecting tape	4	Swing support
5	Photoelectric sensor	6	Loop detector

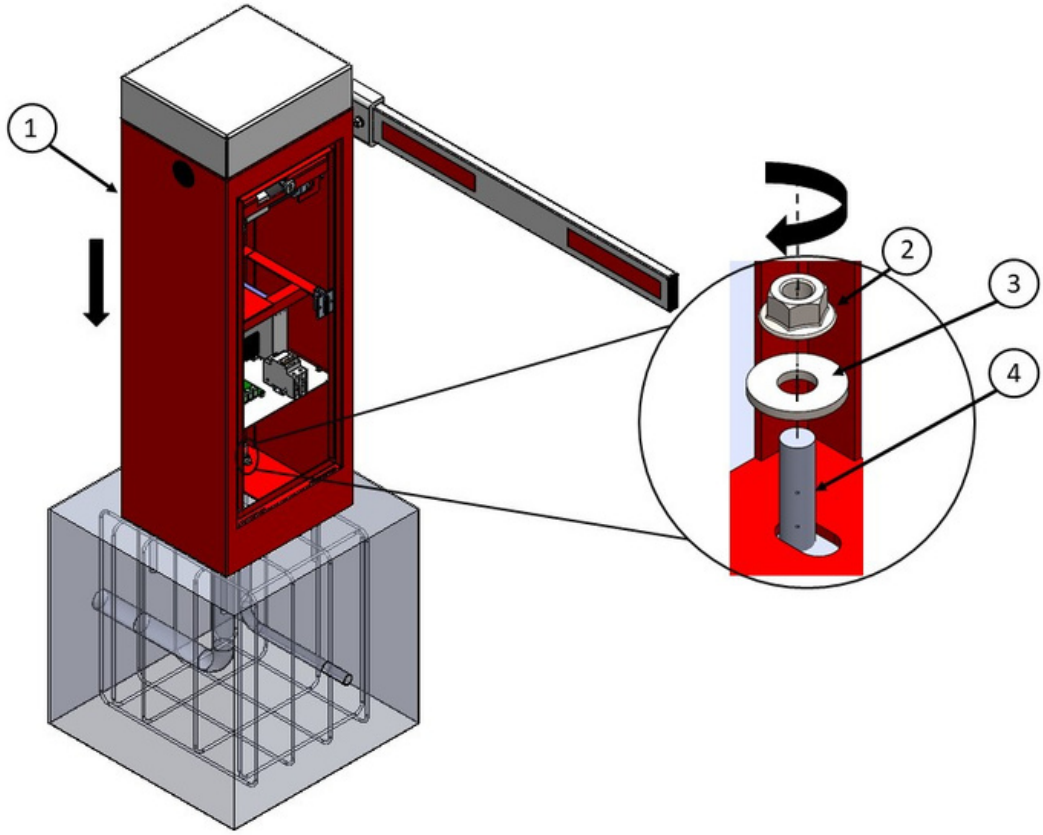
6.5 Boom Balancing



1	M8 Nuts are in both side of the springs	2	B Springs

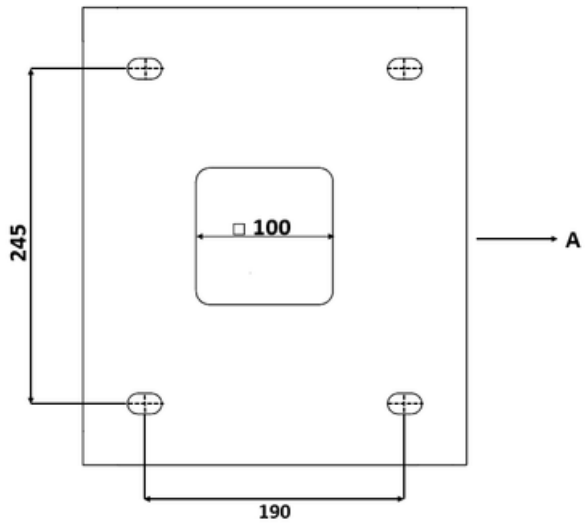
Model	Coil Dia -4 qty	Coil Dia- 4.5 qty	Coil Dia- 5 qty	Total Spring
DKB-2500	1	-	-	1
DKB-3000	2	-	-	2
DKB-3500	1	1	-	2
DKB-4000	1	1	-	2
DKB-4500	-	2	-	2
DKB-5000	-	1	1	2
DKB-6000	-	-	2	2

6.6 Floor fixing



1	Barrier	2	M12 nut
3	M12 Washer	4	Anchor bolt M12

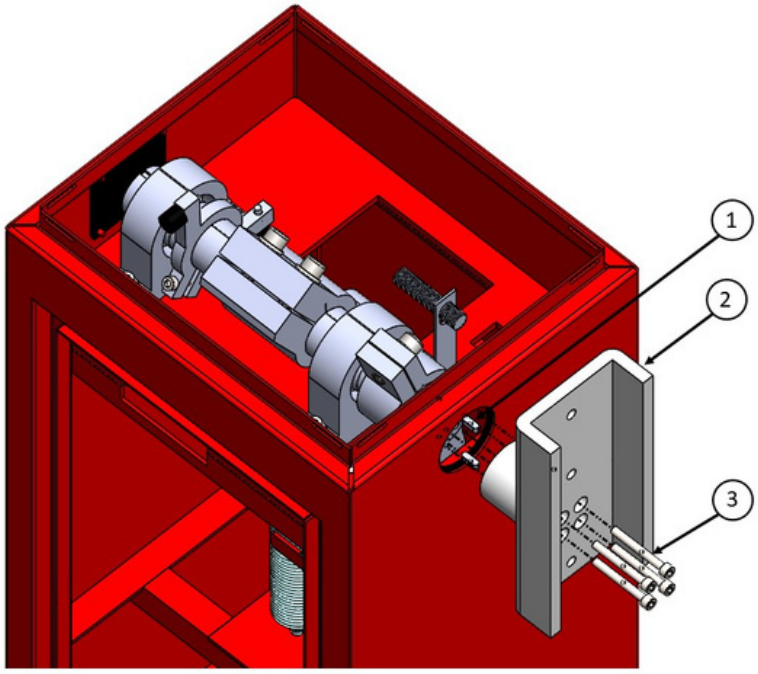
6.7 Drilling template



- Fastening point(245X190)
- Cable routing 100
- A – Direction of road

6.8 Boom Installation

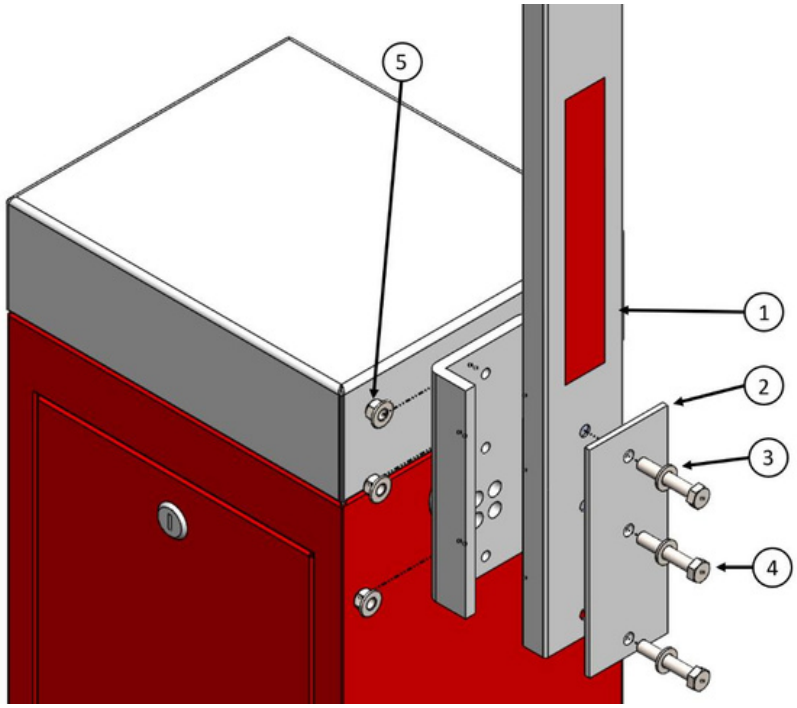
6.8.1 Boom Holder installation video



1	5mm Key	2	Boom Holder
3	M6X50 Allen cap screw		

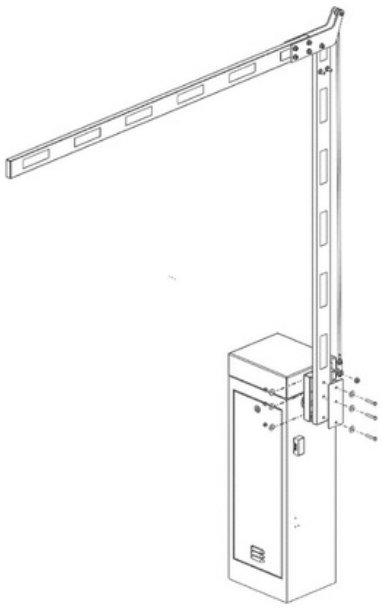
Insert the two keyways in main shaft and insert the boom holder then tighten the M6X50 Allen cap screw 20NM torque.

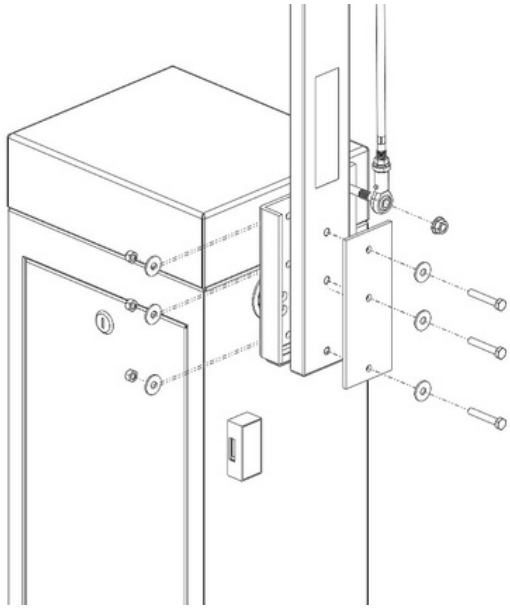
6.8.2 Boom Fixing



1	Boom	2	Boom Holder Plate
3	M8 Washer SS	4	M8X50 Hex bolt SS
5	M8 Nylock Nut SS		

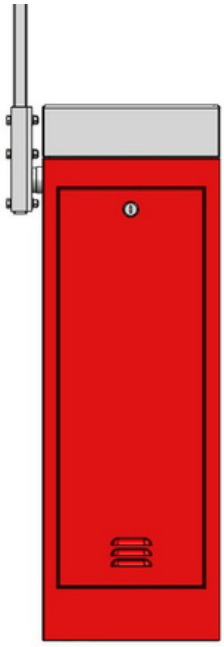
6.8.3 Articulated boom fixing



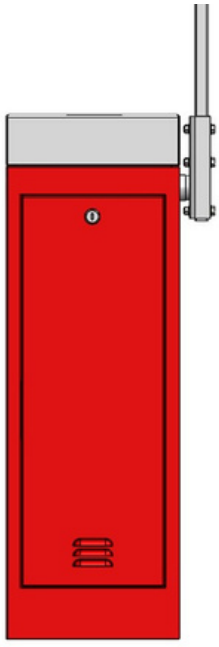


6.9 Right-handed/left-handed Boom

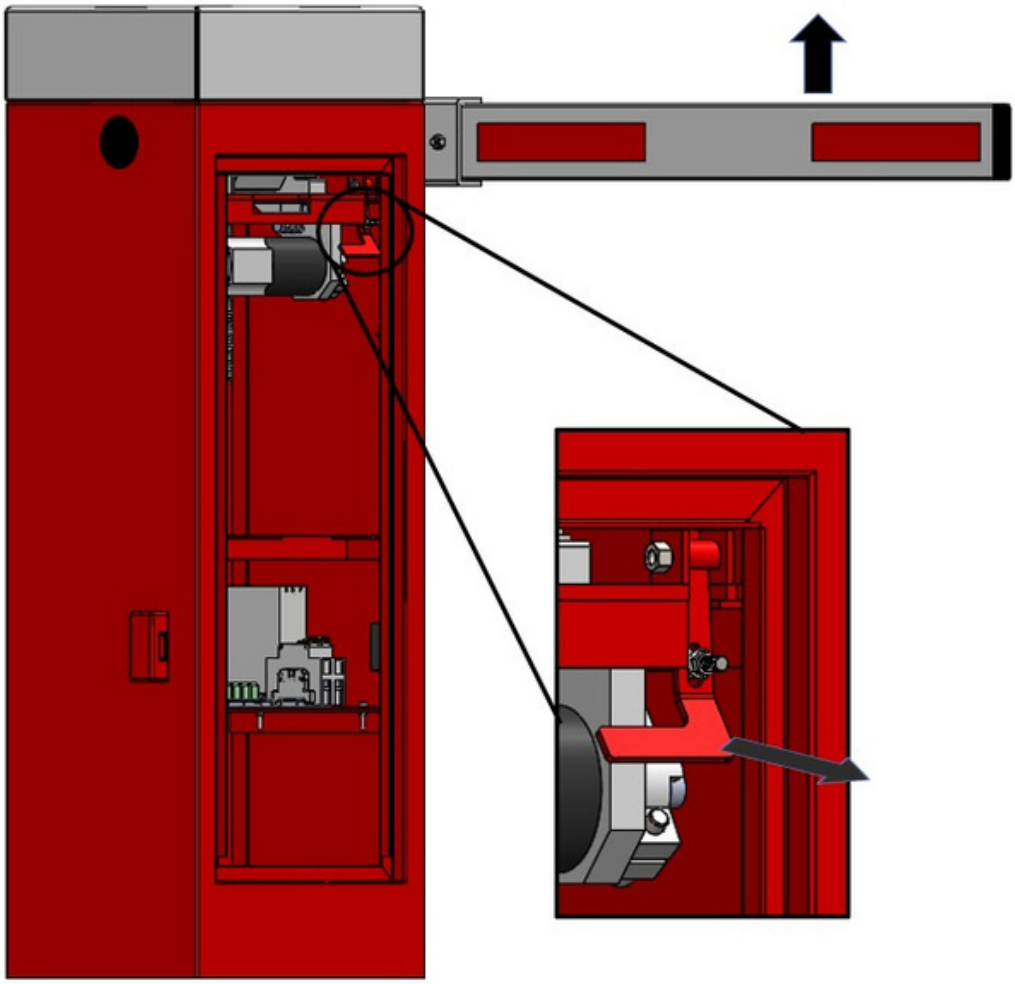
Right-handed barrier



Left-handed barrier



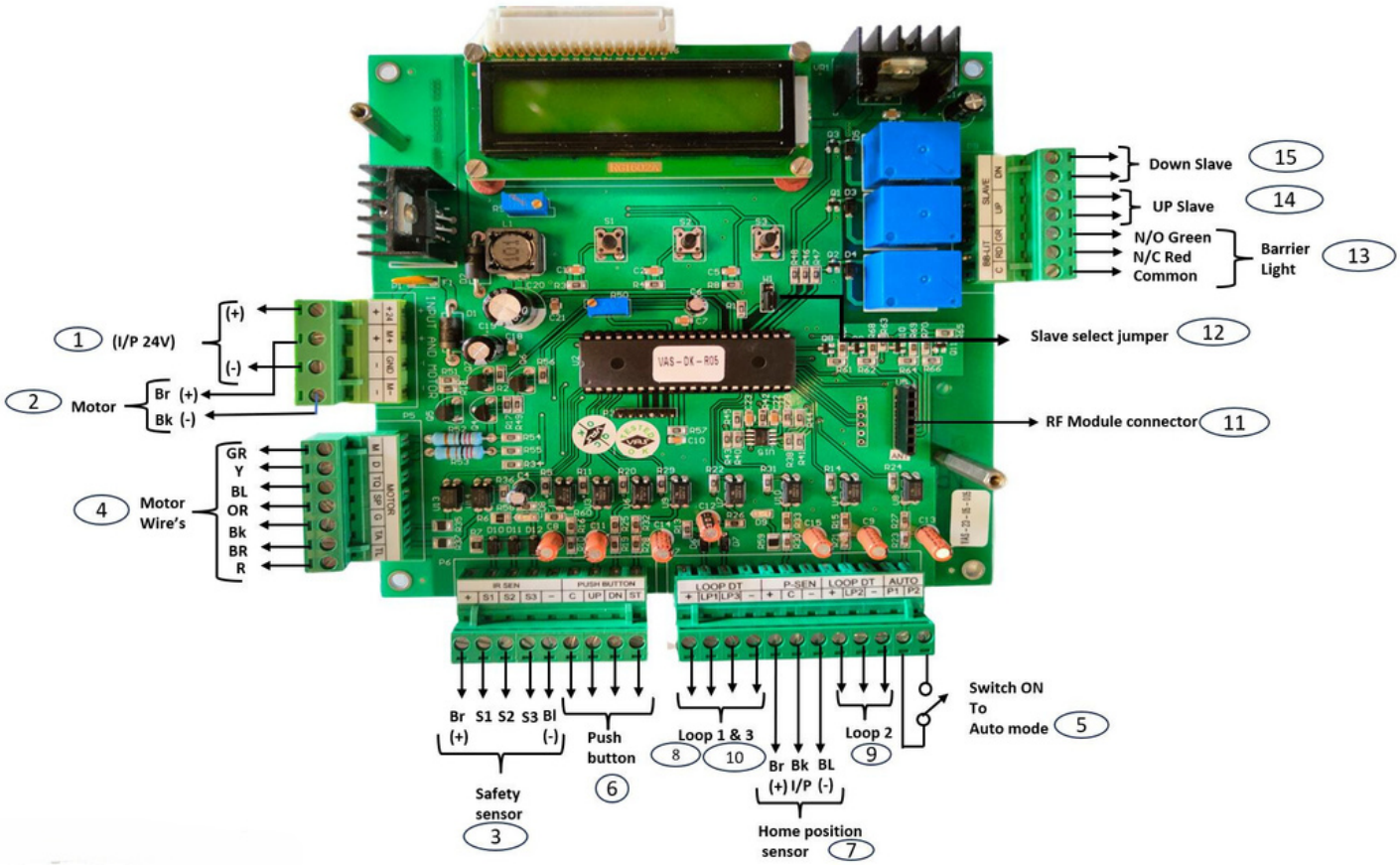
6.10 Emergency release



During a power failure, unlock the barrier by pulling the lever. Now the barrier boom can be moved by hand in the direction of "open".

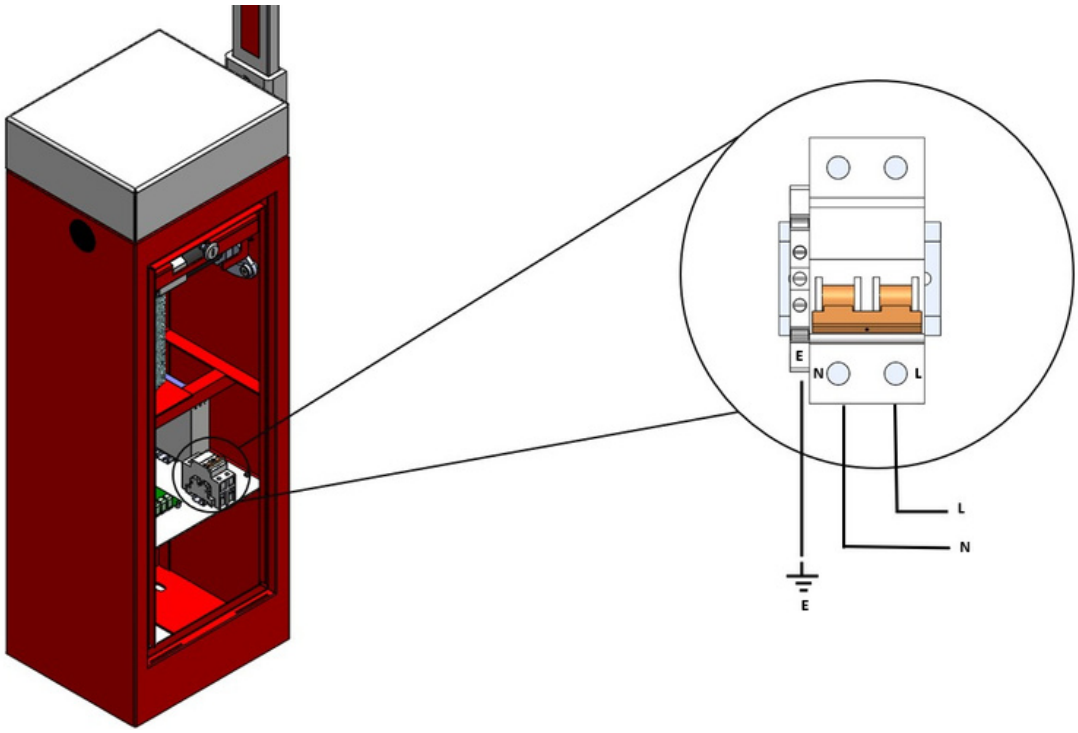
7 Control board details

7.1 Wiring details



1.24V (+) / I/P (-)	SMPS Output to board input.
2. Motor	BK-Black(+), BR-Brown(-) Connect the wire's.
3. IR Sensor	BOOM Safety sensors.
4.Motor wire's	As per color code has to connect. GR-Green, Y-Yellow, BL-Blue, OR-Orange, BK-Black, BR-Brown.
5. Auto Mode	24V(+) connect for Switch on to Auto Mode.
6. Push button	Manual Open, Close, and Stop.
7. Low-level sensor	Home position sensor.
8. Loop 1	Entry access connection. Like the Card reader Module.
9. Loop 2	Vehicle safety PNP Sensor
10. Loop 3	Loop Detector Module
11. RF Module connector	Plug in the remote control module
12. Select jumper	Covert a Master to slave Program
13.Barrier Light	Boom Light Connection, NO-Green Light, NC-Green Light
14.UP Slave	From Master. Slave push-button UP to UP Slave connection
15.Down Slave	For Slave. Master push button Down to Down Slave

7.2 Power source



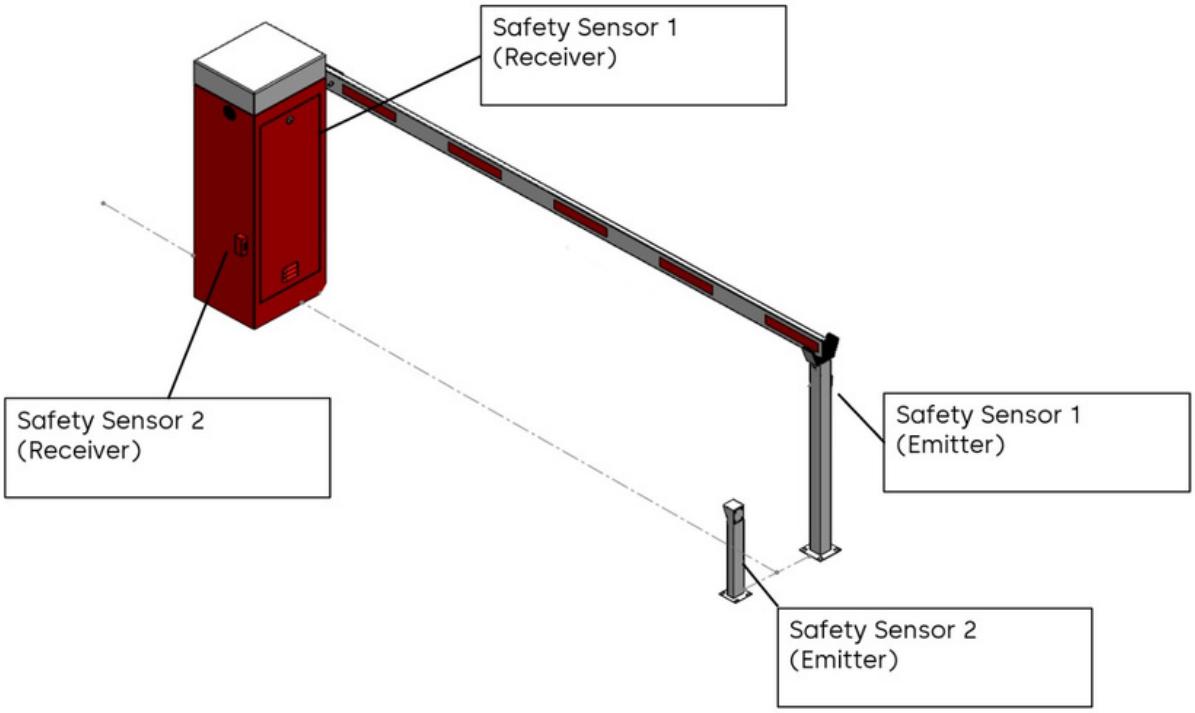
Danger: Electricity, Electrical Hazard

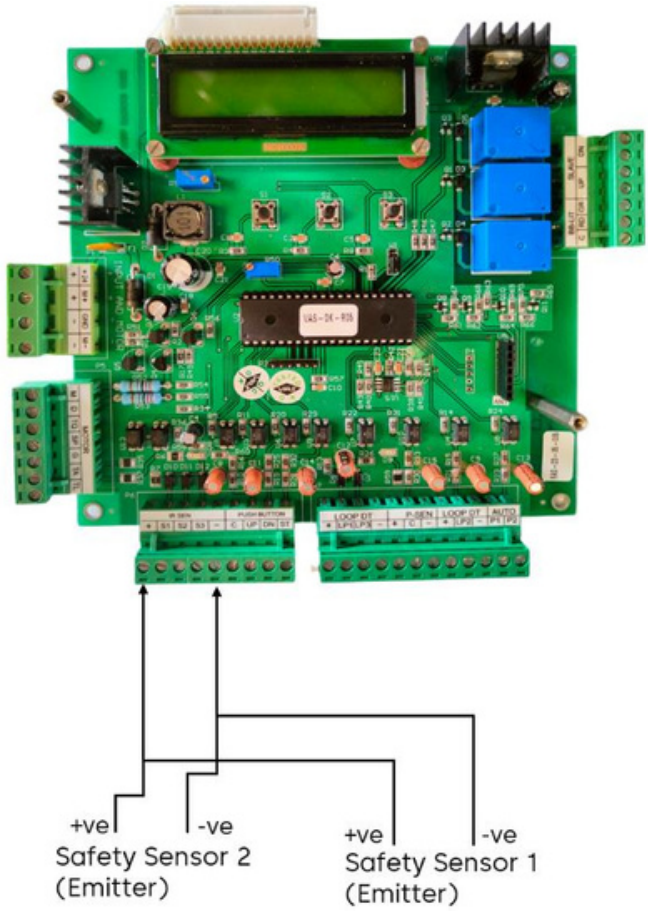
1. Risk of electric shock
2. Switch off the power supply
3. Check for the absence of power

Powered by 230V AC, 50/60 Hz.

L- phase
N- Neutral
E- Earth

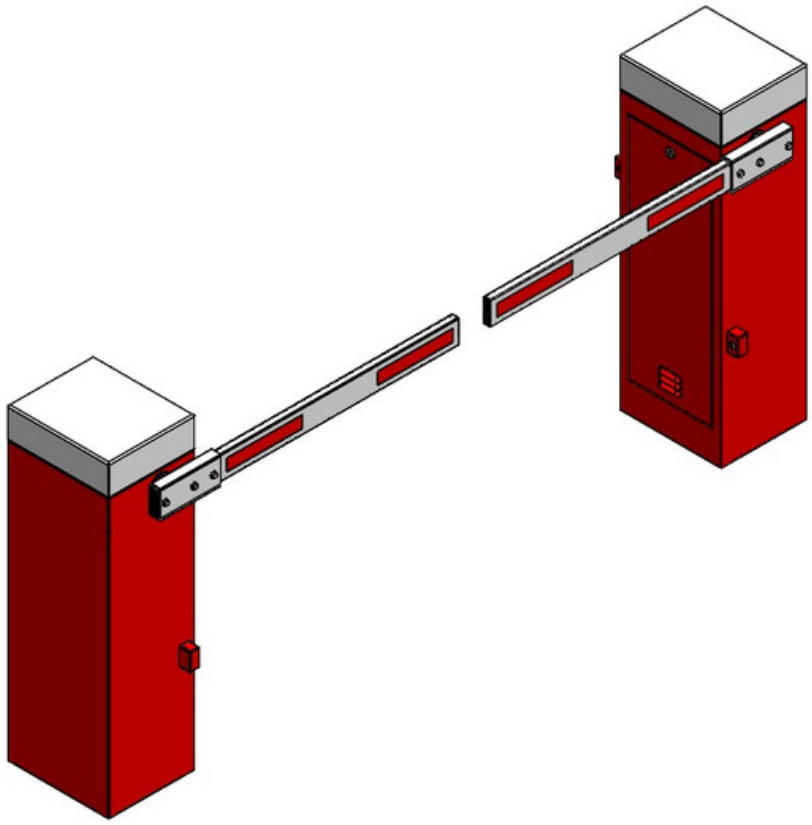
7.3 Safety sensor connection





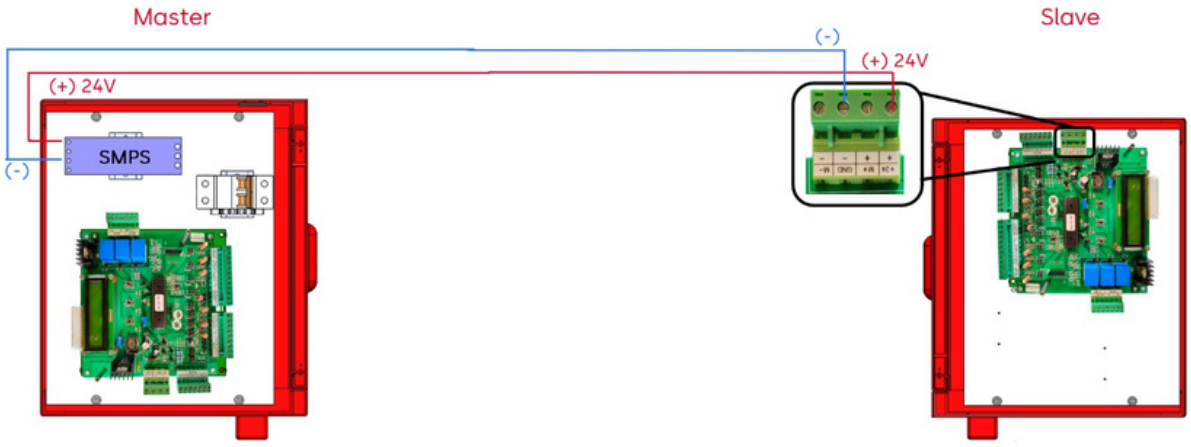
Safety sensor connection

7.4 Synchronized Boom Barrier

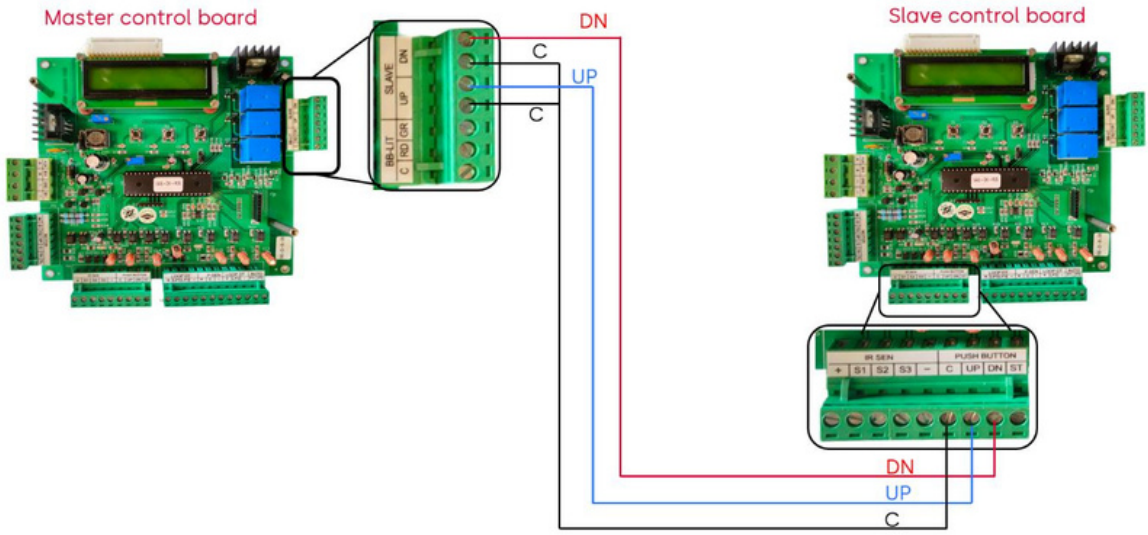


7.4.1 Synchronized Boom Barrier Wiring

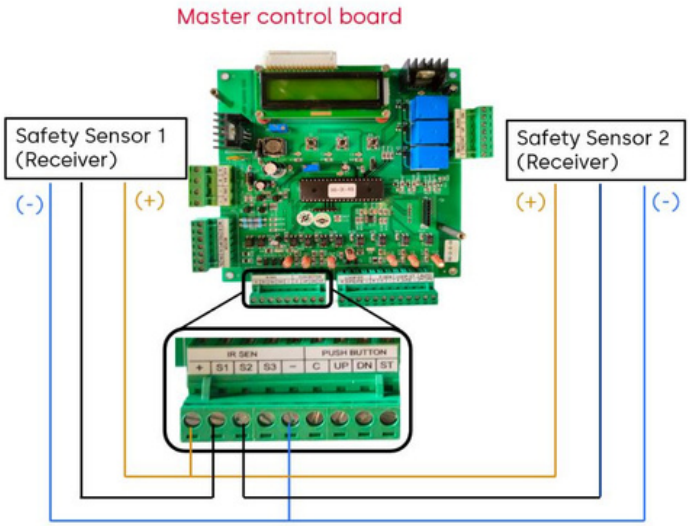
Master-to-slave Power wiring

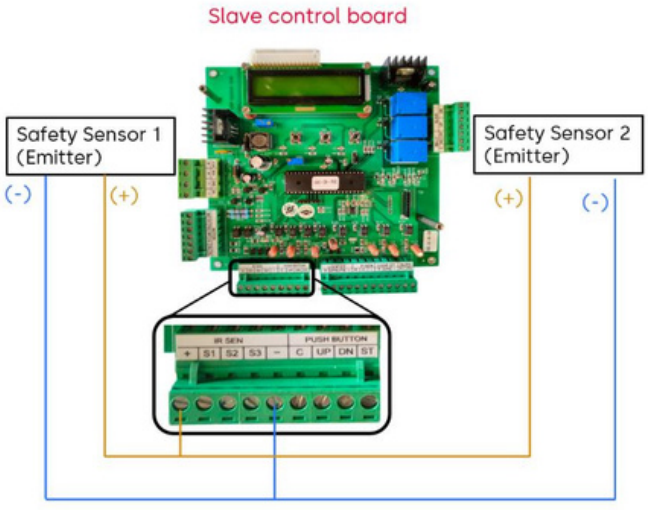


Master-to-slave communication wiring

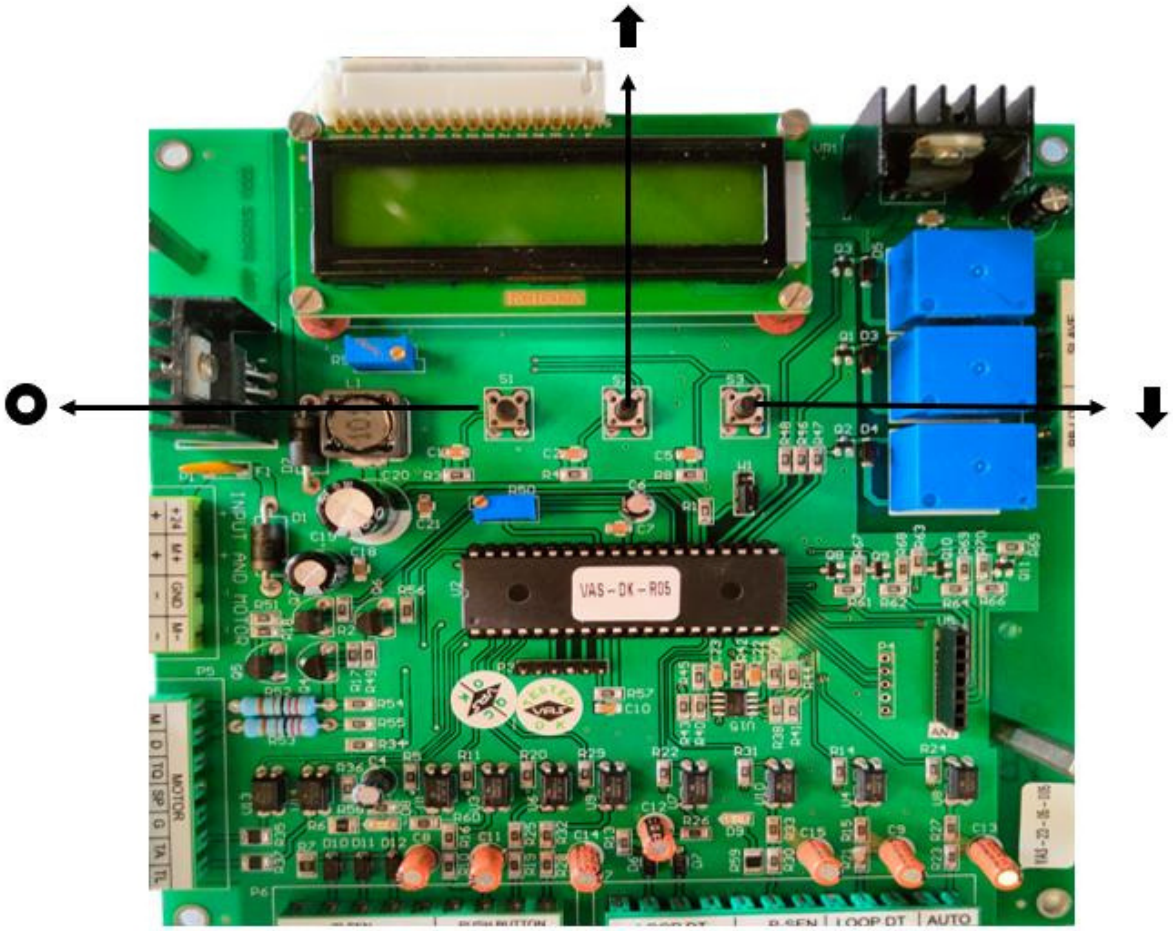


Master and slave Safety sensor wiring



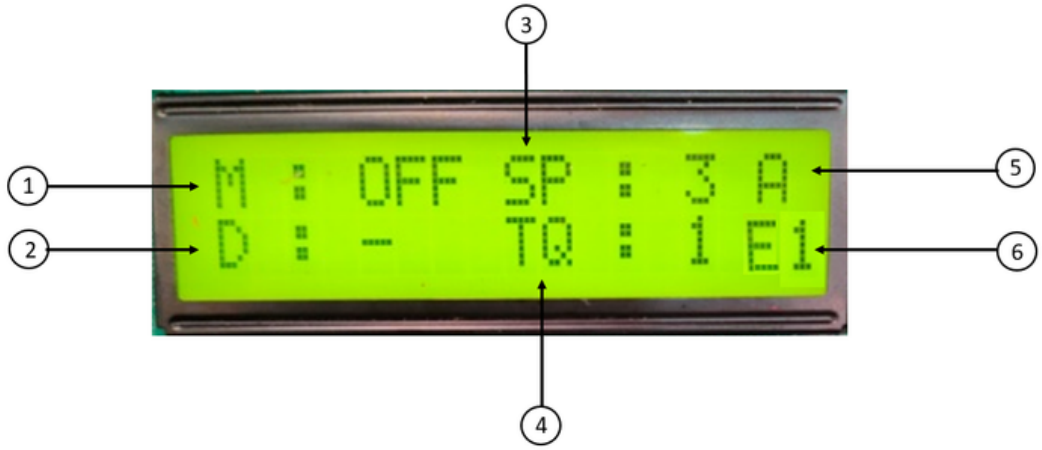


7.5 Programming Setting Details



- Mode selection — Press for mode selection
- UP — Press for up
- DOWN — Press for Down

7.6 Display Details



1. **M : ON/OFF** ON/OFF M means motor, ON/OFF is motor status ON or OFF.
2. **D**: UP/DN D is Direction, Motor rotating direction UP or Down.
3. **SP** : 1-5 SP-Speed level, Control the speed 1-5, 1– Very slow Speed, 2 – Slow speed 4– Medium Speed, 4 – High Speed & 5 – Full Speed.
4. **TQ** : 1-5 Torque level, control the Torque 1-5, 1 – Full Torque, 2 – High Torque 3 – Medium Torque, 4 – Low Torque & 5 – Zero Torque.,
5. **A & M** M is Manual mode. A is Auto mode. To connect 24V(+).
6. **E1** Means error

7.7 Programming Setting

Boom Length(mm)				
2500	CW	Speed: 5	Torque: 5	Angle: 190°
3000	CW	Speed: 5	Torque: 5	Angle: 190°
3500	CW	Speed: 4	Torque: 4	Angle: 190°
4000	CW	Speed: 4	Torque: 4	Angle: 190°
4500	CW	Speed: 4	Torque: 4	Angle: 190°
5000	CW	Speed: 3	Torque: 3	Angle: 190°
6000	CW	Speed: 3	Torque: 3	Angle: 190°

- As per Boom length must program by following simple steps. Press the mode selection button.
- In Display it shows UP DIR: CW, should be CW. Again, press the mode selection button.
- In Display its shows Speed Lev: 1-5, Following Table have to adjust ↑/↓ the speed using UP/Down button. Again, press the mode selection button
- In Display its shows Torque Lev: 1-5, Following Table 1 have to adjust ↑/↓ the torque using UP/Down button. Again, press the mode selection button
- In Display its shows M turn: 1°-190°, Following Table 1 have to adjust ↑/↓ the Angle using UP/Down button. Again, press the mode selection button
- E1-Error. Clear the error to press the center button.

7.8 Control parameter adjustment

The properties of the unit are defined by the parameters in the unit software.

The unit is pre-configured and fully functional upon delivery. In many cases, it is not necessary to set new parameters because the standard adjustments are sufficient.

Any customer-specific configurations must be preceded by a detailed technical assessment.

Any subsequent modifications or extensions can be implemented by a service partner.

7.9 Behavior upon commissioning

The boom leaves are adjusted automatically during initial operation. The boom leaves move into the configured standard position.

7.10 Behavior in the event of a power failure

In the event of a power failure, the boom leaves can be moved in down directions. The boom leaves remain in the home position that they were in when the power failure occurred.

7.11 Behavior when power is restored

The boom leaves are adjusted automatically when power returns. The boom leaves move into the configured standard position.

8 Maintenance

8.1 General maintenance information

CAUTION

Risk of injury due to technical faults.
Technical faults can result in uncontrolled movements of the unit. Faults on electrical units can also result in an electric shock.

- Before maintenance work, disconnect the unit from the power supply.
- Maintenance work must only be performed by technically qualified personnel.

Technical maintenance is required at least once a year but after 100,000 cycles at the latest.

- In addition to the routine function checks, maintenance also includes cleaning the unit.
- All bearings are lubricated for life and do not require relubrication.
- We recommend that the expert inspection be conducted as part of maintenance.
- Once maintenance work has been completed, reset the maintenance counter.

When checking the functions, trigger each function and carry out a functional process (see Operating modes and functional sequences).

8.2 Cleaning

8.2.1 Cleaning outside of the barrier

WARNING

Risk of electric shock when cleaning
Risk of electric shock when cleaning with water.

1. Deactivate the unit before cleaning.

Cleaning intervals

The unit must be cleaned thoroughly at least once a year. Depending on the environmental conditions, it may be necessary to clean the unit at shorter intervals. Cleaning ensures that the surfaces stay clean, and no malfunctions arise from environmental factors. It is thus also necessary to remove dirt from the stainless steel as corrosion is also possible here.

Recommendations for protecting the unit

- Apply cleaning agents with a cloth.
- Do not use any abrasive cleaners.
- Follow the instructions of the cleaning agent manufacturer.
- Periodic maintenance to be carried out by the end-user is as follows: wipe clean the glass surface of the photocells.
- Check that the safety devices work properly; remove any obstruction.

8.2.2 Cleaning inside of the barrier

WARNING!

Risk of electric shock when cleaning

1. Risk of electric shock when cleaning with water.
2. Deactivate the unit before cleaning.

CAUTION!

Risk of Crush Hazard when cleaning

- When cleaning ensure all connections or proper
- Maintenance work must only be performed by technically qualified personnel

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Never clean the inside of the housing with steam or high-pressure cleaners.

Recommendations for protecting the unit

- We suggest checking the state of lubrication and tightness of the anchoring screws on the operator.
- We recommend that the expert inspection be conducted as part of maintenance.

9 Packaging

- Standard: individually packaged on the palette
- Other solutions are also possible depending on the project and customer requirements.

Packing list

The parts configuration depends on the order. One or more packing lists are provided with every delivery. A copy of the packing list is archived in the factory.

10 Transport

10.1 Transport 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 dormakaba immediately in the event of damage.

10.2 Load lifting

WARNING!

Risk of injury by lifting heavy loads!

- Lifting heavy loads may cause serious injuries.
- Never lift the barrier single-handedly.
- To lift the barrier, use a suitable lifting device.
- Wear suitable safety shoes.

11 Disposal

11.1 Disposing of the packaging

- All packaging materials used are environmentally friendly, recyclable and separated by type.
- Packaging materials must be disposed of in an environmentally friendly manner.
- Please consult with local waste management companies.

11.2 Disposing of old units

- Dormakaba units are fully recyclable.
- The regional and country-specific disposal regulations apply.
- Separate all materials by type according to the following criteria:
  - Steel
  - Stainless steel
  - Aluminium
  - Electrical and electronic components
- All parts must be disposed of by certified waste removal companies.

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