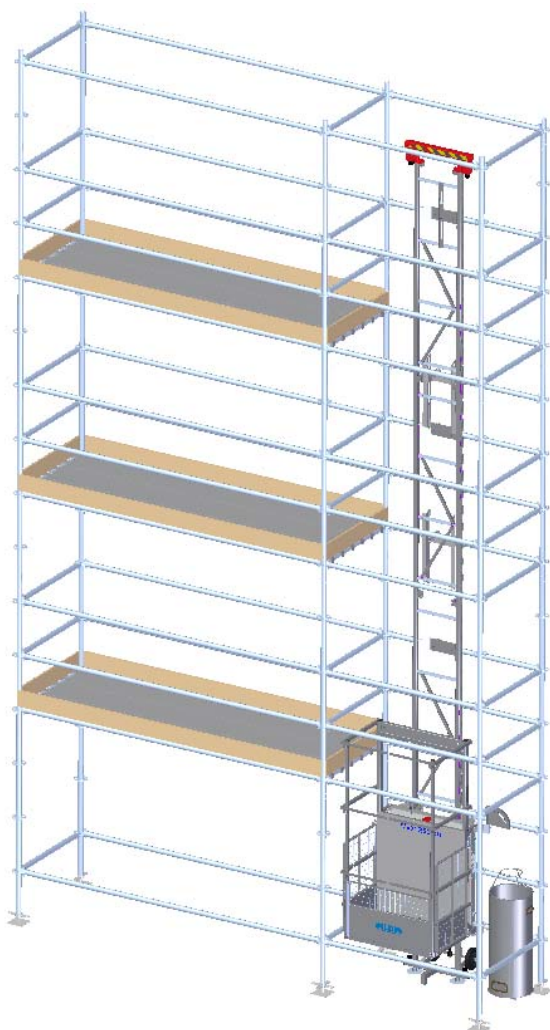


MC250

MATERIAL HOIST



Machine number:

Year of manufacture:

KEEP THIS MANUAL FOR FUTURE REFERENCE

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1. DESCRIPTION OF THE MACHINE

1.1. Introduction

Prior to erection and use, all users must read this manual. A thorough reading is recommended for full compliance with safety regulations.

This manual is delivered with the transport platform and its purpose is to give instructions for proper handling during transportation, erection and maintenance, in compliance with the provisions of EU Directive 2006/42/EC on safe machinery. This instruction manual deals with proper use of the machine as well as proper erection and maintenance.

The manufacturer reserves the right to modify the machine for improvements, so that differences may be found in some manual details. In any case, ALBA-MACREL GROUP, S.L. commits to immediately adapt the manual to the improvements.

Responsibility:

ALBA-MACREL GROUP, S.L. declines any responsibility for damages caused by improper use of the machine as a consequence of non-compliance with the provisions of the present Manual.

ALBA-MACREL GROUP, S.L. declines any responsibility for damages derived from:

- Failure to follow the rules contained in this manual.
- Improper use of the machine.
- The use of non-original spare parts mentioned in the applicable section of this manual.
- Modifications introduced without express authorisation from the manufacturer.
- Handling by personnel not trained for this purpose.

Only appointed trained personnel may use the machine and only qualified technical personnel acquainted with the machine may operate on any part of the same.

This manual must be available to the user at any time for any type of immediate consultation. In order to maintain it in perfect conditions, keeping always a copy close to the machine is recommended.

In any case, the manual is aimed at knowledge strengthening and as a reminder for the personnel, who must previously be well trained by engineers or supervisors, who at the same time must be very experienced in this machine operation.

1.2. General information

The rack and pinion hoist is based on the principle of geared motor transmission to a rack and pinion mechanism. Components are modular and easy to install. It is simple to use and safe for facade work or rehabilitation, significantly reducing the erection time and man-hours.

This machine has been designed for temporary installation on site, and must be used by skilled authorised personnel. Its main advantage is the ability to connect different building

floors for lifting or lowering materials in a fast and safe way. Below, please find the main points to bear in mind prior to erection and use of the machine.

- The hoist is designed for transporting **only loads**. It can be used for transporting materials during building construction, and also for hoisting scaffolding components for assembling scaffold structures.
- The machine runs vertically, geared to the mast rack and guided with support rollers.
- Loading and unloading operations must be carried out by trained personnel.
- Machine operation must be carried out by appointed personnel trained in hoist operation.
- The machine is designed to be fixed at suitable intervals to a load-bearing structure, mainly a scaffolding structure, or also the floor slabs of a construction site, a metal structure, or similar. ALBA-MACREL GROUP, S.L. includes in the machine manual all the information related to the loads transmitted to the vertical support structure and to the ground. It is the responsibility of the technicians at the installation site to ensure that both the support structure and the ground support the loads indicated by the manufacture.

WARNING SYMBOLS:



WARNING:

MAIN SAFETY INSTRUCTION DURING INSTALLATION OR OPERATION IS TO BE ENTERED IN TEXT BOXES LIKE THIS, INCLUDING WARNING SYMBOL (LEFT).

1.3. Technical data and safety systems

Standard carrier	Dimensions	900 x 500 x 900mm	36 x 20 x 36 in
	Maximum capacity	250 kg	550 lb
Carrier for scaffold parts	Dimensions	900 x 500 x 1800mm	36 x 20 x 70 in
	Maximum capacity	250 kg	550 lb
Easy access carrier	Dimensions	1320 x 810 x 1120mm	52 x 32 x 44 in
	Maximum capacity	200 kg	440 lb

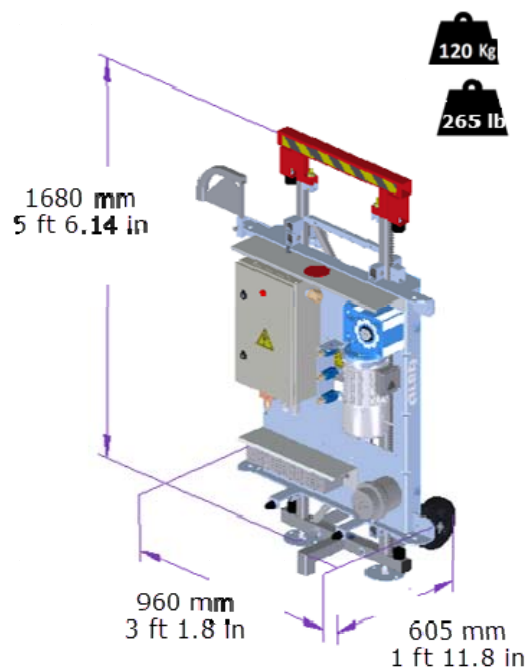
Vertical speed	20 m/min (65 ft/min)
Motor	3 phase 1,5kW 230V 50/60Hz
Maximum height	50 m (164ft) inquire about greater heights
Distance between mast anchorages	2 m (6 ft)
Distance between external anchorages (max.)	3 m (9 ft)
First anchorage (aprox.)	1 m (3 ft)
Noise emission value	> 70dB

SAFETY DEVICES

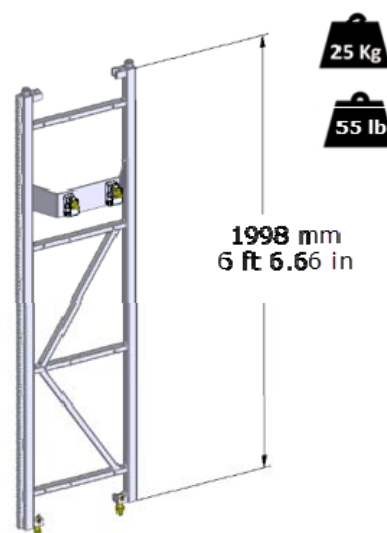
· Gearmotor with electromechanical brake	INCLUDED
· Overspeed parachute with auto-recovery system	INCLUDED
· Emergency lowering lever	INCLUDED
· LED for fault detection	INCLUDED
· Buffers at the ground base	INCLUDED
· Superior endtrack buffers	INCLUDED
· Superior / Inferior endtrack limit switch	INCLUDED
· Safety endtrack limit switch	INCLUDED
· Mast presence detector	INCLUDED
· Emergency stop	INCLUDED
· Kit for installation of 3 –intermediate stops in mast	OPTIONAL
· Base frame enclosure	OPTIONAL

1.4. Main components

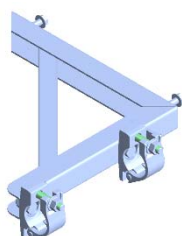
158.0V-USA BASE SET



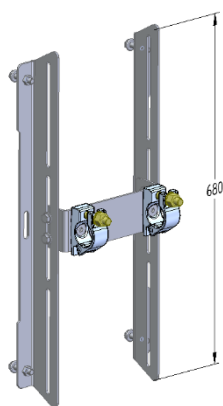
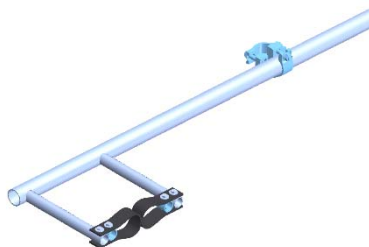
158.92 MASTIL MODULE 2m (78.74 in)



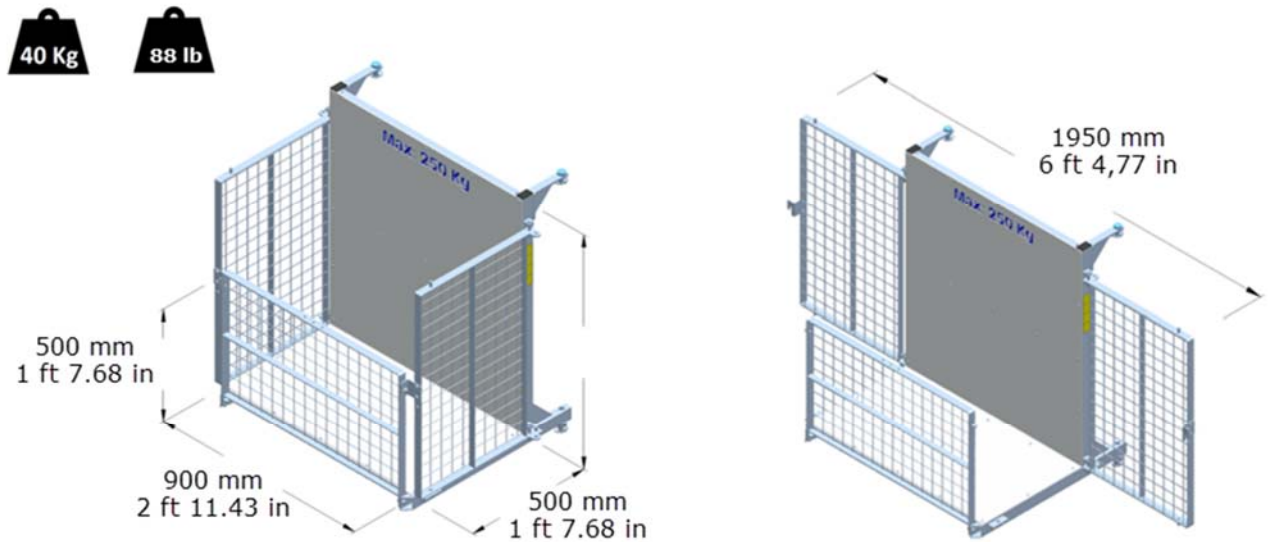
158.81 L ANCHOR



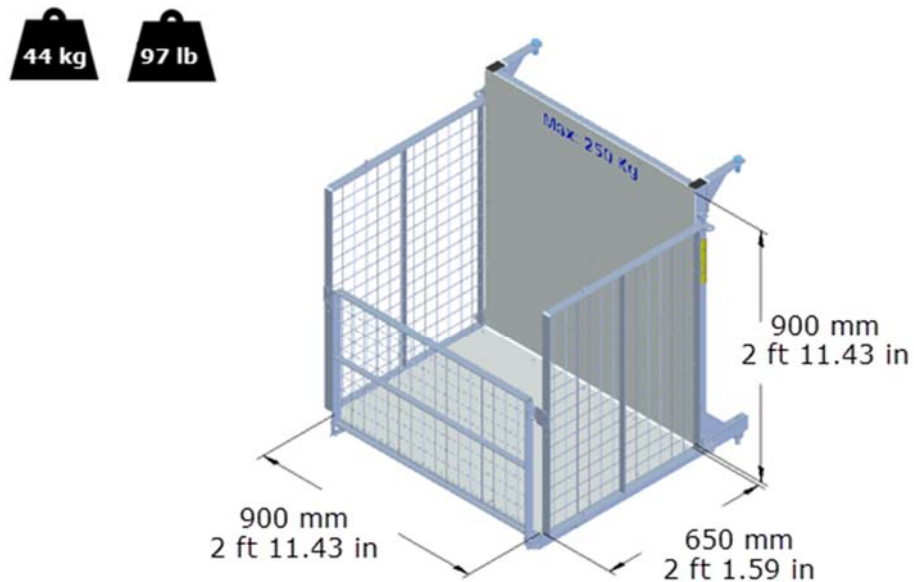
158.84 H ANCHOR

158.671 CABLE
GUIDE TYPE 1158.672 CABLE
GUIDE TYPE 2

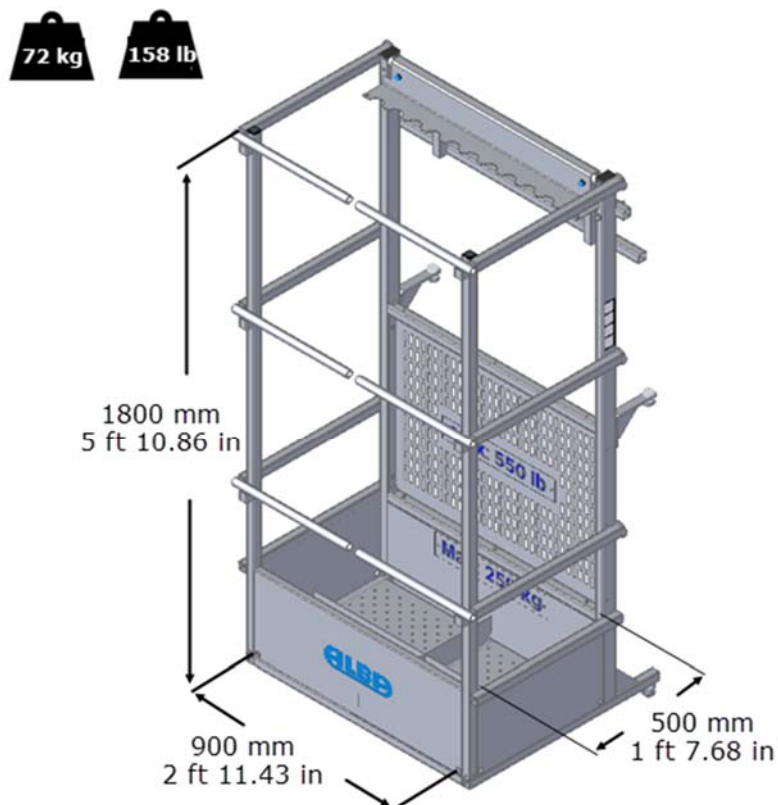
158.41LB STANDARD CARRIER 900x500mm
(35,43 x 19,68 in)



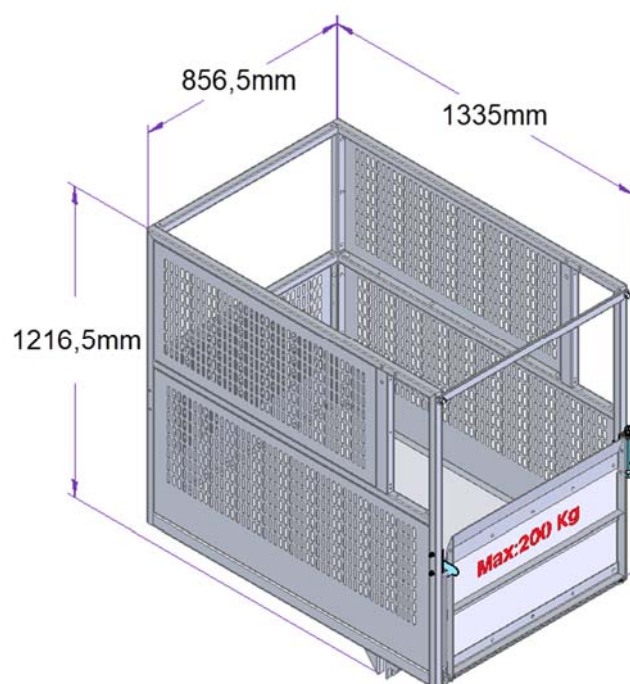
158.46LB SPECIAL CARRIER 900x650mm
(35.43 x 25.6 in)



158.42LB CARRIER FOR SCAFFOLD PARTS



158.40 ACCESSIBLE CAGE



1.5. Base set parts and safety system identification

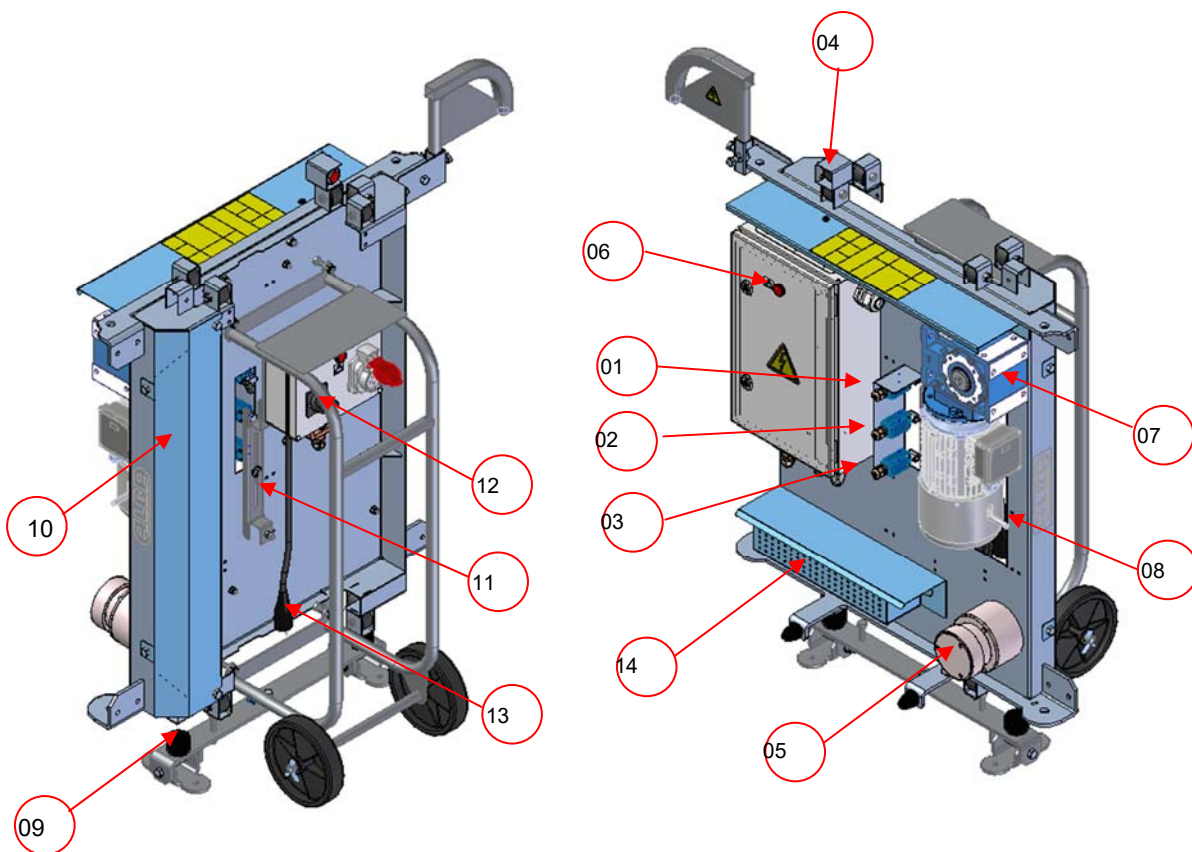


TABLA DE COMPONENTES GRUPO BASE

1	Superior endtrack limit switch	8	Emergency descent lever
2	Safety endtrack switch	9	Base buffers
3	Inferior endtrack limit switch	10	Pinion protection cover
4	Mast presence detector	11	Inferior endtrack limit cam
5	Safety brake parachute	12	General disconnect switch
6	Out of service red light	13	Electrical supply socket
7	Gearmotor with electromechanic brake	14	Resistance

1.6. Other instalattion data

Temperature range for use:	-15°C ÷ 45°C (5 ÷ 113°F)
Relative humidity:	30 % – 90 %
Max. altitude for installation:	1000 m (0.62 mi) (**)
Max. wind speed (SERVICE):	55 km/h (34 mi/h)
Max. wind speed (ASSEMBLY):	45 km/h (28 mi/h)
Max. wind speed (OUT OF SERVICE*):	130 km/h (80 mi/h)

(**) Case of installation in altitude over 1000 m (0.62 mi), and if ambient temperature is over 45°C (113°F), check for installation limits.

2. ASSEMBLY OF THE MACHINE

2.1. Introduction

The following section is dedicated to the safely assembly of the machine. The installation of the hoist can only be performed by qualified and authorized personnel.



WARNING:

To install the hoist protective equipment against falls from height (according to EN 358:2018, EN361:2002, EN364:1993) shall be used, and in any case a protective helmet for the head (according to EN397:2012), plus additional means of protection.



It is important to follow the instructions in detail, to avoid risks in the assembly and disassembly process. The user is obliged to observe, by himself, and for those working in the vicinity, all sources of additional risk, and to comply with all applicable safety standards for the type of equipment used.

2.2. Transport of the hoist

The transport of components of the hoist must be performed by competent persons. See chapter 1.4 to know weight and dimensions for handling.

2.3. Requirements on installation site. Requirements for ground support



WARNING:

Verify that the soil is capable of supporting the load transmitted by the hoist. See the table:

Height	Weight	Base frame + mast	Total load (static)	Total load (dynamic Cd: 1,7)
5 m (16 ft 4.85 in)	400kg (881 lb)	80 kg (176 lb)	480 kg (1058 lb)	760 kg (1675 lb)
10 m (32 ft 9.7 in)		140 kg (308 lb)	540 kg (1190 lb)	820 kg (1808 lb)
15 m (49 ft 2.55 in)		200 kg (440 lb)	600 kg (1322 lb)	880 kg (1940 lb)
20 m (65 ft 7.4 in)		260 kg (573 lb)	660 kg (1455 lb)	940 kg (2072 lb)
25 m (82 ft)		320 kg (705 lb)	720 kg (1587 lb)	1000 kg (2205 lb)
30 m (98 ft 5,1 in)		380 kg (837 lb)	780 kg (1720 lb)	1060 kg (2337 lb)

2.4. Requirements for the electrical connection

- Supply power: 208V to 228V 60Hz, 1 phase from a 20A circuit breaker. Use 220-228V on heights over 150 ft to compensate for voltage drops.
- Use 10/3 dedicated Power Cord with a maximum length of 200 ft to avoid large voltage drops.

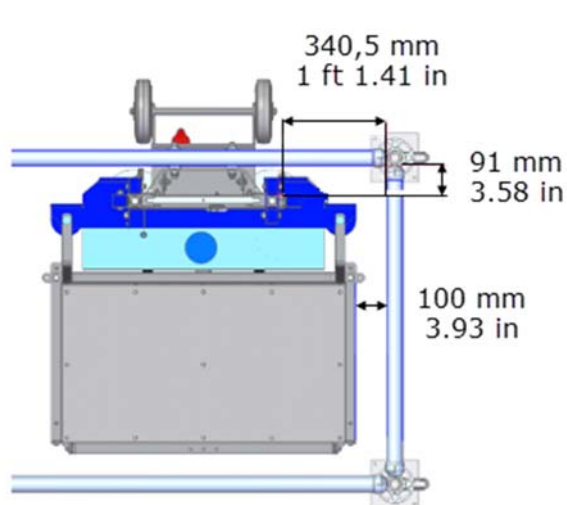
2.5. Erection of the hoist

2.5.1 Placement of the base machine

Pay special attention when moving the MC250 for positioning on the scaffolding. The MC250 has a front leg to give stability to the assembly:

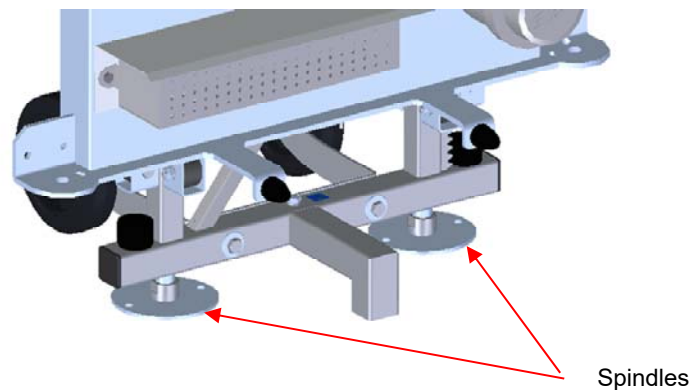


Place the hoist at the installation site:



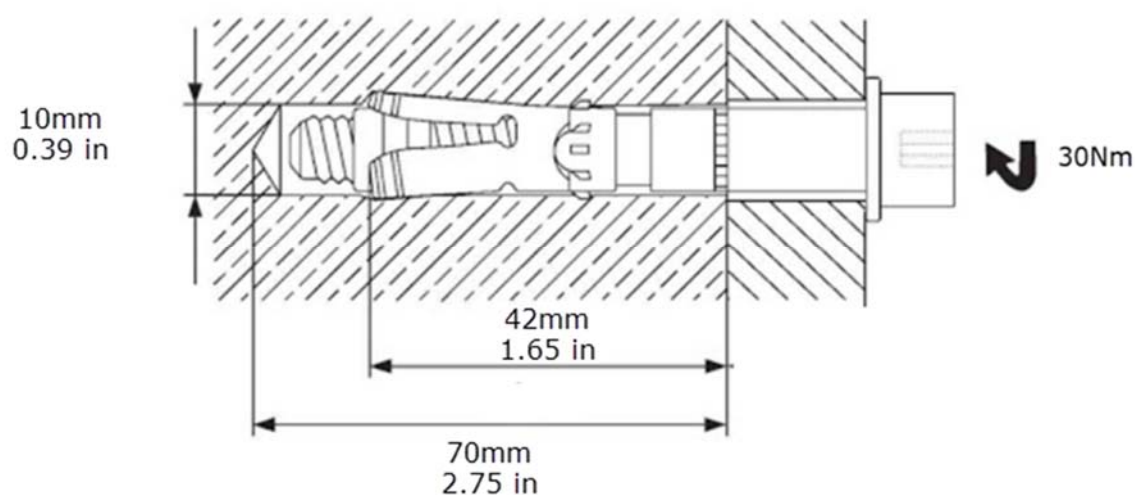
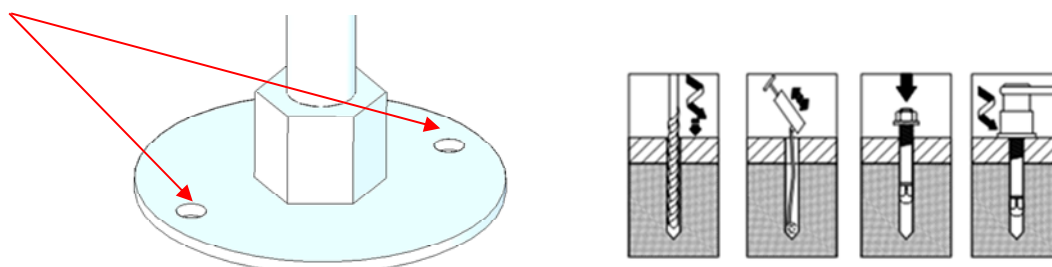
2.5.2 Adjusting the spindle and fixing the base to the ground

The MC250 has two regulation spindles at the base to ensure that the mast is vertical and parallel to the scaffold tubes.



Once the height is adjusted, we will fix the base to the ground by means of two anchoring spits that we will insert into the holes of the spindle base:

Anchoring points



WARNING:

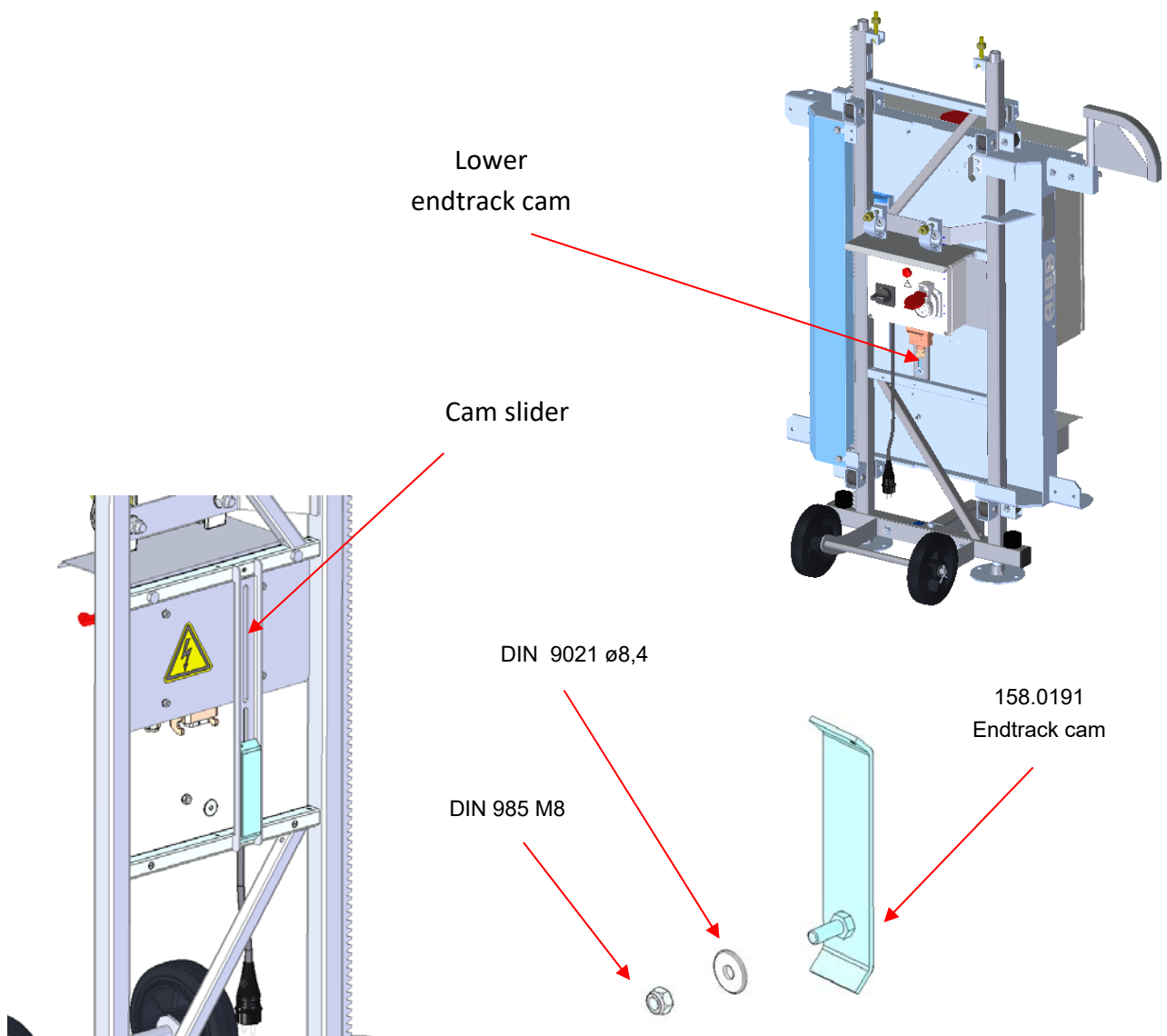
Fix the base to the ground to prevent the lift from slipping. If the anchoring it's not possible, first anchorage to structure shall be at 1 m (3 ft 3.37 in) aprox.

2.5.3 Fixing the hoist to the structure

**WARNING:**

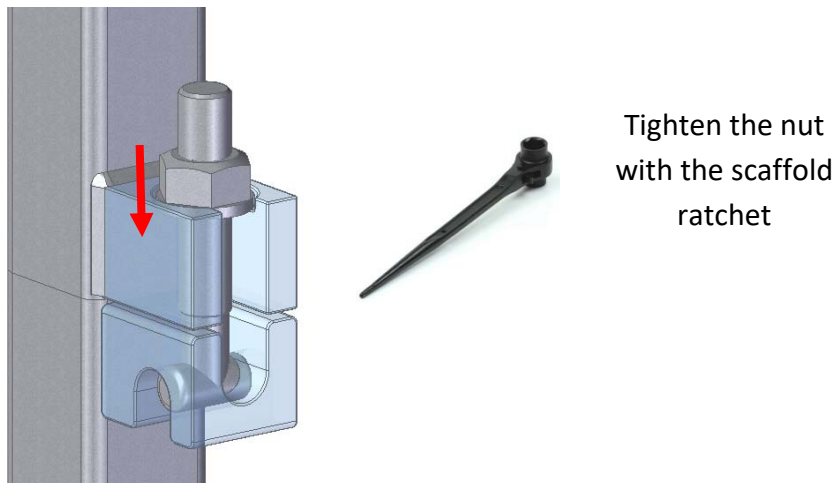
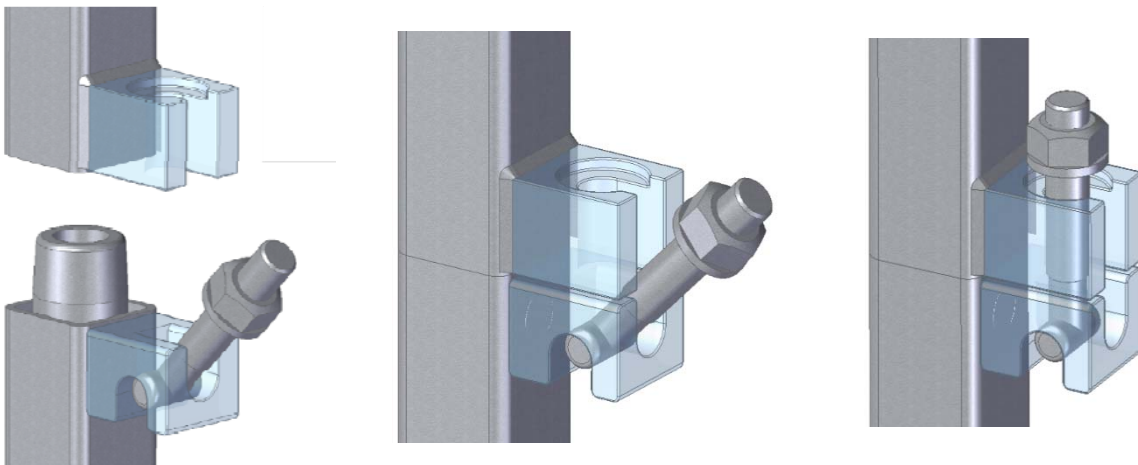
Once the hoist is fastened to the ground and perfectly vertical, it shall be anchored to supporting structure.

Before anchoring the MC250 to the scaffold check that the lower endtrack cam is positioned on the chassis. The cam slider is welded to the first mast, we must check that the cam is screwed to the slider.



2.5.4 Mast column erection

The masts are joined through two T shaped screws. The nuts of these screws have a notch that prevents them from loosening. Due to this the screw cannot be separated from the mast. The screws are tightened with the scaffolding assembly ratchet wrench:



WARNING:

When joining each pair of masts, check that the nuts are tight and that the assembly between masts is correct.

Replace the screws and nuts that show knocks or dents with new ones.

An incorrect mast joint could cause a serious accident.

2.5.5 First anchorage

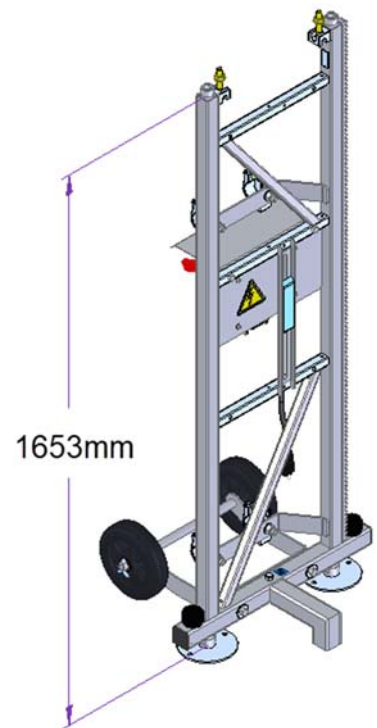
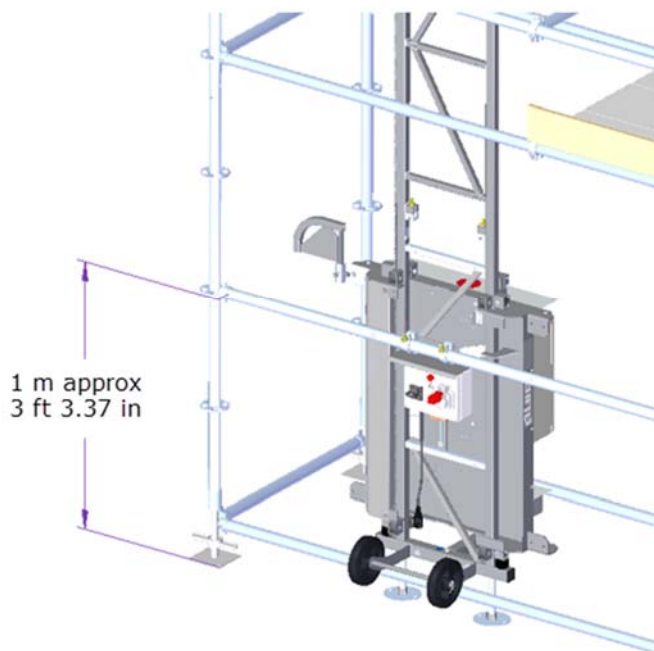
2.5.5.1 First anchorage of the mast (without external anchorages)

When we do not use external anchors, the first anchorage must be made with the clamps that the mast itself brings, at an approximate height of 1m (3 ft 3.37 in).



WARNING:

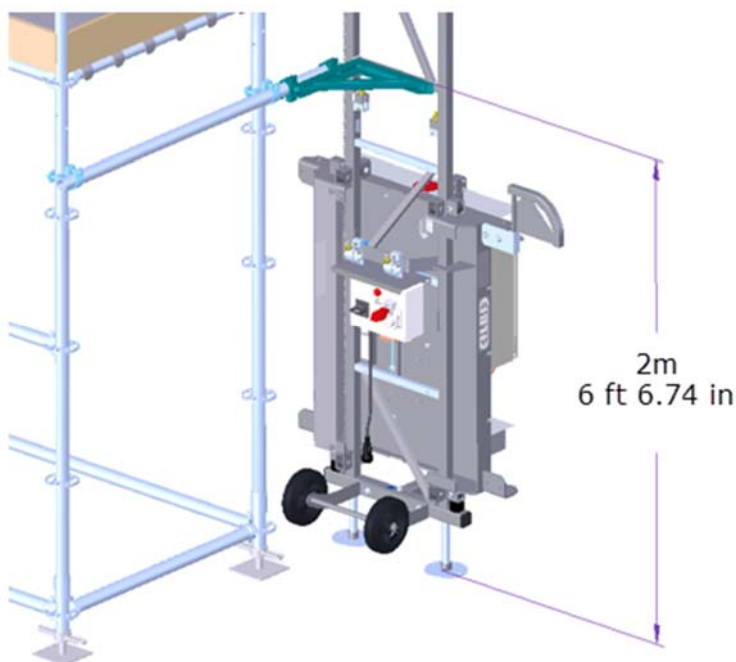
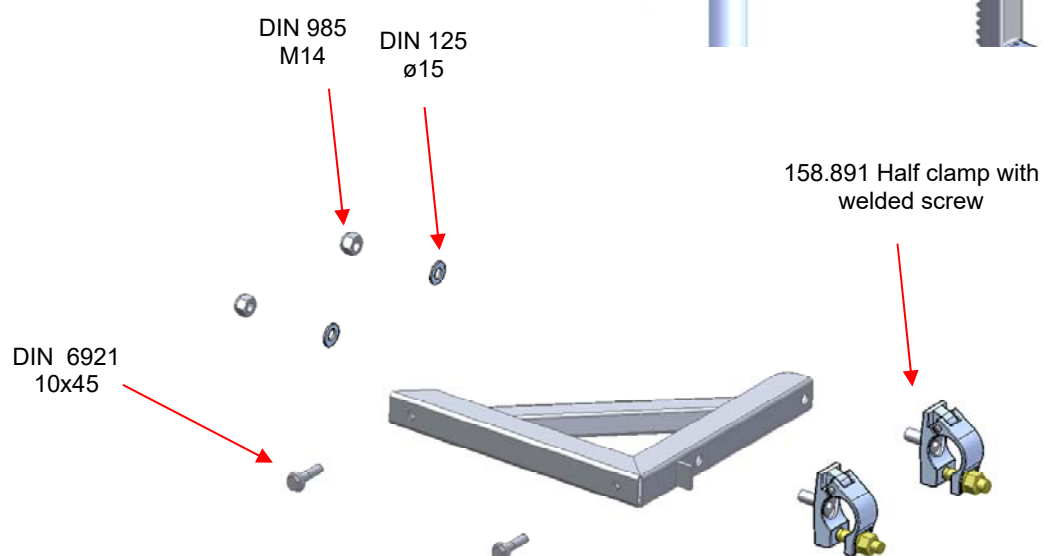
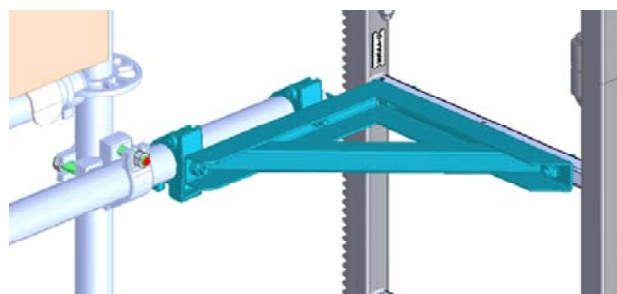
When we anchor the mast itself to the scaffolding structure, the anchor height will be approximately 1m (3 ft 3.37 in).



2.5.5.2 First anchorage L type (158.81)

**WARNING:**

When we use external anchorages the first anchor must be placed at a maximum distance of 2m (6 ft 6.74 in).

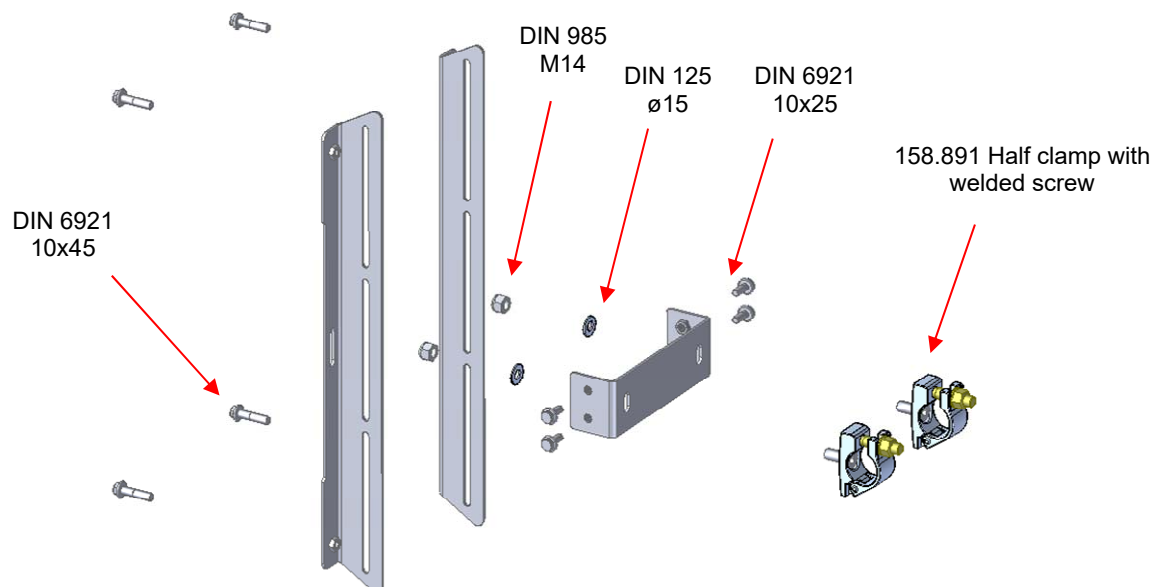
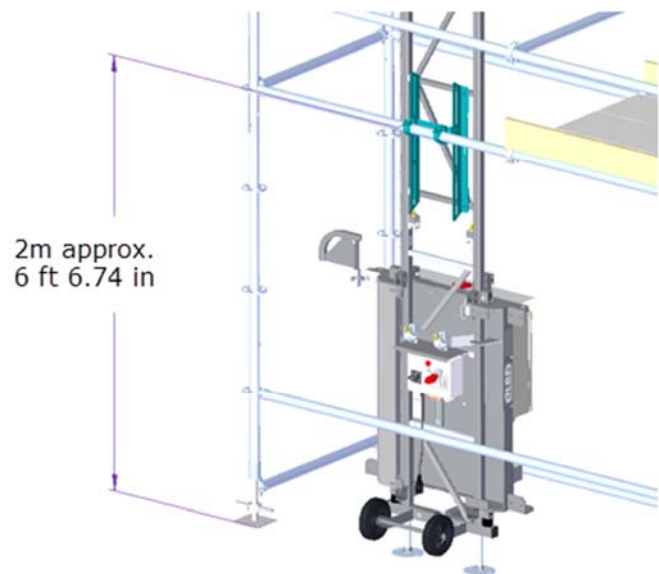
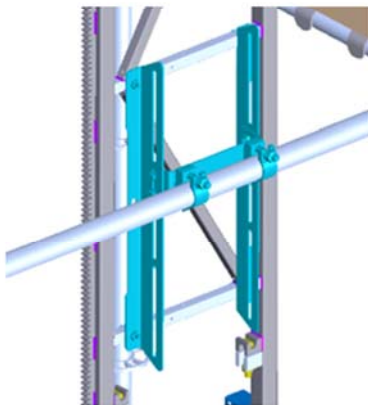
**40 N·m**

2.5.5.3 First anchorage H type (158.84)



WARNING:

When we use H type external anchorages the first anchor must be placed at a approximated distance of 2m (6 ft 6.74in).

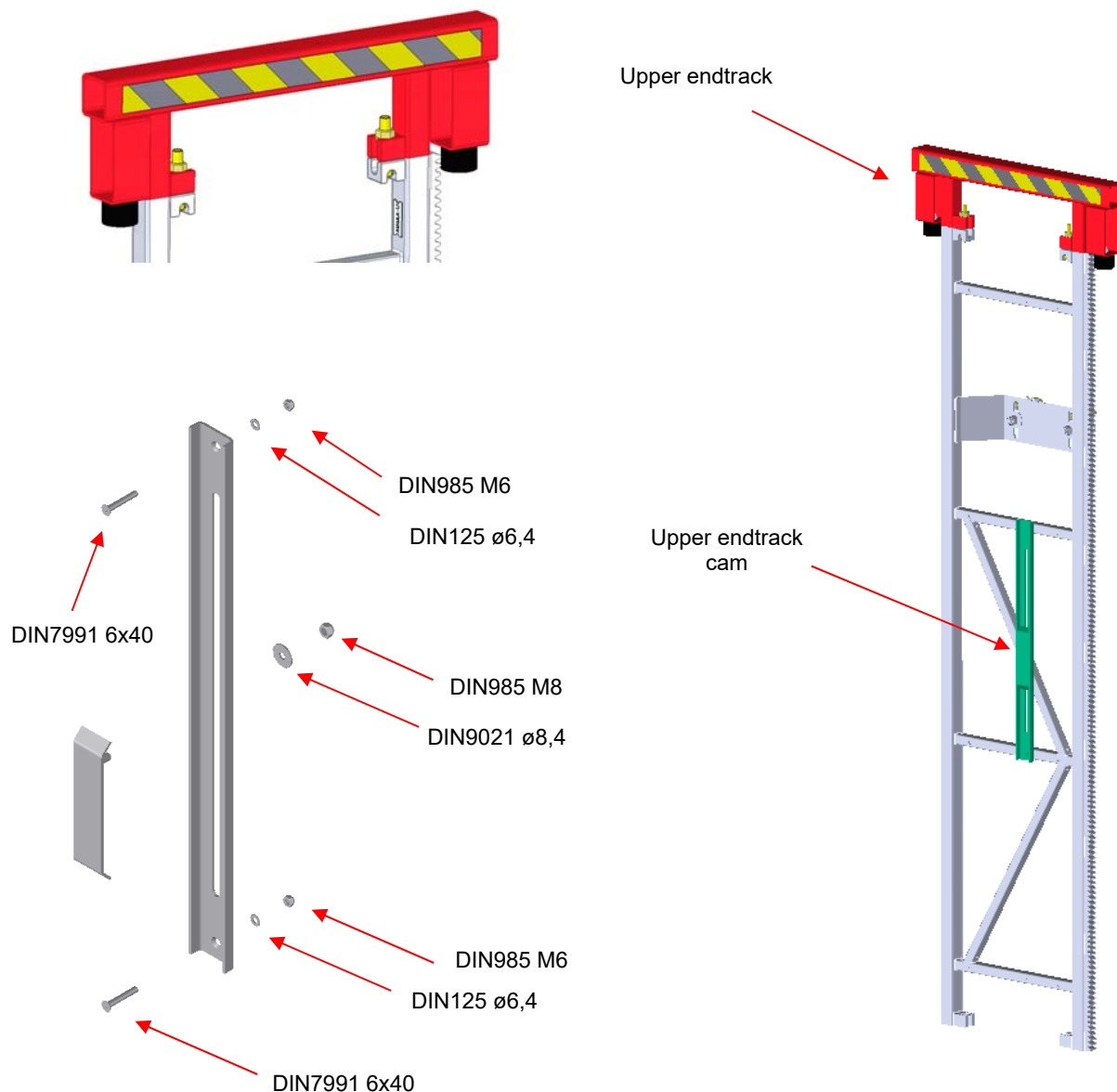


2.5.6 Erection of the mast column



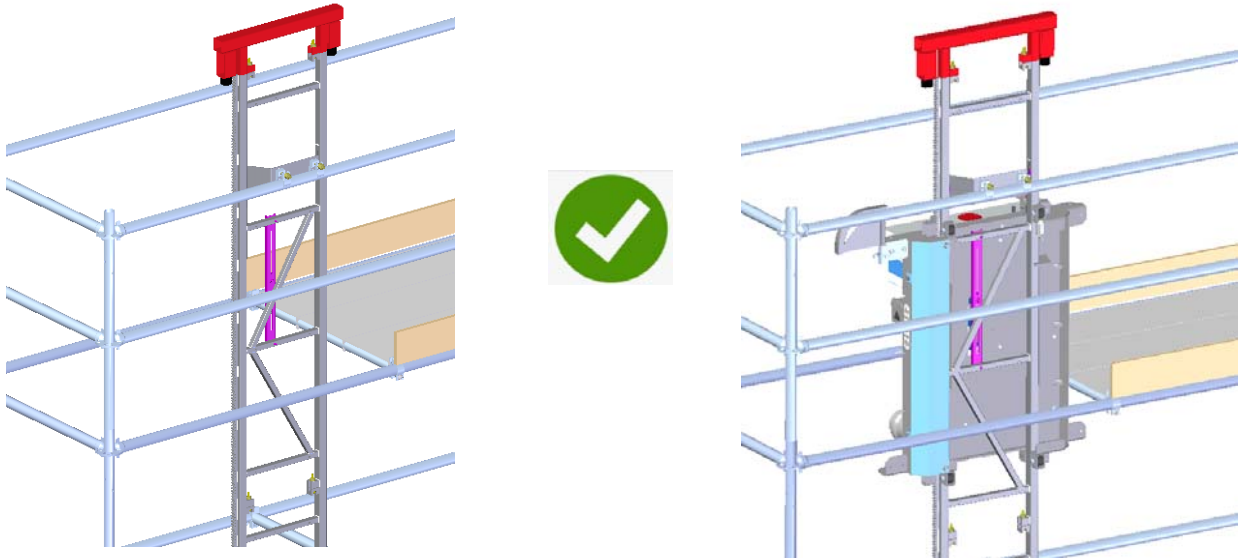
WARNING:

The upper endtrack cam and the upper travel stop must be positioned on the last mast before placing on in the column.



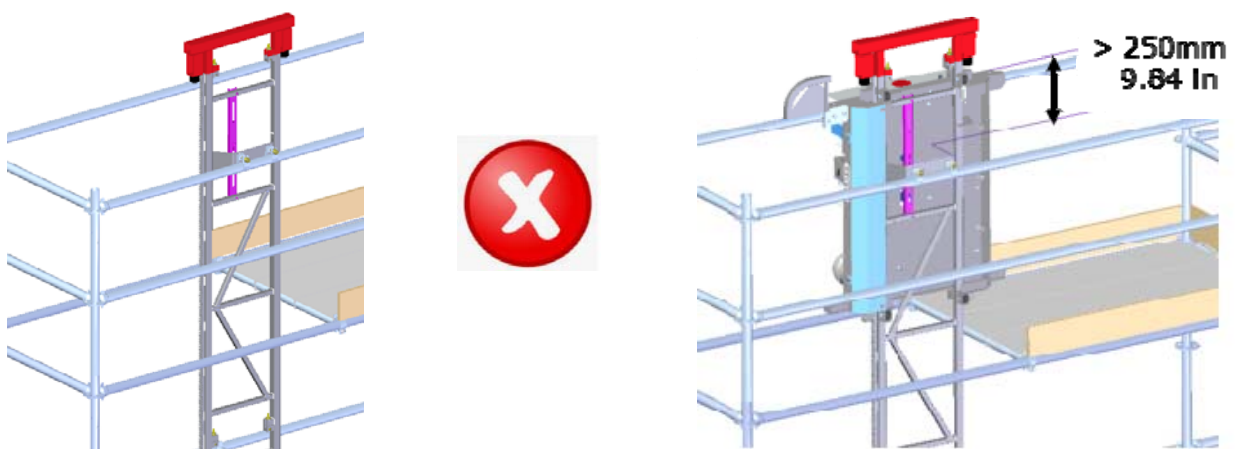
The position of the upper endtrack cam is very important, as it will limit the vertical travel of the MC250. For safety and to avoid possible accidents due to mast breakage, the upper part of the MC250 should never protrude more than 250mm (9.84 in) from the last anchor.

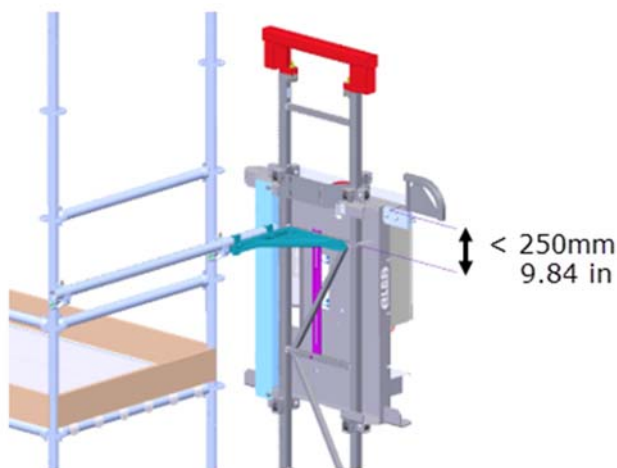
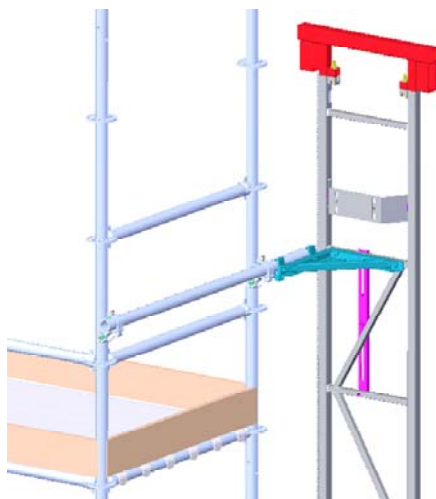
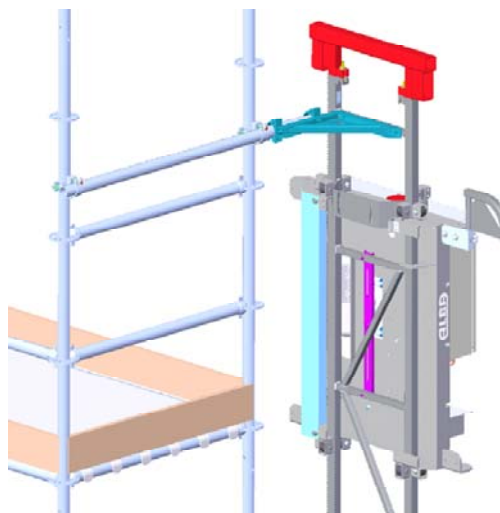
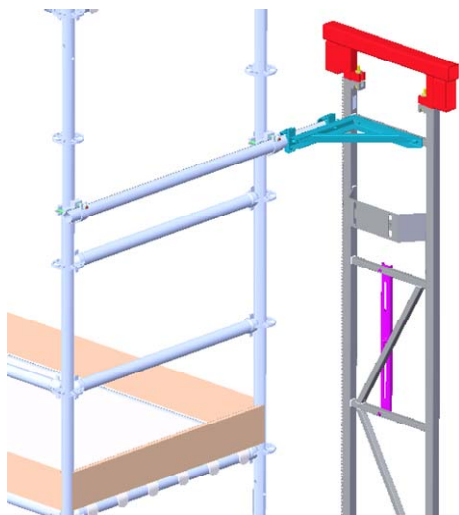
Below are pictures of the correct and incorrect mountings of the upper endtrack cam on the last mast:



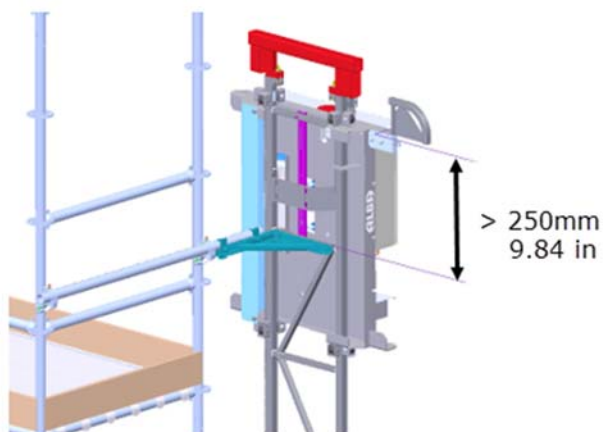
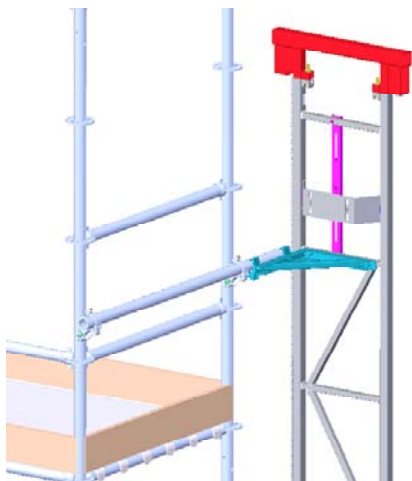
WARNING:

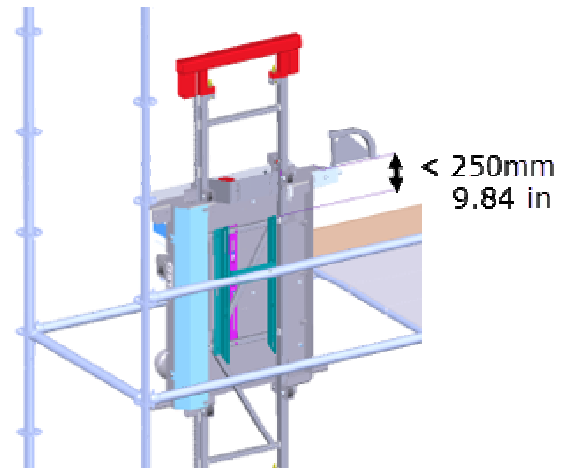
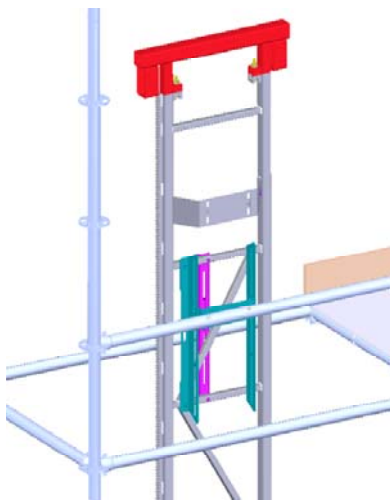
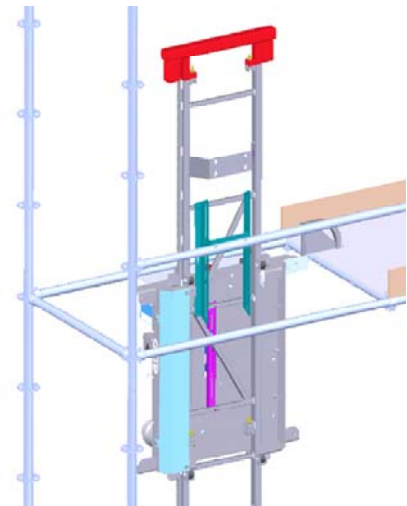
The upper endtrack cam should be positioned so that the top of the MC250 is NEVER more than 250mm (9.84 in) from the last anchor.



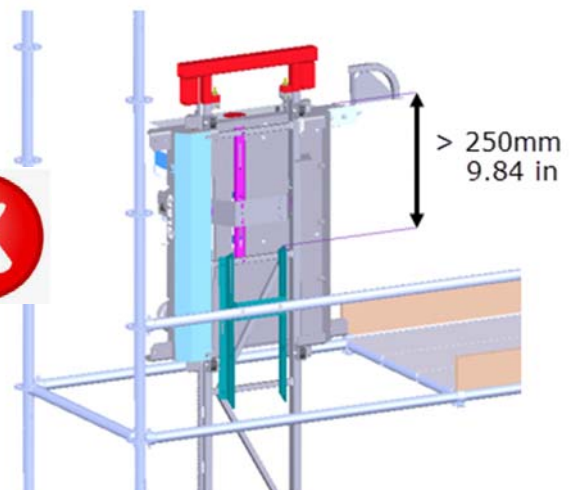
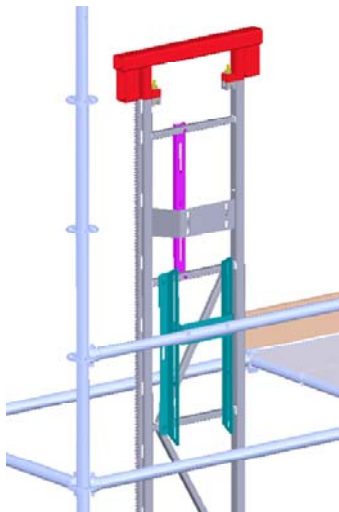
**WARNING:**

The upper endtrack cam should be positioned so that the top of the MC250 is NEVER more than 250mm (9.84 in) from the last anchor.



**WARNING:**

The upper endtrack cam should be positioned so that the top of the MC250 is NEVER more than 250mm (9.84 in) from the last anchor.

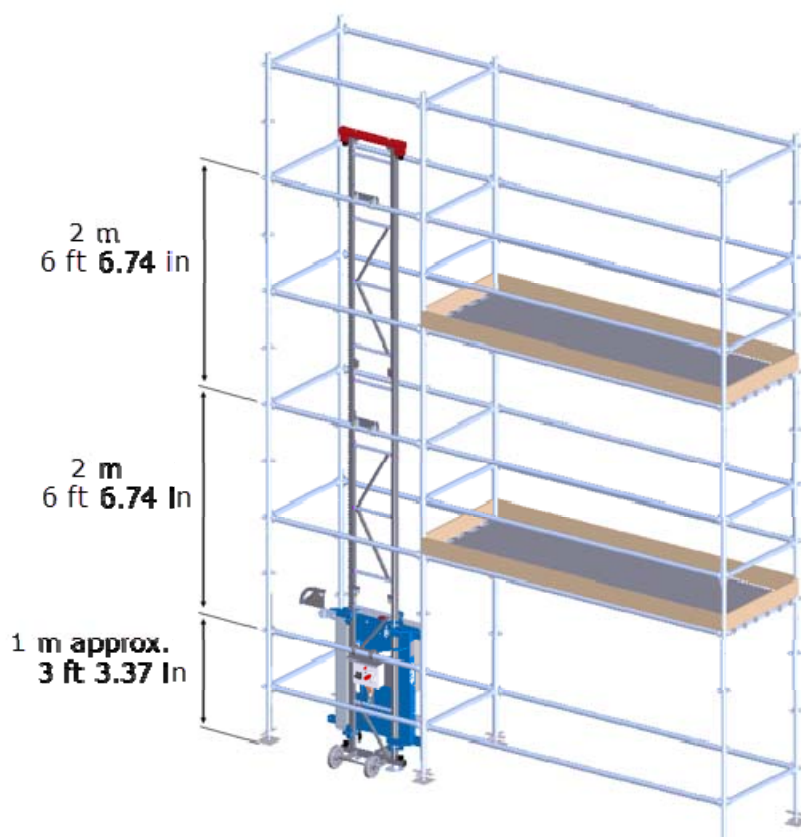


2.5.6.1 Erection of the mast column without external anchorages

**WARNING:**

Install mast and screws always at the same time.

Never raise the hoist over a non-screwed mast module, then there is high chance of collapse and serious injury.

**WARNING:**

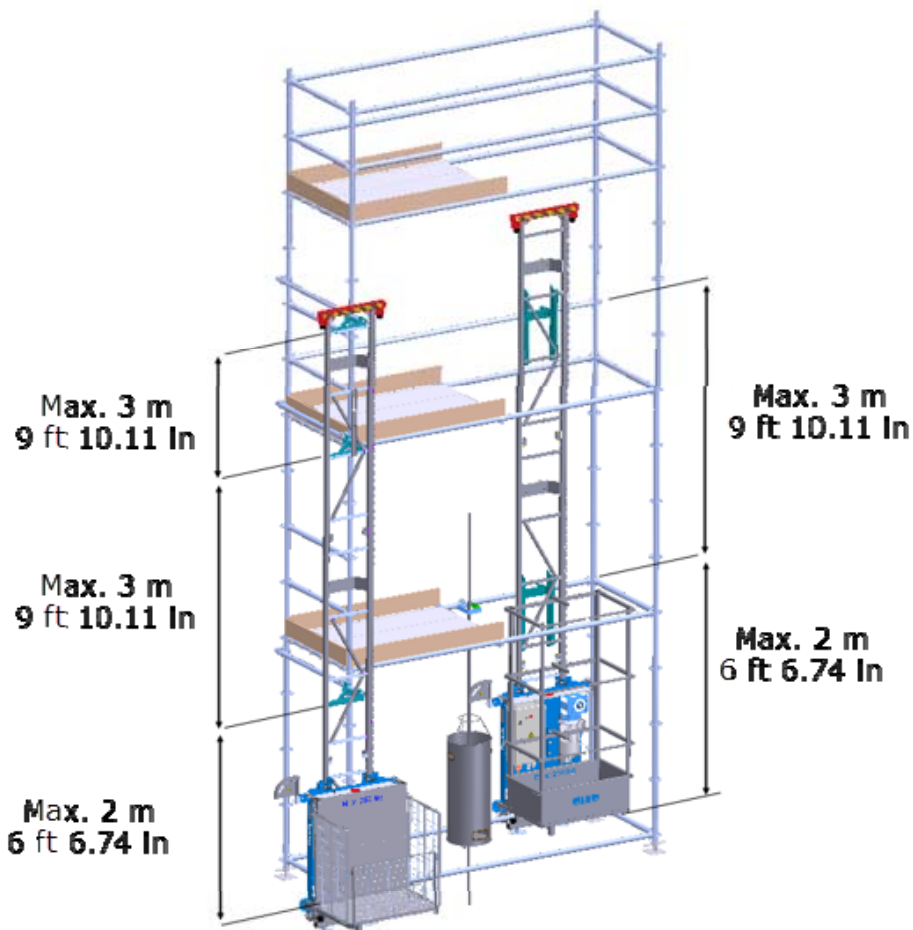
The distance between anchors is fixed (2m - 6 ft 6.74 in). Operations of erection of mast shall be performed from outside the carrier. It is forbidden to transport people in the cage to erect the mast column.

2.5.6.2 Erection of the mast column with external anchorages

**WARNING:**

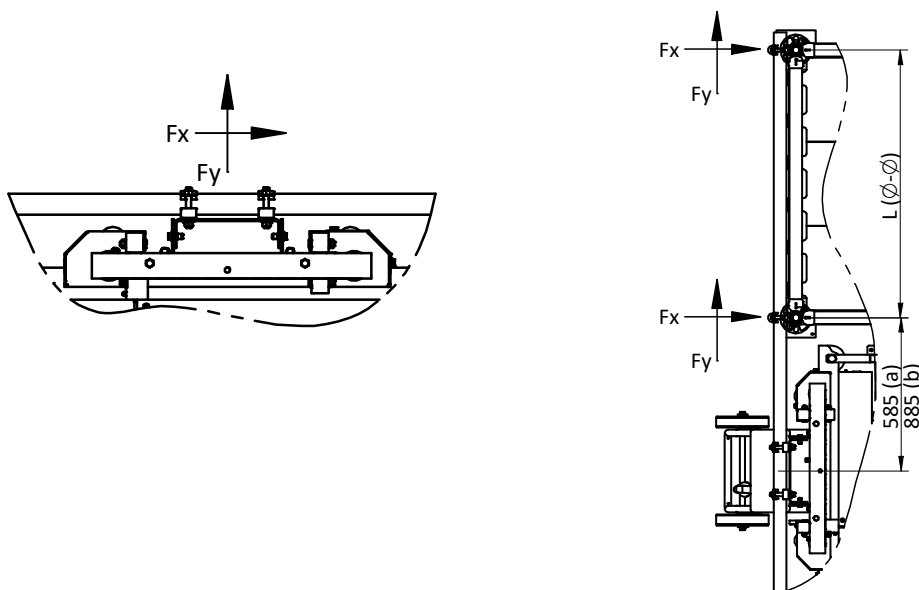
Install mast and screws always at the same time.

Never raise the hoist over a non-screwed mast module, then there is high chance of collapse and serious injury.

**WARNING:**

The maximum distance between anchors will be 3m (9 ft 10.11 in). Operations of erection of mast shall be performed from outside the carrier. It is forbidden to transport people in the cage to erect the mast column.

2.5.7 Checking reaction forces on the anchorages



ANCHORAGE H TYPE– STANDAR CARRIER 900x500 mm (35,43 x 19,68 in) a = 585mm (1 ft 11 in)			
L	0,7m (2 ft 3.56 in)	1m (3 ft 3.37 in)	1,15m (3 ft 9.28 in)
Fx	245 kgf [2,41kN]	172 kgf [1,68kN]	149 kgf [1,46kN]
Fy	166 kgf [1,62kN]	166 kgf [1,62kN]	166 kgf [1,62kN]
ANCHORAGE H TYPE – SPECIAL CARRIER 900x650 mm (35.43 x 25.6 in) a = 585mm (1 ft 11 in)			
L	0,7m (2 ft 3.56 in)	1m (3 ft 3.37 in)	1,15m (3 ft 9.28 in)
Fx	318 kgf [3,12kN]	223 kgf [2,18kN]	194 kgf [1,90kN]
Fy	166 kgf [1,62kN]	166 kgf [1,62kN]	166 kgf [1,62kN]



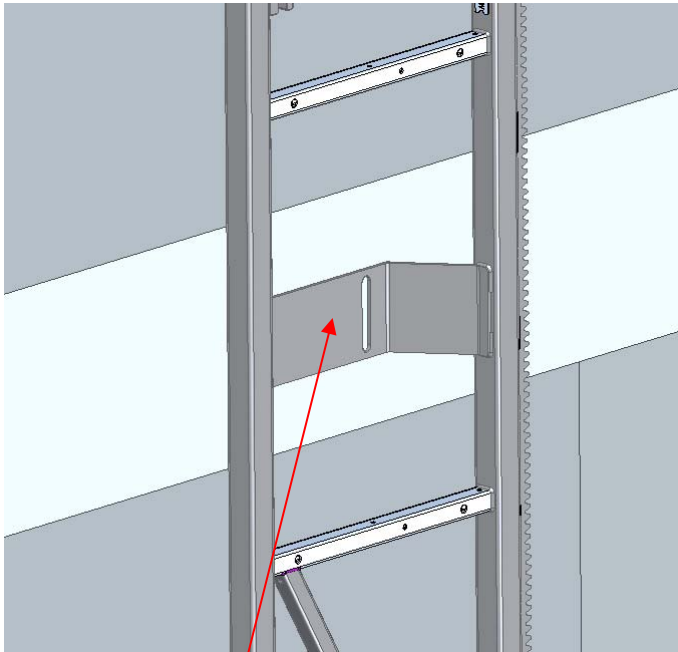
WARNING:

Make sure that external structure supports loads transmitted by the anchors, using table data. Case of anchorage to scaffold structure, it must be fixed to the building at appropriate intervals, to ensure stability.

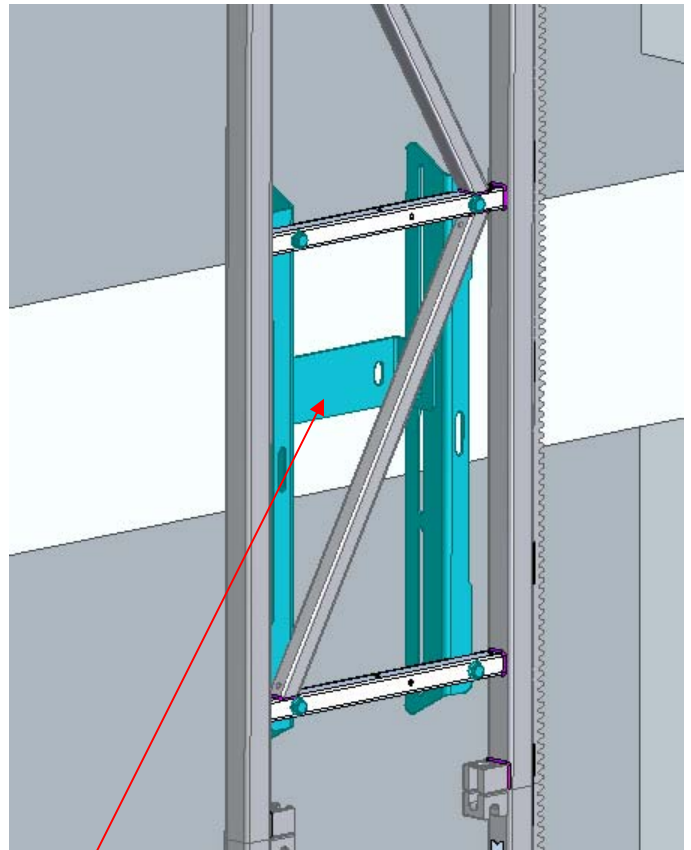
2.5.8 Wall anchorages

2.5.8.1 Anchorage without external anchorages (minimum distance)

The mast of the MC250 is designed to be anchored directly to the wall without external anchorages or with H type anchors (158.84).



Direct wall
anchor

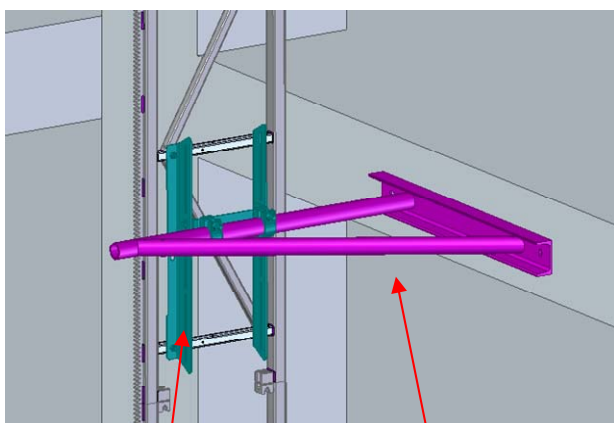
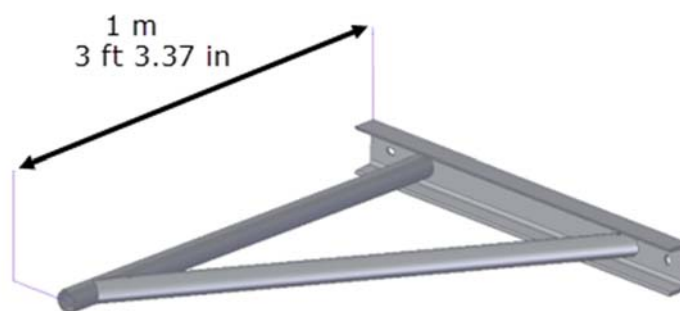


Wall anchor with H type
anchor (158.84)

2.5.8.2 Special anchor for mounting the mast column perpendicular to the wall: 158.8610

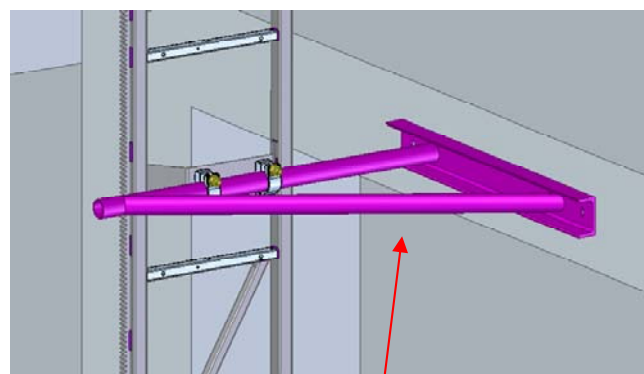
The MC250 mast can be directly tied to the fixed anchor perpendicular to the wall.

If, due to the configuration of the building, it is not possible to use the anchor point of the masts, H type anchors can be used (158.84).



H type anchor
(158.84)

Special fixed anchorage
perpendicular to the
wall 158.86

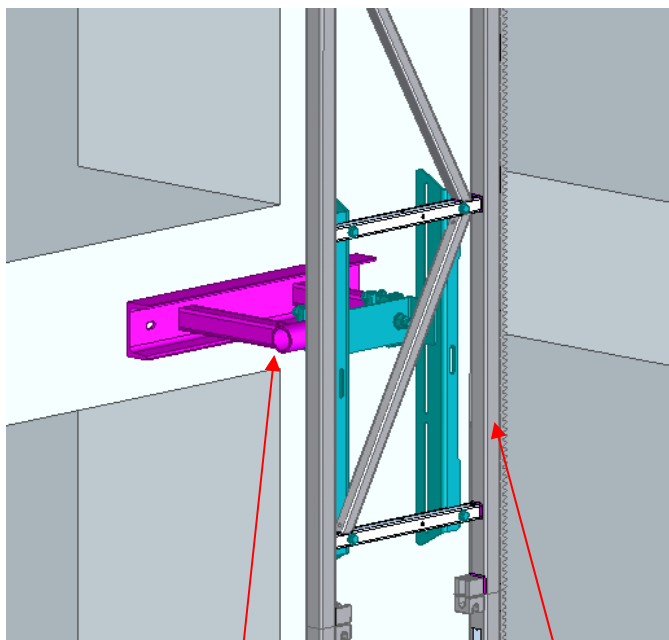
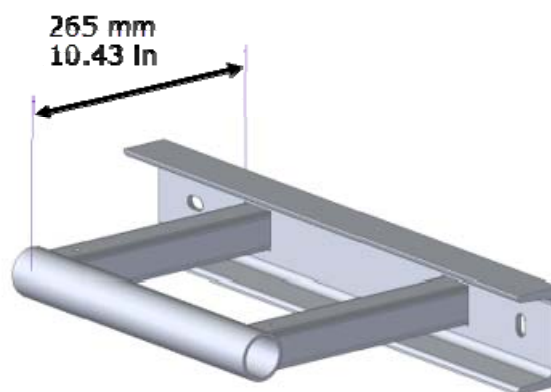


Special fixed anchorage
perpendicular to the
wall 158.86

2.5.8.3 Special fixed anchorage for mounting the mast column parallel to the wall: 158.8700

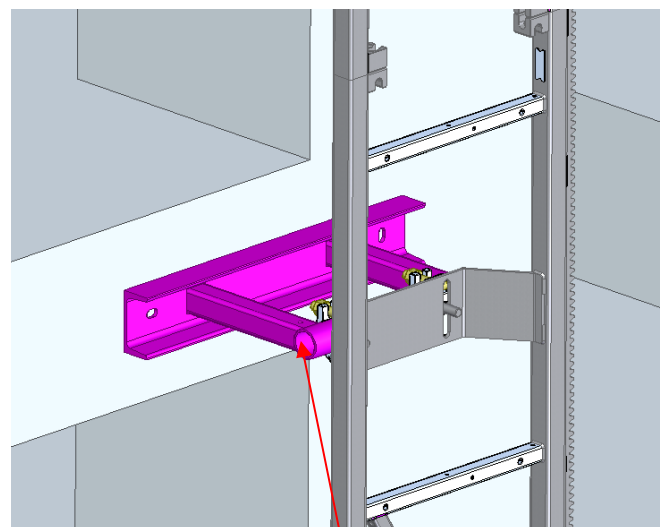
The MC250 mast can be directly tied to the fixed anchor parallel to the wall.

If, due to the configuration of the building, it is not possible to use the anchor point of the masts, H type anchors can be used (158.84).



Special fixed
anchorage parallel to
the wall 158.8700

H type anchor
(158.84)



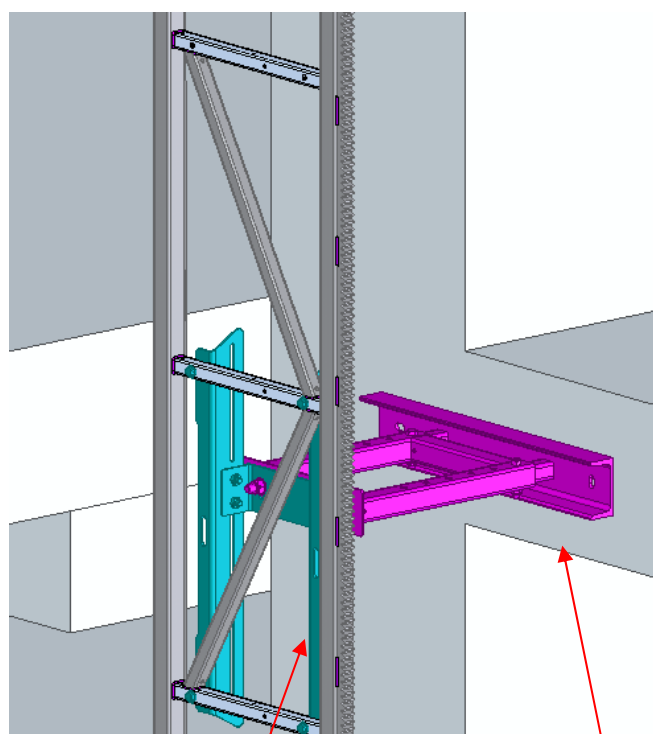
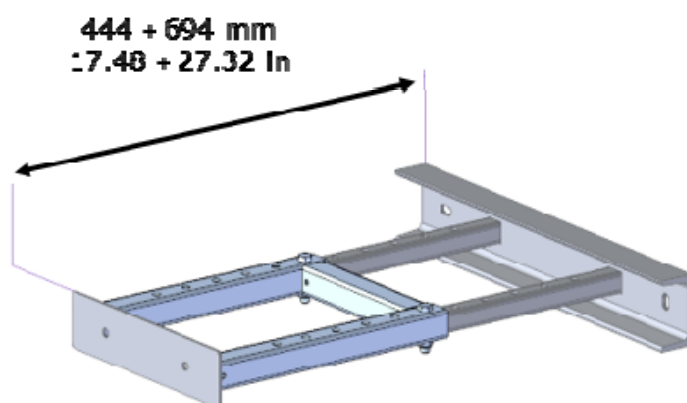
Special fixed
anchorage parallel to
the wall 158.8700

2.5.8.4 Special extensible anchorage for mounting the mast column parallel to the wall: 158.8500

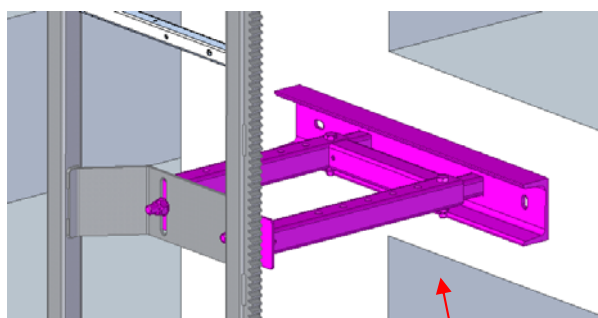
The MC250 mast can be directly tied to the extensible anchor parallel to the wall.

If, due to the configuration of the building, it is not possible to use the anchor point of the masts, H type anchors can be used (158.84).

Extensible anchorage can be mounted for distances between 444 and 694mm (17.48 ÷ 27.32 in).



H type anchor (158.84)

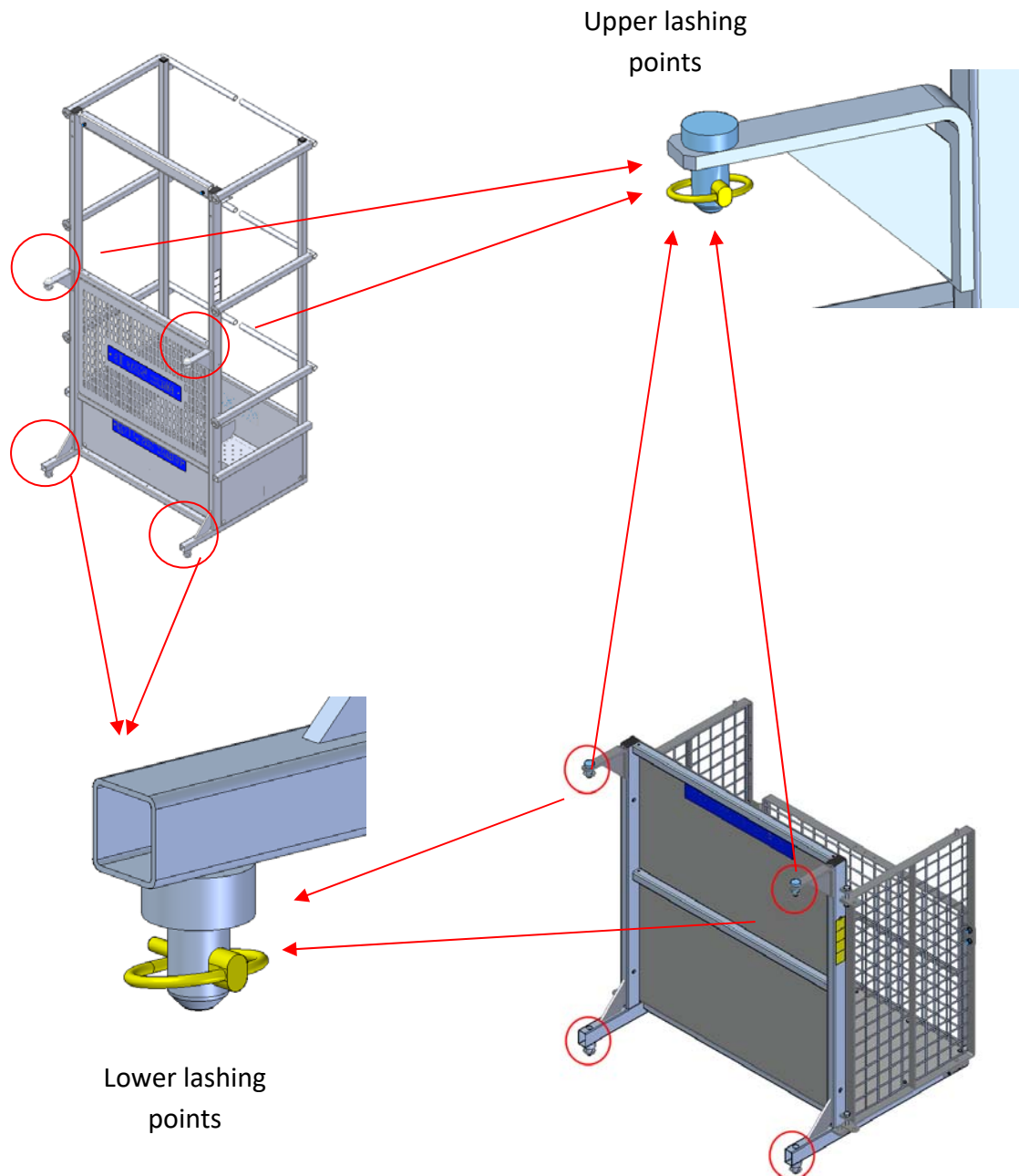


Special extensible
anchorage parallel to
the wall 158.8500

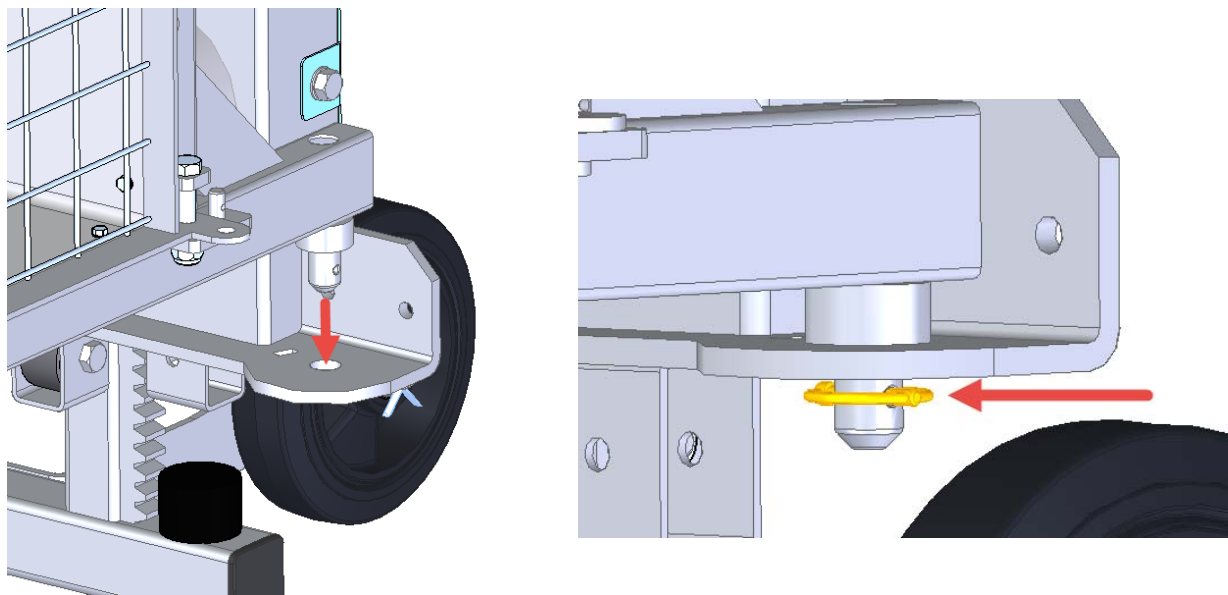
Special extensible
anchorage parallel to
the wall 158.8500

2.5.9 Cage assembly (fixed cages)

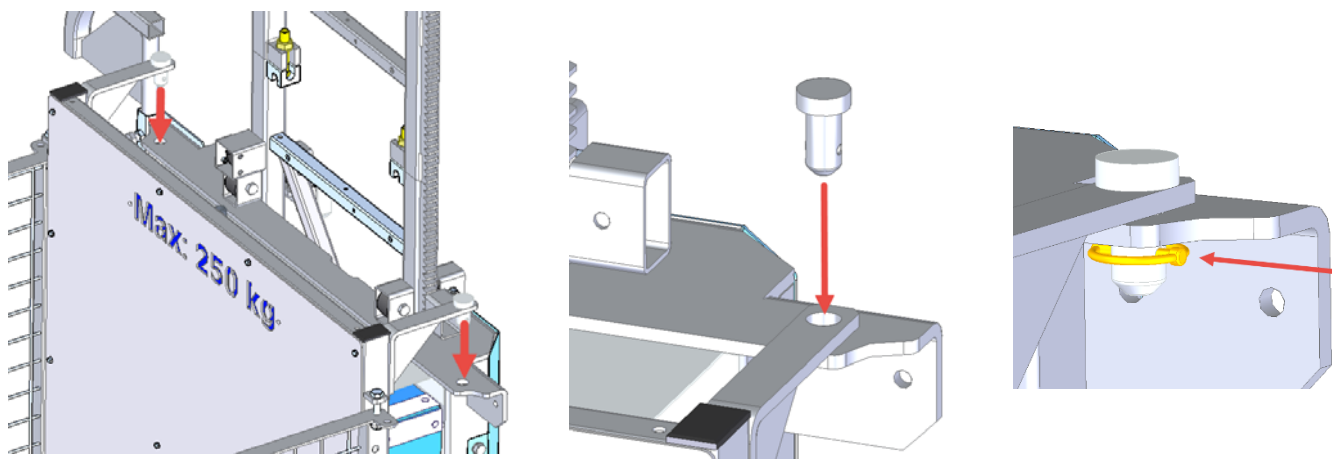
The fixed cages have 4 lashing points to the chassis of the MC-250. The 2 upper lashing points are independent bolts on the basket frame, and the 2 lower are welded to the frame itself.



Lower lashing points:



Upper lashing points:

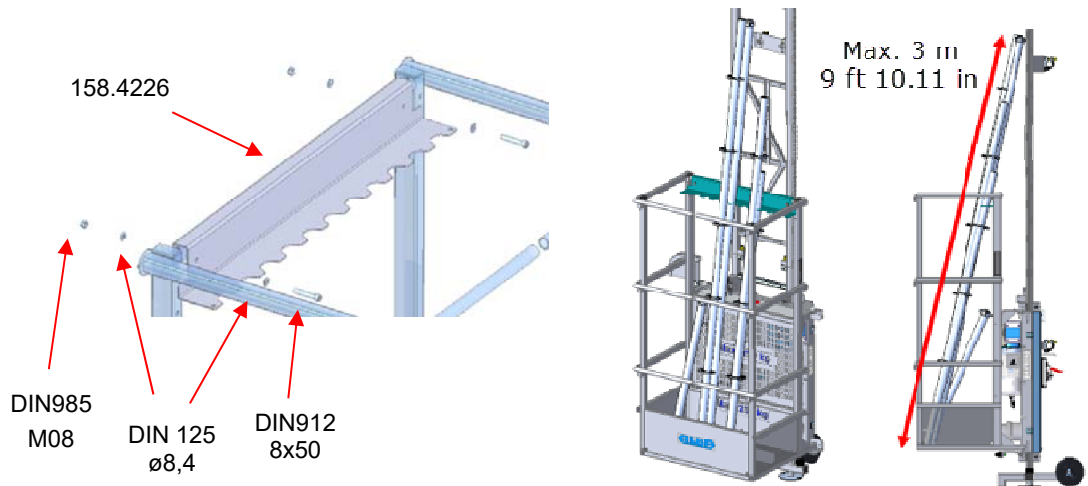


WARNING:

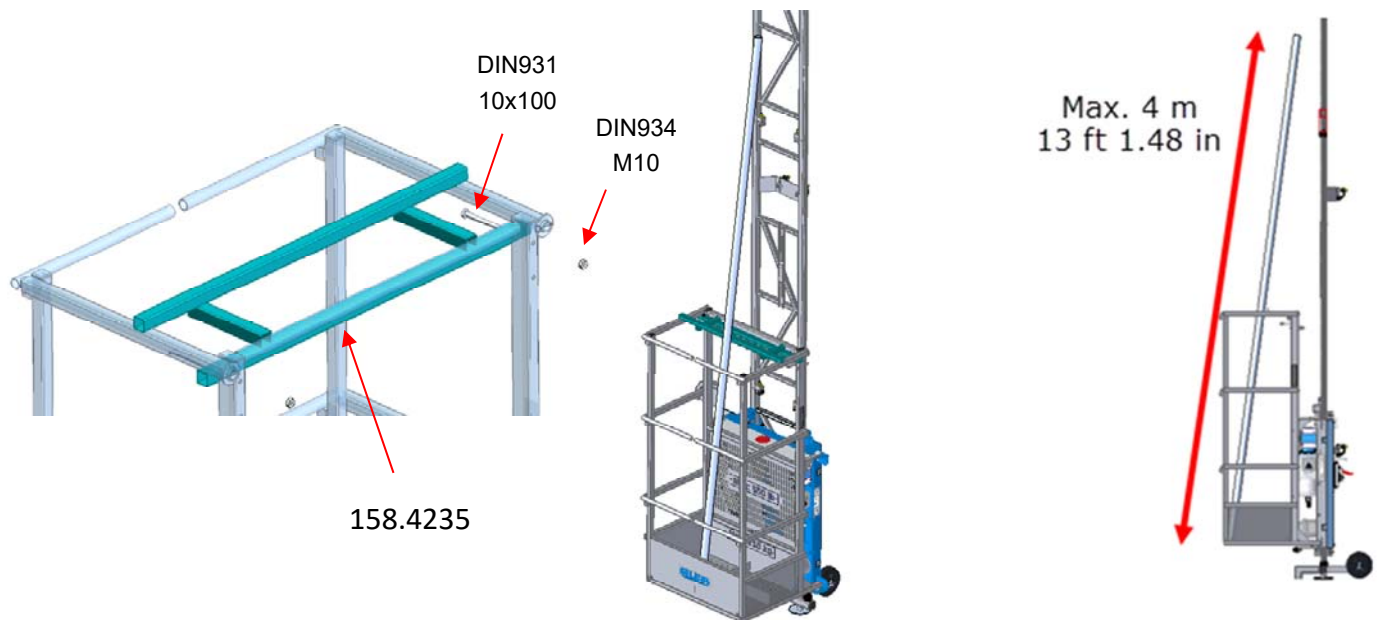
After positioning the cage, check that the 4 pins that connect the cage to the chassis have been perfectly closed.

The scaffolding cage is supplied with two elements to protect the mast from possible interference with material:

The tube organizer 158.4226: for tubes up to 3m (9 ft 10.11 in) in length.



And the upper set of the scaffolding cage 158.4235: for tubes up to 4m (13 ft 1.48 in) in length.

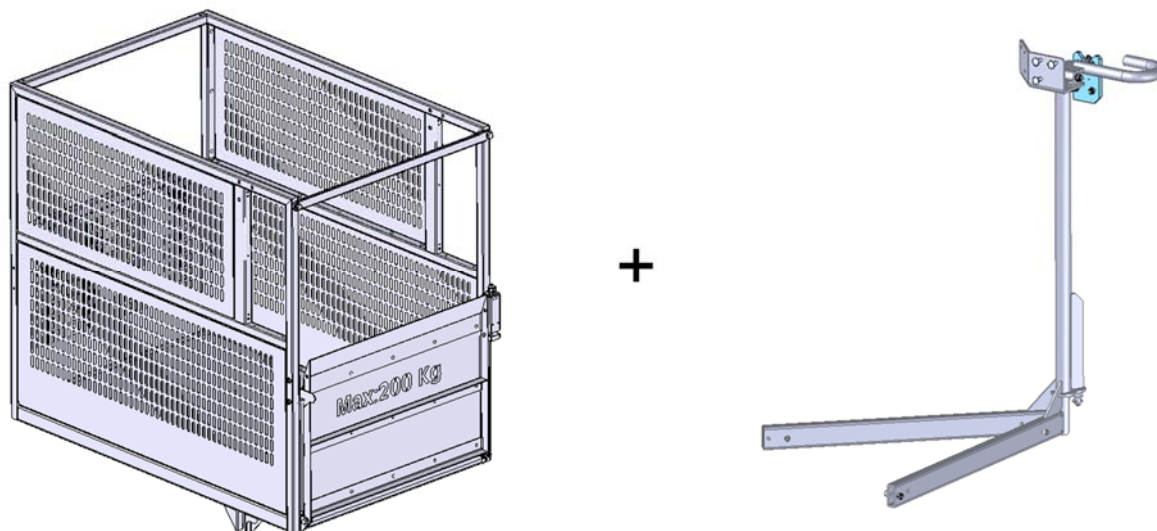


WARNING:

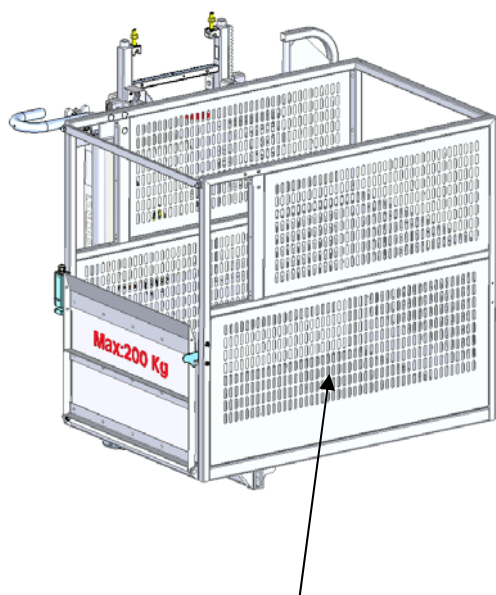
It is forbidden to lift materials longer than 2,5m (8 ft 2.42 in) without using one of the mast column protection elements.

2.5.10 Assembly of accessible cage

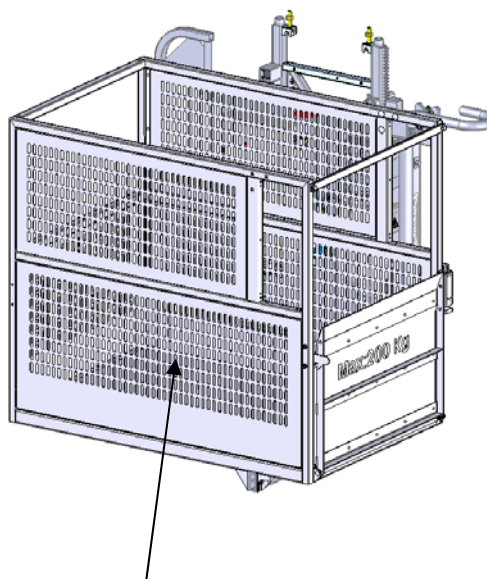
The accessible cages are made up of two assemblies: the cage and the rotating system.



Accessible cages have two mounting positions, left and right:



Left turning cage

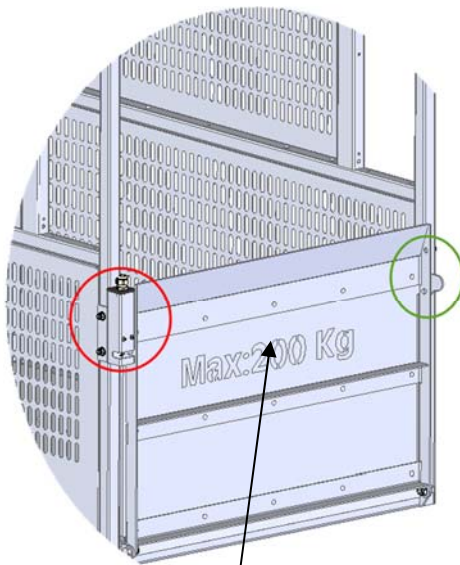


Right turning cage

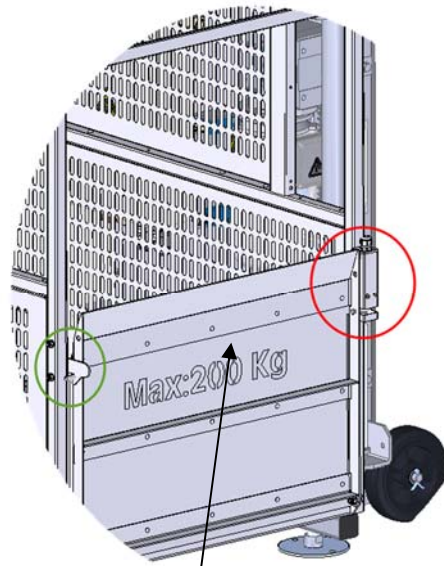
The accessible cages have a safety system that prevents the movement of the hoist if the cage has its door opened or if the rotating system has not been properly secured.

They have two limit switches:

- turning limit switch
- door switch.



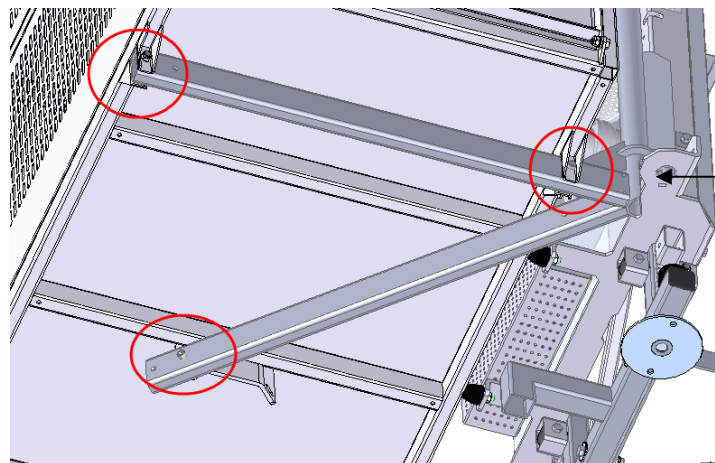
Left turning cage



Right turning cage

By default, the cages leave the factory prepared to make the right turn. If you want to use it with left turn, you will have to change the position of the limit switches and locks of the door:

The cage is screwed to the rotating system at three points on the base:



3x DIN912 10x55

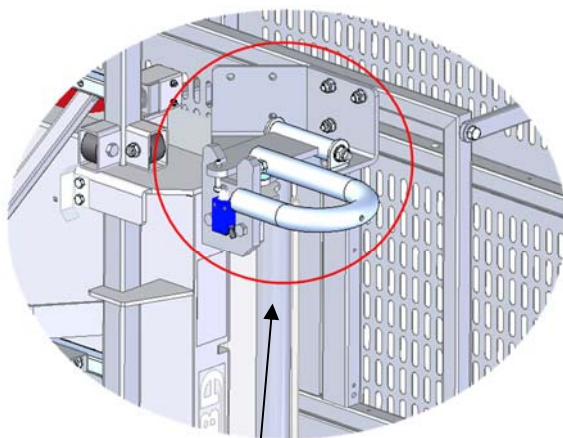
3x NORD LOCK $\varnothing 10$

3x DIN985 M10

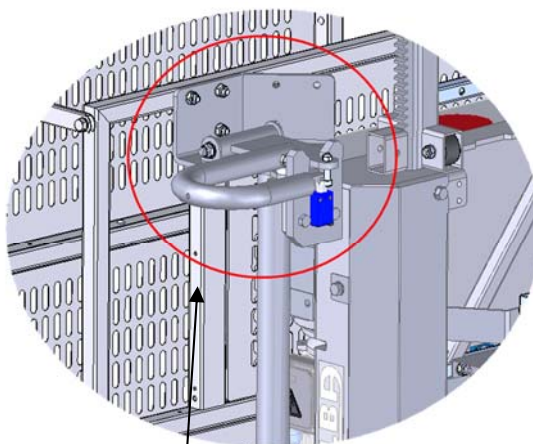
**WARNING:**

Check that the screws that join the basket to the turning system are correctly tightened.

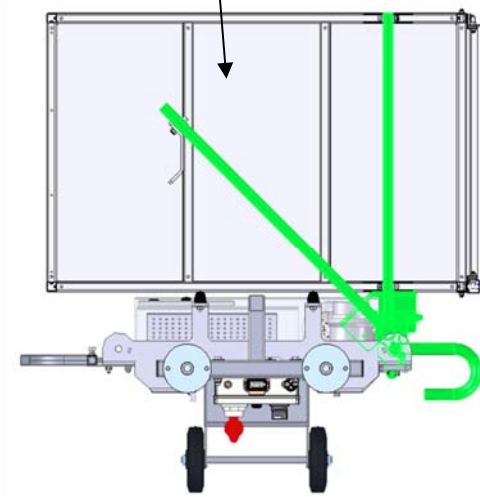
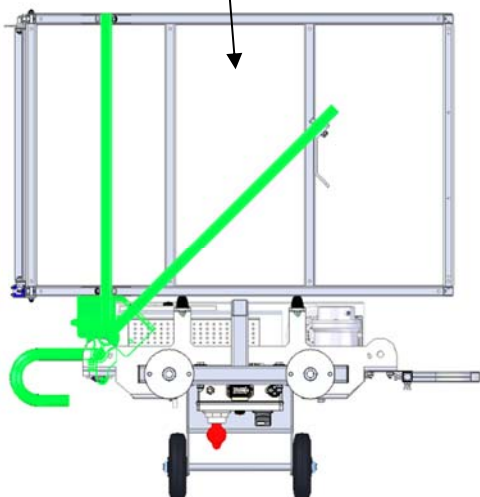
The assembly of the rotating system also changes when you use it with left turn:



Left turning cage

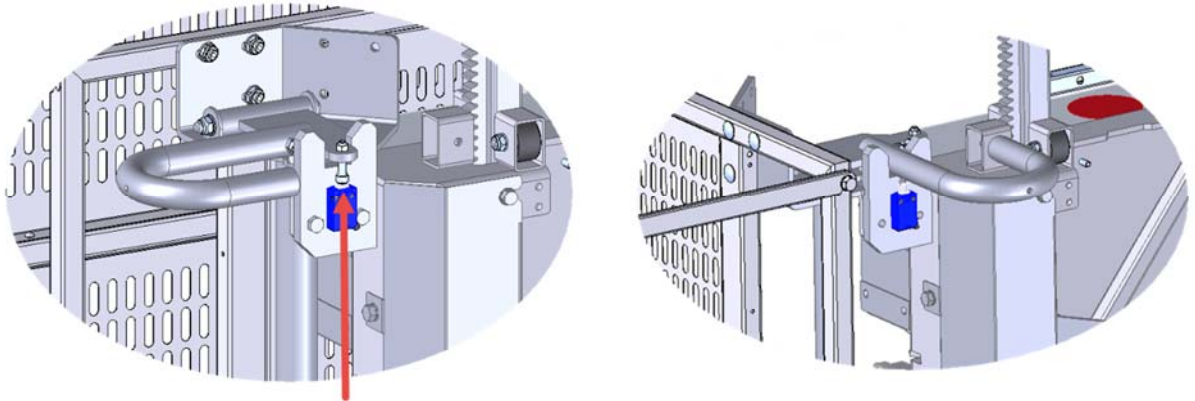


Right turning cage

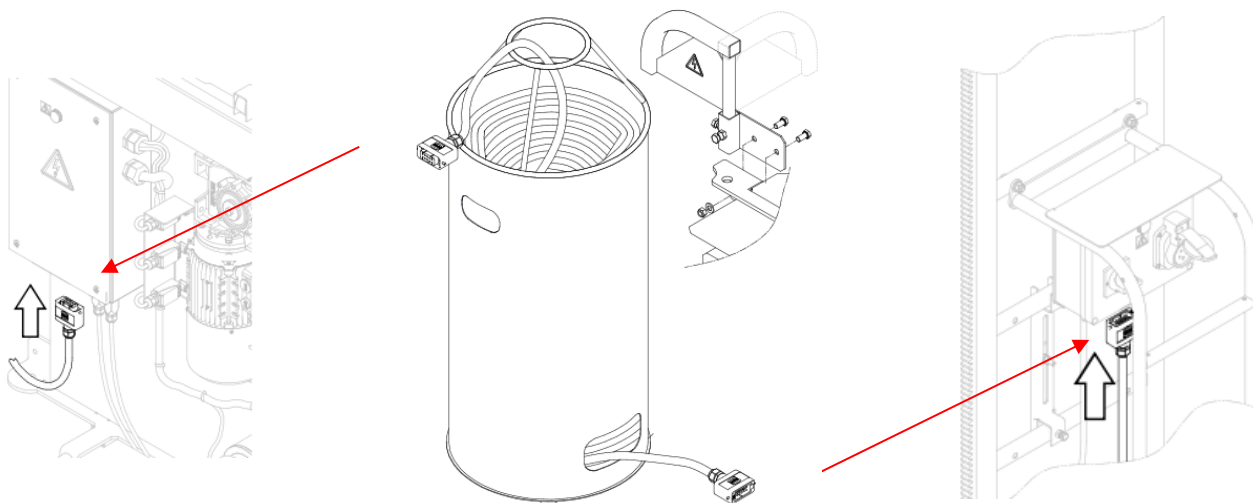


The lever of the rotating system has two positions:

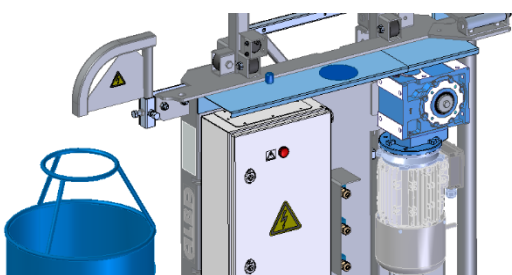
- Travelling position: the screw is pressing the limit switch and the hoist can move up and down. The rotation movement is blocked.
- Charge/ Discharge position: the lever is blocking the rotation movement of the cage but the limit switch is not pressed. The hoist cannot move up and down.



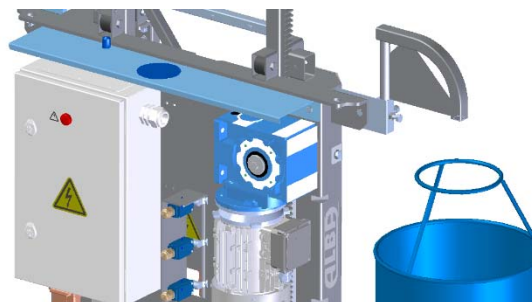
2.5.11 Installing cable holder, cable guides and electric connection



Cable holder – left side



Cable holder – right side



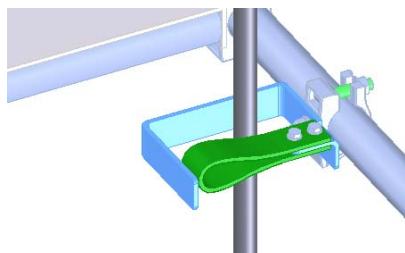
Fitting the cable on hanging bracket



Cable guide type 1 - vertical tube



Cable guide type 1 - horizontal tube



**WARNING:**

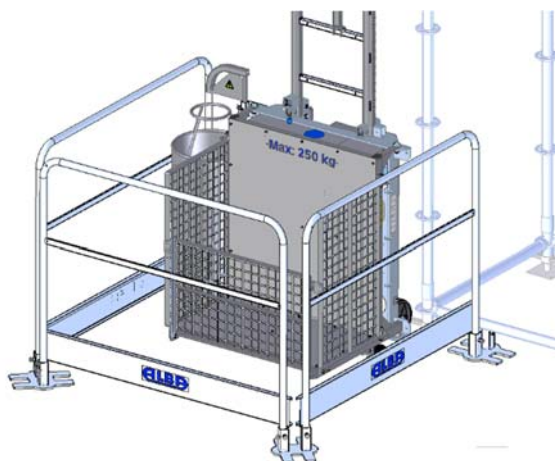
Make sure that the cable is aligned with the holder and rolls up perfectly. Check that there is no interference of the cable with cable guides or with the moving parts of the hoist.

2.5.12 Access protection

2.5.12.1 Ground level protection

**WARNING:**

It is mandatory to protect the ground access level for load, with vertical protection of $h = 1,1 \div 1,2$ m (43.30 $\div$ 47.24 in), and also intermediate rail with no more than 0,5 m (19.68 in) vertical distance.



2.5.12.2 Vertical travel protection

Access of persons to vertical hoist travel shall be protected, to prevent accidents when there is risk of a fall from height more than 2 m (6 ft 6.74 in).

If openings in the vertical travel protection are necessary to access the load, they should not exceed necessary width to allow the opening of the cage door.

2.5.12.3 Loading and unloading areas

In cases in which you can't designate default loading or unloading areas, where the hoist should be operated over the entire vertical travel, the hoist shall be operated from a point from which you have full visibility of complete travel.

**WARNING:**

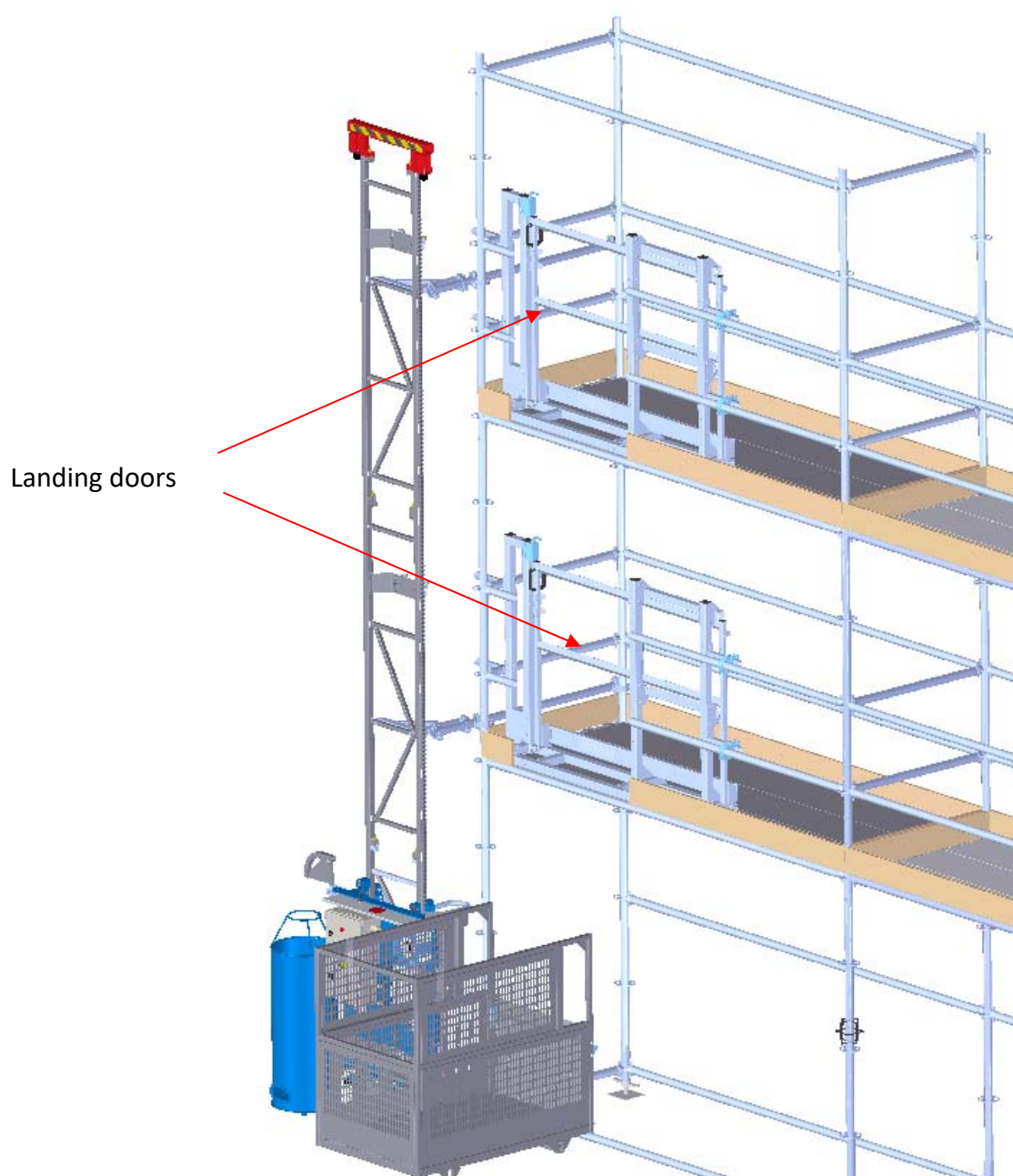
The hoist shall be operated from a point from which you have full visibility of complete travel.

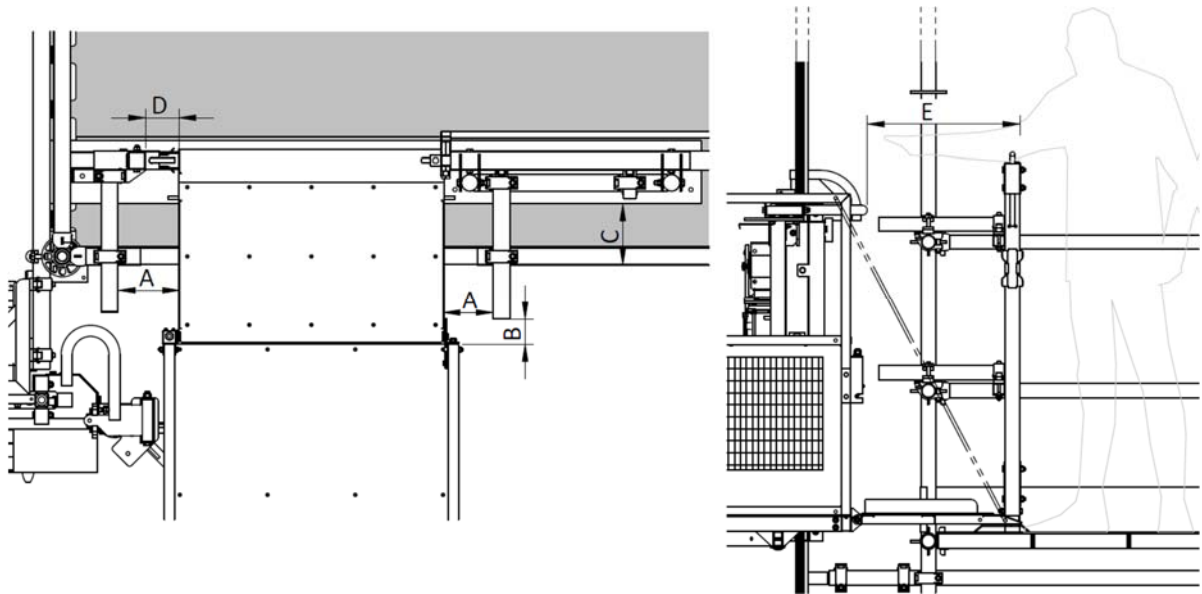
2.5.13 Installing landing doors. Accesible cage.

In the case of using accessible cage that requires access to the hoist at height for loading and unloading, landing doors must be installed at all access levels to avoid the hazard of people falling.

**WARNING:**

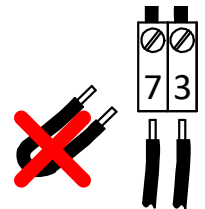
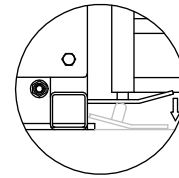
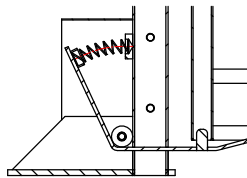
It is forbidden to use the accesible cage without landing doors. The user must verify that there is no gap with a risk of falling in the loading and unloading areas.





DISTANCE OF INSTALLATION

A	< 150 mm
B	< 150 mm
C	± 180 mm
D	± 100 mm
E	± 500 mm



2.6. Dismantling the hoist

For the dismantling of elevator perform the reverse process to that described in this manual, with particular attention to the tasks that present a risk of falling.



WARNING:

For dismantling the hoist instructions for installation and use of the elevator shall be used, and it shall be performed by authorized and trained personnel.

3. USE OF THE MACHINE

3.1. Introduction

The hoist has a point of control exclusively connected to base level panel. All the movements shall be performed with hold-to-run button.



WARNING:

Hoist can only be used by the designated persons, who have been instructed in the safely hoist operation.

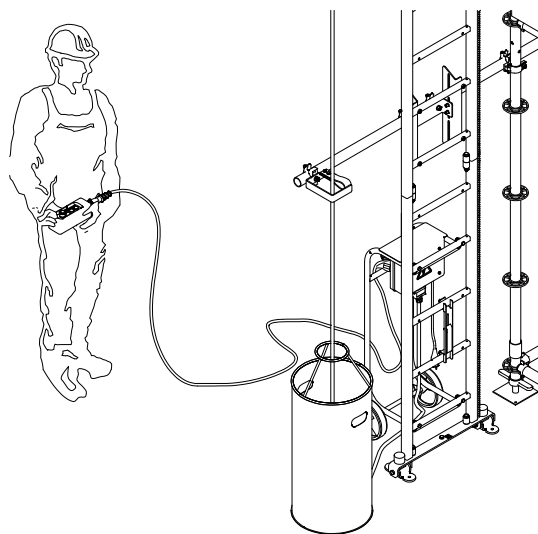
3.2. Using the portable push button control panel

Use the portable control panel from a position in which you have visual access to the full hoist railway.



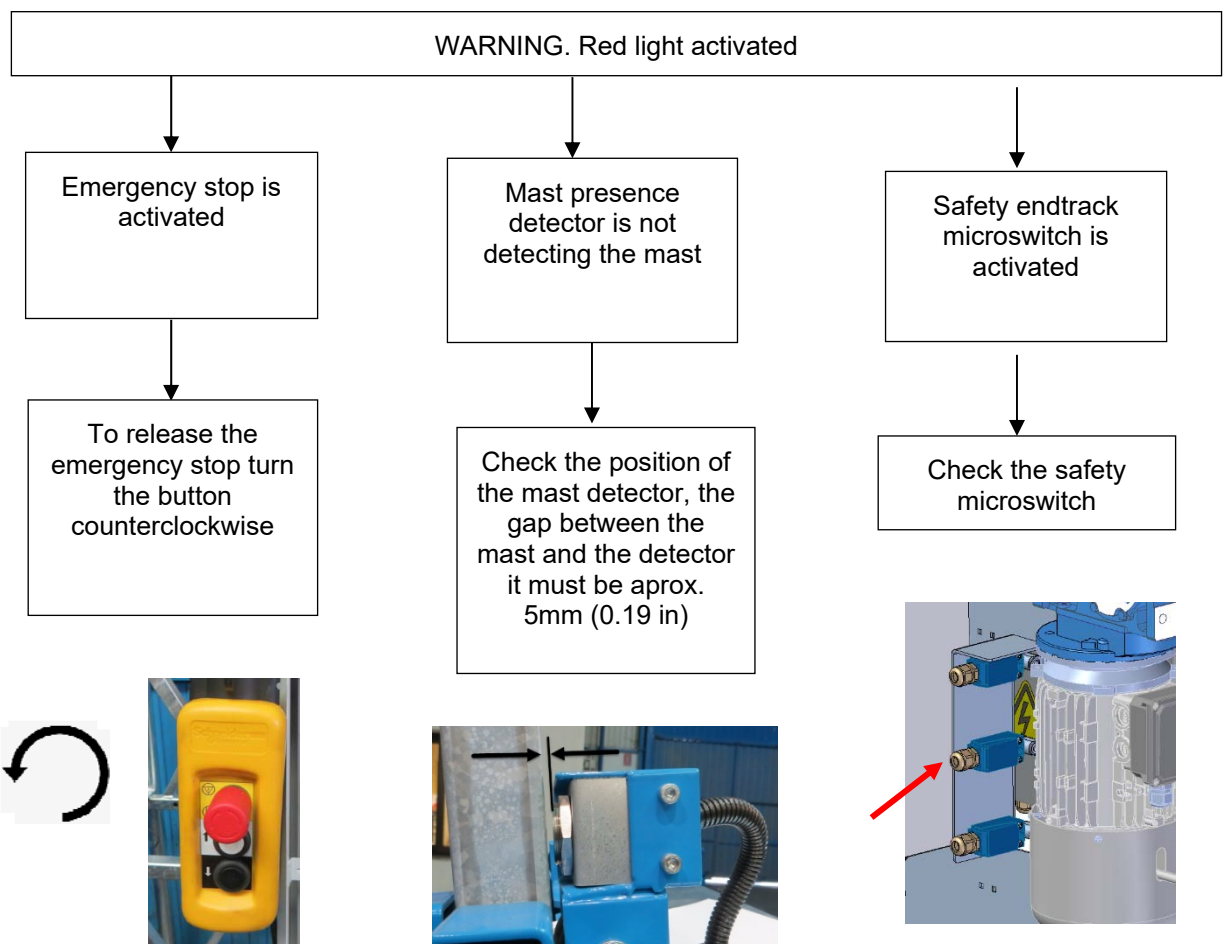
WARNING

It is forbidden to operate the hoist if you do not have visual access to the entire lift travel.





Points of review in case of activation of the red pilot light:



WARNING:

Case of activation out of service red light, check security systems indicated in the above diagram. Once the problem is solved, the control will reset automatically.

3.3. Emergency descent

The MC250 has a lever on the motor that will allow emergency lowering in the event of a power failure.



WARNING:

The operator should move the lever smoothly so that the emergency lowering occurs slowly. If the parachute activation speed is exceeded, it will lock, preventing descent.

3.4. Checking hoist operation before commissioning

Before hoist commissioning, hoist service responsible has to check if hoist is in compliance with following points:

- Hoist is installed with all operational safety systems:
 - Portable control buttons work correctly
 - Superior endtrack switch stops hoist before reaching superior endtrack buffers.
 - Inferior endtrack switch stops hoist before reaching base buffers.
 - Mast presence detector works correctly.
 - OUT OF SERVICE red light indicator works correctly.
- No existen interferencias entre el elevador y elementos exteriores, mástil, anclajes, There's no interference of hoist and external items, mast, ties, supporting structure.
- Inferior access area to the hoist is demarcated and protected properly.

- Hoist travelway is protected to avoid persons falling hazard.
- Door opening systems work properly.

3.5. Forbidden way of uses

- DON'T use the hoist on explosive atmospheres.
- DON'T use the hoist with higher load than shown in the plate.
- Load CAN'T be piled up at the cage floor bounds. It must be located as near as possible from mast.
- DON'T transport loads out of the cage.
- DON'T use the hoist in adverse weather conditions, rain, ice, snow.
- DON'T use the hoist in unacceptable physical condition, treatment of serious illness, under alcoholic drinks effects, or under stress or mental overload condition.
- DON'T use the machine with other parts than those originals from the manufacturer.
- DON'T work without the necessary personal protection gear. These safety devices will vary upon different conditions, therefore, a qualified person in the requirement of safety and health must evaluate the working conditions and mode of use before starting works.
- DO NOT leave the control panel opening key to anyone other than the maintenance person or other qualified person.
- DON'T dismantle integrated equipment whose maintenance is only allowed authorized personnel (ex.: electrical motor, brake, gear-reductor).
- DON'T manipulate electrical system without express permission of the manufacturer.
- DON'T use the hoist without a differential switch on the main power supply connection line.
- DON'T use the hoist with people travelling on the cage.



4. SAFETY DEVICE. FPC-500 PARACHUTE

4.1. Introduction

According to the specifications of Directive 2006/42/EC, the hoist must have a safety device for mechanical locking to act if the speed exceeds a set value. The system only operates during the fall, when the speed exceeds a predetermined value.

4.2. Features

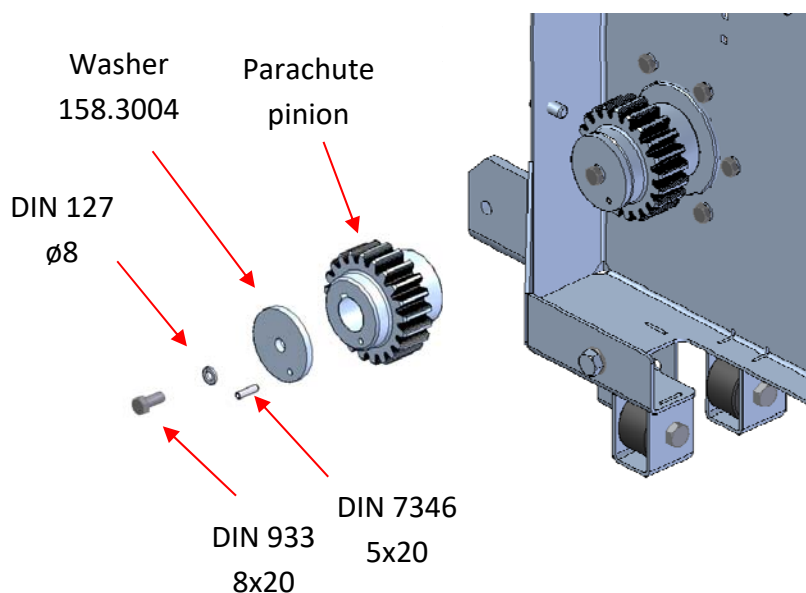
The parachute incorporates 2 identification plates with the CE marking and the characteristics of the brake, one on the cover and the other inside, next to the micro:

- Brake type and assembling position and direction of rotation
- Interlocking speed (r.p.m.) and braking torque (N · m)
- Serial number and manufacturing order. Manufacturing date.



4.3. Parachute assembly

The brake will be firmly fixed to the chassis of the machine, so that the pinion is centered with the rack. The brake must be screwed perfectly to the machine with all screws and washers.

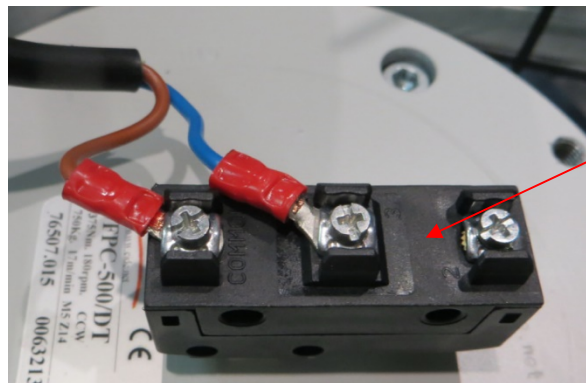
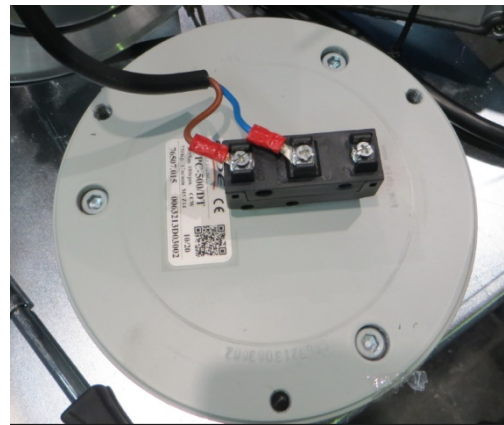


**WARNING**

A parachute must never be mounted in an elevator of characteristics other than those indicated on the plate.

Only the handling and testing of the parachute is permitted by the manufacturer or authorized technical personnel.

Finally, place the safety micro cable in its position, in such a way that it blocks the movement of the machine in case the parachute acts, until the intervention of the technical personnel.



Parachute
micro

Once the parachute has been assembled, the rear cover will be mounted so that it is completely sealed and thus preserve the characteristics of the safety device. The own screws of the brake must not be manipulated under any concept, to guarantee the correct operation.

**WARNING**

The own screws of the brake must not be manipulated under any concept, to guarantee the correct operation.

4.4. Parachute drop test

4.4.1 Manufacturer test

ALBA-MACREL GROUP S.L. performs an integration test on each lift during assembly of the machine to ensure safety and correct operation of the device.

4.4.2 Test during use

Periodically, every **4 months**, or **after each machine** assembly a functional test of the parachute shall be performed in accordance with the instructions set out below. The test of the parachute must be further supplemented with a brake inspection, checking the correct appearance of all the elements and the sealing of the outer cover. This process has to be repeated more often if the machine operates in extreme environmental conditions.

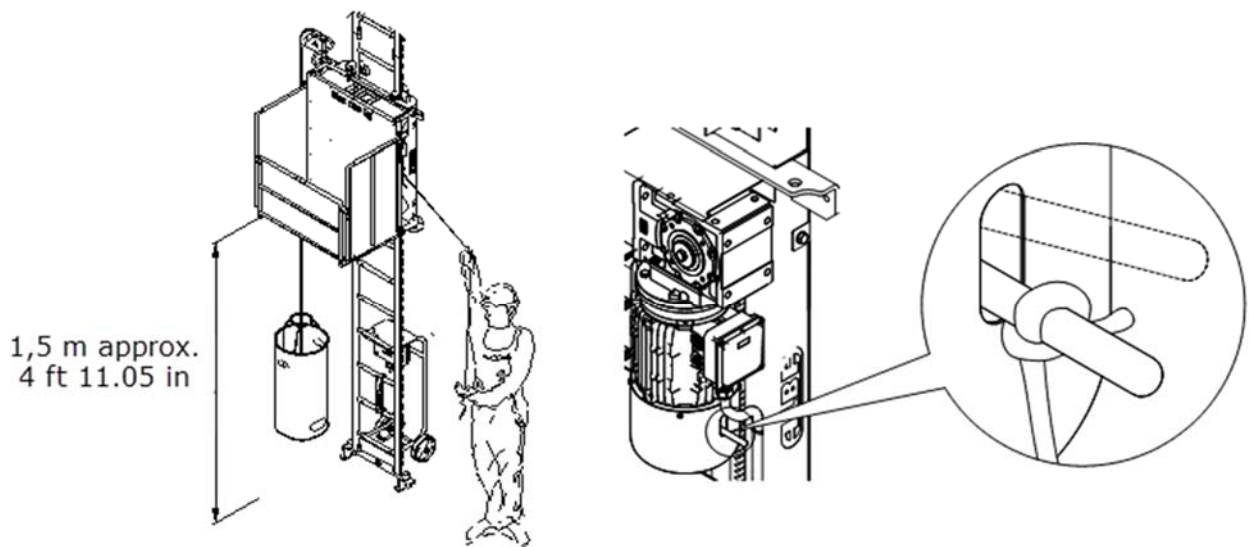
**WARNING:**

Carry out a parachute drop test at the end of each assembly, and then repeat periodically every 4 months.

WRITE THE RESULT IN THE USERS'S MANUAL RECORD.

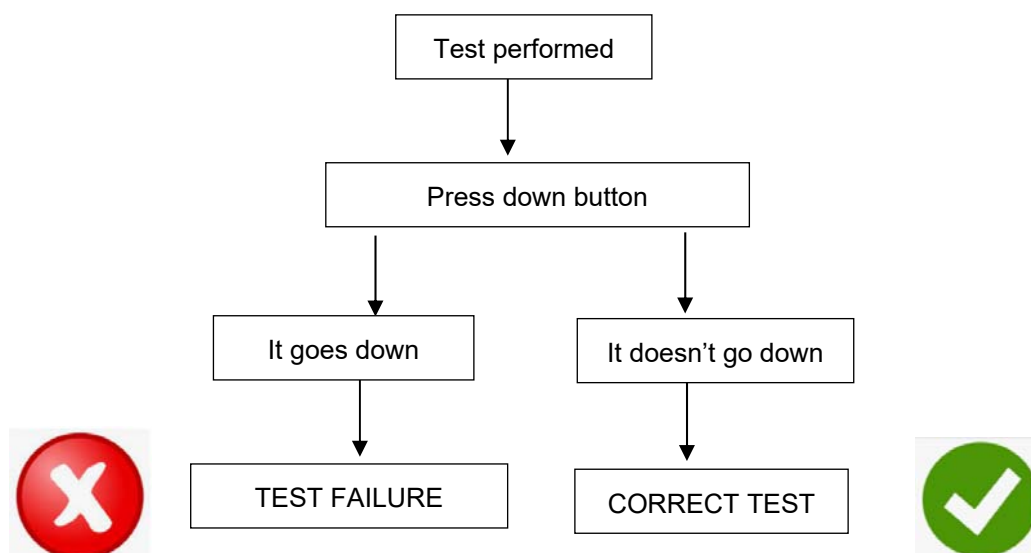
Test procedure:

- Raise the hoist approximately 1,5m (4 ft 11.05 in).
- Tie a cable to the brake lever and pull it diagonally, always out of travelway of the hoist. Pull the cable by dropping the lift until the parachute activates and the machine stops.

**WARNING:**

Verify that the operator is not within reach of the forklift before pulling the lever. Stop the test if the parachute does not activate before reaching the lowest point, and repeat the test increasing the height.

- Check if the parachute is activated pressing the down button on the push button control.

**WARNING:**

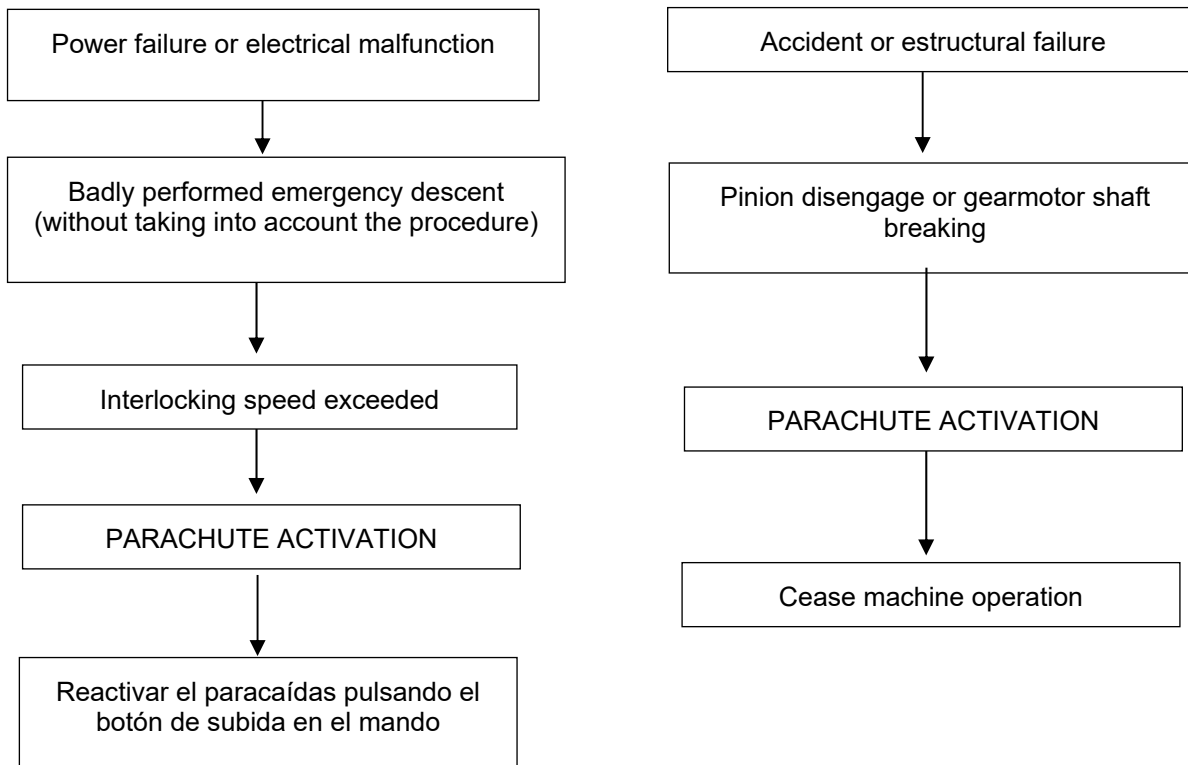
When the parachute is activated the hoist cannot go down.

**WARNING:**

If the test is incorrect, the process must be repeated from the beginning. If the test is correct, the result will be recorded in the maintenance log.

4.4.3 Actions to take if safety device is activated

The parachute acts in case the speed exceeds the predetermined speed. This can only happen if we are testing the parachute or in the following cases:

**WARNING:**

The parachute is automatically reactivated by briefly pressing the raise button. The hoist is ready for service again.

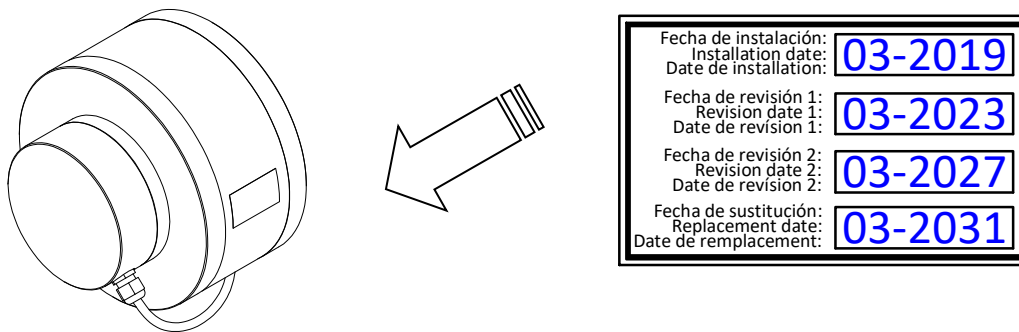
**WARNING:**

In case of accident or estructural failure cease machine operation until the action of an authorized technician.
If there is no clear solution, perform the disassembly of the machine with auxiliary means.

4.4.4 Check and replacement of the parachute

Following the instructions of the manufacturer of the safety device, to ensure the integrity of the equipment over time, proceed as follows:

- Installation of the parachute in the hoist. Test run.
- 4 YEAR LATER: Send the parachute to the manufacturer for revision and calibration.
- 8 YEAR LATER: Send the parachute to the manufacturer for revision and calibration.
- 12 YEAR LATER: Replace the hoist parachute



Additional equipment information: <https://www.eide.net/en/productos/fpc-overspeed-safety-brake/>



WARNING:

After replacing the parachute, a test must be performed. Write the result in the instruction manual record.

5. MAINTENANCE OF THE MACHINE



WARNING

Before carrying out any maintenance intervention under the machine, disconnect the power supply and block the movement of the cabin on the rack, creating a minimum clearance of 1.8m under the lift.

Maintenance tasks must be performed **WITHOUT LOADS**.

5.1. Daily maintenance

Daily maintenance includes basic operations of visual inspection in the hoist, performed by the person RESPONSIBLE of the hoist on the building. EVERY DAY, prior to use, visual inspection of the elevator should be done:

- All the protections are installed, and there are no dangerous holes or gaps.
- There's no accumulation of ice, snow or rubbish inside the cage, or near the hoist.
- There's no excessive wear in the rack, or in the vertical pipe of the mast.
- Load information plate is installed on the carrier.
- Zone below the hoist is delimited and protected.
- There isn't any warped or cracked part (Case of, change it).
- Electrical wires are correctly installed and tightly guided on the hoist.
- Guide rollers are touching the mast tube and without excessive wear.
- There are no power lines near the hoist that endanger people or machine.
- There are no outgoing elements in the facade that may interfere with the machine.
- Electrical safety devices are operational (doors, endtrack switch, mast sensor).
- Emergency stop works properly.
- Anchorages are correctly installed.
- Rack-pinion transmission is correctly engaged.
- Control and power boards are in good condition.
- All the controls, panels and indicators work properly.
- Cable travels and slides over the cable holder properly.

Once all the listed checkpoints are reviewed and the problems that have appeared have been solved, the machine can be safely used.

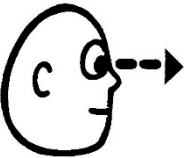
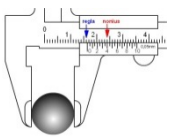
5.2. PERIODIC maintenance schedule

Maintenance of the lift must be performed by the staff responsible for the machine and the results have to be recorded on the MAINTENANCE RECORD.

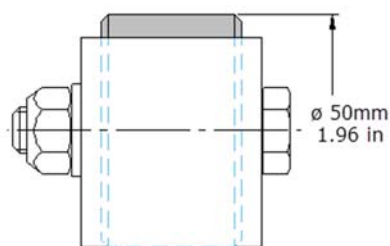


WARNING:
In case of electrical malfunction in the hoist, do not handle electrical equipment. Maintenance and inspection of the hoist only must be performed by authorized personnel.



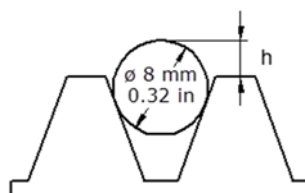
MAINTENANCE CHECKLIST		OPERATION	FREQUENCY
Visual checks 	Upper/lower stop cams	Check status	40h work or monthly
	Mast detector	Check distance $\pm 5\text{mm}$ (0.19 in)	
	Gearmotor oil level	Check level	
	Pushbutton and warning lights	Check operation	
	Mast tube	Wear, erosion or welding	
	Motor brake rectifier	Check output voltage	
	Communication cable	Check status	
	Guide rollers	Visual check	
	Anchorage	Check interference	
	Base buffers	Check status	
Grease 	Mast rack	Use lytic fat	40h work or monthly
	Gearmotor pinion		
	Parachute pinion		
Tighten 	Mast connecting bolts	Use fixed keys	Quarterly (4 times / year)
	Screw for all structure anchors		
Measurements 	Guide rollers dimension	Measure with caliber	Annual or after disassembly
	Rack dimension	Measure with caliber	
	Gearmotor pinion string	Measure with a micrometer	
	Motorbrake airgap checking	Measure with gauges	
General inspection	Masts	Deformation or damage	After disassembly or after periods of non-use
	Anchorage	Deformation or damage	
	Doors, handrails, floors	Deformation or damage	
	Gearmotor and brake	Check rectifier, voltage and coil resistance	

GUIDE ROLLERS



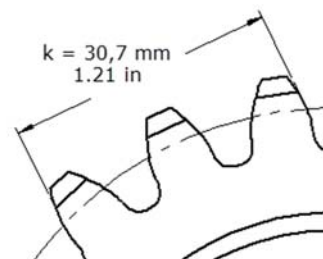
Ø NOMINAL: 50mm (1.96 in)
Replace if $\phi < 48\text{mm}$ (1.89 in)

RACK



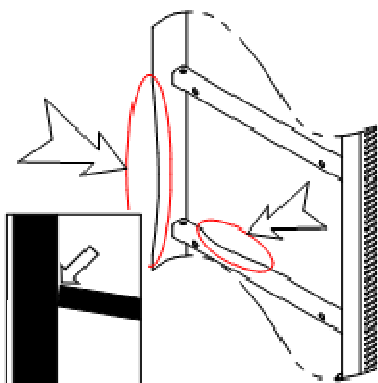
Replace if $h < 2\text{mm}$
(0.08 in)

PINION STRING



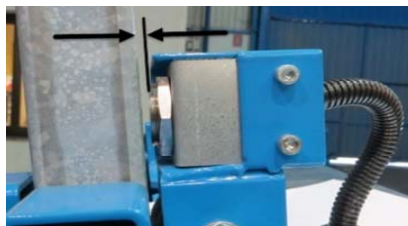
Replace if $K_{3\text{teeth}} < 28\text{mm}$
(1.10 in)

MASTS

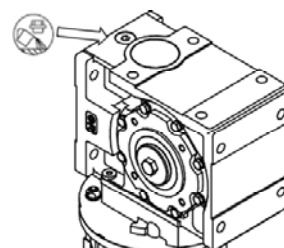


Replace if there is
deformation or damage

MAST DETECTOR

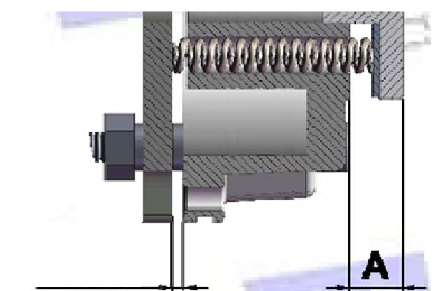


Check distance
5mm (0.19 in) aprox.

GEARMOTOR OIL
LEVEL

Replace the oil almost every 4 years.
PGLP ISO VG 220: $-35^{\circ}\text{C} < T < 100^{\circ}\text{C}$
PGLP ISO VG 460: $-15^{\circ}\text{C} < T < 100^{\circ}\text{C}$

BRAKE AIRGAP

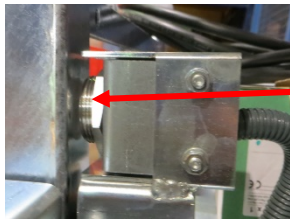


Entrehierro

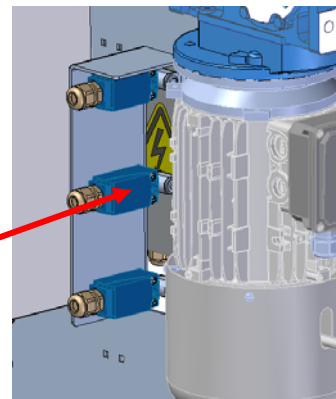
Airgap: $0,2 \div 0,4 \text{ mm}$ ($0.0078 \div 0.0157 \text{ in}$)
Distance(A) for max. torque: 4,5mm (0.18 in)
Minimum thickness of brake disc: 5,75mm (0.23 in)

5.3. Troubleshooting

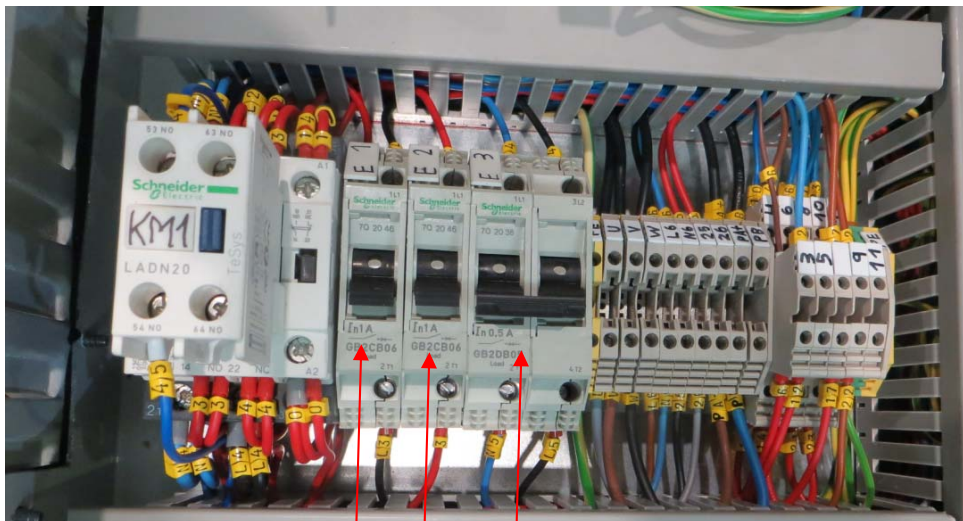
TROUBLE	PROBABLE CAUSE	SOLUTION
Hoist doesn't run (RED LIGHT ACTIVATED)	Emergency stop activated	Check emergency stop
	Safety endtrack limit switch activated	Check safety microswitch
	Mast detector	Check mast detector
The machine moves making an abnormal noise or abruptly	Guide roller or bearing damaged	Check/replace guide rollers
	Lack of Grease in mast rack	Apply Grease to the rack
Machine slides down when loading weight	Brake wear	Check/replace brake (disk, rectifier)
	Brake wear	Check brake airgap
	Overload	Check load on cage
The electric motor does not start or starts with difficulty	Brake rectifier doesn't work	Check/replace brake rectifier
	Power voltage failure	Check supply voltage
The machine does not stop at stops	Problem in endtrack cams	Check endtrack cams and switches
	Problem with motor brake	Check motor brake
The cage vibrates abnormally	Non tighten screws	Check and adjust guide roller screws
	Rack-pinion gear problem	Check rack-pinion gearing
	Lack of lubrication	Apply Grease to rack and pinion
	Roller damage	Check rollers
	Mast tube damage	Check the mast
The reducer sounds/vibrates abnormally	Lack of oil in gearmotor	Check oil level
	Gearmotor bearing damaged	Alert motor technical service
The hoist suffers stops when moving	Communication cable damaged	Check communication cable
	Endtrack switch unadjusted	Check the adjust of switches
The machine goes down when we push up button	Phase error	Change the phases in the motor box
E1 or E2 failure	Problem in transformer	Check/replace the transformer
Drive error: oPF1	Loss of a phase at the inverter output	Check the connections of the drive to the motor
Drive error: oPF2	Motor not connected or motor power too low	Check the connections of the drive to the motor
Drive error: obF	Excessive braking or dragged load	Check resistance connection
Drive error: SoF	Instability or load too high	Check resistance connection
Drive error: EPF1	External device fault	Check motor and brake and E3



Mast presence
detector



Safety endtrack
microswitch



E1

E2

E3

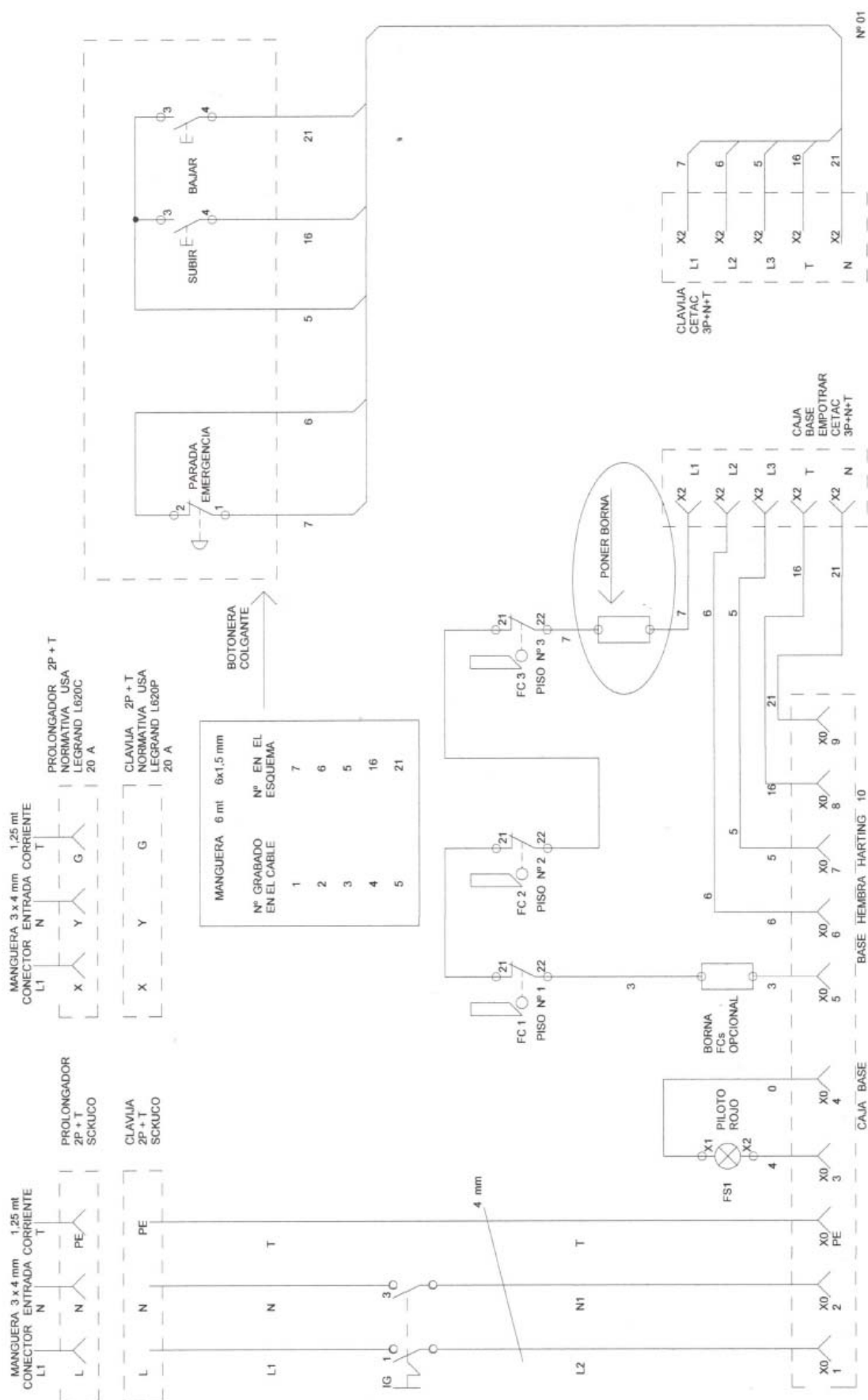
5.4. Maintenance record

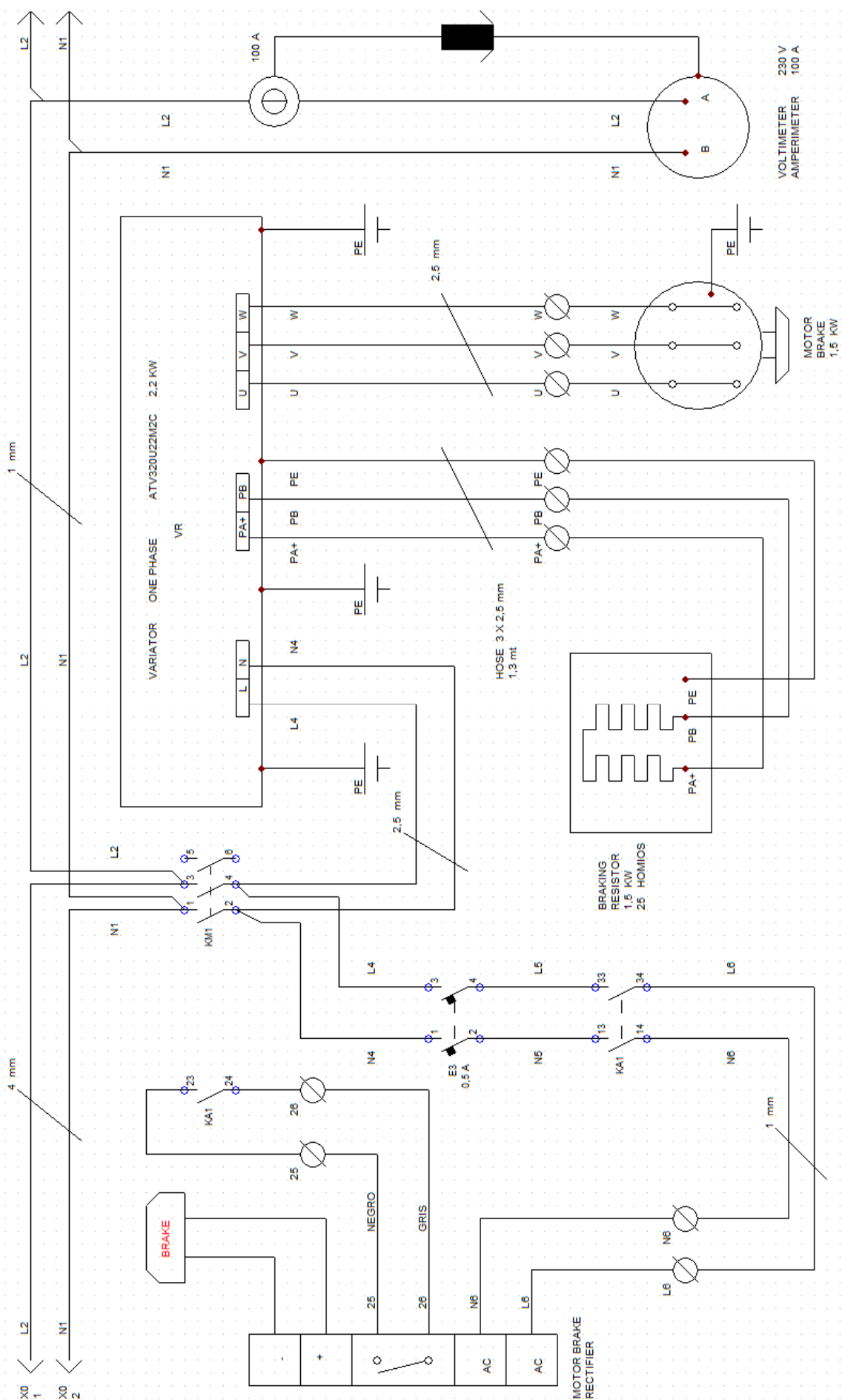
According to the procedure specified in the user's manual, the responsible for maintenance of the hoist should fill this table according to the frequency indicated, for the record of scheduled tasks.

[illegible]

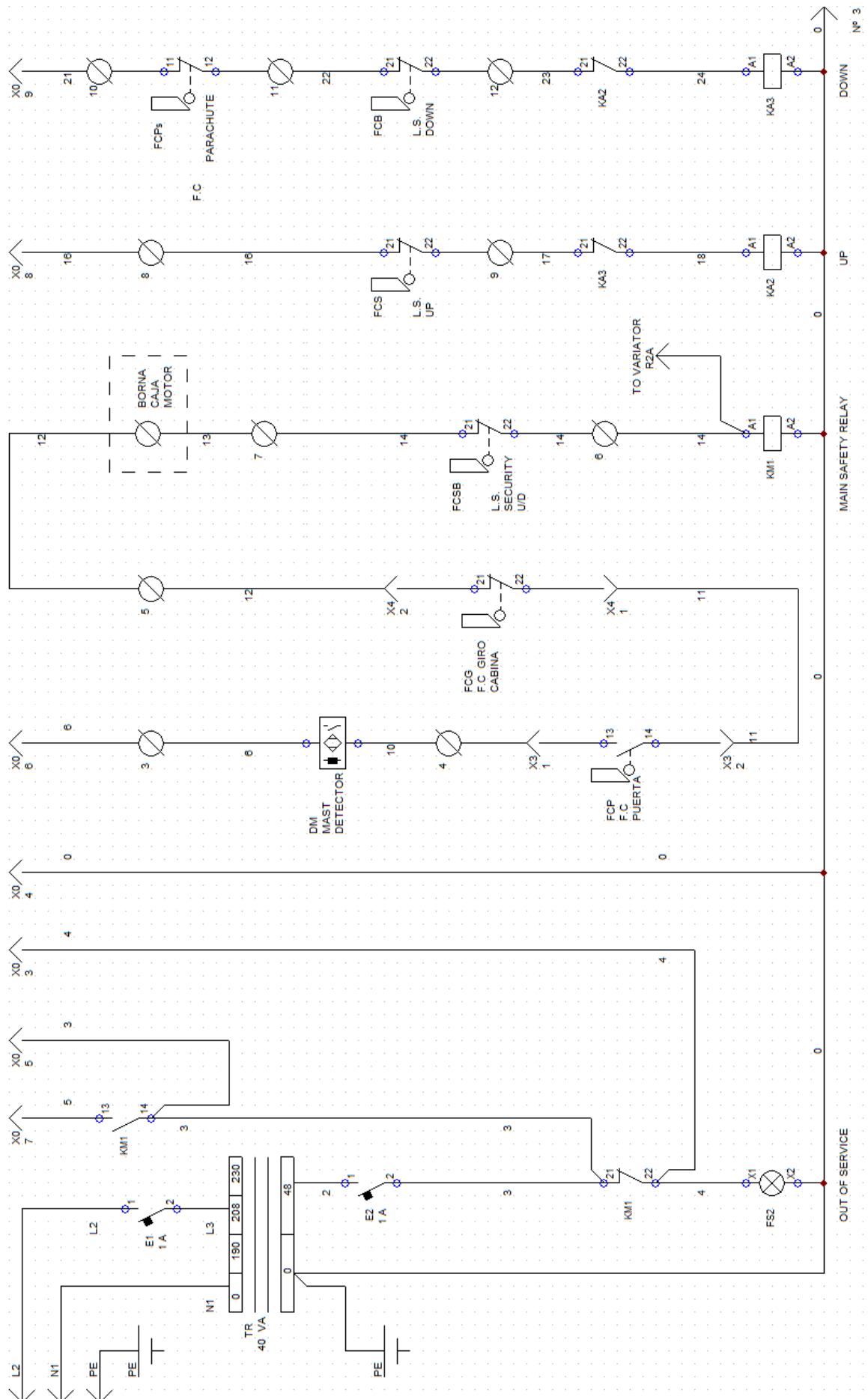
NUMBER	DATE	DESCRIPTION	NAME	SIGNATURE

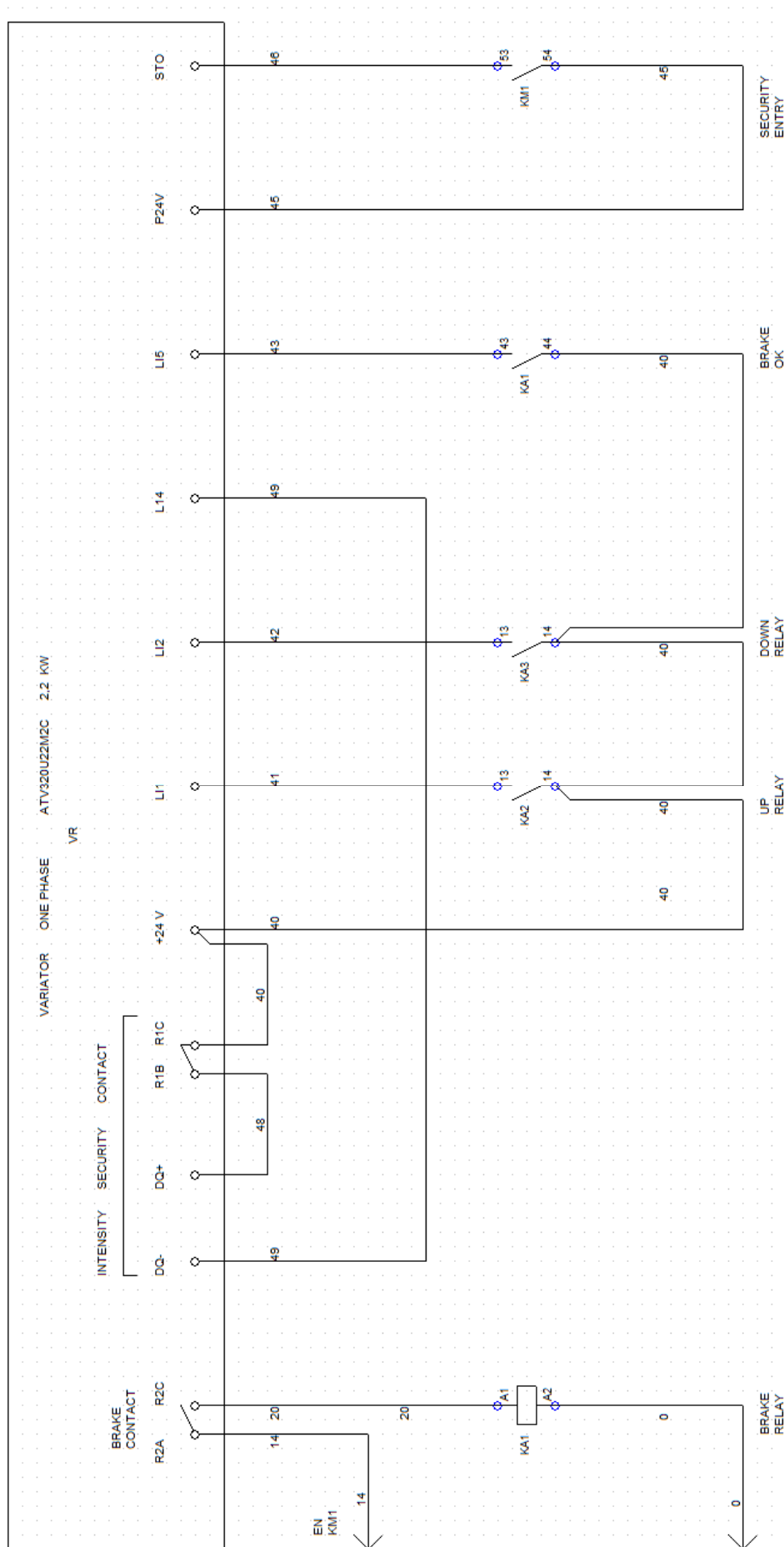
6. ELECTRIC DIAGRAM



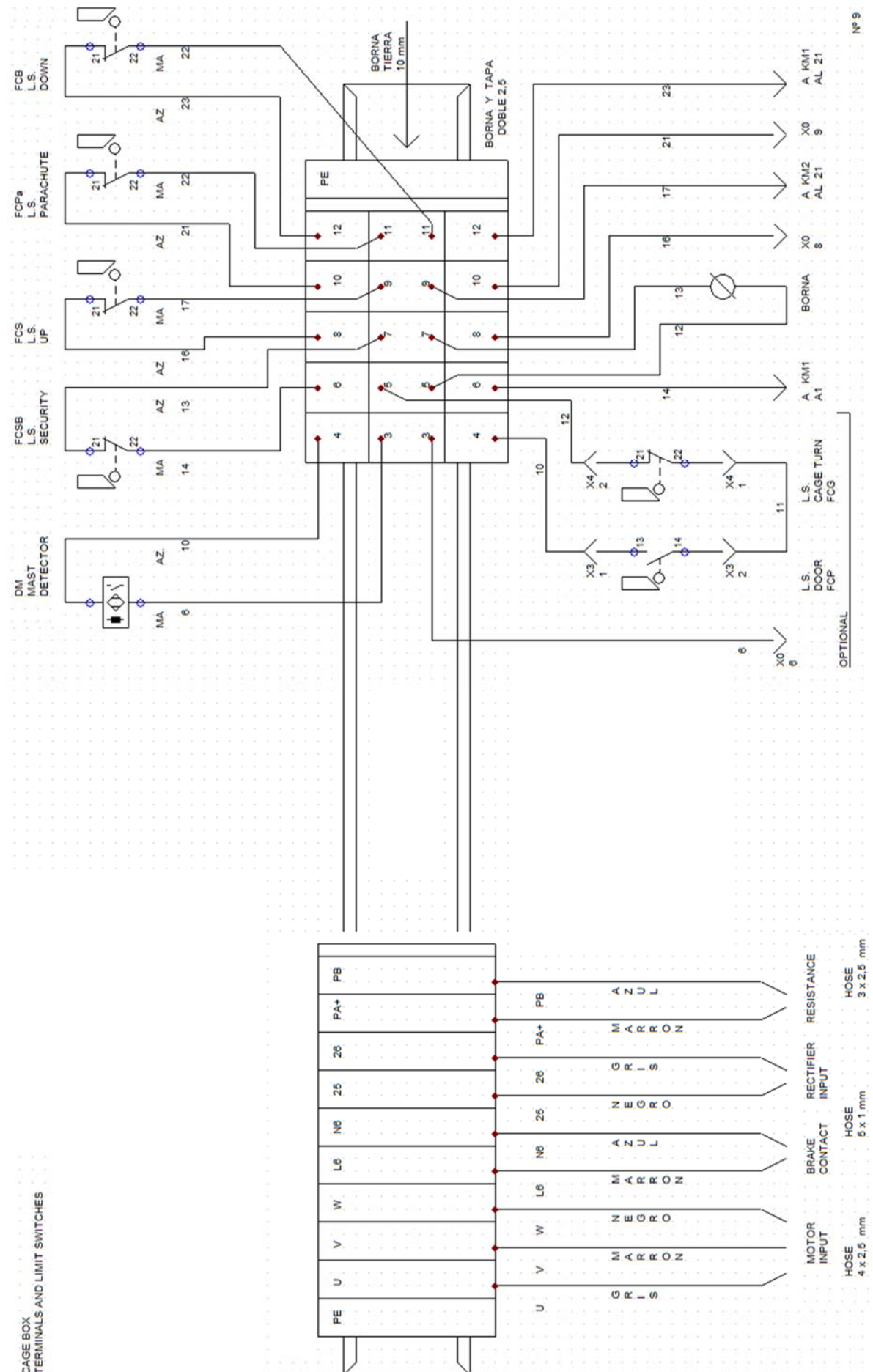


№ 2

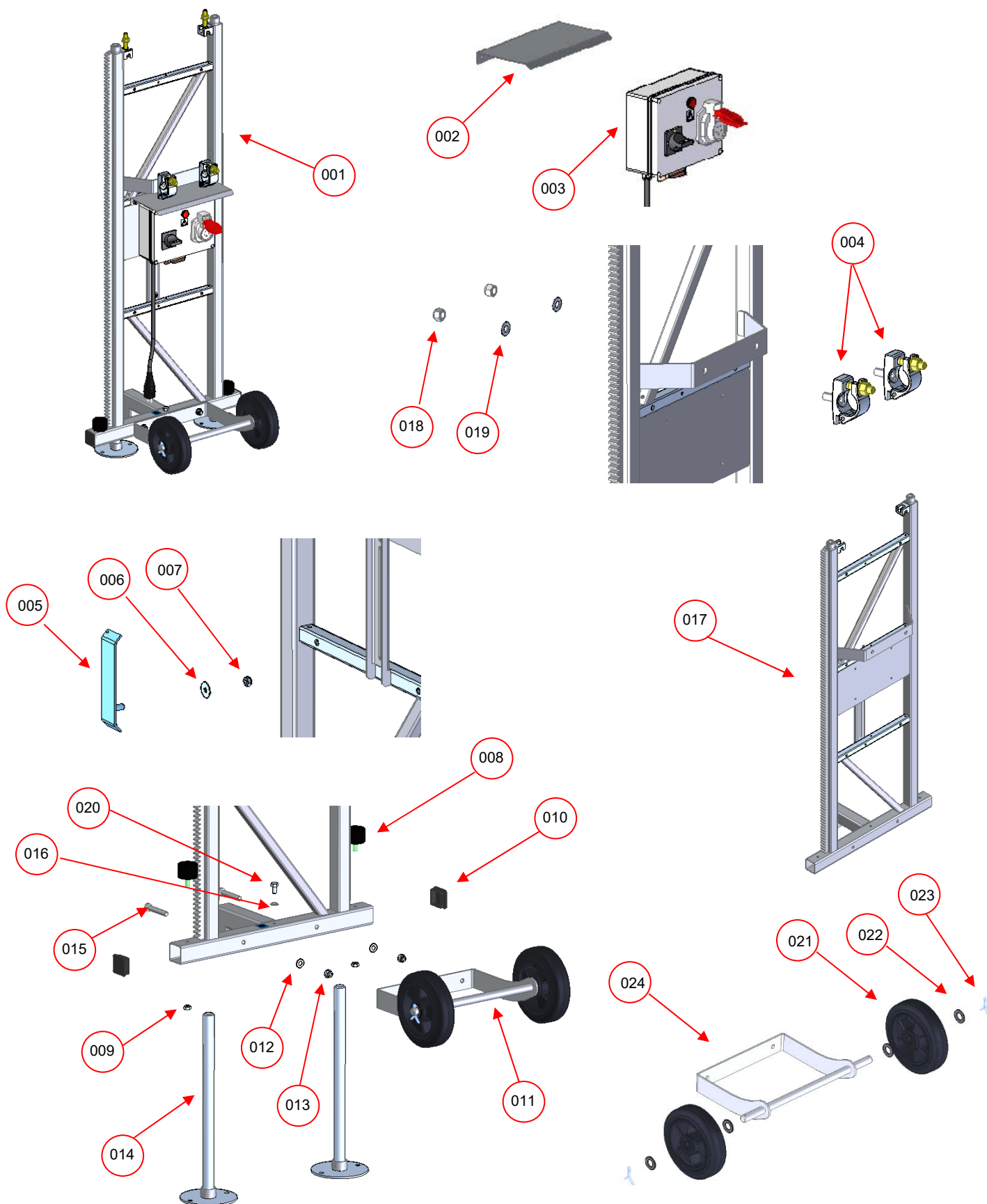




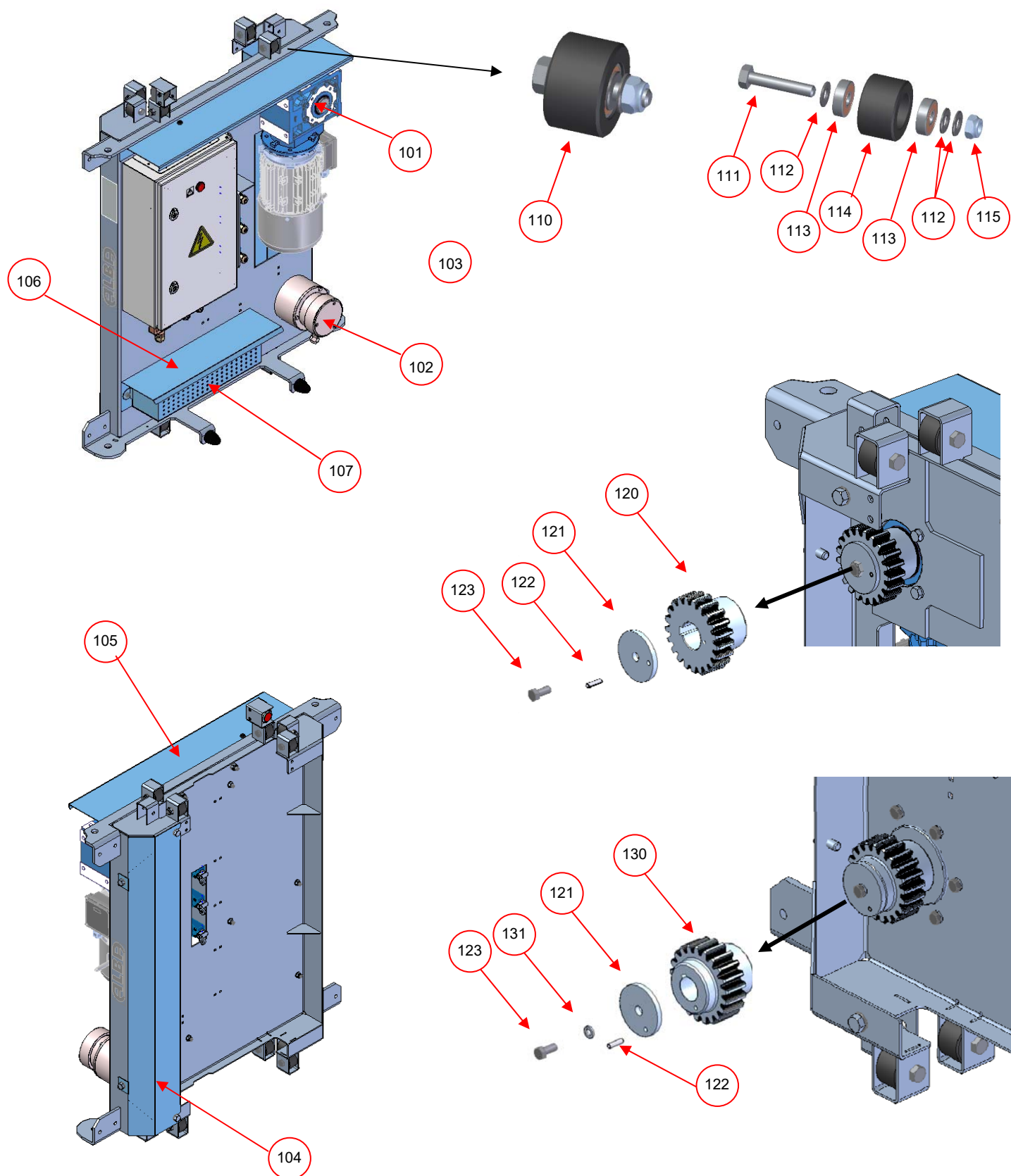
N° 4



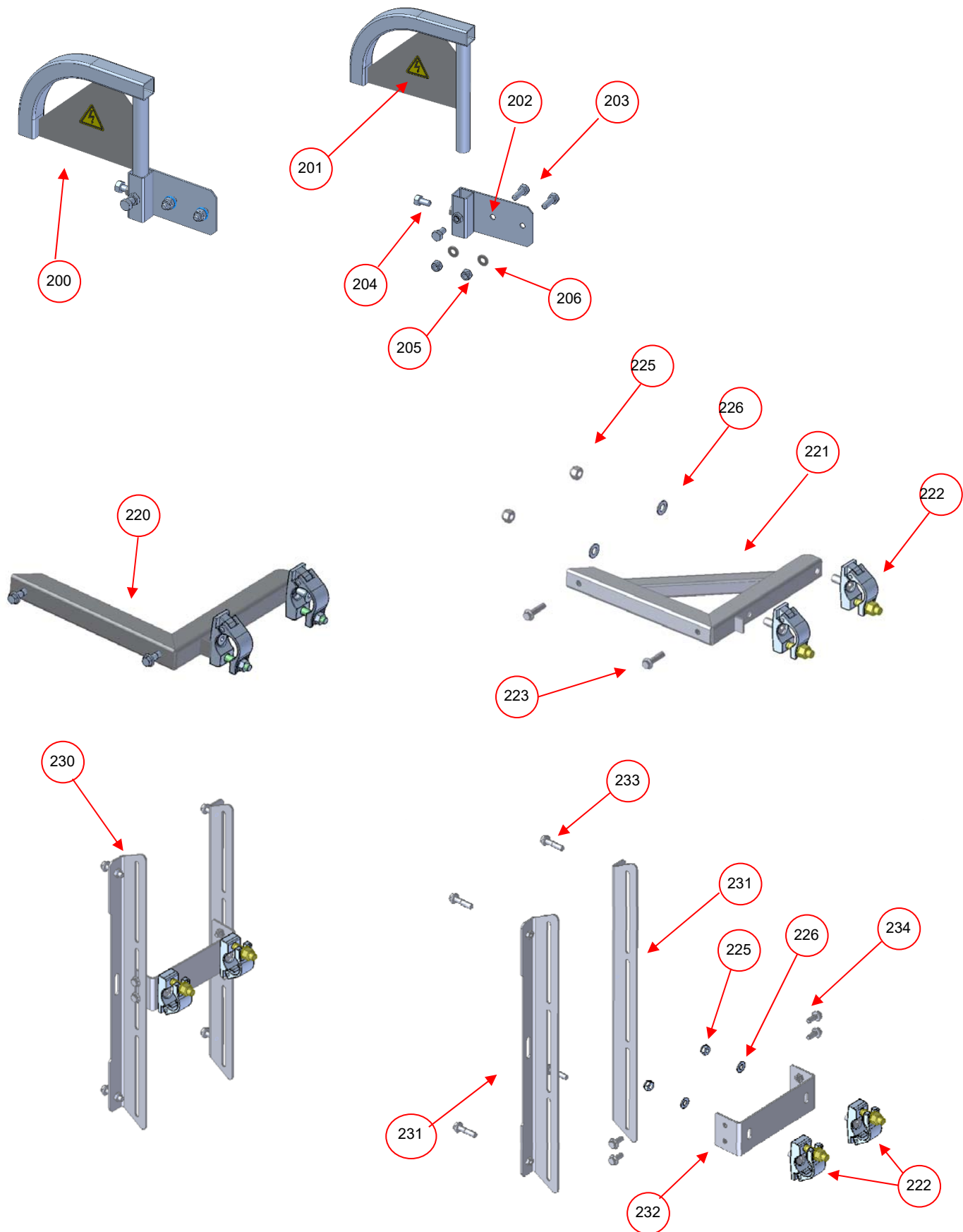
7. SPARE PARTS



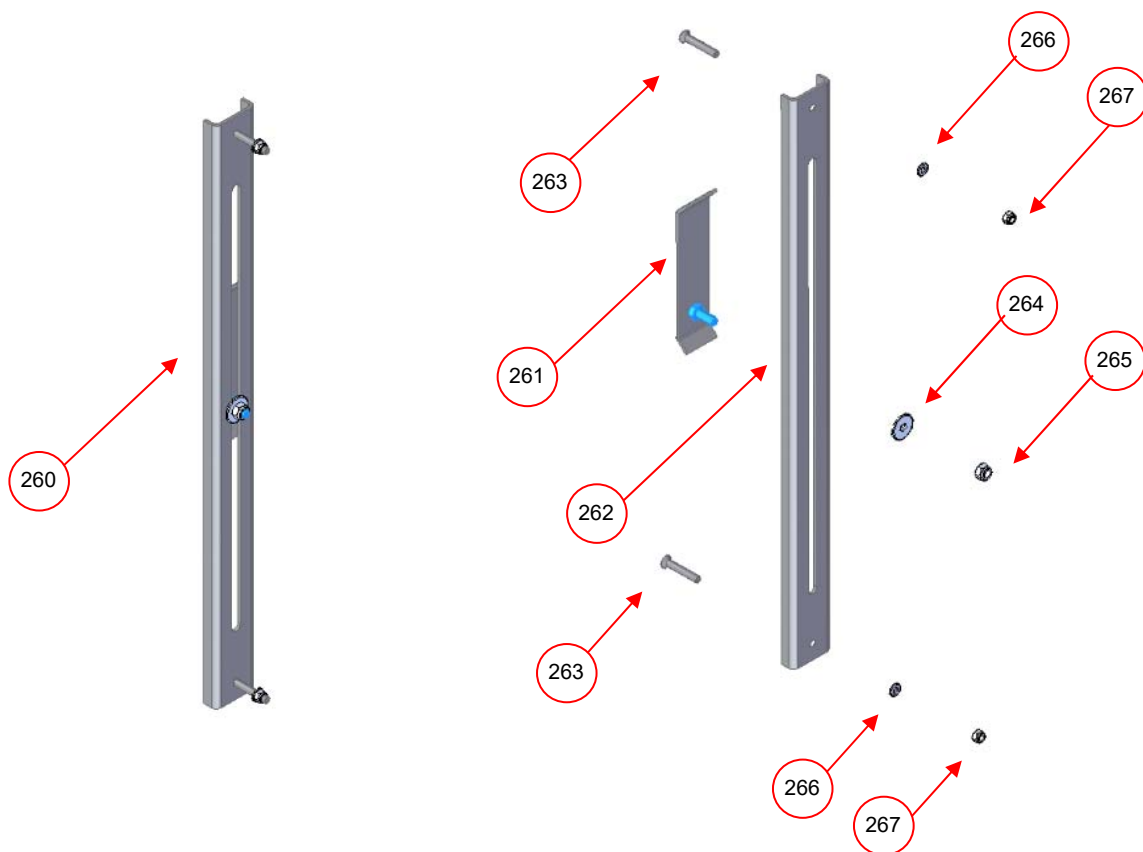
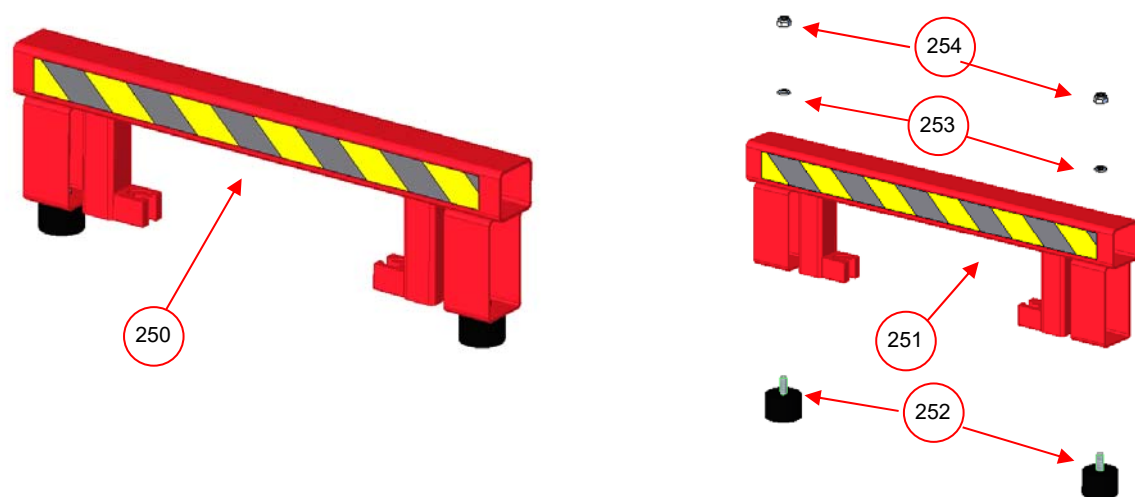
NUMBER	CODE	DESCRIPTION
001	158.0100R	Base set MC250 + first mast
002	158.0111	Protector of control box
003	MANIOBRA047	Electric box with variator
004	158.891	Half clamp with welded screw
005	158.0191	Stop cam
006	D9021-08,4	Washer ø8,4 DIN9021
007	D0985M08	Lock nut M8 DIN985
008	DTOPE06	Shock absorber Ø50x35
009	D0934M10	Nut M10 DIN934
010	DTAP265050	Square cap 50
011	158.0150R	Wheel set
012	D0125-13	Washer ø13 DIN125
013	D0985M12	Lock nut M12 DIN985
014	158.0110	Height adjustment spindle
015	D093112075	Screw M12X75 DIN931
016	D0125-10,5	Washer ø10,5 DIN125
017	158.1500	First mast
018	D0985M14	Lock nut M14 DIN985
019	D0125-15	Washer ø15 DIN125
020	D093310020	Screw M10X20 DIN933
021	DRUEDA03	Wheel
022	D0125-21	Washer ø21 DIN125
023	D009404040	Pin 4x40 DIN94
024	158.0151	Wheels support structure



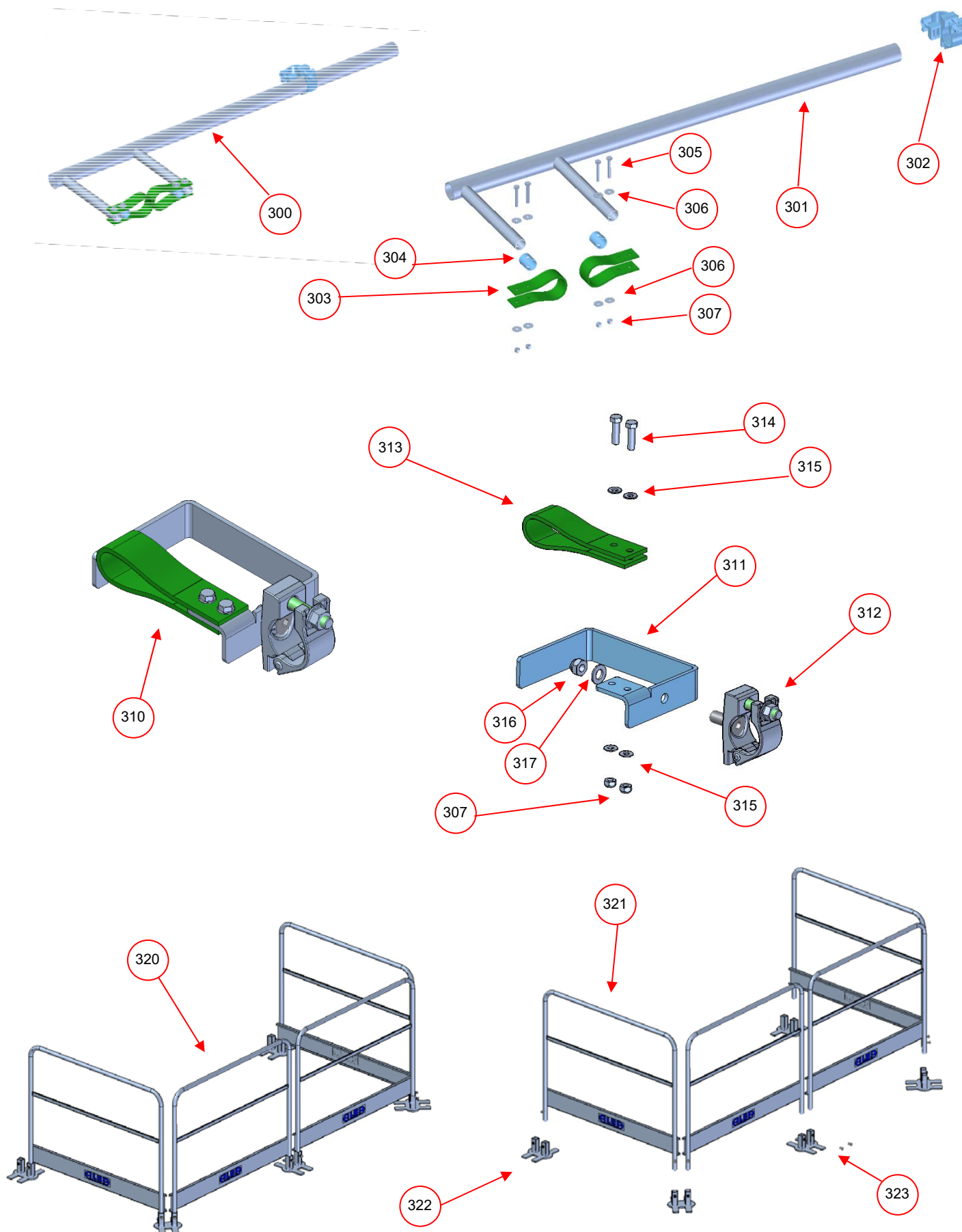
NUMBER	CODE	DESCRIPTION
101	M0044	Gearmotor 3 phase 230/400V 50/60Hz
102	099.3003	Parachute
103	MANIOBRA047	Electric box with variator
104	158.3015	Pinion protector
105	158.3013	Chasis equipment protector
106	158.3018	Resistance protector
107	ERESIST001	Resistance
110	158.316R	Guide roller assembly
111	D093110055	Screw M10X55 DIN931
112	D0125-10,5	Washer ø10,5 DIN125
113	R6200-2RS	Bearing 6200-2RS
114	158.3024	Guide roller
115	D0985M10	Lock nut M10 DIN985
120	158.3005	Pinion Z=21
121	158.3004	Pinion lock washer
122	D734605020	Pin 5X20 DIN 7346
123	D093308020	Screw M8X20 DIN933
130	158.3006	Pinion
131	D0127-08	Elastic washer ø8 DIN127



NUMBER	CODE	DESCRIPTION
200	158.64R	Drum cable outlet
201	158.641	Cable outlet guide
202	158.642	Cable outlet bracket
203	D093310030	Screw M10X30 DIN933
204	D093310020	Screw M10X20 DIN933
205	D0985M10	Lock nut M10 DIN985
206	D0125-10.5	Washer ø10,5 DIN125
220	158.81	L type anchorage
221	158.810	Anchor bracket
222	158.891	Half clamp with welded screw
223	D692110045	Screw M10X45 DIN6941
224	D799112025	Screw M12X25 DIN7991
225	D0985M12	Lock nut M12 DIN985
226	D0125-13	Washer ø13 DIN125
230	158.84	H type anchorage
231	158.8402	Mast coupling angle
232	158.8400	Mounted fixing plate
233	D962110045	Screw M10X45 DIN6921
234	D692110025	Screw M10X25 DIN6921

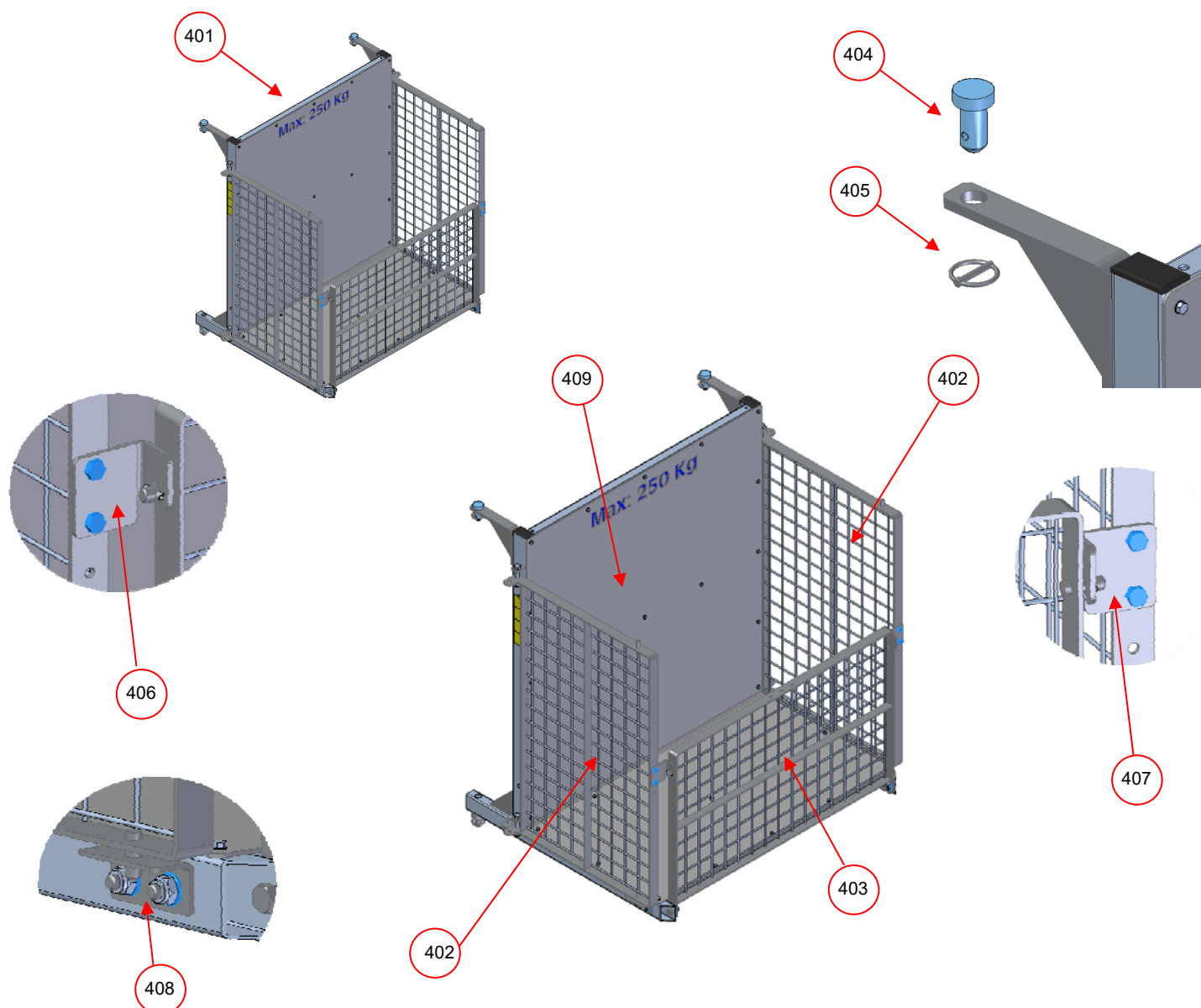


NUMBER	CODE	DESCRIPTION
250	158.014R	Upper mast stop assembly
251	158.0140	Upper mast stop
252	DTOP06	Shock absorber Ø50x35
253	D0127-10	Elastic washer ø10 DIN127
254	D0985M10	Lock nut M10 DIN985
260	158.019R	Stop cam assembly
261	158.0191	Stop cam
262	158.0192	Stop cam slider
263	D799106040	Screw M6x40 DIN7991
264	D0125-06,4	Washer ø6,4 DIN 125
265	D0985M06	Lock nut M6 DIN985
266	D9021-08,4	Washer ø8,4 DIN9021
267	D0985M08	Lock nut M8 DIN985



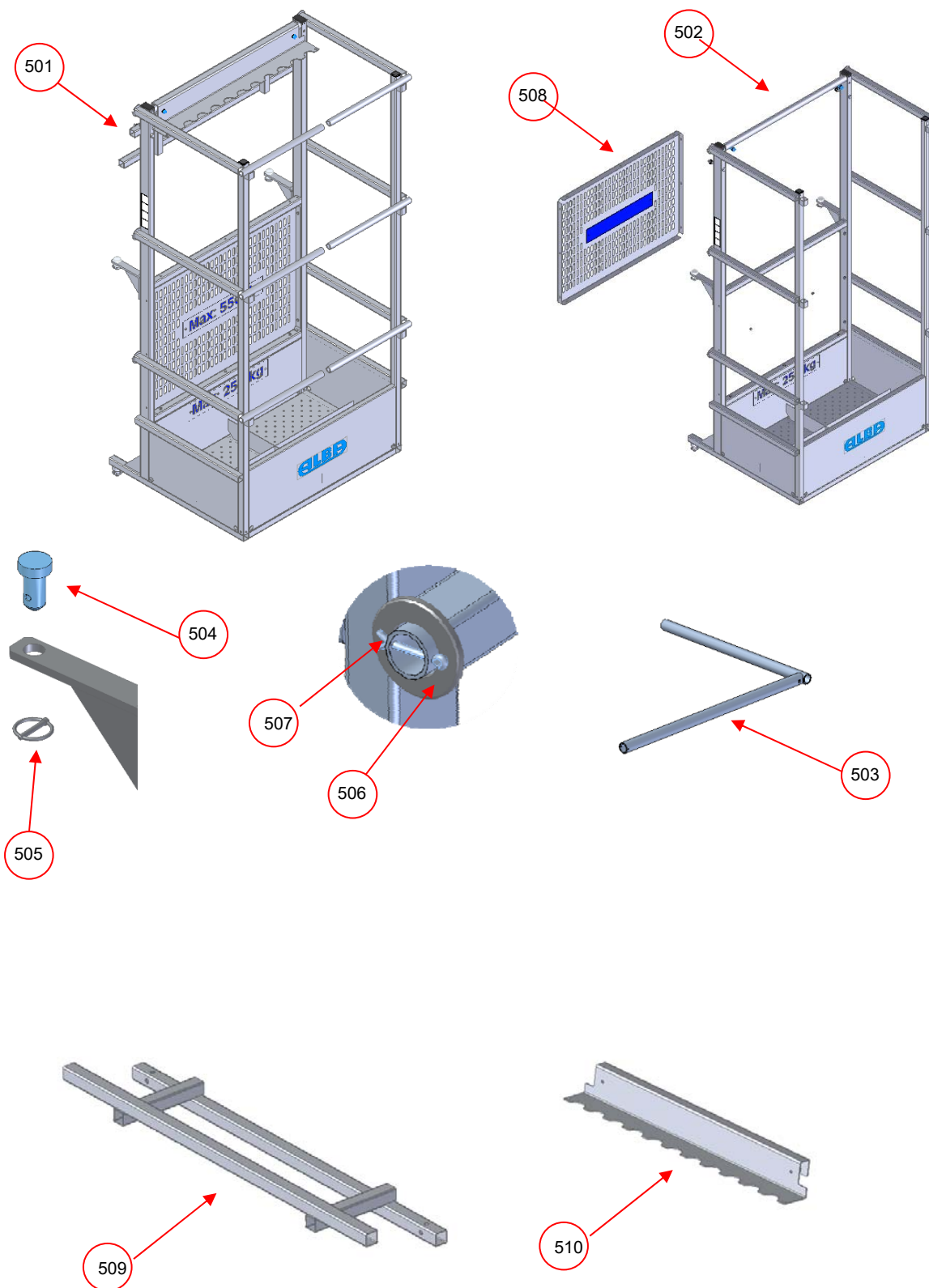
NUMBER	CODE	DESCRIPTION
300	158.671	Cable guide type 1
301	153.6323	Cable guide support
302	086.26	Fixed clamp anchor ø48
303	153.6325	Short retention tire
304	153.6304	Retention tube
305	D093108055	Screw M8X55 DIN933
306	D9021-08,4	Washer ø8,4 DIN9021
307	D0985M08	Lock nut M8 DIN985
310	158.672	Cable guide type 2
311	158.6711	Cable guide plate
312	153.891	Half clamp
313	158.6712	Cable retaining plate
314	D093308030	Screw M8X30 DIN933
315	D0125-08,4	Washer ø8,4 DIN125
316	D0985M12	Lock nut M12 DIN985
317	D0125-13	Washer ø13 DIN125
320	158.12	Base protection kit
321	086.42	Door L=1500mm
322	158.1210	Door support
323	D093312025	Screw M12X25 DIN933

7.1. 900x650 cage



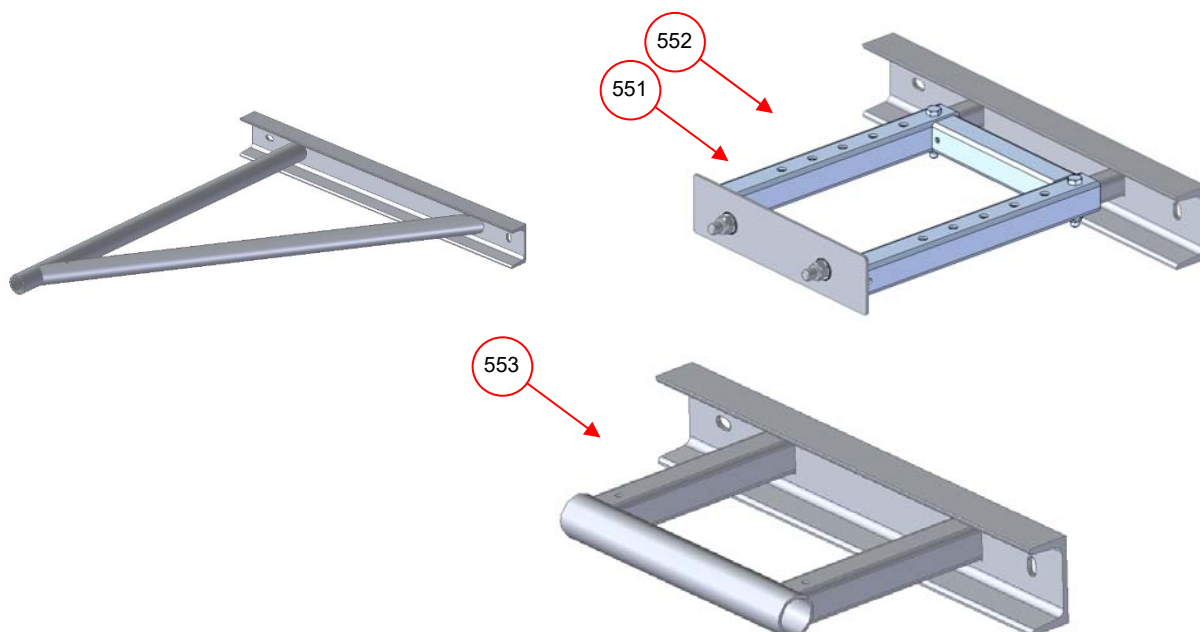
NUMBER	CODE	DESCRIPTION
401	158.41LB	Cage 900X500
402	158.412	900x50 cage side trap
403	158.413	900x50 cage front hatch
404	158.2009	Pin
405	D11023-04,5	Washer pin $\varnothing 4,5$
406	158.4108I	Left lock trigger
407	158.4108D	Right lock trigger
408	158.4105	Closing plate
409	158.411	Cage base

7.2. Scaffold cage



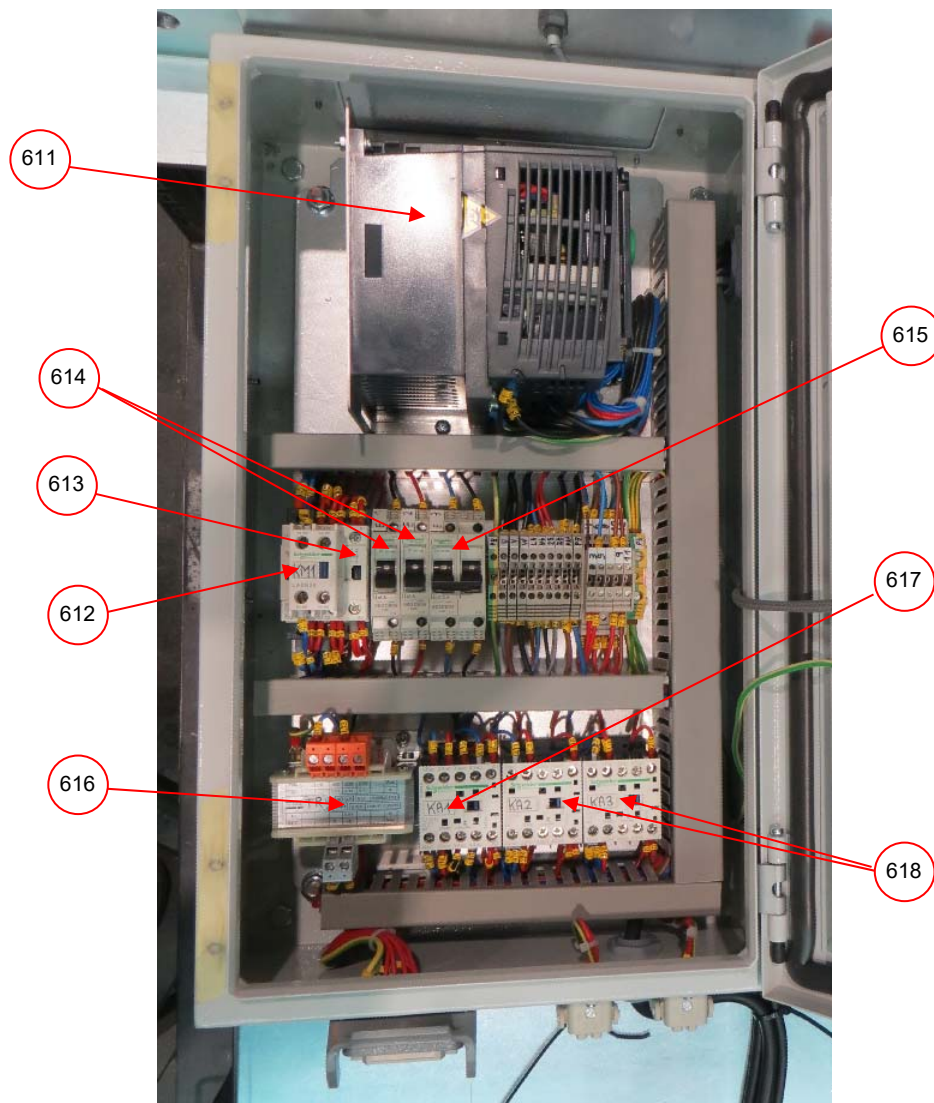
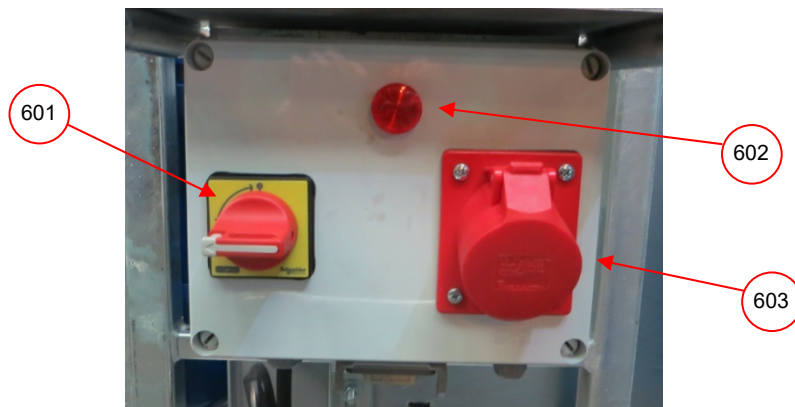
NUMBER	CODE	DESCRIPTION
501	158.42LB	Scaffold cage
502	158.4210	Scaffold cage base frame
503	158.4240	Retention arm
504	158.2009	Pin
505	D11023-04,5	Washer pin ø4,5
506	D0125-28	Washer DIN125 ø28
507	D009404032	Pin ø4 x 3,2
508	158.4255LB	Mast side panel
509	158.4226	Tube organizer
510	158.4235	Upper set of the scaffolding

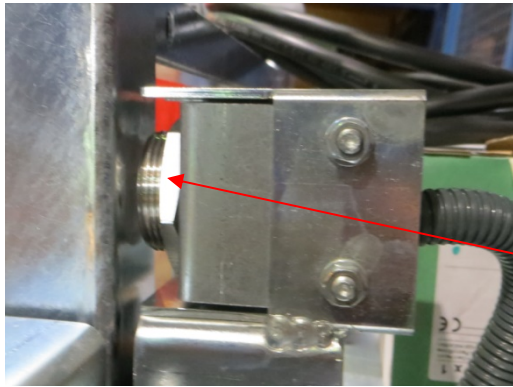
7.3. Wall anchorages



NUMBER	CODE	DESCRIPTION
551	158.8610	Special anchor for mounting the mast column perpendicular to the wall
552	158.8500	Special extensible anchorage for mounting the mast column parallel to the wall
553	158.8700	Special fixed anchorage for mounting the mast column parallel to the wall

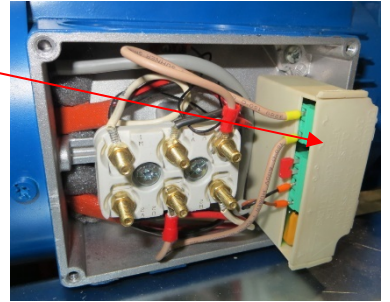
8. ELECTRIC SPARE PARTS





701

702



703

707

704

705

706

NUMBER	CODE	DESCRIPTION
601	EINTER09	Switch
602	EPILOTOR	Red pilot light
603	EBASE06	Plug 3P+N+T
611	EVARIADOR03	Variator 2,2kW
612	ELADN20	Auxiliary contact block LADN20
613	ELC1D18E7	Contacteur 18 ^a
614	EGB2-CB06	Thermal magnetic circuit breaker
615	EGB2-DB05	Thermal magnetic circuit breaker
616	ETR40VA208	Transformator 40VA
617	ECA2KN40E7	Auxiliary contactor
618	ECA2KN31E7	Auxiliary contactor
701	EMICRO015	Mast presence detector
702	ERECT03	Rectifier
703	EMICRO013	Limit switch
704	ERESIST001	Resistance
705	M0044	Gear motor (complete)
	M004401	Motor 3 phase 1,5kW 400V 50/60Hz
	M004502	Reducer i=20
706	099.3003	Parachute
707	ECAPOTA07	Harting

9. NOISE LEVEL

NOISE LEVEL (OUTSIDE THE CAGE)	
A-weighted emission sound pressure level, L_{pA} :	Uncertainty k
71 dB (A)	3 dB (A)

Values determined according to the acoustic test given in EN 12158-1 with use of basic international standards EN ISO 3744 and EN ISO 4871.

Note:

Noise emission values and uncertainty represent an upper limit of the range in which the measured values are susceptible to be present.

10. GUARANTEES

- Our machines are guaranteed for 12 months (in 8 hour shifts) against any fabrication defects, all parts deemed defective by our Technical Service department being replaced free of charge at our Factory, delivered carriage free.
- If the machine is sent to the factory for revision, after having worked for some time, carriage to and from the factory will be born by the purchaser.
- When repair, revision or replacement of parts is carried out at the work site, the applicable expenses (travelling and fitters, electricians, etc. labour costs) will be born by the purchaser.
- This guarantee does not include failures as a result of normal wear, incompetence, overloads, flawed installation or wrong site or poor machine maintenance.
- The guarantee for those parts or materials manufactured by others, bearings, motors, electrical or pneumatic materials, etc., will be limited to that given by our suppliers.
- The guarantee will cease from the moment the machine is repaired or subject to intervention by third parties without our authorisation in writing, or the agreed payment conditions are not complied with.
- In no case will the factory be liable to any payment for damages.