

BASIC TECHNICAL INFORMATION

MAST CLIMBING WORK PLATFORMS

PM 200/210 MODELS



B.F.T. SCAFFOLDING LTD (MAST CLIMBING DIVISION)
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TECHNICAL AND STRUCTURAL FEATURES

	SINGL E MAST	DOUBLE MAST	TRIPLE MAST
Max Height:	130 M	130 M	130 M
Total Platform Length:	2.20 M – 10.0 M	10.0 M – 30.5 M	30.5M – 40.0M
Max Platform Width	1.1 M – 2.4 M	1.1 M – 2.4 M	1.1 M – 2.4 M
Anchor Distance:	Every 6 meters	Every 6 meters	Every 6 meters
Travel Speed:	7 meters /min	7 meters /min	7 meters /min
Lifting Capacity: Access Platform	1,600 kg	3,700 kg	TBC
Platform Voltage:	3 Phase -380 v	3 Phase -380 v	3 Phase -380v
Power Source:	Mains Generator	Mains Generator	Mains Generator

DOUBLE MAST climbing work platforms can be separated and used individually as two **SINGLE MAST** platforms. Their traction units are similar, and a separate electrical cabinet is supplied for each unit. In bi-mast models, the cabinets are linked with control possible from either cabinet. We have also developed a system that allows the installation of **TRIPLE MAST** platforms up to a maximum horizontal length of 40 m.

PLATFORM MODULES

Length 0.6 m & 1.5 m
 Width 0.9 m (PM 200) 1.1 m (PM 210)

The non-slip metallic grid floor makes cleaning and water removal easy, so improving safety conditions at work.

The **PLATFORM MODULES** are coupled together using 3 keyed bolts. They incorporate 1.1 m high balustrades.



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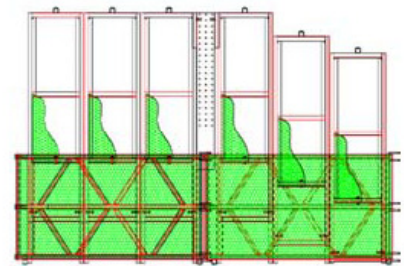
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FAÇADE EXTENSIONS

Length	0.7m	1.3m	1.5m
Width	0.5m		

FAÇADE EXTENSIONS are used to cover any spaces between the platform and the façade. Thanks to their modular system, ALHER MCWP can be adapted for a perfect fit to the shape of any façade, by adjusting their working surface to the individual profile of each site.



As well as extending the working surface area, this reduces the risk of falls. Like the platform modules, the extensions have a non-slip metallic grid floor.

The extensions are coupled to the platform modules using purpose-built rails. Their two set screws are tightened until the desired distance is achieved.

The space between every three façade extensions is covered by intermodule extensions.

The extension kit in front of the power unit is used to cover the space between the mast and the façade. Its hinged mechanism means it can be positioned horizontally for working, then replaced in a vertical position when the machine is ascending and descending. An additional safety system incorporated is an end of stroke device that blocks any movement of the platform when the extension kit is in horizontal position.

The façade extensions include posts for balustrades that allow guards to be erected round the entire platform perimeter.



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ELECTROMECHANICAL FEATURES

	<u>SINGLE MAST</u>	<u>DOUBLE MAST</u>
Motor Rating	2 x 3 HP (6 HP/ 4.4 kW)	4 x 3 HP (12 HP/ 8.8 kW)
Supply Voltage	380 V 50 Hz*	
Control Voltage	48 V	

*The machines are adaptable to any other supply voltage.

The traction unit incorporates a ladder for access to the platform. The Access Door opens inwards and has a locking device to prevent the machine starting up if it is open.

Its 3 large Wheels facilitate its movement and positioning.

Levelling Screws and Stabiliser Arms are used to position the traction units correctly.

MOTORS BRAND: AEG LAFERT

Every power unit has two 3 HP soft-start motors.

Each unit has a centrifugal brake that acts as an arresting device.

Motor power is calculated according to load capacity. Excessive capacity leads to an unnecessarily high power consumption.

REDUCER BRAND: VARMEC

Characteristics:-

- 3 gear trains

ELECTRIC HOSE

A 5-strand 4 mm² diameter electric hose is used.



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SAFETY ELEMENTS

• Speed limiter / Centrifugal brake

System for preventing falls from the platform due to overspeed by the use of a speed limiter-arresting device on each mast, which can stop and support the platform in working conditions.

• Controlled manual lowering system

In the event of an interruption of the power supply.

• Automatic levelling device

End of stroke devices that stop the platform when it departs from the horizontal position, both during normal movement and for the conditions of use envisaged by the manufacturer.

• Final section of mast with half-rack (painted red)

This prevents the platform running off the top of the mast.

• Rack proximity sensor

Located behind the rack. When the device cannot detect the rack, it detains the platform.

• Protected mains switch

Located in the control box that cuts the platform power supply. Is protected by a padlock that prevents unauthorised use when the machine is not in service.

• Platform access doors

Open inwards. Locked by an electrically-operated locking bolt to prevent the platform from working if the door is open.

• Platform floor of non-slip metallic grid

Permits removal of water and easy cleaning.

• Protective balustrades around the platform

The platforms have 1.10 m-high balustrades on the side opposite the façade and on both laterals. They consist of a 20 cm-high baseboard and two rails, one at half-height and the other on top.

If façade extension units are installed, balustrades can also be fitted on the façade side, thus protecting the entire platform perimeter.

• Mast protector

2 m-high metallic wire netting prevents any risk of trapping and/or shearing in the area around the mast.



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• End of stroke microswitches

Fitted at both ground and upper level stops. There is also a third safety microswitch that will activate if any of the earlier devices fails to function.

• Low voltage (48 V) working

• Phase detector and control

Sequence relay to monitor missing phase or phase imbalance and to protect against phase inversion.

OPERATION

The control panel is located on the platform, allowing workers to control the machine's movement from the platform itself.

The up / down controls require sustained pressure, and the machine stops if this pressure is removed.

Also includes emergency stop button.

An acoustic signal warns that the machine is in motion.

The platforms have a controlled manual descent system, by which they can be lowered in the event of a power cut or other emergency. Each elevation unit is fitted with 2 levers that allow the brakes to be freed from the motors-reducers. This is activated smoothly and simultaneously brings the platform slowly down to base level.



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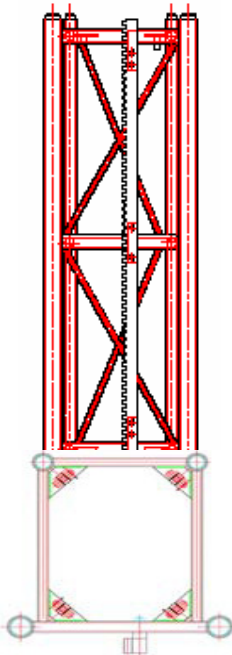
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ELEVATION SYSTEM – MAST FEATURES

RACK & PINION ELEVATION SYSTEM. MODULE 8 RACK



The module 8 rack provides more effective transmission and greater resistance and safety of elevation.

Each section of the rack is individually screwed onto the mast element. This means that either of the two elements can be replaced as required without having to detach the other.

Each power unit has 16 rollers to spread the load uniformly when climbing the mast.

STANDARD MAST	SECTION	Square
PM 200/ 210	GUIDE TUBE	60 x 3,5 mm
	HEIGHT	1.500 mm
	WEIGHT	64 Kg
	FINISH	Hop dip galvanised

The mast has a square section and its internal structure is reinforced.

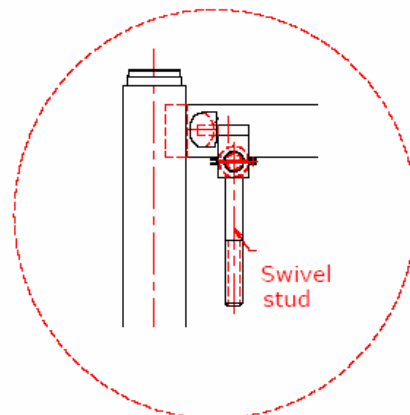
Its dimensions (500 x 500 x 1,500 mm, weight 64 Kg) make it easy to handle during the assembly/ dismantling process.

The galvanised finish gives the steel greater resistance and prolongs its life.

SWIVEL STUDS

Each mast section has 4 M-18 swivel studs. These can be turned and inserted into the lugs of the element above. Washers are then fitted and the adjusting nuts tightened with a 125 Nm coupling torque.

As the studs are secured to the mast sections, there is no risk of loss during assembly/ dismantling work.





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STANDARDS

The mast Climbers we provide/use here at B.F.T., (ALHER PM 200/210 MODELS) have been designed, manufactured and tested by the manufacturer according to the following standards:

• Machinery Directive 98/37/EC

- **EN 292/1.** Safety of machinery. Basic concepts, general principles for design. Part 1. Basic terminology, methodology.
- **EN 292/2.** Safety of machinery. Basic concepts, general principles for design. Part 2. Technical principles and specifications.
- **EN 294.** Safety of machinery. Safety distances to prevent danger zones from being reached by the upper limbs.
- **EN-349.** Safety of machinery. Minimum gaps to avoid crushing of parts of the human body.
- **EN- 418.** Safety of machinery. Emergency stop equipment, functional aspects. Principles for design.
- **EN-614/1.** Safety of machinery. Ergonomic design principles. Part 1. Terminology and general principles.
- **EN- 953.** Safety of machinery Guards. General requirements for the design and construction of fixed and movable guards.
- **EN-954/1.** Safety of machinery. Safety-related parts of control systems. Part 1: General principles for design
- **EN-1050.** Safety of machinery. Principles for risk assessment.
- **EN – 1495.** Lifting platforms. Mast climbing work platforms.
- **EN- 60.204/1.** Safety of machinery. Electrical equipment of machines. Part 1. General requirements.
- **ISO 6336.** Calculation of load capacity of spur and helical gears.



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ASSEMBLY

NOTE: Detailed instructions for assembly of the Mast Climbing Work Platforms are given in the assembly, operating and maintenance manual that accompanies the machine. This dossier is only intended to cover a few aspects of the assembly process in general.

1. Before starting the installation:

You must:

- a. Obtain the relevant regulatory permits for installing the machine.
- b. Check that there is a power supply, prepare the electrical connection.
- c. Order any auxiliary equipment you may need for mounting the platform in situ (mobile crane, tower crane, etc.)

2. Foundations

You must prepare adequate foundations for mounting the platform base, to ensure its stability. Concrete must be at least 150 mm thick, and its dimensions will vary depending on whether the platform is single mast or double mast, and if stabiliser arms are to be attached.

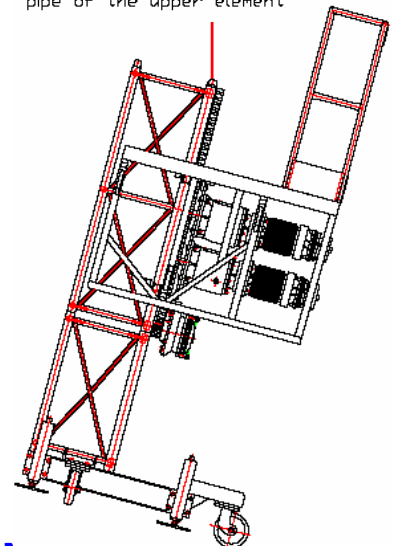
3. Setting the Base

When erecting the platform, it must always be held using the rectangular tube on the upper element next to the rack, as indicated in the diagram.

During transport of the platform to the site, be very careful to avoid damage, particularly to the motors, electrical controls, etc. Also try to screw down and tighten the nuts of the swivel studs on the mast elements so they do not get lost due to vibrations occurring during transport.

The ideal means of transport for the platform is by mobile crane, to avoid the use of one crane on the loading site and another for unloading.

Platform hanging from a cable for the rectangular pipe of the upper element





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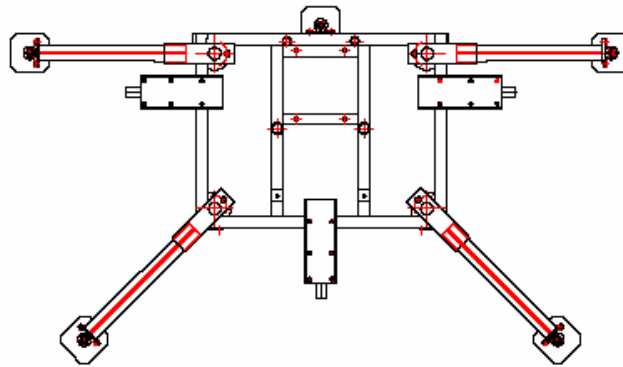
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BASE SUPPORT

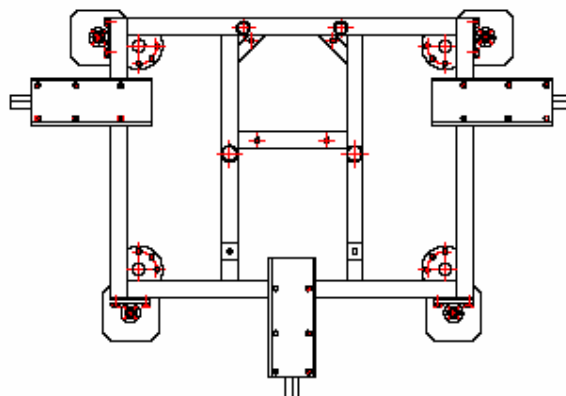
SINGLE MAST PLATFORM

The base of single mast platforms must always be assembled using four stabiliser arms, as indicated in the diagram. If lack of space prevents this, and for platforms of 10 m long or less, the base can be installed using only two stabiliser arms (always with one at each side).



DOUBLE MAST PLATFORM

Double mast platforms do not require the stabiliser arms to be secured to the base. The fifth levelling screw is not required either; the four end screws are sufficient.





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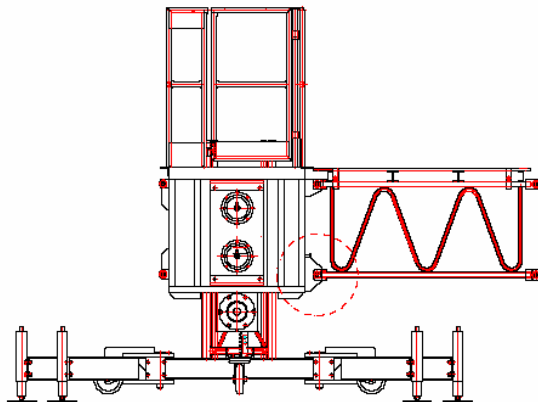
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4. Assembly of the Platform modules

Single Mast Platform

No platform assembly operation must be carried out with the platform level more than 2 metres above the ground.

- 1.- Installing the elevation unit (attaching the stabilisers in the position described above).
- 2.- Earthing of the electrical connection.
- 3.- Levelling of the elevation unit using its levelling screws.
- 4.- When coupling platform modules, alternate the side from which you assemble the elevation unit to ensure it remains as stable as possible at all times. First couple the module using bolts and secure it with locking pins to one side of the elevation unit, then go on to attach another module, this time to the other side of the unit.



Initially,
only
attach 2

platform modules to each side of the elevation unit (7m length), adding their respective balustrades. If 3 platform modules are to be attached to each side of the unit, to reach the maximum length of 10m, the last 2 modules must only be added after the first stay or bracing has been assembled on the structure.

There should be the same number of platforms on each side, or failing that, the difference should be only 0.6 metres (a small platform module).



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All front balustrades must be positioned securely by tightening their screws. The balustrades must always be fitted, except as required when loading and unloading operations at ground level.



WARNING: Assembly or dismantling of the single mast platform must always be carried out with stabiliser arms attached.

Double Mast Platform

The safety measures to be taken for this platform are the same as those already discussed for Single mast platforms.

First, position the elevation units. The two units are identical, so it does not matter whether they are installed on the left or the right. In double mast platforms, you do not need to fit either the stabiliser arms or the fifth levelling screw.

To assemble the elevation unit bridge, position the modules one after the other. If there is a gradient, start assembly with the elevation unit on the lower part of the gradient. Join and secure each module until you reach the other elevation unit. Units must be levelled and bolts and balustrades positioned as described for Single mast platforms.

When joining the last module of the platform's central bridge to the second elevation unit, you may wish to connect the electrical controls to the elevation units and the power supply to raise or lower the unit, making it easier to position the bolts.



WARNING: The lowest bolt of the first and last platform module in the central part must not be attached either for assembly nor in normal operation.



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5. Assembly of Mast

a. Positioning of the Mast Elements

All masts can be assembled by two people. The process described must be duplicated if a bimast platform is being assembled.

First, load the mast elements (3) and the bracing tubes required for the first bracing to the platform. Use two people to place the next element over the element below, securing it with 4 swivel studs. To raise the element more easily, you may also use a pole and winch.

NOTE: You may also use a crane, provided that you ensure appropriate safety measures are taken. If you do so, do not unite more than 4 mast elements at a time.

The platform must be raised until the rack detector is roughly 20 cm away from the end of the platform (if raised too far, the detector will stop its ascent).

Install all the mast elements required to reach the height where the first bracing is to be attached. As a rule, 2 elements should be attached first, then the third element braced. The platform must not move over this element until it is anchored in place.

Next proceed with the bracing as described below.

After completing the bracing, go down again to load up the mast elements and bracing tubes required for the next bracing to the building. Repeat this process until the entire run of the platform is completed.

The final mast element is always the one with only a half rack (painted red) which acts as a safety device.

Note: *You must check that the swivel studs, the lug welds and all components involved in coupling the mast elements are in good condition.*



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b. Positioning the Bracing Elements

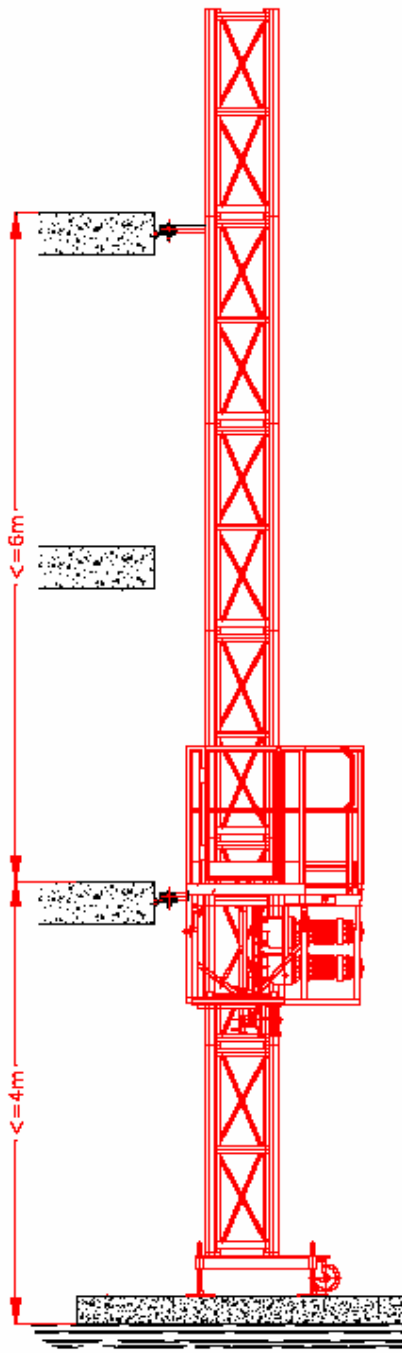
The building bracing elements ensure the perfect verticality of the raising system (mast) and also absorb any horizontal forces produced.

The first bracing should be made at a maximum height of 4 metres. Subsequent bracings must be at intervals of not more than 6 metres (every 4 elements).

Before each bracing, check the levelling of the mast in both directions and that the platform is parallel to the building.

When due to construction requirements, the bracing elements cannot be placed at the intervals established by the manufacturer, you must consult the manufacturer about the best way to complete the assembly (use of stabiliser arms, etc.).

Before starting the bracing to the building, it is very important to choose the best procedure for fixing the anchor plates to the wall.





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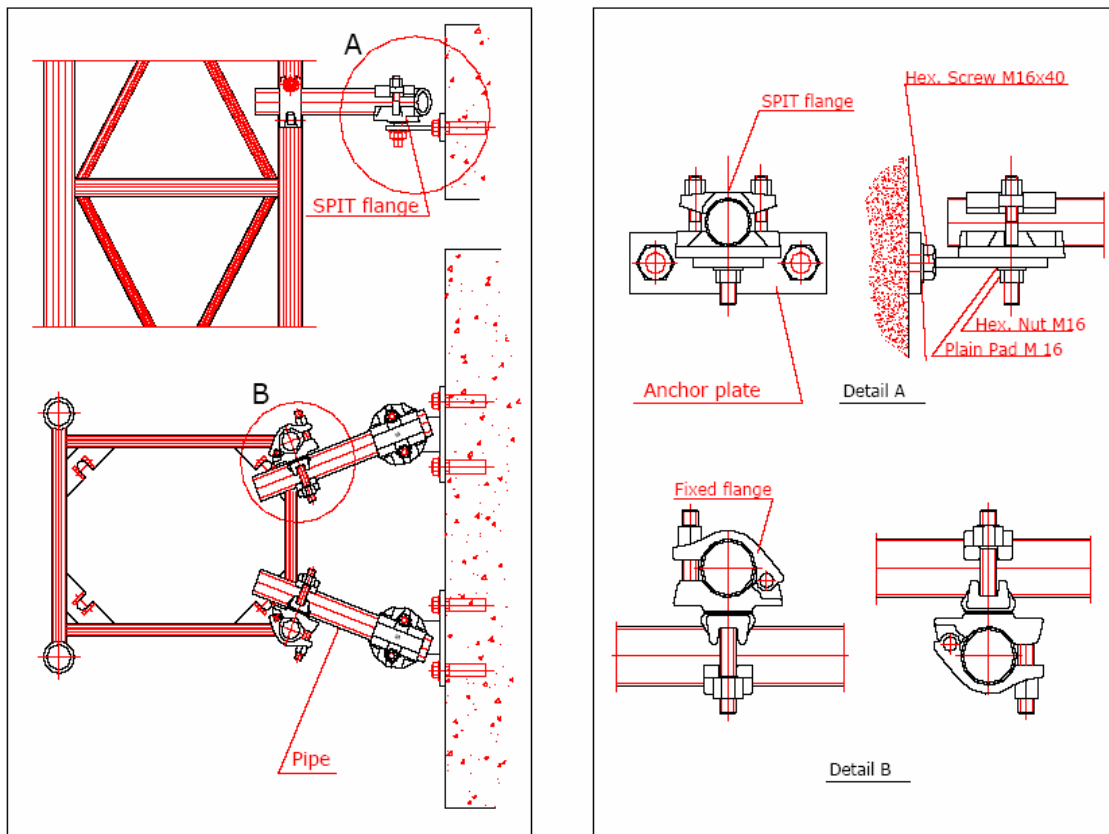
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First secure the anchor plates to the wall (these can be anchored either to the frontage or at each floor) as appropriate.

With the mast levelled, position the two 48 support tubes so that each forms a 30° angle with the perpendicular at the façade.

The joints must be made using flanges.



c. Installation of Other Elements

Assembly of the platform is completed by positioning the upper and lower buffers, the self-levelling rods (for the Double mast platform), mast protectors, etc...