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HANDBOOK

Jib Cranes

S/N

Ref

- Type
- Floor Mounting
 - Wall Mounting
 - Column Mounting

 - Manual Slewing

 - Profile Track
 - Under Braced I-Beam
 - Over Braced I-Beam

SWL (kg)

Jib Radius "S" (m)

Column height "H" (m)

Year of Manufacture

01/2009

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INTRODUCTION

This handbook is to be sent with the supply of the machine. It is of interest for people who intend to install, maintain and use the machine. Users must be competent and follow the instructions detailed in this document. Once supplied with the machine, it is the responsibility of the owner to ensure that this book is kept safely in a dry, sheltered place, where it can be easily accessed for consultation.

Should this handbook be lost or damaged, a replacement handbook can be re-ordered by providing the information detailed on serial number plate/label, attached to the machine.

Warranties and responsibilities

The warranty is valid for 12 months from the date of delivery. This handbook corresponds to the machine and its characteristics at the date it was supplied. The warranty for this machine's use as determined at the time of delivery is dependent on the careful observance of the instructions in this handbook.

Therefore, the manufacturer retains the right to void the warranty for:

- uses other than those specified in this handbook
- non-authorized modifications or repairs to the machine
- the use of non-approved spare parts.

The responsibility of the manufacturer is not retained in the situation where the machine is transferred from the primary user to a secondary user. This responsibility can be re-established if the new user notifies the manufacturer and providing the correct procedures of installation and machine use are followed.

When the machine is sold to another user in a country with a different language, it is responsibility of the first customer to provide a copy of the present handbook, with an accurate translation.

1. MACHINE HANDLING

1.1 Packing

Columns, jibs, frames and brackets with tie rods are supplied without any packing.

Fragile parts, electrical equipment, hoist and trolley or other equipment are packed in cardboard boxes.

Special packing can be supplied upon request.

The packing material can be disposed of with the normal urban waste.

1.2 Transport

The transport of the machine, packed as per chapter *Packing (1.1)*, must be carried out by qualified carriers, who are able to provide a proper handling of the materials.

Check that:

- The material hasn't been damaged in transit;
- No heavy article has been laid on the machine;
- The material hasn't been exposed to weather, frost or heat sources;
- Has not been stored in damp conditions;
- Is handled according to the instructions.

If the conditions aren't as specified above, contact the manufacturer.

Upon receipt, the packing and the other materials must be complete, that is:

- They mustn't be dented, marked, damaged or broken;
- They mustn't be wet or have marks due to weather, frost or heat;
- They must not have been tampered with.

2. MACHINE GENERAL CHARACTERISTICS

2.1 Marking

- Manufacturer's name;
- Serial number;
- Manufacturing year;
- Capacity.

Serial numbers will generally be found on the column and/or arm of the jib crane.

2.2 Technical and constructive characteristics

This chapter describes the general characteristics of the jib cranes.

2.2.1 Floor Mounting Crane

This is composed of a jib connected to the column. The column is fixed to the floor with anchor bolts or chemical anchors.

The jib can rotate manually to the limits of the column or to its own slewing limiters.

2.2.2 Wall Mounting Crane

This is composed of a jib connected to a support bracket fixed to the wall or to a support pillar with anchor bolts.

The jib can rotate manually to a certain degree, limited by its fixture or its own slewing limiters.

2.2.3 Column Mounting Crane

This is composed of a jib connected to a support bracket fixed around a column to another bracket with anchor bolts.

The jib can rotate manually to a certain degree, limited by its fixture or its own slewing limiters

2.2.4 Jib Arms

Made from:

- a) Profile Track Sections braced from above the track according to the safe working load.
- b) Steel I-Beams braced from above the beam according to the safe working load.
- c) Steel I-Beams braced from under the beam according to the safe working load

They are mounted on a support pin revolving from the jib support bracket.

2.2.5 Jib Support Brackets

They are composed of reinforced plates, which the jib rotates in. The brackets are either part of the Floor Mounting Pillar or separate top and bottom brackets that can be mounted to walls or around columns.

2.2.6 Pillars

Self-supporting, made of pipe or a special structure composed of steel box sections. At the bottom they have the plate fixed directly to the floor or via anchor bolts and frame. At the top they have brackets for the jib support.

2.2.7 Anchor Frame & Bolts

Supplied on request to fix the column into a concrete foundation plinth.

2.2.8 Wall Mounting Brackets Kit

Comprises of a top and bottom bracket for mounting the pivot pin of the Jib arm inside. These brackets are supplied undrilled and require drilling to suit the surface upon which the Jib will be mounted.

2.2.9 Column Mounting Bracket Kit

Comprises of a *Wall Mounting Bracket Kit (2.2.8)* along with top and bottom rear mounting brackets and threaded rod and studding. All the brackets are supplied undrilled and require drilling to suit the column they will mount around. The threaded rod and studding should join the front and rear brackets in order to create a pivot point for the arm. In some rare situations this kit may require some extra support, to ensure it doesn't slide down the column.

2.2.10 Electric Kit

Usually to supply an electric chain hoist or other lifting device along the jib arm. The electrics supply kit comprises of:

- a) for Profile Track Jibs
 - Cable Trolley(s) that run inside the profile behind the load trolley
 - Cable Clamp to fix cable at the start point of the arm
 - 4core 1.5mm PVC Flat Cable with small tail to connect to supply
 - PVC Cable Glands PG16 size thread
- b) For I-Beam Jibs
 - Cable Trolley(s) that run along I-Beam behind the load trolley
 - Cable Clamp to fix cable at the start point of the arm
 - 4core 1.5mm PVC Flat Cable with small tail to connect to supply
 - PVC Cable Glands PG16 size thread

Upon request a third type of system can be supplied. It comprises of an external track and trolleys, which carry the cable along the arm.

3. INSTALLATION AND TESTING.

3.1 Before Installation

3.1.1 Working Conditions

The temperature range of the environment and/or near the machine working area must be within the following:

- max temperature +50°
- min temperature - 10°
- Moisture 70%
- Altitude ² 1000 m.

Machines mustn't be placed near heat sources.

The area must be free from:

- Steam, smoke or dust, and the atmosphere mustn't be corrosive or explosive;
- Magnetic fields.

No precautions are necessary when the machine is installed in a covered area, protected from weather.

When the machine is installed outside, exposed to weather, or in a sea environment:

- A fixed shelter is required for the hoist and the trolley;
- Protective covering should be placed over the electric parts.
- Standard paint finish is not suitable for outdoors use, please speak to manufacturer for advice.

3.1.2 Classification

The machine should not be used outside its classification (see FEM rules) as indicated on the documentation.

The service class of the machine is calculated on the grounds of two parameters:

Total working time in hours: mechanisms working time measured in hours.

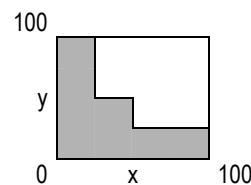
Service type: load quantity the machine is submitted to during the working time.

The service class of the machine is obtained from the combination of the total working time in hours and the service type.

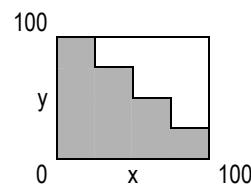
The class of the machine described in this handbook is:

Mechanisms M4
Structures A3

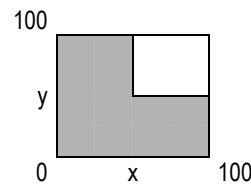
use time	Hours		service type			
	from	to	L1	L2	L3	L4
T0	0	200	M1	M1	M1	M2
T1	200	400	M1	M1	M2	M3
T2	400	800	M1	M2	M3	M4
T3	800	1600	M2	M3	M4	M5
T4	1600	3200	M3	M4	M5	M6
T5	3200	6300	M4	M5	M6	M7
T6	6300	12500	M5	M6	M7	M8
T7	12500	25000	M6	M7	M8	M8
T8	25000	50000	M7	M8	M8	M8
T9	50000		M8	M8	M8	M8



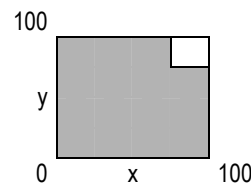
Light
x = % of working time
y = % of load
Cranes rarely lifting the maximum load but mostly lifting small loads.



Medium
x = % of working time
y = % of load
Cranes occasionally lifting the maximum load but mostly lifting medium to small loads.



Heavy
x = % of working time
y = % of load
Cranes frequently lifting the maximum load but normally lifting medium loads.



Very heavy
x = % of working time
y = % of load
Cranes normally lifting loads close to the maximum load.

3.1.3 Hoist Selection

When a hoist is installed on the crane, it must have the following characteristics:

- The capacity mustn't be over the crane plate capacity;
- The capacity indications on plates or on the hook mustn't be over the crane capacity;
- The lifting speed mustn't be over 12mpm;
- The translation speed mustn't be over 20mpm;
- The centre of the hoist hook must coincide with the centre between the trolley wheels.

3.2 Preliminary Operations

Before proceeding with the assembly and installation it is necessary to carry out some checks in order to ensure safety throughout the assembly and after installation is complete.

So:

- CHECK that the characteristics of the machine are the same as indicated in the order and corresponding to its use;
- VERIFY that the nominal capacity is over or equal to the loads to be lifted and that the lifting height isn't less than the effective installation conditions;
- CHECK that the working area is congruent with the shape of the machine;
- VERIFY that there is nothing that could interfere with the machine and its fixing position, as well as the lifted and/or transported load;
- CHECK that the trajectory doesn't meet things or persons. If it does, be sure that proper safety devices are installed;
- CHECK that the charges the machine transmits to the structure it will be fixed to (floors, columns, walls, etc.) have been taken into account;
- CHECK that supports and suspensions of the machine are fit for the characteristics of the machine itself;
- CHECK the anchors;
- CHECK that the machine is complete, not damaged;
- CHECK that all parts are present;
- BE SURE that there aren't breakages, torn electric wires, dents, rust, jammed braking surfaces;
- CHECK that the insulation and the section of the feeding electric cables are fit for the installed voltage. Do not use temporary patch cords;

Ensure these checks are also carried out for machines put in service after a long storage period.

Call the manufacturer immediately if there are problems and don't install the machine.

3.3 Pillar Jib Crane Assembly

The crane is fixed to the floor to the foundation frames set into the concrete or through chemical anchors directly in the floor.

3.3.1 Assembling the Anchor Frame in a Concrete Foundation

- a) Prepare the Anchor Frame by positioning the anchor bolts into the template and fastening the top and bottom bolts.
- b) Place the frame in the foundations, take care that the bent side is under the rods of the iron reinforcement in the plinth and that the upper side of the frame is at the same level of the floor. The frame must be perfectly levelled: use a level, if necessary.
- c) Fill the plinth, protecting the external part of the anchor bolts and nuts to avoid covering them with concrete.

The foundation plinth should be designed by a technician provided at the customer's expense to accommodate the jib stresses, and the nature of the ground and filling material.

3.3.2 Mounting the Pillar on the Anchor Frame

- a) Before assembling the pillar, remove the nuts from the anchor frame bolts.
- b) Lift the pillar without the jib and place it on the base plate fixing it to the anchor bolts with the nuts and the washers.
- c) Check with a level, placed on the jib supporting pin, that the column is square. It may be necessary to put shims on the anchor bolts under the base plate.
- d) Tighten the nuts and repeat this operation after a few working days to eliminate any clearance due to the plinth settling.

3.3.3 Mounting the Pillar with Chemical Fixings or Expandable Mechanical Fixings

- a) Check that the stretch of floor where the column will be installed is perfectly level.
- b) Lift the column without the jib and keep it vertical, fixing it to the floor temporarily by bracing it with weights.
- c) Bolt the base to the ground using either chemical fixings or expandable mechanical fixings. Follow the instructions supplied with the fittings for installation method.
- d) Check with a level, placed on the jib pivot pin, that the column is square. It may be necessary to put shims on the anchor bolts between the base plate and the floor.
- e) Tighten the nuts and repeat this operation after a few working days to eliminate any clearance due to the plinth settling.

3.3.4 Jib Arm Mounting

- a) Remove the pivot pin from the column or arm.
- b) Lift the jib horizontally and place it between the column plates. Plate holes have to correspond with the bush holes on the sleeve.
- c) Insert the rotation pin through the support plates and the jib arm kingpin.
- d) Secure the pin by bolting through the pin plate into the tapped hole on the support plate.
- e) Check that the jib is perfectly horizontal using a level and rotating the jib 90° right and left.

3.4 Column Mounting Jib Crane Assembly

The crane can be fixed to:

- A concrete pillar;
- A pipe pillar;
- An iron pillar with open section.

The manufacturer of the iron structure should equip the structure with ribbed plates to allow the use of lateral stops.

Arrange holes in the wall for the tie rods fixing on the opposite side.

Brackets aren't equipped with lateral stops.

3.4.1 Assembling the Support Brackets

Upper Brackets Assembly

- a) Drill both front and back plates to suit the column width
- b) Position threaded rod through front and back plates using bolts to tighten and lock in position

Lower Brackets Assembly

- a) Drill both front and back plates to suit the column width
- b) Position threaded rod through front and back plates using bolts to tighten and lock in position

Ensure the top and bottom bracket assemblies are tight to the jib arm kingpin, but loose enough to allow the arm to pivot. We recommend that you work to a tolerance of 2mm +/- 0.5mm.

3.4.2 Jib Arm Assembly

- a) Sling the beam with nylon bands, ensuring that it is well balanced, and lift it. If it is not possible to use a proper lifting device or if the space isn't large enough, lift the crane with a forklift truck, tying it to the forks and ensuring that the load is well balanced and doesn't exceed the capacity of the forklift truck.
- b) Position the Jib kingpin between the upper and lower mounting brackets.
- c) Insert the rotation pin through the support plates and the jib arm kingpin.
- d) Secure the pin by bolting through the pin plate into the tapped hole on the support plate.
- e) Tighten all retaining nuts
- f) Check that the jib is perfectly horizontal using a level and rotating the jib 90° right and left.
- g) After assembling the crane, weld or bolt stops on the iron column to stop the crane from sliding.

3.5 Electric Equipment Assembly

3.5.1 Trolleys Sliding in Profile Track Jib

- a) Insert cable clamp into profile track and position as close to column or wall as possible.
- b) Insert cable trolleys in track profile.
- c) Loosen the bolts fastening the formers to the trolleys and clamps.
- d) Feed the cable through the clamp and trolleys and spread the festoon evenly
- e) Connect the cable to the hoist and isolator.

3.5.2 Trolleys Sliding along I-Beam Lower Flange

- a) Loosen the girder clamps on the cable clamp and position it as close to the column or wall as possible. Then tighten the girder clamps around the I-Beam.
- b) Loosen the wheel clamping brackets on the cable clamps and position the wheels so they will fit around the I-Beam. Once in position tighten the wheel brackets, ensuring that the trolleys can run freely along the beam without catching or slipping off.
- c) Feed the cable through the clamp and trolleys and spread the festoon evenly
- d) Connect the cable to the hoist and isolator.

3.6 After Installation

After installation, check:

- That the line voltage is as expected for the crane working;
- That the voltage at the motor terminals is within -10% of the nominal value;
- That all expected safety devices have been installed;
- That the crane run is free from obstacles;
- That any needed stops for crane rotation and for trolley travel are installed;

3.7 Use after Long Period of Storage

The machine should be subjected to regular maintenance to ensure suitable and safe operations whenever required.

When the machine is used after long storage:

- Check the condition of the machine as per chapter *After installation* (3.6);
- Carry out thorough maintenance as per chapter *Periodic maintenance* (5.2);
- Carry out the working tests as per chapter *Test* (4).

4. TEST

The testing procedure verifies the correct working conditions and performance of the crane. These procedures should also be carried out on machines put in service after a long storage period.

Should any potentially dangerous condition arise, or bad or incorrect running of the machine, stop the test and ascertain the reasons with the aid of this handbook; or inform the manufacturer, asking for their prompt intervention.

4.1 Test without Load

Before testing:

Check that:

- No noise or vibrations occur during rotation.
- There is no possibility of fixed parts colliding during rotation
- The crane must be level and not rotate without the operator intervention.

4.2 Dynamic Test

Carry out the dynamic tests with value masses corresponding to the plate crane capacity plus an overload coefficient equal to 1.1 (load equivalent to 110% of the nominal load).

Check:

- That noises and vibrations are absent;
- The deformations, measured under load presence, disappear after the load is put on the ground;
- The functioning of all the safety devices;
- That the conditions advised by the hoist and trolley handbook are met.

4.3 Static Test

Carry out the static tests with value masses corresponding to the plate crane capacity plus an overload coefficient equal to 1.5 (load equal to 150% of the nominal load for cranes with capacity up to 1000 kg, and with value masses corresponding to the plate crane capacity plus an overload coefficient equal to 1,25 (load equal to 125% of the nominal load for cranes with capacity over 1000 kg.

Apply the dynamic test load equal to 110% of the plate capacity 0,5 m from the ground. Slowly, by hand, add the difference required to reach the static test load.

The test load should be applied for not more than 10 minutes.

During this time, check that no breakage or sliding occurs and the structure does not give, and the load limiting device inhibits all the movements with the exception of the downwards movement.

At the end of this test, execute a loadless running cycle in order to check the machine's integrity before starting the operating.

5. MAINTENANCE, REPLACEMENTS AND ADJUSTMENTS

To provide long lasting efficiency, a proper maintenance of the machine parts must be implemented.

If concerns arise pertaining to the hoist and the trolley or other equipment installed on the crane, follow the instructions contained in their handbooks.

Any service or repair of the machine must be carried out by qualified personnel.

When qualified personnel are not available, the user should inform the manufacturer, who will either attend the machine or recommend a reliable firm operating in the customer area.

5.1 Routine Maintenance

Refers to the maintenance that may be done by qualified personnel or directly by the operator and which doesn't require the use of special instruments and equipment.

Weekly:

- Check the efficiency of the feeding line and any of its components;
- Check that all safety devices are working correctly;
- Check that any fixed stops are working correctly;
- Check the efficiency of brackets and tie rods for wall and column mounting cranes, ensuring that no sliding has occurred.

5.2 Periodic Maintenance

Refers to checks for any necessary adjustments or replacement of parts. These should only be carried out by qualified personnel.

During the maintenance both of mechanical and electrical parts, it is necessary to switch off the machine at the mains and put up a "machine undergoing maintenance" sign.

Periodic maintenance must be carried out every six months, or sooner if a situation occurs requiring urgent attention.

Check the crane:

- For any cracks and/or paint flaking on the welding. In case of anomalies, examine the welding with penetrating liquid or an equivalent method;
- Check that the structure hasn't deformed;
- Check that the fixing tie rods of wall cranes or anchor bolts of column cranes to the foundation plinth are well tightened;
- Check the bushes to ensure there are no cracks or deformities.
- Check that the jib is always perfectly horizontal
- Check the tightness of all bolts.
- Check for slip on column mounting bracket kits

These checks should also be carried out on machines put in service after a long storage period.

5.3 Check Book

A check book should be kept to record the machine's three monthly and annual service history. It is duty of the person in charge of servicing to keep this register accurately with full technical details.

The name of worker and the date of service must be clearly indicated.

In the event of testing showing insufficient security or unreliable functioning, DO NOT HESITATE to substitute parts and/or components during the examination.

Please find check sheets at the end of this handbook.

5.4 Faults

We have attempted to cover possible reasons for the machine ceasing to function, along with suggested causes and remedies.

However, damage can often be prevented by paying attention to any unusual vibrations, noises, crashes, sparks and excessive clearances, which are an indication of arising trouble and if ignored can cause serious problems.

The trouble check and remedy must be executed by qualified personnel with a proper understanding of the safety controls that should be in place during the work. Any tools used should be in good condition.

In case of lack of qualified personnel or doubts about the precautions to be adopted, call the manufacturer.

Faults, components and remedies

The rotation movement is blocked.

- Bush breakage: replace bush.

Unsteadiness of the jib positioning.

- Excessive slope of the rotation axis: check the crane is vertical and the anchorage system is firmly tightened.

5.5 Replacements

5.5.1 Replacement of Bushes

- a) Sling the jib with nylon bands to a hook of a lifting device or to the forks of a forklift truck.
- b) Remove the rotation pin of the jib
- c) Lay the jib on the floor and replace the bushes.
- d) Reassemble the jib as per chapter *Jib mounting*.

5.5.2 Replacement of the Electric Supply System

Disconnect the machine from the power feeding line.

5.5.2.1 Trolleys Sliding in a Profile Jib Track

- 1) Remove the plastic end cap, end stop and dead bolt from the end of the profile track. Remove the load trolley and hoist. Remove the trolleys with the cable from the track.
- 2) Undo the bolts that clamp the former around the cable enough so that the trolley can be removed.
- 3) Remove the trolley and replace it with a new one.
- 4) Refit the trolleys in order, replace the load trolley and hoist, replace the end stop, dead bolt and end cap.

5.5.2.2 Trolleys Sliding along I-beam Lower Flange

- 1) Loosen the nut supporting the wheel carrying brackets of the trolley and remove them opening the trolley, or remove the end plate.
- 2) Remove the trolley from the beam, take off the cable and insert a new trolley. Replace it by reversing the method of removing it.

5.5.2.3 Cable Replacement

- 1) Disconnect the cable from the hoist, cable trolleys and from the isolator.
- 2) Insert a new cable making it go through the supports of the trolleys so that the festoon is evenly distributed.
- 3) Connect the cable to the hoist and to the isolator.

6. OUT OF SERVICE OR SCRAPPING

When the machine

- Is dangerous when working;
- Needs maintenance;
- Is no longer necessary

It must be put out of service as follows:

- Disconnect the machine from the feeding line;
- Place it where it cannot cause trouble or danger and it cannot be used;
- Put an "Out of service" sign onto the machine;
- Fix the machine into a static position that will not be affected by vibrations or crashes;
- Disassemble the machine and store it or scrap it.

When the machine has to be scrapped, take into account the different materials (metal, oil, plastic, rubber, etc.) its parts are made of, if possible utilizing a specialist firm and always respecting the laws regarding industrial waste disposal.

7. USE INSTRUCTIONS

7.1 Operator Instructions

The operators of the machine should be:

- Adult;
- Able bodied;
- Have appropriate technical ability;
- Careful and responsible workers;
- Able to react appropriately in dangerous situations.
- Adequately trained

7.2 Safety Rules for the Operators

The operators have to:

- Be aware of and understand the contents of the chapters *Forbidden usage* and *Safety rules*;
- Respect the signs placed by the user, showing "safety rules" and instructions, that must be well visible where the machine is working;
- Inform the all other users about any abnormality, damage or inefficiency of the machine, which may occur during its use, and stop all operations immediately;
- Know the procedures to be taken in dangerous situations;
- Make use of devices recommended for their personal safety.

7.3 Restrictions of Use

- DON'T attach accessories or equipment or lift loads exceeding the maximum capacity.
- DON'T make any reverse manoeuvre. Don't start an opposite manoeuvre if the dynamic effects of the previous manoeuvre haven't finished.
- DON'T lift loads with surfaces exposed to the wind, which aren't according to the standard used for the calculation.
- DON'T use the machine if it is not completely efficient and/or if doubts arise about the integrity of some components, accessories included.
- DON'T tamper with the machine
- DON'T make the machine work in cycles and load conditions over the ones foreseen for the use.
- DON'T modify the machine in order to change its original use without the manufacturer's permission.
- The use of the machine is NOT ALLOWED to untrained operators;
- DON'T lift and/or transport persons or animals.

7.4 Safety Rules

- TAKE CARE not to knock against people or obstacles in the working area.
- AVOID any dangerous abnormal strain to the structure, rough tension of the chains, motors being overcharged etc.
- CHECK that the machine support (beam, fixed point etc.) is in good condition and is permanent.
- CHECK that all safety systems are installed.
- CHECK that the contact between machine and electric feeding line is fitted, permanent and not precarious in any way
- CHECK that the control board and the out going cables are complete and without breakages, abrasions, uncovered or cut wires.
- OBEY the instructions on the machine.
- CHECK the condition of the lifting device and follow the instructions or its handbook.

Check Book

See chapter (5.3).

Three monthly tests

Give an indication such as: very good, good, fairly good, worn, to be replaced, replaced on...

Date
Weldings
deformations
Screws and tie rods tightening
gaps
jib
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