E-PHTM

User & Maintenance Manual

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EFFECTIVE FILAMENT WINDING® PIONEERS

E-PHTM

USER & MAINTENANCE MANUAL

TABLE OF CONTENTS

1. INSTRUCTION MANUAL FOR USE AND MAINTENANCE

Name: equipment for GRP pipe testing with water under pressure

Model: E-PHTM 300-3000

Number: 21_112

1.1. PREMISES

1.1.1. PURPOSE OF THE INSTRUCTION MANUAL

This Instruction Manual is an integral part of the machine and is intended to provide all the information necessary for:

- The correct sensitization of operators to safety issues;
- Handling of the machine, packed and unpacked in safe conditions;
- The correct installation of the machine;
- In-depth knowledge of its functioning and its limits;
- Its correct use in safe conditions;
- Carrying out maintenance operations correctly and safely;
- Dismantle the machine in safe conditions and in compliance with the regulations in force to protect the health of workers and the environment.

The managers of the company departments, where this machine will be installed, are required, according to the regulations in force, to carefully read the contents of this Instruction Manual and to have it read by the operators and maintenance technicians in charge, for the parts which are their responsibility.

The time spent for this purpose will be largely rewarded by the correct functioning of the machine and its use in safe conditions.

1.1.2.HOW TO READ THE INSTRUCTION MANUAL

The Manual has been divided into independent chapters, each of which is aimed at a specific operator figure (INSTALLER, OPERATOR AND MAINTENANCE TECHNICIAN), for which the skills necessary to operate the machine in safe conditions have been defined.

The sequence of the chapters responds to the temporal logic of the life of the machine. To facilitate immediate understanding of the text, terms, abbreviations and pictograms are used, the meaning of which is indicated in par. 6.

The Instruction Manual consists of a cover, an index and a series of chapters (sections). The initial page shows the identification data of the machine and model (and serial number, if any), the revision of the Instruction Manual and, lastly, a photograph/drawing of the type of machine described, to help the reader identify the machine and its relative manual.

Starting from the first page of the index, there is the revision table of the Instruction Manual and its parts, which correlates the revision level of the entire Manual with that of the index and the component chapters and shows the issue date of the entire Manual with a certain level of revision.

1.1.2.1. FIGURE NUMBERING

Each figure is numbered progressively.

Numbering restarts from "1" at each section change.

The numbering is made up as follows:

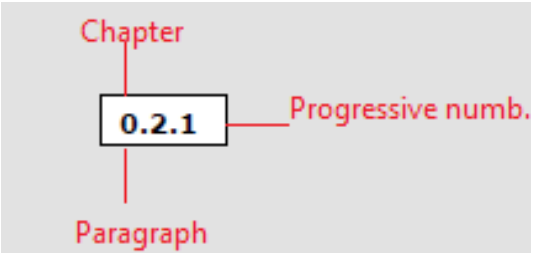


Figure 1

1.1.2.2. TABLE NUMBERING

Each table is numbered progressively.

Numbering restarts from "1" at each section change.

The numbering is made up as follows:

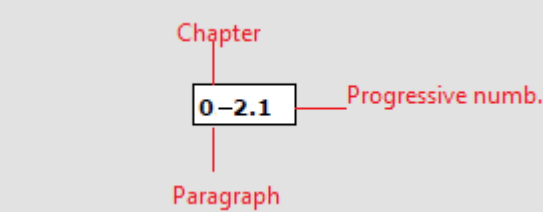


Figure 2

1.1.2.3. UNIT OF MEASURE

The units of measurement present are those foreseen by the International System.

1.1.3.KEEPING THE INSTRUCTION MANUAL

The Instruction Manual must be kept with care and must accompany the machine in all changes of ownership that it may have in its life.

Conservation must be favoured by handling it with care, with clean hands and not depositing it on dirty surfaces.

Parts must not be removed, torn or arbitrarily modified.

The Manual must be filed in an environment protected from humidity and heat and close to the machine to which it refers.

Upon request by the User, the manufacturer can provide additional copies of the machine Instruction Manual.

1.1.4.INSTRUCTION MANUAL UPDATE

The Manufacturer reserves the right to modify the project and make improvements to the machine without communicating it to the Customers, and without updating the Manual already delivered to the user.

Furthermore, in the event of modifications to the machine installed at the Customer's site, agreed with the Manufacturer and which involve the modification of one or more chapters of the Instruction Manual, it will be the responsibility of the manufacturer to send the affected chapters to the holders of the Instruction Manual involved.

It is the user's responsibility, following the instructions accompanying the updated documentation, to replace the old chapters with the new ones in all copies owned, the initial page and the index with those with the new revision level.

1.1.5.RECIPIENTS

The Manual in question is addressed to: the Installer, the Operator and Qualified Personnel qualified to maintain the machine.

EXPOSED PERSON: means any person who is wholly or partially in a dangerous area;

OPERATOR: means those people who have followed specialization courses, training, etc. and have experience in installation, commissioning and maintenance, repair, and transport of the machine.

QUALIFICATION OF THE RECIPIENTS (see par. 0.6):

The machine is intended for industrial, and therefore professional and non-generalized use, therefore its use can be entrusted to qualified figures, in particular, those who:

- Have reached the adult age;
- Are physically and mentally suitable to carry out jobs of particular technical difficulty;
- Have been adequately trained on the use and maintenance of the machine;
- Have been judged suitable by the employer to carry out the task entrusted to them;
- Are able to understand and interpret the operator's manual and the safety instructions;
- Know the emergency procedures and their implementation;
- Possess the ability to operate the specific type of equipment;
- Are familiar with the specific rules of the case;

- Have understood the operating procedures defined by the manufacturer of the machine.

1.1.6.SAFETY SIGNS

HAZARD!

HIGH VOLTAGE HAZARD

ELECTROMAGNETIC HAZARD

TRIPPING HAZARD

DROP (FALL) HAZARD

BURN HAZARD

RISK OF SQUEEZING THE LEGS

HAND CRUSH HAZARD

COUNTER-ROTATING ROLLERS HAZARD

PINCH POINT HAZARD

CRUSHING HAZARD

COUNTER-ROTATING ROLLERS HAZARD

SUDDEN LOUD NOISE HAZARD

LINE TRANSPORT SYSTEM

NO PACEMAKER WEARERS

NO METAL OR WATCHES

DO NOT STAND HERE

FOOT CRUSHING HAZARD

HAND CRUSHING HAZARD

WEAR EAR PROTECTION

WEAR EYE PROTECTION AND EARMUFFS

WEAR HARD HAT AND EARMUFFS

WEAR EYE PROTECTION

WEAR EYE PROTECTION AND HARD HAT

WEAR SAFETY GLOVES

WEAR HARD HAT

WEAR A MASK

WEAR A RESPIRATOR

CAUTION AIR SYSTEM UNDER PRESSURE

FORBIDDEN TO OPEN

DO NOT WORK UNDER THE TABLE
IF NOT MECHANICALLY BLOCKED

DANGER!
The operator may only use the machine in accordance with its intended use in a safe and technically perfect condition!

DANGER!
Competent personnel must ensure that unauthorized persons avoid dangerous areas!

DANGER!
The electrical equipment of the machine must be tested regularly. Defective cable insulation, loose connections, and burnt cables must be removed immediately. The main electrical cabinet must always be locked. Only authorized personnel are allowed access.

DANGER!
Work on the electrical system may only be carried out by competent and authorized workers! There is a risk of electric shock, which can range from severe burns to heart failure!

WARNING!
Observe all safety and accident prevention regulations!

WARNING!
When carrying out hazardous work, the main switch must be switched off and secured against being switched on again!

WARNING!
When installing the machine, the relevant safety rules must be observed and accidents must be avoided by prudent handling! This mainly concerns the use of safe means of transport and lifting devices! In addition, all dangerous places created, even if only temporary, must be adequately insured!

1.2. TECHNICAL SUPPORT INFORMATION

The Machines are covered by a guarantee, as foreseen in the general conditions of sale. If, during the period of validity, faulty operations or failures of parts of the machine occur, which fall within the cases indicated by the guarantee, the Manufacturer, after the appropriate checks on the machine, will repair or replace the defective parts at his home.

We remind you that modifications carried out by the user, without explicit written authorization from the Manufacturer, void the guarantee and relieve the Manufacturer from any liability for damage caused by a defective product.

This is particularly true when the aforementioned modifications are performed on safety devices, degrading their effectiveness.

The same considerations apply when using non-original spare parts or spare parts other than those explicitly indicated by the manufacturer as "SAFETY DEVICES".

For all these reasons, we advise our customers to always contact the Manufacturer's Assistance Service.

1.2.1. ITEMS UNDER CUSTOMER SCOPE OF SUPPLY

Without prejudice to any different contractual agreements, the following are normally the responsibility of the Client:

- Foundations;
- Electrical power supply of the machine, in compliance with the regulations in force in the country of use;
- Pneumatic supplies at the indicated connection points;
- Water inlet and outlet.

1.3. SAFETY

1.3.1. GENERAL WARNINGS

Before making the Machine operational, carefully read the instructions contained in this Manual and carefully follow the indications contained therein.

The manufacturer has made every effort to design this machine, as far as possible to be INTRINSICALLY SAFE.

Notwithstanding the above, the implementation of the safety system will be defined by the end-user, seeing that the equipment is inserted in a manufacturing plant with other equipment.

The user can conveniently integrate the information provided by the manufacturer with additional work instructions, obviously not in conflict with what is reported in this Instruction Manual, to contribute to the safe use of the machine, namely:

- Great attention must be paid to the operator's clothing: Avoid using clothes with hooks that could get caught on parts of the machine;
- Avoid using ties or other loose clothing;
- Avoid wearing bulky rings or bracelets that could get your hands caught in the parts of the machine;
- Avoid modifying or changing the settings of the safety devices;
- Avoid carrying out temporary repairs or restoration work that does not comply with the instructions.

It is essential to diligently follow the following guidelines:

- It is forbidden to operate the machine in automatic mode with the fixed and/or movable protections removed;
- It is forbidden to inhibit the safety devices installed on the machine;
- Operations with reduced safety must be carried out scrupulously respecting the indications provided in the relative descriptions;
- After an operation with reduced safety, the temporarily removed protections must be restored as soon as possible;
- Do not modify parts of the machine for any reason; in the event of a malfunction, due to failure to comply with the above, the manufacturer is not liable for the consequences. It is advisable to request any modifications directly from the manufacturer;
- Clean the machine coverings, panels and controls with soft, dry cloths or cloths slightly soaked in a mild detergent solution; do not use any type of solvent, such as alcohol or petrol, as the surfaces could be damaged;
- Position the machines as established at the time of the order, according to the diagrams supplied by the manufacturer, otherwise the Manufacturer is not liable for any inconveniences.

Controls and checks

The machine must be checked as indicated in Chapter 6 of this Instruction Manual.

If worn or defective parts are not promptly replaced, the manufacturer assumes no responsibility for damage from accidents that could result.

The checks must be carried out by an expert; they must be of a visual and functional type, with the aim of guaranteeing the safety of the machine.

They include:

- Verification of all load-bearing structures, which must not show any cracks, breaks, damages, deformations, corrosion, wear or alterations compared to the original characteristics and specifications;
- Verification of all mechanical parts;
- Check all the safety devices installed on the machine;
- Check all connections with pins and screws;
- Functional check of the machine;
- Checking the status of the machine;
- Verification that the machine's performance corresponds to the service for which it is intended (work cycles - intermittence - time of use - load to be moved);
- Verification of the adequacy of the state of conservation (cleaning, lubrication) and maintenance of the machine and its main components;
- Verification of the suitability and functioning of the electrical system; in particular check the correctness of the connections and that there are no precarious and dangerous connections;
- Verification of the correct functioning of the motors;
- Constant check of the efficiency of the push-button panel;
- Check the functionality of the stop/emergency buttons;
- Verification of the lighting conditions of the area and visibility of the work area;
- Use of "slow" speeds for approach and positioning operations;
- Check that the power supply to the machine is cut off in the event of inspections, repairs, or routine maintenance interventions;

- For all operations, use of suitable work clothing, in compliance with safety standards in the workplace;
- Compliance with the maintenance intervention schedule and record any related observations at each check; also compliance with the provisions of current regulations;
- Reporting any operating anomalies (faulty behaviour, suspected breakage, incorrect movements and abnormal noise levels) to the Department Manager and putting the machine out of service.

The results of this verification must be reported on a special sheet.

ATTENTION!

If anomalies are found, they must be eliminated before putting the machine back into operation, and the expert who carries out the check must note the repair on the report sheet, thus giving approval for the use of the machine.

If the person carrying out the check finds cracks or dangerous anomalies, he must promptly:

- Notify the machine manufacturer;
- Put the machine out of service in the event of malfunctions, carrying out the appropriate checks and/or repairs;
- Make sure that there are no objects amongst the parts of the machine;
- Check that after any maintenance operation, no objects remain between the moving parts.

In order to guarantee maximum safety in handling the machine, it is in any case FORBIDDEN:

- To tamper with some parts of the machine;
- Use the machine in working order but not in complete efficiency;

- Modify the machine to change the originally established use, without explicit authorization from the Manufacturer.

INTENDED USE

The intended use of the E-PHTM 300-3000 is to plug fibreglass pipes to then be filled with water and put under pre-established pressure to check their water tightness.

Each diameter must correspond to a certain pressure, for a certain time, from which it will be possible to see, from the instrumentation or visually, if the pipe has leaks or seepage.

Subsequently, the pipe is emptied and released, and through the movement of the trolleys, it is positioned out of constraints and pushed out of the machine onto special unloading platforms, from which it will follow its destination path.

The use of products/materials other than those specified by the Manufacturer, which can cause damage to the machine and dangerous situations for the operator and/or people close to the Machine, is considered incorrect or improper.

1.3.2.CONTRAINDICATIONS FOR USE

The machine must not be used:

- For uses other than those described, for uses different or not mentioned in this manual;
- At pressures different from those established in the design phase;
- In an explosive, corrosive or highly concentrated atmosphere of dust or oily substances suspended in the air;
- In a fire-risk atmosphere;
- Exposed to bad weather;
- With safety devices excluded or not working;

- With electrical jumpers and/or mechanical devices that exclude utilities/parts of the machine itself.

To avoid anomalous and dangerous stresses on the mechanical equipment and the structure of the machine, it is advisable to avoid violent impacts between the handling equipment and the end bumpers. The limit switch devices are positioned in such a way as to allow the complete stroke when they are reached at a reduced speed, while the space required for braking is greater the higher the speed, being all managed by a PLC.

Dangerous areas are all those that can be included in the range of action of the machine.

If operations other than those programmed are carried out, such as loading unsuitable pieces or positioning outside the limits, or other unforeseen situations, this can interfere with the installed program and internal shocks could occur which prevent the correct functioning of the machine.

1.3.3.SAFETY DEVICES

The following safety devices are installed in the machine:

1. Emergency Stop from the hand control;
2. Buttons for one-stage operation, not with retention;
3. Irremovable fixed protections;
4. Indicative signs;
5. Operating instructions;
6. Software that interlocks out-of-cycle machine movements.

To manage the safety devices, refer to the electrical diagrams.

1.3.4.SIGNS

The signs that must be installed near the machine and its work area are as follows:

1.3.4.1. Prohibition signs

- Sign indicating the prohibition to remove the safety devices or guards of the machine;
- Sign indicating the prohibition to repair and/or adjust while in motion;
- Access prohibition sign for live parts.

1.3.4.2. Danger signs

- Sign indicating general danger.

1.3.4.3. Mandatory signs

- Sign indicating the obligation to use protective footwear;
- Sign indicating the obligation to use gloves;
- Sign indicating the obligation to use protective clothing;
- Sign indicating the obligation to use the helmet.

2. E-PHTM 300-3000 INSTALLATION

2.1. TRANSPORT AND HANDLING

2.1.1. MOBILE HEAD

Weight Ton 34

L x W x H Cm 466 x 282 x 363

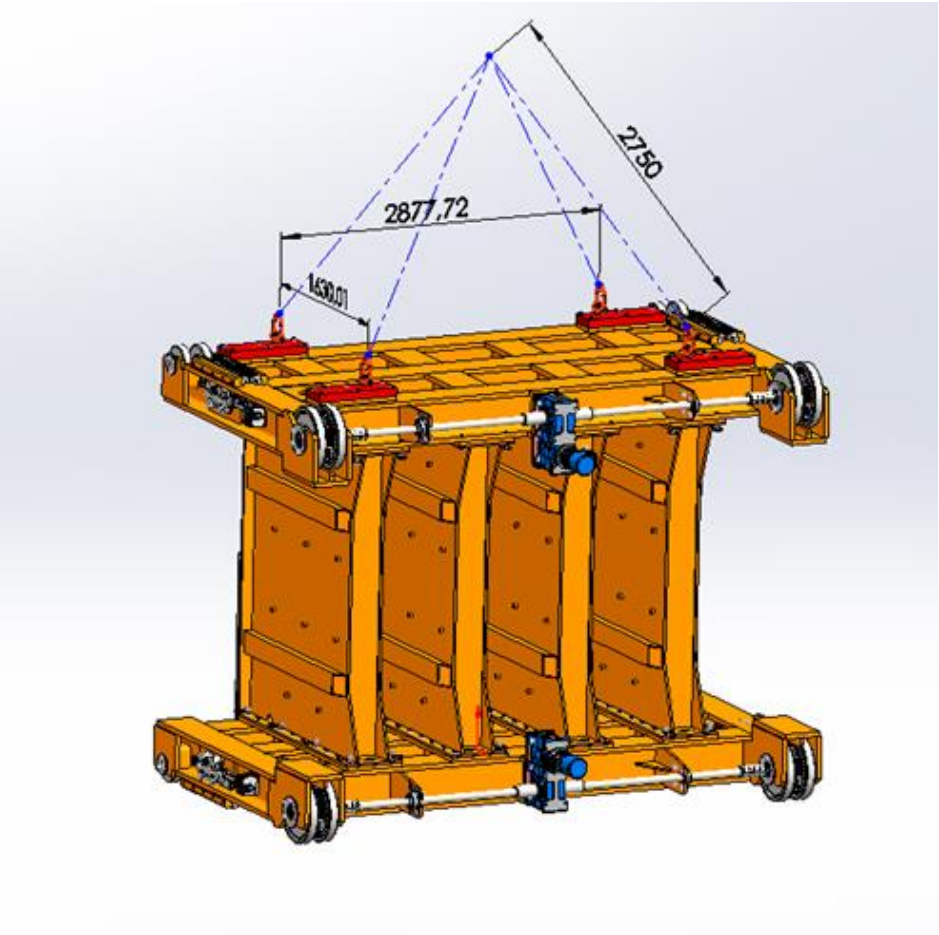


Figure 3

2.1.1.1. LIFTING POINT

For lifting, there are 4 attachment points made up of DSS M48 UP swivel eyebolts with a payload of 20T each.

The eyebolts will be screwed at equal distances from the centre of mass to have the right division of weights and balance of the piece.

The calculation of the size of the eyebolt was given by the configurator, as well as the minimum length of the lifting branches or chains.

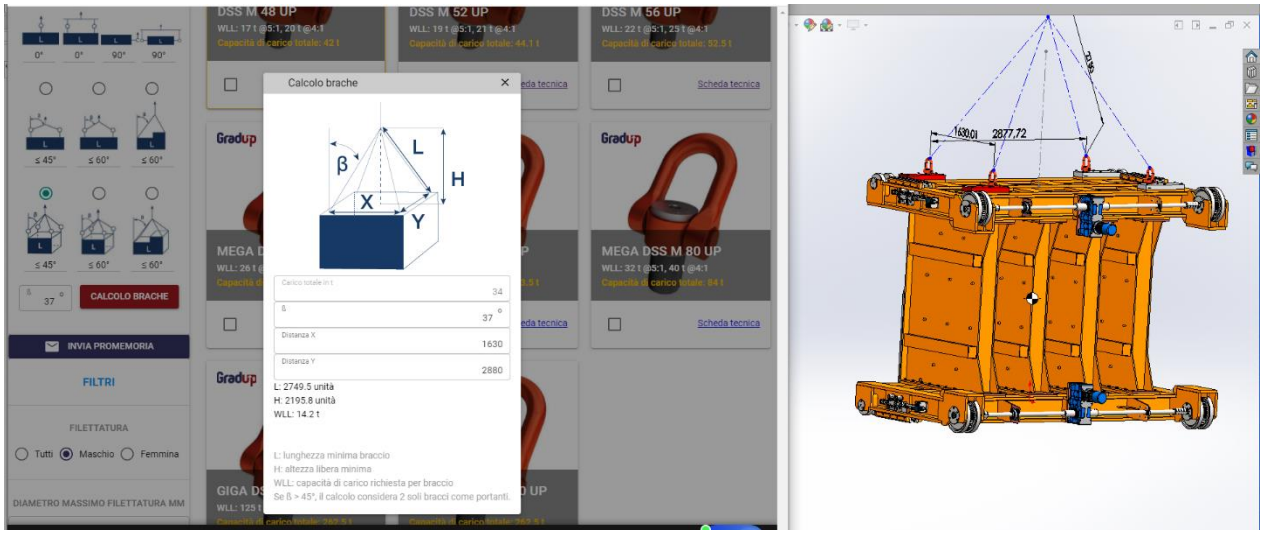


Figure 4

The minimum length of the belts must be 275 cm.

The 70mm thick lifting plates, certified 3.1 with UT Class S3-E4 inspection certificate according to Euronorma, are fixed to the structure with 6 M20 8.8 screws for each plate.

2.1.2.FIXED HEAD

Weight	Ton 31
L x W x H	Cm 408 x 204 x 393

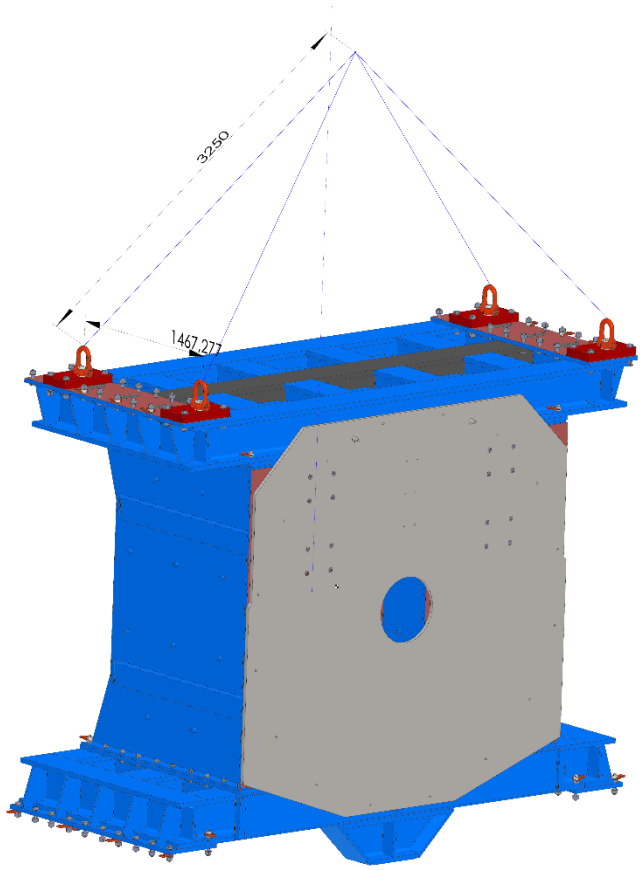


Figure 5

2.1.2.1. LIFTING POINT

For lifting, there are 4 attachment points made up of DSS M48 UP swivel eyebolts with a payload of 20T each.

The eyebolts will be screwed at equal distances from the centre of mass to have the right division of weights and balance of the piece.

The calculation of the size of the eyebolt was given by the configurator, as well as the minimum length of the lifting branches or chains.

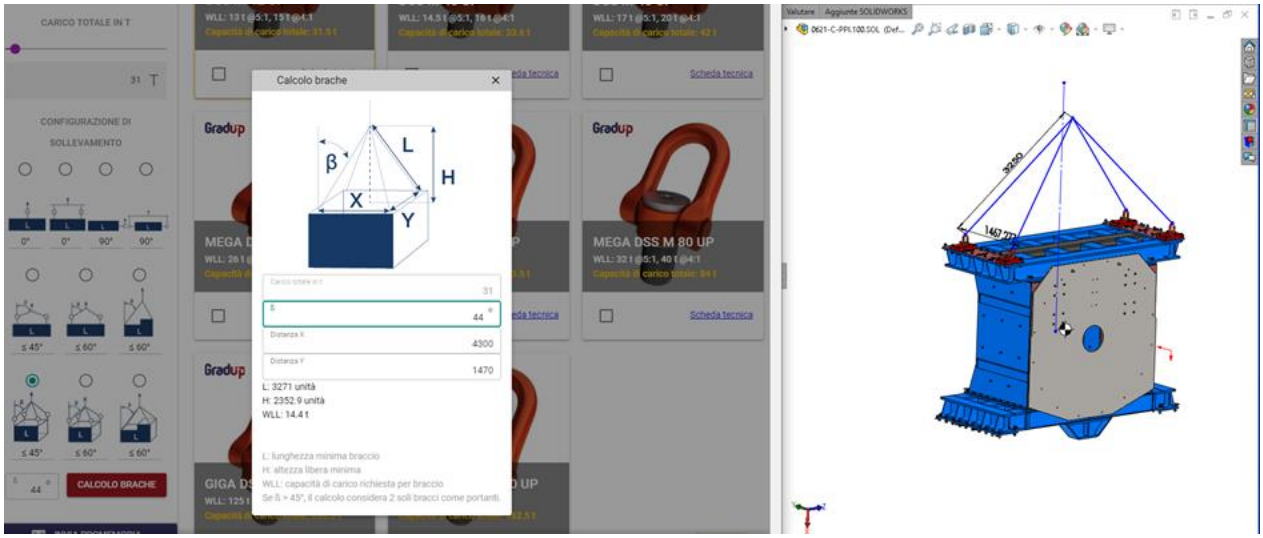


Figure 6

The minimum length of the belts must be 325 cm.

The 70mm thick lifting plates, certified 3.1 with UT Class S3-E4 inspection certificate according to Euronorma, are fixed to the structure with 4 M30 8.8 screws for each plate.

2.1.3.LOWER BEAMS

Weight Ton 6,5

L x W x H Cm 80 x 60 x 1800

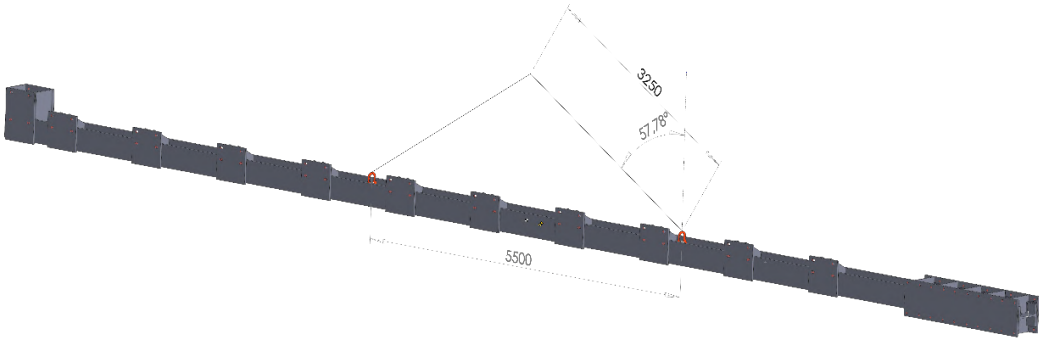


Figure 7

2.1.3.1. LIFTING POINT

For lifting, there are 2 attachment points made up of DSS M36 UP swivel eyebolts with a payload of 12T each.

The eyebolts will be screwed at equal distances from the centre of mass to have the right division of weights and balance of the piece.

The calculation of the size of the eyebolt was given by the configurator, as well as the minimum length of the lifting branches or chains.

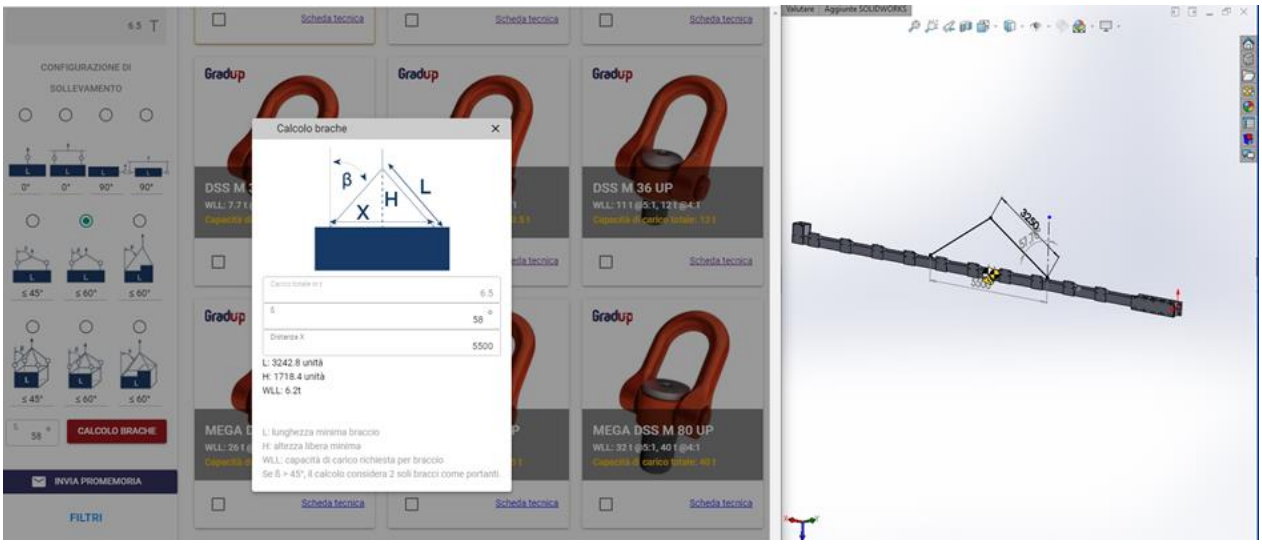


Figure 8

The minimum length of the belts must be 325 cm.

The 60mm thick lifting plates, 3.1 certified with UT Class S3-E4 inspection certificate according to Euronorma, are fixed to the structure with 4 M20 8.8 screws for each plate.

2.1.4.UPPER BEAMS

Weight	Ton 6,5
L x W x H	Cm 72 x 50 x 1800

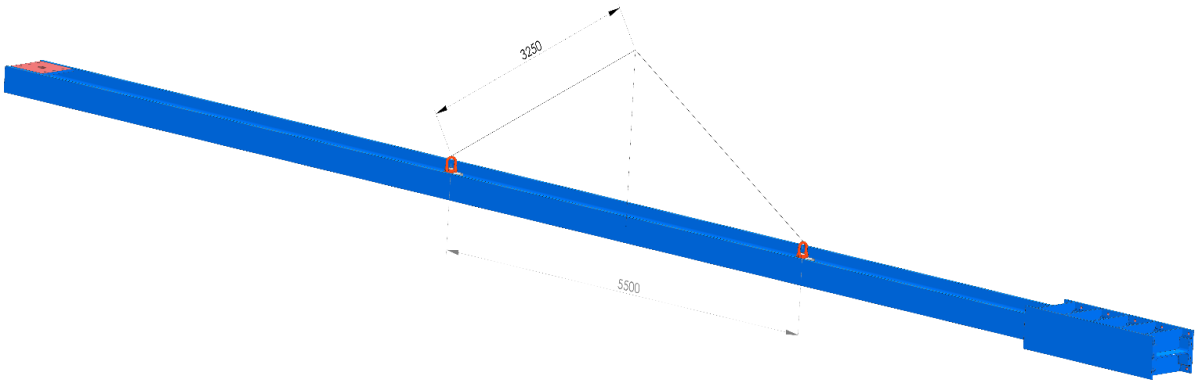


Figure 9

2.1.4.1. LIFTING POINT

For lifting, there are 2 attachment points made up of DSS M36 UP swivel eyebolts with a payload of 12T each.

The eyebolts will be screwed at equal distances from the centre of mass to have the right division of weights and balance of the piece.

The calculation of the size of the eyebolt was given by the configurator, as well as the minimum length of the lifting branches or chains.

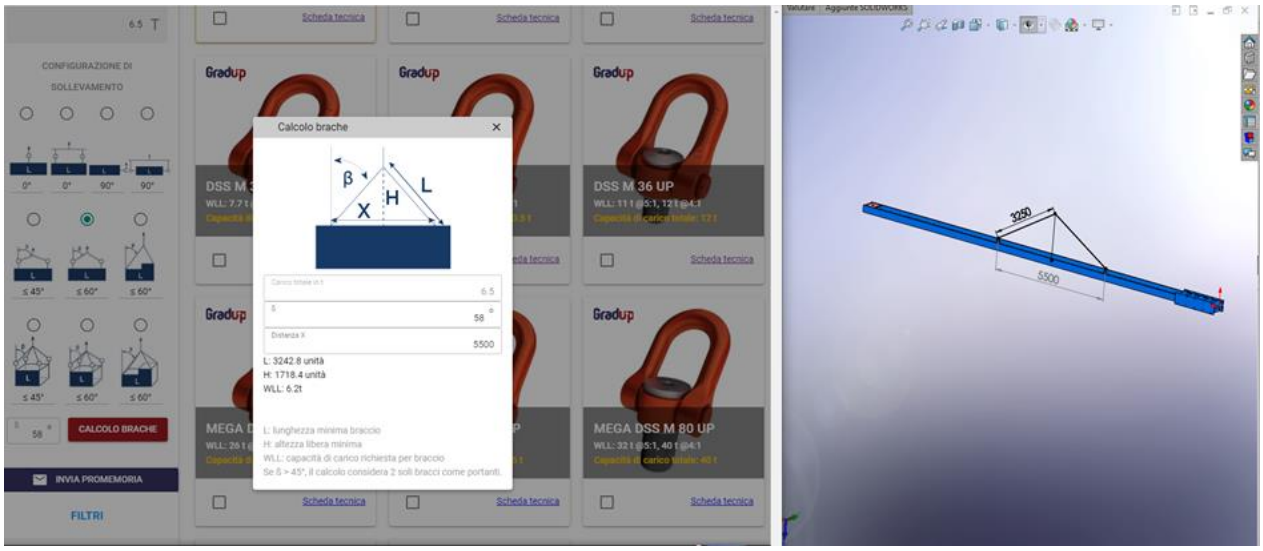


Figure 10

The minimum length of the belts must be 325 cm.

The 60mm thick lifting plates, 3.1 certified with UT Class S3-E4 inspection certificate according to Euronorma, are fixed to the structure with 4 M20 8.8 screws for each plate.

2.1.5.PREPARATIONS

2.1.5.1. Installation preparations

For installation, it is necessary to prepare a manoeuvring area suitable for the dimensions of the machine and the chosen lifting means.

The preparation of the machine must be carried out in such a way as to make the ergonomics and safety of the workplace optimal: leave a sufficient area around the same to allow easy use and handling of the material to be worked and for maintenance operations and adjustment.

Checks to be carried out under the direct and exclusive responsibility of the customer before proceeding with installation:

2.1.5.2. Preliminary checks for installation

Before proceeding with the installation, the following operations must be performed:

- verify that the manoeuvring space available is suitable for the chosen model and in particular that in its action it does not interfere with existing equipment or structures;
- check that the electrical system is perfectly functional and in particular:
  - that the section of the line cable is sized to support the absorption of the motors;
  - that the line is adequately protected by a differential magneto-thermal protection switch; that the grounding system is effective and functioning.
- prepare an adequate situation to carry out the tests;
- verify that the installation works do not interfere with the normal activity of the workshop (factory, construction site, etc...), causing dangerous situations for the workers.

In the event of interference, isolate the area affected by the works and the exit routes of the vehicles using signal tape and indicator signs to signal the presence of moving vehicles.

2.1.5.3. Preparation of the electrical system

The connection to the electrical system must be carried out by specialized and qualified personnel, in compliance with the electrical diagram and the provisions prescribed in the Laws and/or Technical Standards regarding safety in the workplace and electrical systems in force.

2.1.6.ASSEMBLY

The assembly operation, once the above instructions have been observed, consists in the placement of the machine according to a precise layout previously elaborated, considering machine spaces, operating spaces and spaces for escape routes.

The operation of placing the machine requires placing it with **millimetric precision** on special floor anchoring rods previously laid during the concrete work.

Once placed and freed from the lifting means, the small parts and accessories removed for handling are assembled by specialized and suitably trained and instructed personnel.

The equipment must be assembled following the technical instructions and the assembly drawings.

Before carrying out the assembly, the foundation must be prepared and suitable for the structure and the forces it develops on the beams.

The foundation must be prepared with a cage of steel reinforcement that holds the threaded bolts anchored, suitably laid and accordingly to the measurements that have been provided, within state-of-the-art tolerances.

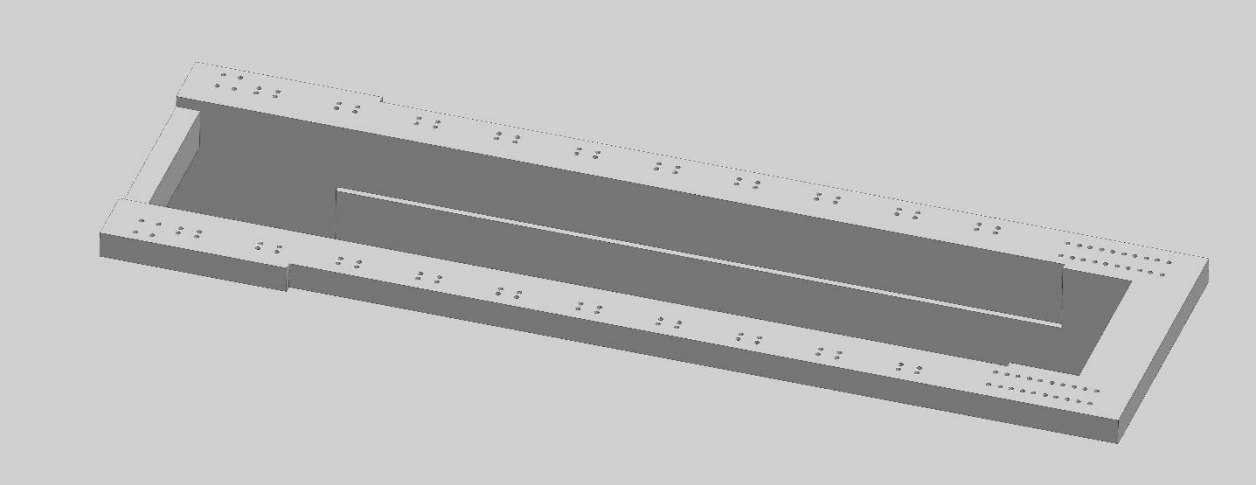


Figure 11

The two beams are mirrored and must be laid at a precise centre distance, paying attention to the orthogonality of the position of the corresponding tooth between the two racks.

This operation must be verified by initially checking the centre distances and diagonals, especially on the part where the rack is mounted.

Levelling must be carried out using suitable shims to obtain solid contact under the surface of the support plates.

THIS IS THE MOST IMPORTANT PART OF THE ASSEMBLY. IF THE BEAMS ARE NOT INSTALLED CORRECTLY, THE HYDROTESTER WILL NOT WORK PROPERLY AND IT IS IMPOSSIBLE TO CORRECT UNLESS DISMANTLING THE COMPLETE HYDROTESTER!

Figure 12

After laying the base beams, install the fixed head.

The keyways (5 per side) are machined on the contact faces between the beams and the headboard.

Before blocking the beams, carry out a dimensional check of positioning and linearity to ensure that the tabs mounted on the bases are exactly level with the seats of the lower base of the head.

By lifting the head, check the cleanliness of the lower base.

Oil the lower base and the support base on the beams, especially the LOCKING KEY SLOTS.

Lay the fixed head on the beams, centring it with conical centring pins between the fixing holes of the two parts.

The beams and the foundation must be in perfect contact without any space in between.

Figure 13

Fit the fastening screws between the beams and the head, tightening the bolts with a torque wrench and using bolt lubricant.

If there is no bolt lubricant, the torque must be higher, as per the table in Fig. 18.

For each bolt size, different values are specified according to the strength class of the bolt, and according to an appropriate coefficient which considers the friction under the head and of the thread:

1. Coefficient 0.10: phosphate/galvanized screws – good quality manual lubrication;
2. Coefficient 0.15: burnished/galvanized screws – summary lubrication (factory oiling);
3. Coefficient 0.20: coated or uncoated screws – dry assembly.

			COPPIA DI SERRAGGIO Nm TIGHTENING TORQUE Nm		
Filettatura Thread	mm ⬡	A	Coppia Torque Classe di resistenza Resistance grade		
			8.8	10.9	12.9
M 16	24	0,10 0,15 0,20	153 198 232	225 291 341	263 341 399
M 18	27	0,10 0,15 0,20	220 283 330	313 402 469	366 471 549
M 20	30	0,10 0,15 0,20	311 402 471	440 570 667	515 667 781
M 22	34	0,10 0,15 0,20	424 552 648	602 783 920	704 917 1077
M 24	36	0,10 0,15 0,20	534 691 809	758 981 1148	887 1148 1343
M 27	41	0,10 0,15 0,20	784 1022 1201	1114 1452 1706	1304 1700 1997
M 30	46	0,10 0,15 0,20	1067 1387 1628	1515 1969 2311	1773 2305 2704
M 33	50	0,10 0,15 0,20	1442 1884 2216	2048 2676 3148	2397 3132 3684
M 36	55	0,10 0,15 0,20	1855 2418 2840	2636 3435 4036	3085 4020 4723
M 39	60	0,10 0,15 0,20	2399 3139 3697	3410 4463 5255	3990 5223 6150

Figure 14

Once the screws have been tightened, lift the mobile head.

Figure 15

Make marks on two corresponding teeth on the two racks to allow for the carriage to be positioned perpendicular to the axis.

Make sure that the teeth of the sprockets and those of the racks intersect each other.

Figure 16

Figure 17

Release the motor brakes and, using a hoist, move the mobile head to allow it to adapt to the position.

Bring the movable head towards the end of the beams on the opposite side of the fixed head.

Lift the first upper beam and check that the keyways areas are clean.

Lubricate the bases, oil them and check the keyways on the upper base of the FIXED head.

Lay the beam fitting the keyways and the key slots, and check their exact contact.

Check the exact point of contact between the beam and the wheels of the mobile head and between the toothed wheel of the mobile head and the rack.

Figure 18

Perform the bolts closure on the connection of the beams to the fixed head, using the method previously described for the closure of the low beams.

Figure 19

Install the closing head beams, starting with the vertical ones that are to be fixed to the foundations and the upper beams.

Figure 20

In this phase, it may be necessary to shim the bases of the beams, to ensure the correct connection between the vertical beam and the upper beam.

Check the correct adjustment, looking at the contact between the upper beam and the upper wheels of the mobile head, and verifying the distance between the lower and upper beams.

Before assembling the horizontal closing beams, check the perpendicularity of the vertical ones, also measuring the diagonals, bringing everything to the height by means of shims where required.

Assemble the three upper belt trolleys by removing two side wheels, positioning them one in front of the other, and reassembling the two removed wheels in a position which accommodates the profile of the upper beam.

Figure 21

Fit the 4 upper safety beams on the mobile head, checking the position and clearance (+0.5mm of maximum clearance).

Figure 22

Electrically wire the mobile head and carry out the complete movement back and forward to verify that the position is correctly adjusted.

Position the block safety beams inside the racks (above and below).

Figure 23

Insert the lower trolleys (connect them using the telescopic beams), and then assemble the platforms.

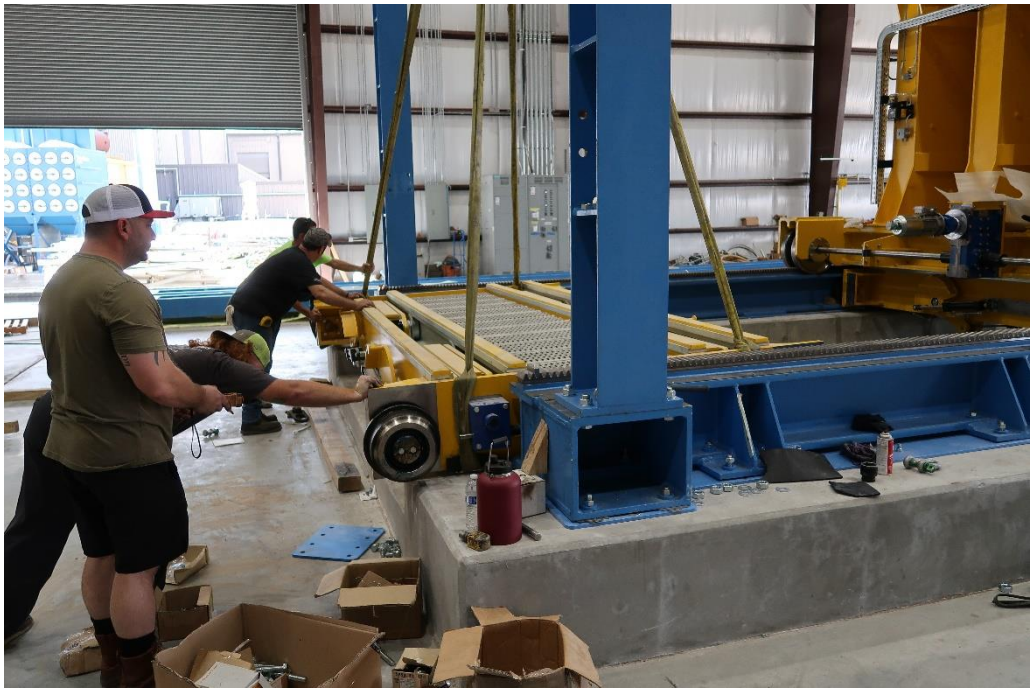


Figure 24

3. CONNECTIONS

3.1. Electrical connection

The internal connections of the machine are carried out by qualified personnel.

The electrical connection between the machine panel and the customer's electrical distribution power supply line must be carried out by the customer's qualified personnel.

Follow the instructions below for preparing the electrical system:

- Make the connection between the cable and the power line via the terminal in the junction box located on the column or in its immediate vicinity.

At the costs and under the direct responsibility of the customer, electrical protections for short-circuit over-currents will be needed, such as fuses, magneto thermal and differential switches, or whatever is necessary and required by current regulations.

4. PRELIMINARY CONTROLS

Before the commissioning of the machine, the following operations must be carried out:

- Control of all security systems;
- Control of protections;
- Signage control.

Before commissioning the machine, it is necessary to carry out a series of checks and controls in order to prevent errors or accidents from occurring during the Commissioning phase:

- Check that the machine has not been damaged during the assembly phase;
- Verify, with particular care, the integrity of electrical panels, control panels, electrical cables and pipes;
- Check the correct connection of all external energy sources;
- Check the free movement and possible free rotation of all moving parts.

The testing during installation must be carried out by the specialized workers who have carried out the assembly, carefully following the procedure indications for testing during installation.

The tests to which the machine must be subjected are of two types:

- Dry tests;
- Dynamic functional tests.

5. DRY TEST

How to carry out functional tests "without load":

- Activate the main switch of the electric line;
- Place the emergency stop button on the push-button panel in the "running consent" position;
- Press the "start/alarm" button;
- Check the machine parts;
- Check the functioning of the limit switches of all movements;
- Check the program settings to be performed according to the sample;
- Perform a cycle start;
- Check the end of the cycle.

6. DYNAMIC FUNCTIONAL TESTS

How to carry out maximum dynamic functional tests:

- The workers and operators have to be equipped (individual protective equipment - helmet, gloves and safety shoes) if employees; ensure conformance thereto by external workers;
- Carry out checks using a test pipe;

- Verify the functionality of the operations and their correctness;
- Carry out the checks of all movements, carefully checking the functionality and the position quotas, never bringing the power to maximum immediately but performing all task initially at a lower speed.

7. MACHINE DESCRIPTION

7.1. MACHINE OPERATION

The equipment is essentially a non-destructive test machine for the leak test of fibreglass pipes placed under water pressure.

The pipes, prior to the tests, are transported with trolleys to the loading beams.

When the trolleys arrive at the loading beams, the external arm of the loading beams is lowered to allow the trolley to unload the pipe to be tested.

Once the pipe is loaded onto the beams, the outer stoppers swivel upwards.

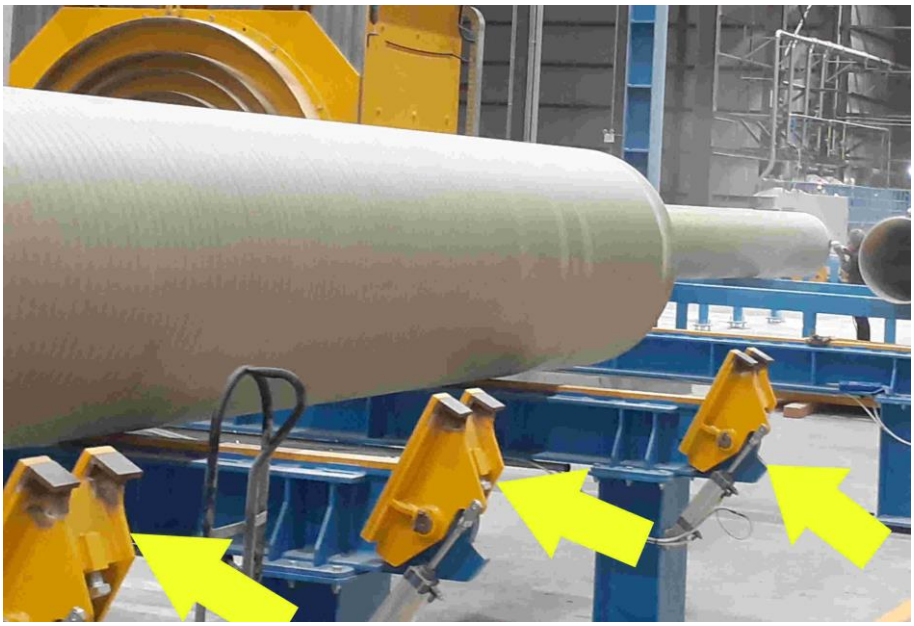


Figure 25: Outer stoppers swivel upwards

To be prepared to receive the pipe, the machine must have:

- The inner stoppers of the beams in the lower position;
- PHTM trolley stoppers on the unloading side raised up and on the loading side completely lowered;
- Distance between the PHTM trolley stoppers according to the diameter;
- The correct plugs (for the diameter to be tested) positioned in the vertical height for the diameter to be tested, otherwise replace them according to the tooling procedure;
- Longitudinal position of the PHTM trolleys that will allow the insertion of the pipe into the fixed plug;
- Belt tensioner in the loose position.

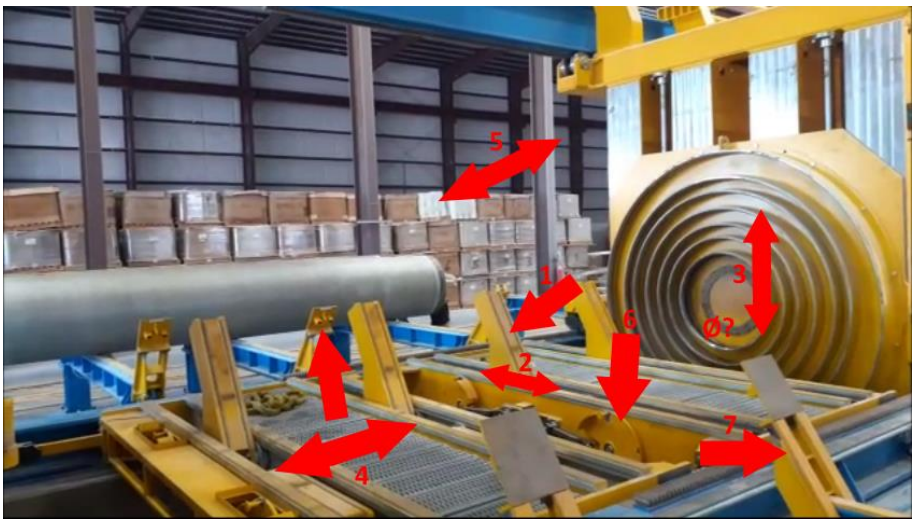


Figure 26: Loading set up

Figure 27: Loading set up

When the pipe enters the machine, (when it lays on the PHTM stopper on the unloading side), the following operations are carried out:

- Lifting the inner arms if the loading beams;
- Lifting of stoppers on PHTM trolley stoppers loading side;
- Attach the safety belts;
- Approach and insert the pipe into the fixed side plug, by moving the PHTM trolleys;
- Approach and insert the plug on the mobile carriage by moving it, until it is correctly positioned and in phase for automatic blocking of the carriage;

,

Figure 28: Pipe ready for test

- Execution of the test using the pumping system placed on the plug from the fixed head, and a relative visual check for any leaks from the pipe.

Figure 29: Water skid

At the end of the test, the following operations will be carried out:

- Emptying the pipe using the low-pressure pump;
- Retraction of the mobile head;

- Movement of the lower carriages to extract the pipe from the fixed plug;

Figure 30: Pipe during extraction from fix head

- Releasing of the belts;
- Manual release of the belts from the tensioners of the lower carriages;

Figure 31: Releasing of the belts

- Lowering of the stoppers on the unloading beams;
- Lowering of the PHTM trolley stoppers – unloading side;
- Manual handling of the pipe towards the unloading beams;

- When the pipe is above the unloading beams, lift the inner unloading beam stoppers;
- Raise the PHTM trolley stoppers for unloading and lower the PHTM trolley arm for the loading side.

Figure 32: Machine ready for loading

7.1.1.DIAMTER CHANGE

The pipes rest on the upper surface of the PHTM trolley and move by rolling, therefore the pipe axis on the machine is always equal to the radius of the pipe itself. The plugs must be adjusted accordingly.

The vertical motorizations of the plugs have a height control via a multi-turn absolute encoder, therefore the machine, even if switched off and on again, retains the memory of the plug position.

The positioning (distance between them) of the PHTM trolley stoppers (to be adjusted according to the ND to be tested) is controlled by an encoder, which widens the space in the case of large diameters or narrows the space in the case of smaller diameters.

PLUG 1	PLUG2	CENTRAL PLUG 1	CENTRAL PLUG 2
900	800	400	300
1100	1000	600	500
1300	1200		700
1500	1400		
1800	1600		
2200	2000		
2600	2400		
3000	2800		

Figure 33: Set of plugs

ASSEMBLING THE CORRECT PLUG

The plug has an upper lifting point (for plugs with larger diameters), or a central hooking system to be screwed on (for smaller plugs).

Once the plug has been hooked on the lifting point, the fixing screws, located on the external diameter of the plug plate, are unscrewed.

Once the plug has been removed and laid down, the one to be mounted is attached to the lift and brought close to the mobile plate, using the two upper centrings, which will put the plug in the correct position.

The locking screws are screwed back in, and from the fixed side, the water transport pipes are reconnected, suitable for the flow rate based on the diameter of the pipe to be tested, called central plugs.

Looking at the table published below, we see that in the two largest sizes, there are 7 possible diameters for plugs.

In addition to these 7 diameters, 3 other plugs can be adapted, which have 2 diameters each and screwed into the centre of the larger plugs.

If the diameter to be tested is not among those installed, a plug change is necessary.

The central plugs have a gasket on the flange on the fixed head side, which is important for the water tightness of the system.

7.1.2. CHANGE OF THE LENGTH

The operation to change the length, to test longer pipes, consists in adjusting the distance between the PHTM trolleys, using the telescopic supports, to place them away from any interference with the heads (in the most closed position).

To be clearer, the distance between the PHTM trolley and the plug on the fixed head must be at least 500 mm (19.68"), and the same distance must be kept between the opposite PHTM trolley and the plug in the mobile head.

This distance is necessary for the pipe extraction operations from the plugs, moving the PHTM trolleys, using the cylinders, which have strokes of 500 millimetres (19.68”).

If the length of the pipe is less than the dimension of the trolleys in the tightest position, it is necessary to unhook one trolley and manually position it at the end of the beams (mobile head side).

This operation requires only a visual inspection, or a measurement, and needs attention to avoid collisions between the plugs mounted on the mobile and fixed head and the trolleys.

Before carrying out these operations, bring the plugs to the rest position, which corresponds to a fully raised plug.

7.2. MACHINE DIMENSIONS

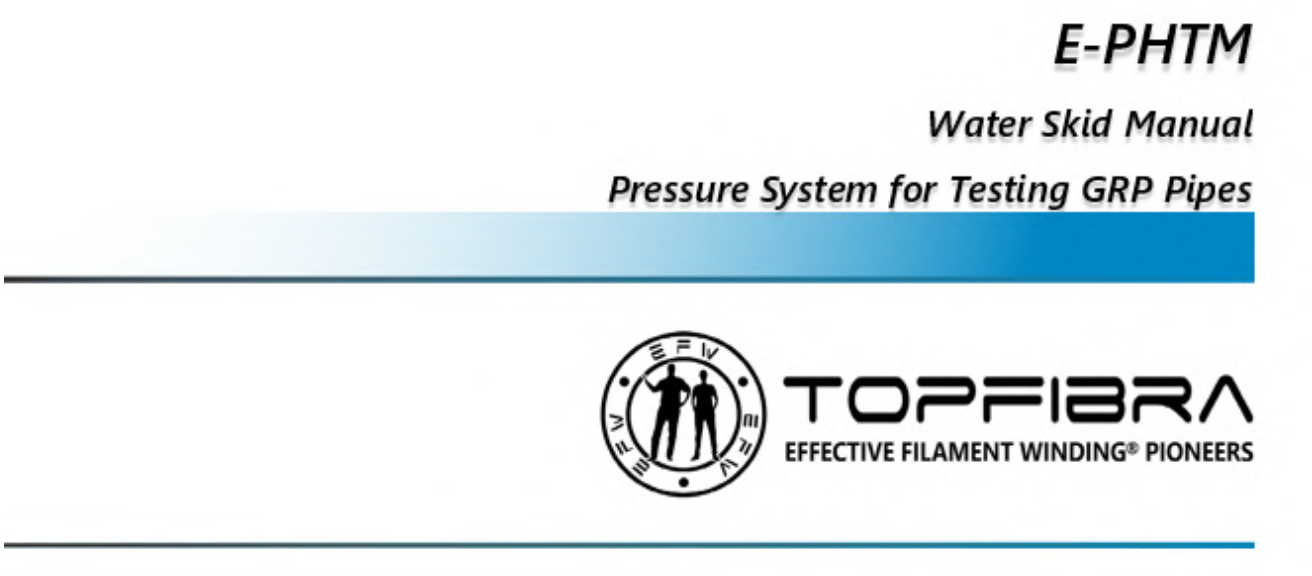
- Width 16.000mm (630”);
- Length 20.000 mm (788”);
- Height 5.000 mm (197”).

8. HMI PANEL

Please refer to the file C147 E-PHTM INSTRUCTIONS FOR USING HMI PANEL.

9. WATER PRESSURE SKID

Please refer to the file C147 - E- PHTM WATER SKID.



10. MAINTENANCE

10.1. CORRECT MAINTENANCE

The proper functioning and maintenance of the effectiveness of the machine depend a lot on the operator who uses it, being himself the best connoisseur of the same.

To ensure that the interventions are as rational as possible, a maintenance program is shown below which describes the checks and interventions envisaged on the machine, which include:

- **Ordinary maintenance**: consists of the checks carried out by the workers assigned to use and/or by the maintenance personnel of the machines present in the company, without requiring the use of particular equipment and/or tools for its execution;
- **Periodic maintenance**: consists of targeted lubrication checks on the mechanisms, replacement of worn parts, and cleaning of the parts most directly exposed to dust and/or the action of external agents, carried out by expert and specialized personnel.

To ensure the safety of the operators and avoid substantial damage to the machine, it is always advisable to replace the component that is not able to offer sufficient guarantees of safety and/or reliability, without waiting for it to be completely and definitively put out of use.

For periodic maintenance, refer to the table indicated at the end of the manual.

10.2. LUBRICATIONS

Lubrication of moving equipment, necessary to avoid direct contact between the rolling parts of the machine, is one of the indispensable conditions for guaranteeing a long life and optimal functioning.

The precautions to be observed in the lubrication of lifting and translation equipment are highlighted in this paragraph.

In consideration of the technology used for the lubrication of the parts of the machine, this maintenance operation can also be carried out by unskilled personnel, who in any case must scrupulously comply with the instructions contained in this manual and operate with attention and common sense, even if it is a simple topping up of the lubricating liquid containment tanks, which in any case must be of the prescribed quality.

The diagram of the components of the lubrication system shown below indicates some brands of products and the type required on the machine.

For the hydraulic units, the oil must be changed after the initial 2500 to 3000 operating hours. Subsequent changes must be performed in intervals of 2500 operating hours or at least once a year. In an environment with the presence of fine particles of dirt or abrasive materials, the oil must be changed more frequently. Where larger quantities of oil are involved, the oil should be changed based on the laboratory analysis results. Jointly with the oil change, the inside of the tank and filter elements must be cleaned. They must be cleaned or changed after the initial start-up, too. The regular cleaning and changing of filter elements extend the service life of a hydraulic device by preventing the dirt to enter it. It is advisable to instate a machine log-book already at the first start-up. In this logbook time intervals for performing individual inspections shall be recorded. Components of the hydraulic device must be regularly inspected at precisely defined times.

The hydraulic units contain about 100 litres each (0.84 bbl.) of oil, according to the table below.

The grease pumping stations each contain about 2 Kg (4 lb) of material, according to the table below.

CLASSE	SIMBOLI ISO	CAMPO DI APPLICAZIONE	FIELD OF APPLICATION	Mobil	oiltek	PETRONAS LUBRICANTS	Q8	REPSOL	ROLOIL	ROTHEN	Sinclair LUBRIFICANTI Divisione della Fuchs Lubrificanti S.p.A.
C	CKB 32	INGRANAGGI MODERATAMENTE CARICATI	MODERATELY LOADED GEARS	MOBIL DTE OIL LIGHT	OILTEK HLP 32	FL LP 32	Q8 VERDI 32	ARIES 32	ARM 32-V	CODRA 32	COMMANDER OIL AW 32
	CKB 68			MOBILGEAR 600 XP 68	OILTEK HLP 68	FL LP 68	Q8 VERDI 68	ARIES 68	ARM 68-V	CODRA 68	COMMANDER OIL AW 68
	CKC 150	INGRANAGGI MOLTO CARICATI	HEAVILY LOADED GEARS	MOBILGEAR 600 XP 150 MOBILGEAR XMP 150	OILTEK EP 150	FL BAKU R 150 EP	Q8 GOYA 150	SUPER TAURO 150	EP 150	GTR 150	WARRIOR EP/NL 150
	CKC 320			MOBILGEAR 600 XP 320 MOBILGEAR XMP 320	OILTEK EP 320	FL BAKU R 320 EP	Q8 GOYA 320	SUPER TAURO 320	EP 320	GTR 320	WARRIOR EP/NL 320
F	FD 10	CUSCINETTI DI MANDRINI, CUSCINETTI IN GENERE	SPINDLES AND BEARINGS	MOBIL VELOCITE OIL N° 6	OILTEK HL 10	FL HIDROBAK 10	Q8 HAYDN 10	TELEX E 10	LI 10	CODRALUBE M10	COMMANDER OIL AW 10
	FD 22			MOBIL VELOCITE OIL N° 10	OILTEK HL 22	FL HIDROBAK 22	Q8 HAYDN 22	TELEX E 15	LI 22	CODRALUBE M22	COMMANDER OIL AW 22
G	G 68	GUIDE	SLIDEWAYS	MOBIL VACTRA OIL N° 2	OILTEK G 68	FL HUSOLI 68 GS	Q8 WAGNER 68	ZEUS GUIA 68	ARM 68-EP	TENAX 68	TRUSLIDE OIL 68
	G 220			MOBIL VACTRA OIL N° 4	OILTEK G 220	FL HUSOLI 220 GS	Q8 WAGNER 220	ZEUS GUIA 220	ARM 220-EP	TENAX 220	TRUSLIDE OIL 220
H	HM 32	SISTEMI IDROSTATICI	HYDROSTATIC SYSTEMS	MOBIL DTE 24 MOBIL DTE EXCEL 32	OILTEK HLP 32	FL HIDROBAK 32	Q8 HAYDN 32	TELEX E 32	LI 32	CODRA PLUS 32	COMMANDER OIL AW 32
	HM 46			MOBIL DTE 25 MOBIL DTE EXCEL 46	OILTEK HLP 46	FL HIDROBAK 46	Q8 HAYDN 46	TELEX E 46	LI 46	CODRA PLUS 46	COMMANDER OIL AW 46
	HM 68			MOBIL DTE 26 MOBIL DTE EXCEL 68	OILTEK HLP 68	FL HIDROBAK 68	Q8 HAYDN 68	TELEX E 68	LI 68	CODRA PLUS 68	COMMANDER OIL AW 68
	HG 32	SISTEMI CON GUIDE IDROSTATICHE	HYDRAULIC AND SLIDEWAYS SYSTEMS	MOBIL VACTRA OIL N. 1	OILTEK HG 32	FL HUSOLI 32 HG	Q8 WAGNER HW 32	ZEUS GUIA 32	LI 32 EP	CODRA PLUS HV 32	TRUSLIDE OIL 32
	HG 68			MOBIL VACTRA OIL N. 2	OILTEK HG 68	FL HUSOLI 68 HG	Q8 WAGNER HW 68	ZEUS GUIA 68	LI 68 EP	CODRA PLUS HV 68	TRUSLIDE OIL 68
X	XBCEA 1	GRASSI MULTIFUNZIONALI	MULTI-PURPOSE GREASES	MOBILUX EP 1	OILTEK BEARING EP1	FL JOTA IND 1	Q8 REMBRANDT EP 1	GRASA LITICA EP1	LITEX EP 1	SUPERGREASE EP 1	RENOLIT EP 1
	XBCEA 2			MOBILUX EP 2	OILTEK BEARING EP2	FL JOTA IND 2	Q8 REMBRANDT EP 2	GRASA LITICA EP2	LITEX EP 2	SUPERGREASE EP 2	RENOLIT EP 2
	XBCEA 3			MOBILUX EP 3	OILTEK BEARING EP3	FL JOTA 3 FS/I	Q8 REMBRANDT EP 3	GRASA LITICA EP3	LITEX EP 3	SUPERGREASE EP 3	RENOLIT EP 3

Figure 34

There are also manual greasing points, such as undercarriage bolts and bearings, and their location will be indicated on the drawing, even if they are visually exposed.

For the manual greasing point we recommend re-greasing every 4500 hours and using SKF LGMT 2.

10.3. ORDINARY MAINTENANCE

10.3.1. General prescriptions

Once a month, check the functioning of the Emergency Stops by running the machine without load and test the correct intervention (total arrest of operation) of the Emergency Stops themselves.

In the event of a malfunction, entrust troubleshooting to specialized personnel only, and if not indicated by the diagnostics, call the Manufacturer's technical assistance.

Check the continuity of the earth circuit every 2 years, by carrying out the continuity measurement according to the provisions of the local standard.

The machine has been designed to reduce ordinary maintenance to a minimum, it is up to the operator to judge the state and its suitability for use.

It is recommended to stop and intervene with maintenance whenever non-optimal functioning is perceived; this will always ensure maximum efficiency.

Visually check the condition of the individual parts that make up the machine, verifying that there are no alterations due to sagging or deformation.

For all maintenance that does not require voltage to the power components, the system must be stopped by disconnecting the power supply from the main switch, locking it in the "0" position.

10.3.2. Daily checks

Visual checks of the main parts of the machine and its movements:

- Wearing plates;
- Main wheels;
- Belt tensioning;

- Trolleys stoppers;
- Hydraulic hoses;
- Water hoses with particular attention on the high-pressure lines (see P&I);
- Tightness of connections and hydraulic components;
- Movement of the valve;
- Pressure release valve;
- Pressure switches;
- Pressure sensors;
- Bolts to fix the lateral safety blocks;
- Checking the conditions of the accessories applied to the machine (for example the automatic greaser);
- Control the regularity of rotation and movement of both the working axis and the lower stations;
- Checks the functions (test of the limit switches, a test of the motors, a test of the "stop/start-emergency" buttons, etc...).

10.3.3. Weekly checks

- Check the integrity and general functionality;
- Check the wearing plate condition – keep them clean and lubricated;
- Check the position of the wearing plates scrapers;

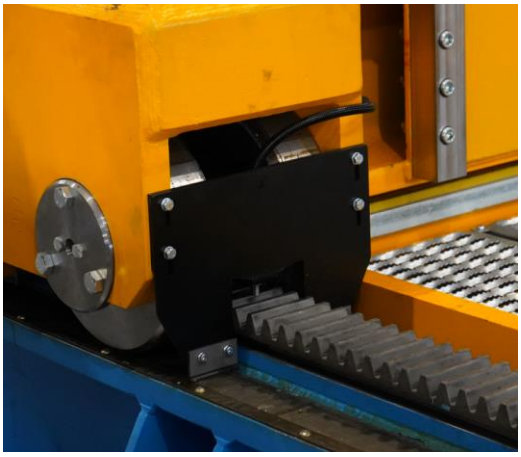


Figure 35

- Check the rack condition by looking for wearing signs;

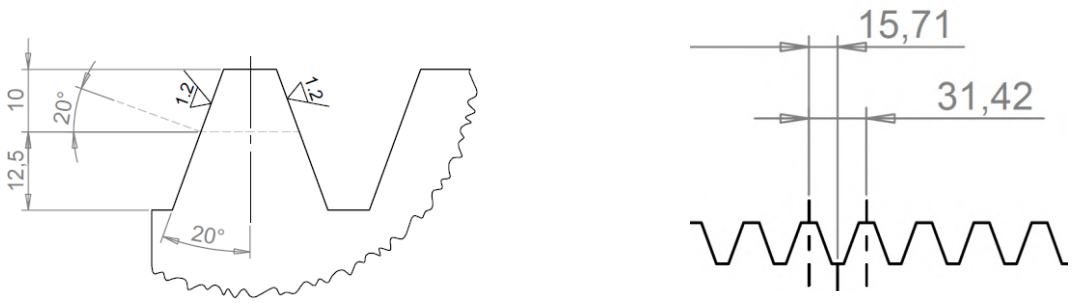


Figure 36

- Check the condition of the main 4 blocks;
- Check the rack groove and the correct position of the safety block;

Figure 37

- Check the lock mechanisms;

Figure 38

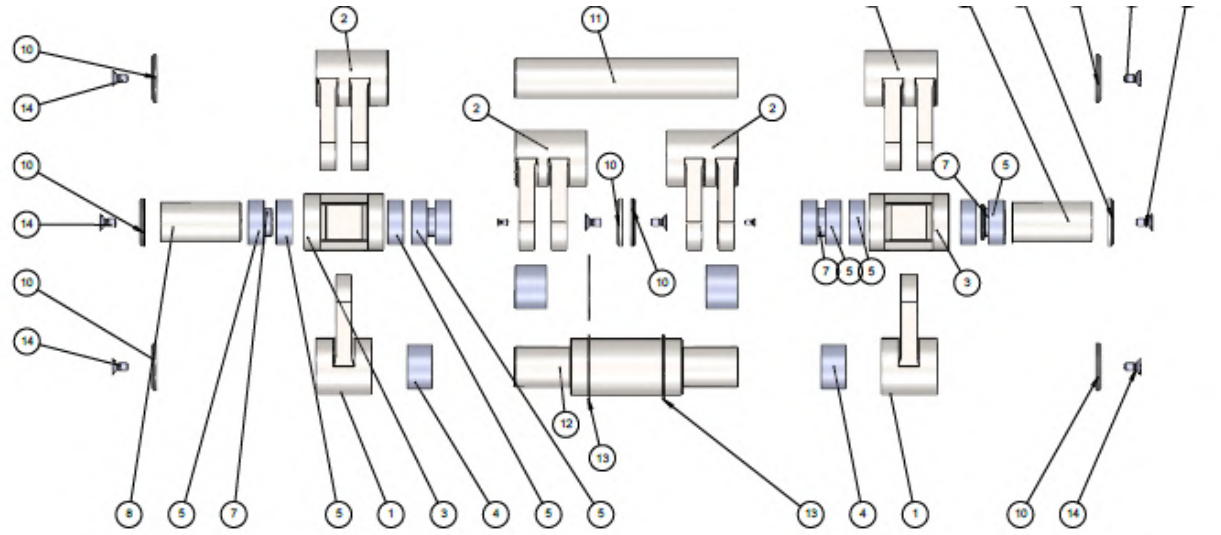


Figure 39

- Check the junction box and the power line, with cleaning and arrangement of the connectors;
- Control the mobility of the mobile heads, the plug plates and the trolleys;
- Check the bolts (torque) that fix the main beans to the concrete;
- Check the bolts (torque) for the connection between the fixed head and the beams.

Before any maintenance operation, the maintenance technician must cut off the power supply by acting on the main switch, close the padlock provided on the electrical panel, and keep the key in his custody.

10.3.4. Planned maintenance

Failure to comply with the requirements releases the manufacturer from any liability under the Warranty.

Scheduled ordinary maintenance including inspections, checks and interventions which prevent stops and breakdowns, and keep the following under systematic control:

- The state of lubrication of the machine;
- The condition of the parts subject to wear;
- The torque of the bolts that fix the beams;
- The torque of the bolts that fix the upper stoppers;
- Detailed inspection looking for cracks in the rack;
- Detailed inspection looking for cracks in blocks;
- Detailed inspection of the mechanism to move the blocks;
- Detailed inspection of the pressure hoses;
- Details inspection of the main valve that divides the high pressure with the low pressure in the skid.

10.4. EXTRAORDINARY MAINTENANCE

An accurate and complete overhaul of the machine must be carried out at the end of its work cycle to evaluate its full efficiency and the possibility of continuing to use it.

10.5. DIAGNOSTICS AND TROUBLESHOOTING

For defects or malfunctions of the machine not described in this Manual, please contact the Manufacturer.

The entire diagnostics relate to possible errors with a brief descriptive indication of that sector in which an anomaly has been recorded.

An anomaly or an error is generated because the cycle sequence has not completed the exact path/function for which the machine has been programmed.

This happens for various reasons, which can be the breakage of a part, the incorrect positioning of an axis or a mobile element, or the positioning of a workpiece, as more simply from a voltage surge.

Visually ascertain what the diagnostics describe on the screen, and then, always visually ascertain what has happened without rushing without indication on the machine.

Also always check the cause that produced the stop, as this avoids subsequent machine stops and possible rejects, or even worse, dangers for operations.

They will be reported as an attachment to the descriptive sheets of the diagnostics integrated in the program, with related possible advice on the possibility of remedying the incident, and the type of recommended recovery intervention.

11. ASSISTANCE AND SPARES

11.1. ASSISTANCE

For any type of information relating to the use, maintenance and installation of the machine, the Manufacturer has a dedicated organization that is always available.

The Customer should ask the questions in clear terms, with references to this Manual and the instructions listed.

11.2. SPARES

For any spare part, contact the Manufacturer indicating the code and description of the part, referring to the attached lists. ALWAYS USE ORIGINAL SPARE PARTS.

The manufacturer is not liable for breakages, malfunctions or damage to people or things deriving from the use of non-original parts.

For the management of spare parts, the Manufacturer presents a list of recommended spare parts. The use of non-original spare parts is not recommended and, if this occurs, the conditions of the Warranty (if still in place) and the Manufacturer's Liability in the use of the machine will cease, and the Manufacturer will not be liable for any damage caused to persons and/or things.

In order to interact most effectively with our technicians when ordering spare parts, please follow the following procedure:

- Call the TOPFIBRA support and describe the type of fault found;
- Possibly describe the non-functioning part;

- Trace the detail of the machine by following the overall or assembly drawings and the relative lists;
- Order the part.

12. ANNEX 1 - CHECKLISTS

12.1.1. PERIODIC CHECKS

The customer is obliged to comply with the maintenance and surveillance program described in the User Manual.

He also must submit the machine to the following periodic checks, recording or having the results of the following checks recorded in this "Inspection Register" by personnel in charge and trained for the purpose.

12.1.2. AUDIT RECORDS

- QUARTERLY REVIEW;
- ANNUAL REVIEW.

12.1.2.1. QUARTERLY REVIEW

The specialized technician, in charge of carrying out the check, indicates the date of the check in the following list and expresses a summary judgment on the conditions of the various components (bad, mediocre, fair, good, excellent, etc.).

STATUS	REJECTED	BAD	SUFFICIENT	GOOD	EXCELLENT
MAIN STRUCTURE					
CORROSION PROTECTION					
MOTORS					
GEARBOXES					

JACKS					
LIMIT SWITCHES					
MAIN WHEELS					
BEARINGS					
PINS					
HYDRAULIC UNIT					
ELECTRIC UNIT					
LUBRICATIONS					

Date: _____

Technician

_____

12.1.2.2. ANNUAL REVIEW

The specialized technician, in charge of carrying out the check, indicates the date of the check in the following list and expresses a summary judgment on the state of conservation of the machine, bearing in mind the conditions of its various components, which may be found to be in an insufficient, bad, mediocre, sufficient, fair, good or excellent condition.

STATUS	**REJECTED**	**BAD**	**SUFFICIENT**	**GOOD**	**EXCELLENT**
MAIN STRUCTURE					
CORROSION PROTECTION					
MOTORS					
GEARBOXES					
JACKS					
LIMIT SWITCHES					
MAIN WHEELS					
BEARINGS					
PINS					
HYDRAULIC UNIT					

ELECTRIC UNIT					
LUBRICATIONS					

Date: _____

Technician

_____

For more information contact us by writing at

support@topfibra.eu

or

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