MENEGOTTI TECHNICAL MANUAL

ELLEVA PRO 500

Illustrative picture.

Attention:

Before operate **Menegotti equipament**, read this **technical manual**, itself will inform and instruct the operator about the operation. By the way, you avoid possible working accidents and early maintenance on at the equipment.

MENEGOTTI

MÁQUINAS PARA CONSTRUÇÃO CIVIL

The **Company**

We want to BUILD good business with you.
Brand reference of quality in the civil construction segment. National leader in sales of concrete mixers. Present in more than 40 countries. Recognized for developing a complete product mix, in the PRIME and PRO lines, which provide greater productivity on the construction site and profitability to the businesses.
We are Menegotti Metallurgical Ltda, a company of the Menegotti Group. And we want to offer you the best that we have.
PRIME Line - Economy work: With products made to meet more economic works, with great performance and low maintenance.
PRO Line - Professional work: Machines designed for professional use in works from small to large, which require high productivity, safety and profitability.

The **Product**

The Elleva Pro 500 Lifting Device is an equipment manufactured from the composition of steel tubes and sheets. Its function is to carry out the movement of materials in civil construction, combining large load capacity with speed and safety for the operator.
The main purpose of this machine is to transport loads vertically, within its operating capacity. Its installation must be done by trained professionals. This machine is the ideal tool for reducing physical efforts, increasing operator productivity and efficiency.
• **Menegotti reserves the right to make changes to the product without prior notice. If any Information in this manual is not consistent with the physical product, consider the current product and the manual as a reference only.**

Characteristics:

• **360 ° Rotation:** The Elleva Pro 500 has a 360 ° rotation around its main axis, in order to facilitate the unloading operations of the materials.
• **Truss-shaped Tripod:** A great advantage of this machine is the truss-shaped tripod, which allows a significant gain in the useful transport volume.
• **Transmission System:** The machine has a transmission system consisting of a motor with a brake, which guarantees immediate stops during cargo handling. It also has a set of gears that provides you with the necessary force to lift the load of 500 kg at an average operating speed of 21 m/min.
• **Various accessories:** The Elleva Pro 500 Lifting Device brings several accessories to assist in the most diverse types of transport, namely: brick cart, block cage, 60l and 90l box, hoisted cart, hoist brick basket, steel cable protection and pallet lifter. With the help of these accessories, greater productivity and practicality are achieved, combined with ergonomics and safety, making the equipment versatile, practical and efficient for the most diverse applications.

Safety **Informations**

This machine, if not observed the safety recommendations, presents risks of falling, crushing, amputation and electric shock.
This manual contains notes, cautions and warnings that must be followed to avoid the possibility of improper use, damage to the machine or personal injury.

NOTES: Contains additional information on important procedures.
CAUTIONS: Provide important information to prevent errors that could damage the machine or its components.
WARNINGS: Warn about conditions or practices that can lead to personal injury or even death!

Operational Security

The workers involved in the operation, maintenance, inspection and other interventions in the machine, must receive training provided by the employer and compatible with their functions, which addresses the risks to which they are exposed and the existing and necessary protective measures, in order to prevent accidents and illnesses. The machine, if operated improperly or by unauthorized persons, presents risks to the physical integrity of the operator.

NEVER allow untrained people to operate the machine.
ALWAYS read, understand and follow the instructions in the Instruction Manual before attempting to operate the machine.
ALWAYS make sure the operator is familiar with the proper safety precautions and operating techniques before using the machine.
ALWAYS prepare the workplace in order to prevent accidents at work, following the guidelines in this manual and the specifications of current safety standards.
NEVER operate the machine in applications that are not intended for its job.
NEVER change or disable the operational and security functions.
NEVER use accessories that are not recommended by Menegotti for the machine. It can cause damage to the machine and/or injury to the user.

We **DO NOT** take responsibility for any accidents due to modifications to the machine. Such changes will result in the loss of the warranty.
ALWAYS use caution and common sense when operating the machine.
ALWAYS in case of damaged or missing parts, immediately contact Menegotti at 0800-727-8033 for replacement.
ALWAYS with the machine off, perform a daily inspection of the machine parts. The machine cannot be used if there are signs of malfunction. In case of problems, contact the Authorized Menegotti Service immediately.
ALWAYS make sure that all people are at a safe distance from the machine. Stop the machine if people enter the machine's work area.
ALWAYS keep the machine out of the reach of children.
ALWAYS insulate the working area of the machine and keep the place clean, unobstructed and well lit.
NEVER leave the machine running unattended.
ALWAYS turn off the machine when it is not being operated.
ALWAYS wear protective clothing when operating the machine. Wear safety glasses or goggles, ear protectors and safety shoes.
ALWAYS keep hands, feet and loose clothing away from moving parts of the machine.
ALWAYS avoid contact with the rotating parts of the machine.

Electric motors

ALWAYS make sure that the electrical installations meet the current safety standards.
ALWAYS avoid contact of the extension with the ground, especially if it is wet.
ALWAYS inspect any electrical extension before connecting it to the mains, do not use bare, broken, or spliced extensions.
NEVER connect more than one machine to the same outlet and/or electrical extension.
NEVER modify the machine plug.

It is **NOT** recommended to use “T” connections.
ALWAYS disconnect the machine from the mains before any inspection, cleaning or maintenance operations.
ALWAYS check that the voltage source corresponds to the voltage indicated on the machine plate.
NEVER throw water on electrical parts when cleaning the machine.
NEVER operate the machine in the rain.
NEVER operate the machine in environments where flammable substances, liquids, gases or dust are present. Electrical equipment can create sparks that can react with these items.

Service security
Poorly maintained machines can become a safety hazard! In order for the machine to operate safely and properly for a long period, periodic maintenance and occasional repairs are necessary.

WARNINGS:
DO NOT attempt to clean or repair the machine while it is working.
DO NOT operate the machine without safety devices and guards or without operating conditions.
ALWAYS keep the area around the muffler free of debris to reduce the risk of accidental fire.
ALWAYS replace safety devices and guards after repairs and maintenance.
ALWAYS leave the cooling fins clean of debris.
ALWAYS perform periodic maintenance as recommended in the Instruction Manual.
ALWAYS replace worn or damaged components with replacement parts recommended by Menegotti for the maintenance of this machine.

Technical **Specifications**

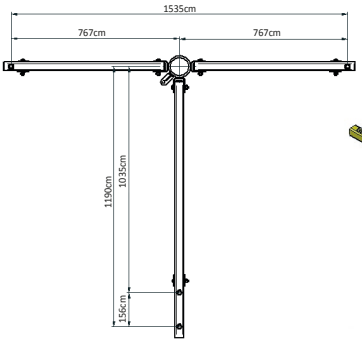
Technical Data	Elleva Pro 500
Lifting Capacity	500 Kg
Lifting Height	60m | 80m | 100m
Lifting Speed	21 m/min
Turning Angle	360°
Boom Length	1,45 m
Motor	Three-phase 3 CV w/ Brake Motor 220 / 380 V
Steel Cable Specication	Ø6mm 17x7 AF Non rotational IPS
Net Weight	179kg | 182kg | 185 Kg
Dimensions (W x L x H)	1600 x 2750 x 2060 mm
Packing Dimensions (W x L x H)	785 x 2480 x 575 mm

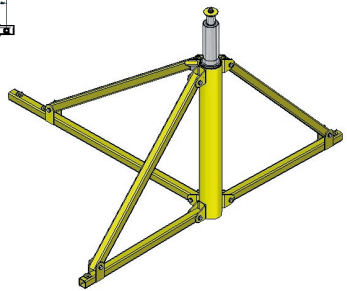
Optional	Function
Brick Cart	Transport the blocks into the block cage.
Block Cage	Store the blocks during the move operation.
Boxes 60 and 90 L	Store bulk materials during movement.
Hoisted Cart	Perform the horizontal displacement of materials in the wheelbarrow function as well as operate in the vertical movement of loads.
Hoist Brick Basket	Store blocks and bulk cargo during handling operations as well as carry out horizontal displacements in the work environment.
Pallet Lifter	Assist in moving the hoist brick basket as well as moving pallets in general.
Steel Cable Protection	Protect the operator against the risk of contact or breakage of the steel cable.

Machine **Settings**

Mounting and installing the tripod:

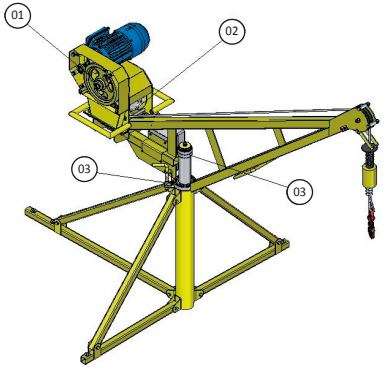
Fix the tripod with 4 parabolts 5⁄8'' according to the holes shown in the figure below, in order to obtain a firm fix, drilling depth using a 5/8" bit should be at least 10 cm. Another fixing alternative is to make through-holes and fix with a threaded rod, with nut and washer under the slab and on top of the tripod.





Lubrication:

All lubrication points indicated in the figure must be lubricated with lithium grease before starting the machine, as indicated in the section 'Machine maintenance'.



1 - Gears;
2 - Steel cable;
3 - Tripod Bearings;

Electrical Installation:

After choosing the voltage that supplies the electric motor of the equipment, it is necessary to check if the mains voltage is compatible with the chosen voltage, otherwise serious damage to the equipment and the motor may occur. The motor connection must comply with the chosen voltage, otherwise serious damage to the equipment may occur.
The voltage must be selected by changing the connection as described below in "Voltage change procedure" and as specified in the wiring diagram.

The electrical installation must follow the instructions of NBR 5410 and be performed by a qualified professional (NR10). This requires the installation of a residual differential switch or "DR" circuit breaker.

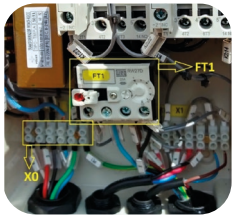
- For 380V machine, use an industrial plug 5 pins 16A.
- For 220V machine, use an industrial plug 4 pins 32A.


Plug 4 Pins (3P + E)


Plug 5 Pins (4P + E)

Voltage change:

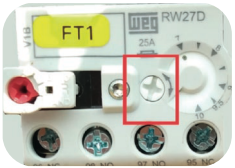
Before performing the voltage change, it is necessary to identify which items must be modified so that the equipment works at the desired voltage. The changes will take place in the modular terminal block "X0", in the FT1 Relay and in the motor housing.



The voltage change is carried out in three steps for both voltages:

STEP 1: Motor Breaker:

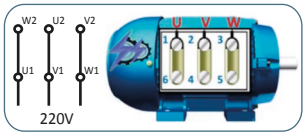
The relay setting implies which current it will be disarmed. For the equipment voltage at 220V, the Relay setting must be 9.4A and for the 380V voltage this same setting must be 7A.
This adjustment is made at the front of the relay shown in the figure on the side.

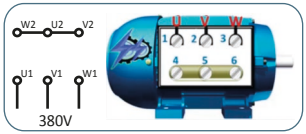


STEP 2: Voltage Selection:
On 220V: Place the jumper connecting terminals T and N.
On 380V: Remove the jumper made between terminals T and N.

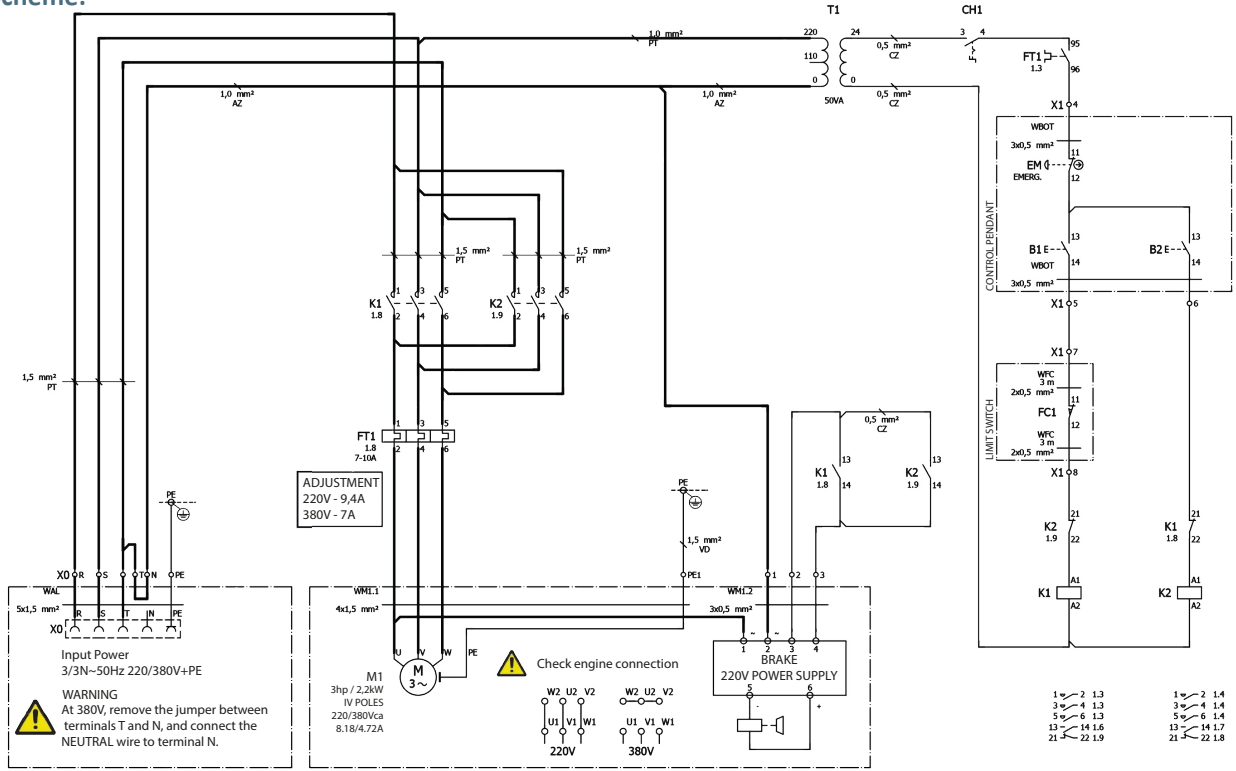
380V Connection

STEP 3: Check the motor connection.





Electric Scheme:



Pre-Use **Inspection**

NOTE: Perform the pre-use inspection of the machine at each start of shift, change of operator and after maintenance. Every inspection must be recorded in a specific document, including the date and observed flaws, the corrective measures adopted and the indication of the person, techn cian or qualified company that carried out the inspection.

Items to inspect:

• Check that all components are present and safe.

• Inspect the entire electrical extension, especially for cuts, friction cable, broken plugs and connectors. Never use extensions that are not in good condition.

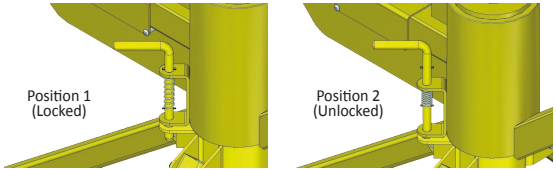
Machine **Operation**

Up and down button: After all the conditions of installation, lubrication and electrical supply are met, the lifting device is able to start the movement of loads on the construction site. To start the movement, the up or down button must be kept pressed, as shown in the figure on the side.

To stop the movement, stop pressing the up or down button, immediately stopping the movement due to the electric motor's brake system. The equipment has an emergency button which must be activated if necessary.

Vertical and lateral movement of the transported cargo:

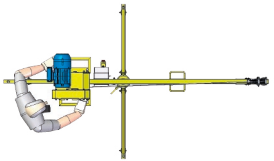
During the vertical load movement operation, the equipment must be kept in 'Position 1 - Locked' and to move the load laterally (boom rotation) the equipment must be unlocked by placing it in 'Position 2 - Unlocked', as shown in the following figure.

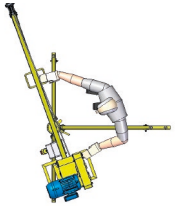


NOTE: You should not pick up loads that are out of the reach of the product or use it to perform oblique tractions of any kind. Do not remove loads attached to the ground.

Approximation and final movement of the cargo:

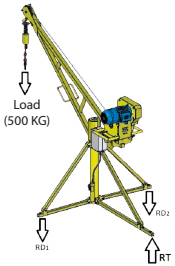
After the vertical movement of the load, the lateral movement must be carried out in order to enable the operations of unloading the transported materials. In order to minimize the risk of the operation as much as possible, the lateral movement procedure must be performed in two stages as shown in the figures below:





Reaction at attachment points:

Boom Length	1,45 M
Load Factor	1,5
Load (Kg)	500
RT (Kg)	880
RD1 (Kg)	950
RD2 (Kg)	950



Machine **Cleaning**

It is essential for a long service life of the equipment, that a daily cleaning is carried out, and that any type of dirt from the equipment is eliminated. Be careful not to spill water on the electrical parts of the equipment.
For the conservation of the equipment, and the safety of the users, we recommend:

- Clean all machine components carefully;
- Do not spill water on the electrical parts of the machine;
- Lubricate the specified parts with the grease recommended in the maintenance plan;
- Take care not to get dirt in the winding reel of the steel cable;
- When winding or unwinding the steel cable on the spool, the same must must be tensioned through the minimum weight of the counterweight. Ensure a good winding of the first layers, as this will increase the useful life of the cable;
- The cable must always be stretched so that the spool does not unwind, for this reason, it is recommended not to touch the hook on the floor or in other places that relieve the tension caused by the counterweight;
- Always use 3 clamps for securing the rotating hook to the end of the cable;
- Steel cables must be periodically well lubricated, protecting them from corrosion and reducing internal and external friction, increasing their durability;
- Burnt oil should never be used to lubricate cables, as it is an acidic liquid that, instead of protecting, accelerates the corrosion process and usually presents particles that end up increasing the wear of the cable by abrasion;
- Steel cables should be inspected periodically to see if they need to be replaced.

Machine **Maintenance**

NOTE: The preventive and corrective maintenance of the machine must be carried out in accordance with the official national technical standards in force and, in the absence of these, the international technical standards. Maintenance with the potential to cause occupational accidents must be the object of planning and management carried out by a legally qualified professional.

Brake Maintenance

Since they are of simple construction, the motor brakes are practically maintenance-free, except for the periodic adjustment of the air gap. It is recommended to perform the internal cleaning when water, dust, etc. penetrates, or during the periodic maintenance of the engine.

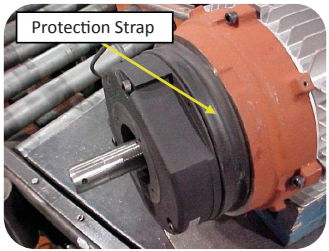
Air Gap Adjustment

The motor brakes are supplied with the initial air gap, that is, the separation between the armature and the frame with the applied brake, pre-set at the factory to its minimum value indicated in the table below.

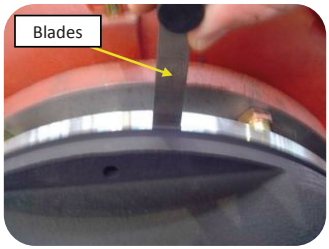
Motor Housing	Brake Size	Air Gap Initial	Air Gap Maximum	Air Gap Maximum Braking Emergency	Minimum Brake Disc Thickness
90	BFK458-10	0,2 mm	0,5 mm	0,3 mm	7,5 mm

With the natural wear of the brake disc, the air gap gradually increases, and it will not affect the proper functioning of the brake until it reaches the maximum value indicated in the table. However, when reaching this value, the air gap must be readjusted to its initial values, proceeding as follows:

1) Remove the fixing screws and remove the baffle cover.
2) Remove the protection strap.

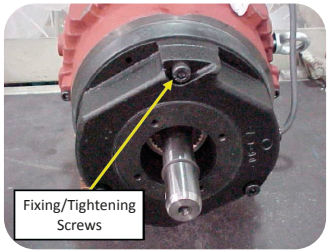


3) Measure the air gap at three points, close to the adjusting threaded bushings, using a set of feeler gauge blades.



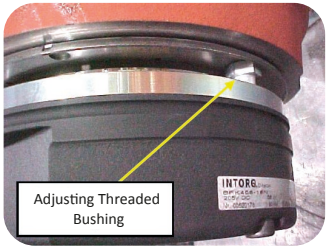
4) If the measurement found is greater than or equal to the maximum value indicated, or if the three readings are different, carry out the adjustment as follows:

a. Loosen the fixing/tightening screws;



b. Adjust the air gap to its initial value indicated in the table, using the threaded adjustment bushings and then tighten evenly (tightening torque values in the screw torque table) the three tightening screws. The air gap value must be uniform at the three measurement points and be such that the standard blade corresponding to the lower limit can freely penetrate all the way around, and the blade corresponding to the upper limit cannot be inserted at any point.

NOTE 1: 1/6 turn in the bushing changes the air gap by approximately 0.15 mm.
NOTE 2: For electromagnets with more than three clamping screws, alternately tighten the screws crosswise.
NOTE 3: Use a torque wrench to check the tightening torque.



c. Make a final check of the air gap, proceeding with the measurements according to item 3.
d. Put the protection strap back on.
e. Put the the baffle cover back on, fixing it with the screws.

Air gap inspection and readjustment intervals

The time interval between the periodic adjustments of the air gap, that is, the number of braking operations until the wear of the pads brings the air gap to its maximum value, depends on the load, the service conditions, the impurities in the working environment, etc.

The ideal interval can be determined by maintenance, observing the practical behavior of the motor brake in the first months of operation, under real working conditions.

Electromagnet Ohmic Resistance Values

To check the state of the electromagnet, the value of the ohmic resistance can be measured. To perform the measurement, a multimeter is needed to measure the resistance between the two wires of the electromagnet. Below table with the respective values of ohmic resistance (at 20 °C) according to the type of brake and voltage of the electromagnet.

Model	Electromagnet voltage (V).	Electromagnet Resistance (ohms) +/- 8%
BFK458-10	24	19,2
	96	297,3
	103	331,5
	170	963,3
	180	1012,5
	190	1203,3
	205	1273,5

Screw Torque Table

SCREW TORQUE TABLE		
Description	Location on the Machine	Torque
HEX SCREW M10X30 DIN 933 8.8 and NUT M10	Mirror and Reel Fixing	44,1 Nm
HEX SCREW M12X35 DIN 933 8.8	Head Fixing	78,5 Nm
HEX SCREW M10X70 DIN 931 8.8	Fixing the Sleepers of the Tripod Set	44,1 Nm
CLAMP 1/4"	Locking the End of the Steel Cable	9,8 Nm
PARABOLTS 5/8" OU M16	Fixing the Tripod Set to the Construction Slab	167 Nm
TIGHTENING SCREWS	Air Gap	9,5 Nm

Maintenance Plan

Below are some recommended guidelines for better machine maintenance and performance. We also recommend that engine maintenance is carried out and followed according to the procedures described in the Motor Manual.

MAINTENANCE PLAN - ELLEVA PRO 500									
I= Inspect and replace if necessary L= Lubricate R= Replace	Initial Inspection (20H or 1 Month)	Every 50 hours	Every 100 hours	Every 200 hours	Daily	Weekly	Monthly	1 Year	Comments
MECHANICAL SYSTEM									
Grease Points		L				L			Gears, bearings and steel cable.
Steel Cable Winding		I/L				I/L		R	Observe the existence of broken wires, wear, folds and dents.
Screw Tightening		I				I			Tighten the screws according to the table in the technical manual of the machine.
Clearance Gears Power Train				I			I		Check and adjust if necessary.
Bearing Condition			I				I	R	Observe abnormal noises or vibrations, as they may be signs for the replacement of the bearings.
ELECTRICAL SYSTEM									
State electrical wiring	I				I				Check for bare or shorted wires.
Operation of the limit switch sensor	I		I				I	R	If showing signs of failure, it should be replaced.
Adjusting the engine brake disc clearance				I			I		Adjust according to manufacturer's manual the engine.

Problems **Solution**

Electrical Problems:

NOTE: Any electrical intervention must be carried out with the machine disconnected from the power and by a trained professional.

SYMPTOM	CAUSE	SOLUTION
Does Not Turn On	Lack of Energy	• Check for voltage at the three terminals of the outlet.
		• Check that the main switch on the control panel is connected.
	Lack of Phase	• Check for badly connected wires.
	Tripped Circuit Breaker	• Check that the circuit breaker holds the motor current and switch it on.
	Control Panel Off	• Turn on the main switch located on the side of the control panel.
Excessive Panel Noise	Contactors Ringing	• Poorly connected wires.
Motor Rumbling and Warming	Brake Coil Locked or Not Driven	• Check that the magnetic brake coil is being properly fed. Check electrical diagram on manual.
		• Check the clearance between brake discs as described in this manual.
Lack of Power to Raise the Load	Lack of Phase	• Poorly connected wires.
Inverted Up and Down Movement	Phase Wire Inversion	• Invert one phase wire through the other in the socket.
Limit Switch Does Not Act When Load Rises	Key Failure	• Replace.
	Inverted Command Wiring at the Control Pendant	• Check connections according to the electrical diagram in the manual.
Control Pendant Up and Down Doesn't Act	Damaged On/Off Switch	• Replace.
	Damaged Control Panel Transformer	• Check and replace if necessary.

Mechanical Problems:

NOTE: Any intervention by the mechanics must be done with the machine disconnected from the power and by a trained professional.

SYMPTOM	CAUSE	SOLUTION
Lack of Power to Raise the Load	Locked Brake Discs	• Adjust the clearance as described in this manual.
Load Slides / Machine Does not Hold the Load	Worn Brake Discs	• Check the clearance and adjust. If necessary, replace the magnetic brake.
Excessive Gear Noise	Damaged Bearings	• Check and replace if necessary. Observe the maintenance plan contained in this manual.
	Loose Mirror Fixing Screws	• Retighten the screws. Observe the maintenance plan contained in this manual.
Steel Cable with Crushed and/or Broken Wires	Life Limit, bad winding that causes crushing, contact with sharp edges during work	• Check the condition of the cable periodically. To eliminate obstacles in contact with the cable during movement. Replace it if there are signs of damage.
Machine Rotates While Lifting the Load	Uncoupled Lock	• Dock the lock during the lifting process.
Steel Cable Rising Inverted	Cable Voltage Lack When Load Goes Down	• Always keep the cable tensioned with its counterweight. When unloading the load, do not allow the cable to loosen to the point of start to unwind freely from the spool.
		• Unroll the cable until it reaches its position of correct winding. Then rewind with the cable tensioned.

Product Warranty

The conditions and terms of this warranty are non transferable and go into effect on the date of purchase of this equipment, proven by presentation of the sales invoice issued to the first end user. At the time of delivery of the equipment, the customer must be provided with the information and technical orientations according to the contents of this manual.

Not, however, included in this warranty are defects arising from improper use, negligence, imprudence or malpractice, nor are repairs or alterations to any part and/or component of the equipment. Also not included are: the assembly of any sets of parts by technicians not from the Factory itself or from an Authorized Technical Assistant, application other than which it was specied, mechanical or electrical overloading as well as lack of phase, use in environments for which it was not designed, incorrect voltages and frequencies, incorrect lubrication, damage caused by accidents of any nature, such as floods, gales, fire, landslides or due to transportation.

Removal or any alteration to the serial numbers originally placed on the product will render the warranty null, where the Sales invoice and Warranty Certicate must be presented in relation to the equipment in question.

This warranty is limited to the repair, replacement of parts or assembly of parts in which, through examination by a Menegotti Authorized Technical Assistant with prior authorization from the Factory, any manufacturing defect will be veried. This repair or replacement will be performed by the authorized Technical Assistant, where the purchaser will be responsible for risks and expenses arising from transport to and from the authorized Technical Assistant, and where labor and parts will not be charged according to the terms of this warranty. This warranty replaces any other warranty, implicit or explicit, as well as all any obligation or responsibility on the part of our company in relation to the above mentioned product.

MENEGOTTI Post Sales Department and Technical Assistance.

Term of Warranty

By the present CERTIFICATE provided from original purchaser, Menegotti guarantees this product against manufacturing defects, for a period of 12 (twelve) months, being: the first 3 (three) months of legal guarantee, and the last 9 (nine) months a special warranty guaranteed by Menegotti, counted from the invoice issue date of the first final consumer. Not included in this equipment warranty are components subject to wear through use such as: bearings, steel cable, electrical plugs, gears and engine breaking.

This warranty includes the replacement of parts and repairs due to manufacturing defects duly noted by the factory or Authorized Technical Assistant. This warranty will be rendered null and void in the case of damages arising from accidents, acts of nature, application other than which it was designed, connection to improper electrical supply or subjected to extensive power fluctuations, or, if opened by persons or workshops not authorized by Menegotti. The consumer will be responsible for freight expenses for transporting the product to the technical assistant or factory. Menegotti has an ample network of Technical Assistants throughout the country.

The equipment includes an electric motor and this warranty covers internal defects in the motor originating from its manufacture. Defects not covered in this warranty include: overloading due to lack of or excessive phase, use of voltage outside that specified, broken or crushed casing due to negligence during transporting /or storage, coupling or energizing outside specifications and general defects from improper use and/or incorrect installation.

In agreement with these terms,

Customer:_____
Model:_____ **Serial Number:**_____
City:_____ **Date:**_____

Customer

Menegotti Authorized Service