INSTRUCTIONS MANUAL
EDGE BANDING MACHINE
OF HOT- MELT GLUE

KM-500
KM-550

TECHNICAL DETAILS:

THICKNESS BOARD	MÍN.	8 mm
	MAX	40 mm
WIDE BOARD	MÍN.	75 mm
LONGITUDE BOARD	MÍN.	120 mm
THICKNESS EDGING	MAX.	2 mm
SPEED ADVANCES		5.5 m/mi

ELECTRIC CONNECTION:

VOLTAJE			Total CV	Total KW	Total AMP.
230		monofasica	3,40	2,50	12,8
230		trifasica	3,40	2,50	7,4
400		trifasica	3,40	2,50	4,3
415		trifasica	3,40	2,50	4,1
440		trifasica	3,40	2,50	3,9

END TRIMMING UNIT: **V-2**

MOTOR: 0.2 Kw.

TRIMMING UNIT: **JC-2**

MOTOR: 2 x 0.27 Kw.

DRAG UNIT:

MOTOR: 0.37 Kw.

CE Declaration of Conformity

We Robland bvba, Kolvestraat 44 8000 Brugge

Declare, under our only responsibility, that the product

EDGEBANDER MACHINE SERIES KM-500 km-550

Serial Nº:

Considered a machine according to the Machine Regulation 2006/42/CE.

And to which this declaration refers, fulfils the following regulations or regulatory documents.

EN 14121:2007;
EN 60204-1:1999;
EN 13849-1:2008;
EN 953: 1998;
EN 1088: 1996;
EN 13850:2007

The product described herein fulfils the following European Regulation:

2006/95/CE Low Tension Regulation
2004/108/CE CEM Regulation
98/37/CE Machine Regulation

Brugge — Yves Damman

(Place and Date) — (Name and Signature)

Esta declaración de conformidad cumple los requisitos de la norma europea EN 45014 „Criterios generales para declaraciones de conformidad de suministradores (ISO/IEC Guía 22 : 1996)"

1 INTRODUCTION:

1.1 Purpose of the operating manual:

This manual is aimed at the operator and especially the personnel responsible for using the machine correctly and thereby achieving good safety at work. It is, then, recommended that the manual be read through carefully, paying particular attention to the sections on warnings, precautions and methods of use, and that it is kept close to hand for future reference, preferably next to the machine itself. **"Translation of the Original Manual", the manufacturer has the "Original Manual" and distributed via E-mail: spares@robland.com**

1.2 Presentation:

KM-500 edge banding machine is automatic machine equipped with a bottom vertical gluing station, pressure rollers, front and back end trimming station and trimming station.

1.3 Reference standards:

KM-500 edge banding machine is designed and built in accordance with the following standards:

- Community Directives: 2006/95/CE, 2004/108/CE, 2006/42/CE
- Harmonized norms: EN 14121:2007, EN 60204-1:1999, EN 13849-1:2008, EN 953:1998, EN 1088:1996, EN 13850:2007

1.4 General warnings and recommendations:

Proper use of this machine involves perfect knowledge of these instructions for use and of all the risks arising out of improper use. The machine must therefore only be used by authorised personnel.

Safety when using this machine is only guaranteed for the functions and materials specified in these instructions for use. Robland accepts no responsibility in cases where the machine has been used for purposes other than those indicated in and complying with these instructions for use.

ROBLAND accepts no responsibility in matters related with machine safety, reliability and performance in cases where the warnings and suggestions in this manual have not been respected, in particular concerning the activities of erection and assembly, use, routine and special maintenance and repair.

The electrical installation for the machine must comply with CEI 64.8 (CENELEC HD 384-IEC 408) standards. The machine builder renounces all types of responsibility

in cases where the machine has not been correctly connected to the earthed (grounded) equipotential installation, such that the protective devices behind the machine itself are not operative. For this reason, explicit reference is made to the entire contents of the chapter relating to the characteristics of the electrical installation.

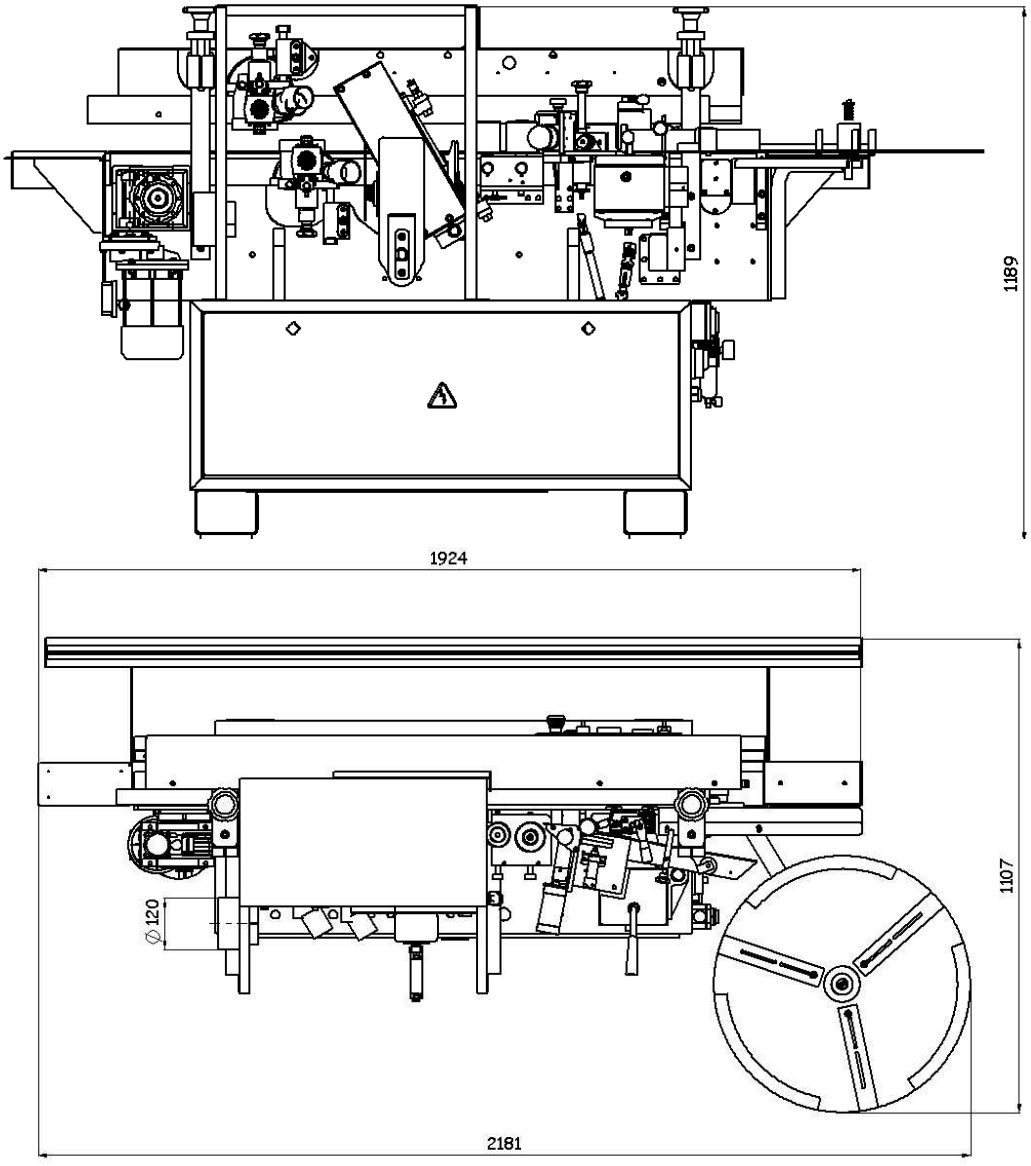
Original spare parts only must be used for special maintenance and repair work.

It is always advisable to contact our technical assistance service concerning repairs. The responsibility for perfect machine operation rests solely with the user, if the equipment has not been repaired or maintained by personnel authorised by ROBLAND.

1.5 Technical details:

- Dimensions of machine:

Dimensions of the edge banding machine it is shown in a following shape: (Measures mm)



more technical details:

- Dimension cable: Electric cable 5x4.
- Protection necessary for the installation of the machine:
  Automatic diferencial swich pole 63 Amp. Sensibility 300 mA.
- Pneumatic pressure of work / maxim: 6 Kg/cm^2 / 8 Kg/cm^2
- Diameter machine`s mouth aspiration 120 mm.
- Air consumption 400 m^3/h. Speed min. 20 m/sec
- Noise emitted by the machine. Empty 81 dB(A), Full Charge 83 dB (A).
- Weight machine: 490 Kg.

1.6 Identification plate:

Always specify type and serial number to the manufacturer for any information, request for spare parts, consultation etc…

2 MACHINE INSTALLATION:

2.1 General safety rules at the KM-500 edge banding machine installation:

- The person in charge of the machine must be instructed in how to use the machine correctly and informed of the relevant safety devices and tools and accessories.
- The devices fitted to the edgebander must be correctly set up and adjusted.
- The appropriate routine and special machine maintenance tasks must never be neglected.
- Before starting each job and before switching the machine on, check that the control and working stations are free from chippings of previously removed material.
- The machine operator must always wear suitable safety clothing bearing in mind the type of activity being carried out, protective gloves, safety footwear and spectacles or goggles for example. Remember never to wear clothing or objects that may get caught in the machine such as loose clothing, ties, watches, rings and so on.
- Before beginning any operation, check that there are no persons or other obstacles in the vicinity of the machine that may present a risk.
- Make sure the cable connecting the machine to the electrical supply is fully unwound and not coiled up.
- Do not situate inflammable substances near the machine to prevent the risk of an accidental spark causing fire or explosion.
- The machine operator must always consider the possible consequences before moving his hands towards the most dangerous zones.

- Never remove the yellow protections located on the gluing set, as they prevent the risk of burns to the operator.
- The operator must always be particularly careful when working the pedal that sets the machine into operation.
- Always keep the machine switched off when not in use.
- Do not enter, touch or handle zones where movements take place before switching the machine off.

2.2 Limits of use:

This machine has been designed to work with the following materials:

- Solid wood
- Laminated or unlaminated chipboard
- M.D.F.
- Various compound materials, provided they are wood-based

The machines have been designed and built to work in closed industrial environments. Sitting the machine in an unsuitable location must be considered as improper use. The machines are not intended for edge banding materials other than those described, and any such use must also be considered as improper.

To trim edges made of the following materials:

- Laminated plastics
- ABS
- PVC
- Melamine products
- Wood band in roll form
- Strip up to 2mm thick

The comand post of machine is easily accessible for workers, and is located outside danger zone for them. From that zone and to be in position to operate the controls, worker is the increased visibility of the machine, being away and protected from danger zone.

The staff required for the work of the machine KM-500 will be as maximum of two operators. One located at the entrance to introduce boards and other to collect boards mechanized. The space required for these, is found in paragraph 2.4.

The connection of the machine should be carried out only by authorized personnel.

Before any handling in the machine and safety and proper functioning of the machine, must be read with care this manual.

2.3 Personal Protective Kit

Work must wear an appropriated and authorized protection kit.

- Ear Protection: When machining pieces by shaving cutting.

- Eye Protection: For preparation tasks.

- Safety Footwear: Worker must wear safety shoes while working.

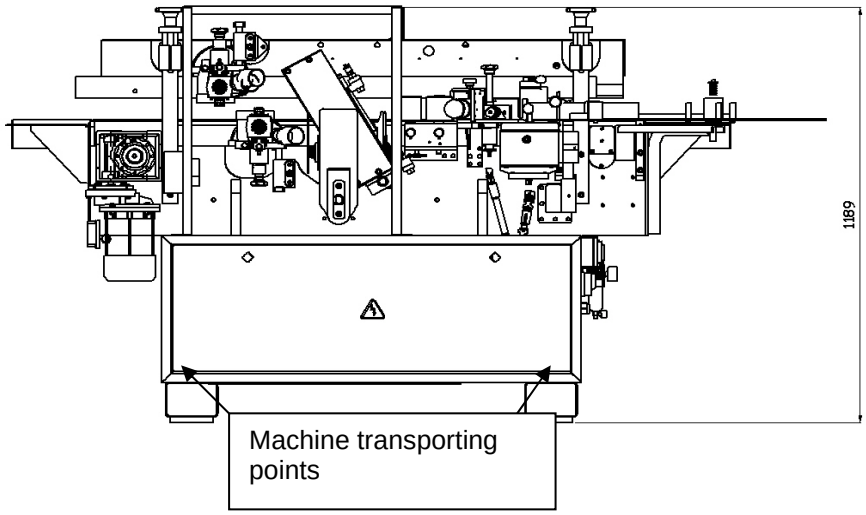
- Dust Protection mask: Worker must wear protection mask when processing materials without dust aspiration device.

- Hand Protection: Worker must wear gloves when handling hot pieces, glue or cutting tools.

2.4 Machine movement and sitting:

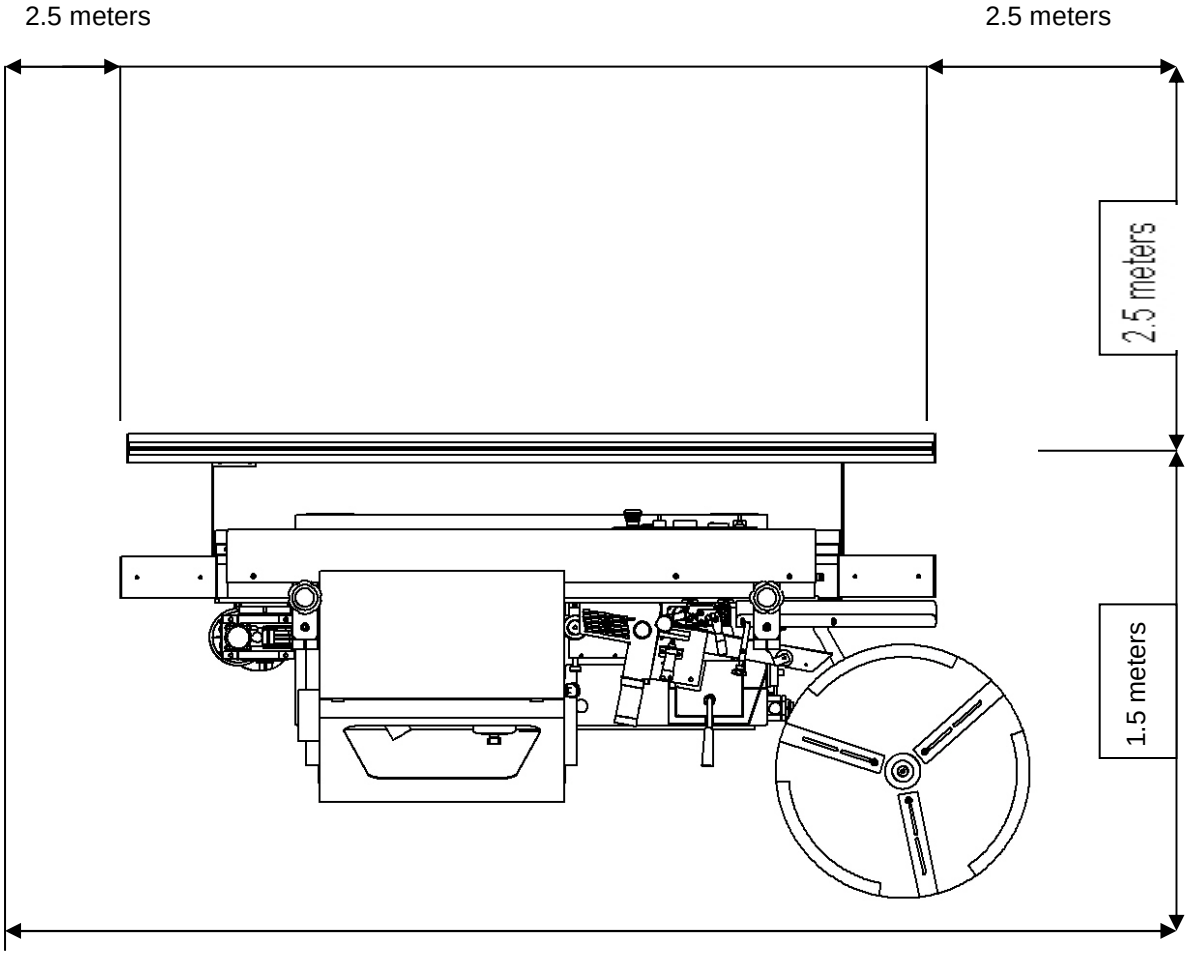
The machine must be lifted and transported taking into consideration that the support points must be as close as possible to the transporting bars. Take all possible precautions in machine lifting, handling and moving operations to avoid the risks of unforeseen movements which could endanger persons or property.

The machine must be sited on a flat surface able to withstand the weight of the machine. Site it in an optimum position with regard to operational requirements, where electrical connection is easy and with enough light to ensure that all parts of the machine are visible. If the machine is unstable once in position, the support bolts should be adjusted until the machine is stable and level.



2.5 Dimensions and safety zones:

The utmost care must be taken to avoid allowing objects that obstruct correct working from occupying the safety zones as detailed in the figure below.



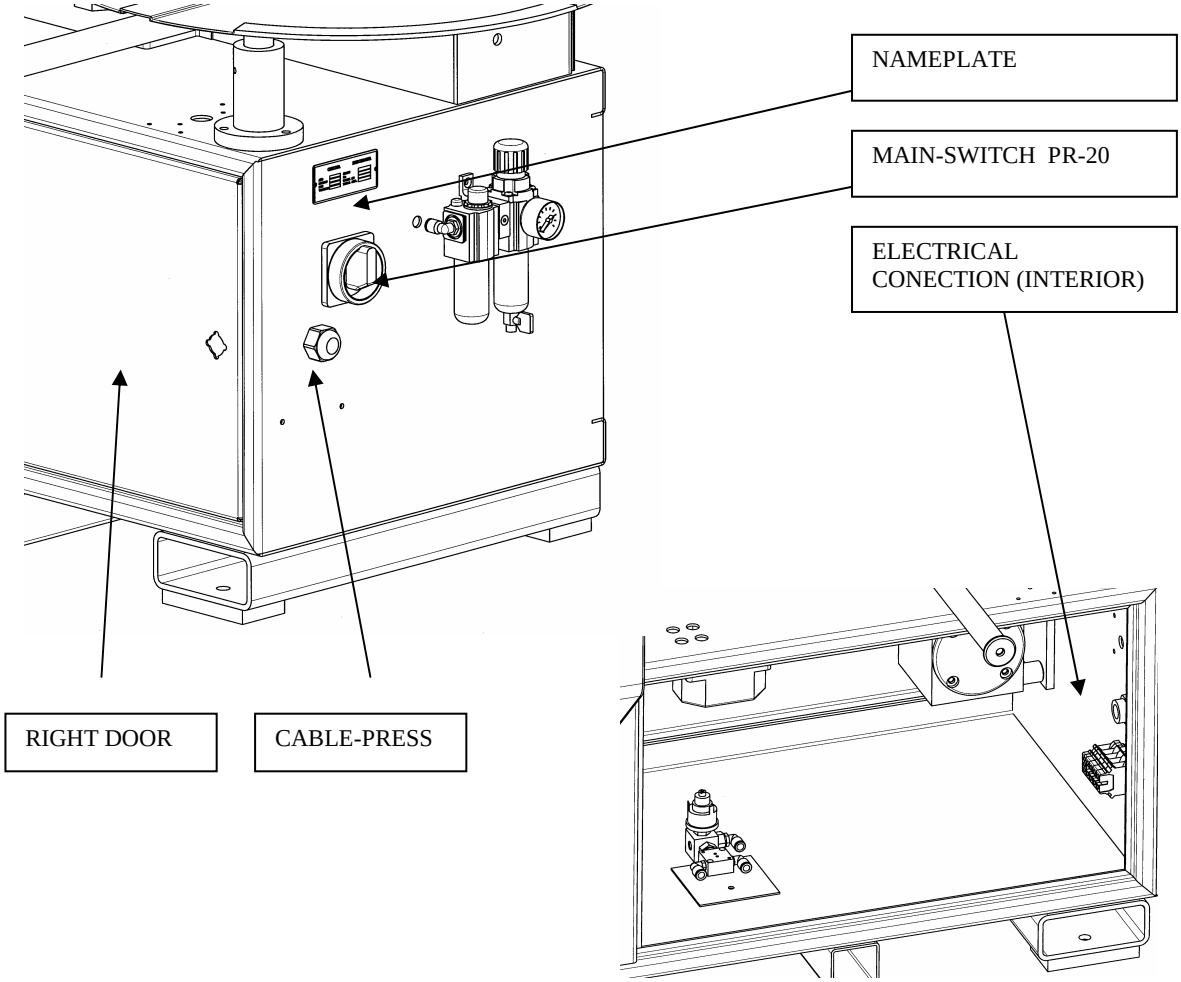
2.6 Electrical installation:

The electrical connection to the bottom right of the machine interior must be opened to make ready the electrical installation. It is recommended that the machine is not connected up the electricity supply until it is in its final position, and a check has confirmed that the line voltage is the same as that shown on the machine nameplate at the top of the main supply connection box. A check must also be made to confirm that the main electrical supply to be connected to the machine complies with the following safety requirements:

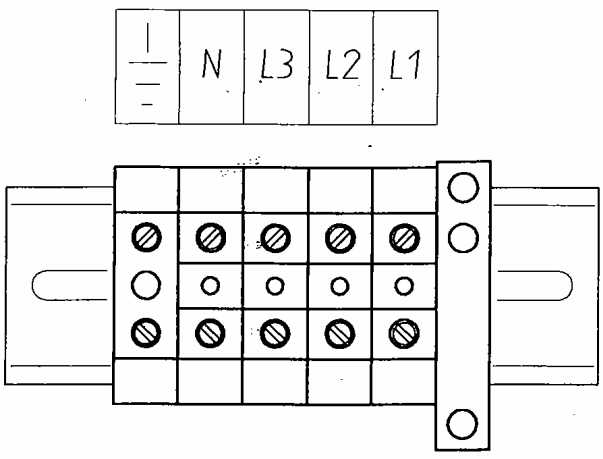
The installation must conform to IEC 408 standards.

Presence of earthed equipotential supply.

Presence of fuses or circuit-breakers to guard against short circuits on each conducting cable, except the earth and neutral cables.



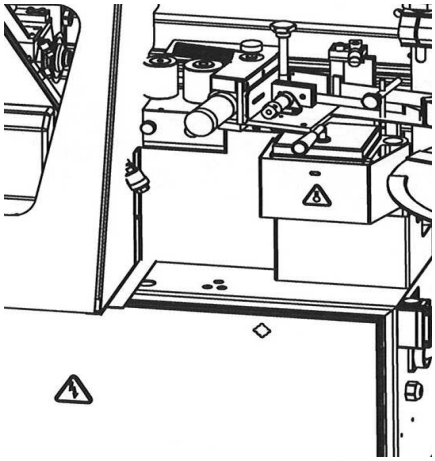
To make the connection, insert the cables from the main supply in the four terminals L1-L2-L3-N, securing them with the cable-press and fixing the earth cable using the appropriate nut. Connection is via terminals, and the cable cross-section must be at least 2.5mm. If the chain turns in the wrong direction, change two phases in the terminal connection .



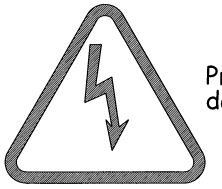
2.7 Pneumatic installation:

Connection to the line is made with a rubber or nylon tube of 6mm minimum inside diameter, 10/12mm being ideal. Connect the air service (FRL) unit using a minimum ¼" female fitting (supplied with the machine). Pressure must be at least 6 atmospheres, with a maximum of 7 atmospheres.

The air service unit consists of a Filter, to clean the air of dust and humidity capable of damaging the valves and seals on the pneumatic cylinders; a pressure Regulator to adjust the machine's working pressure to its optimum value.



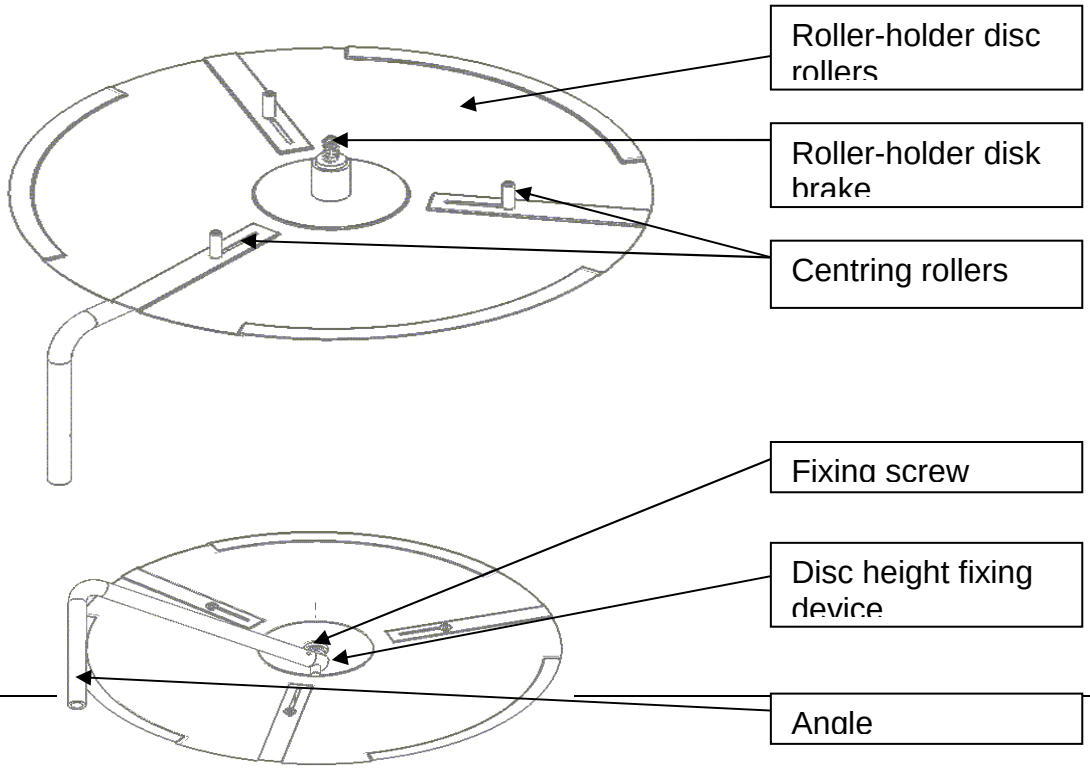
Precaution.
High temperature



Precaution, electrical
danger of shock

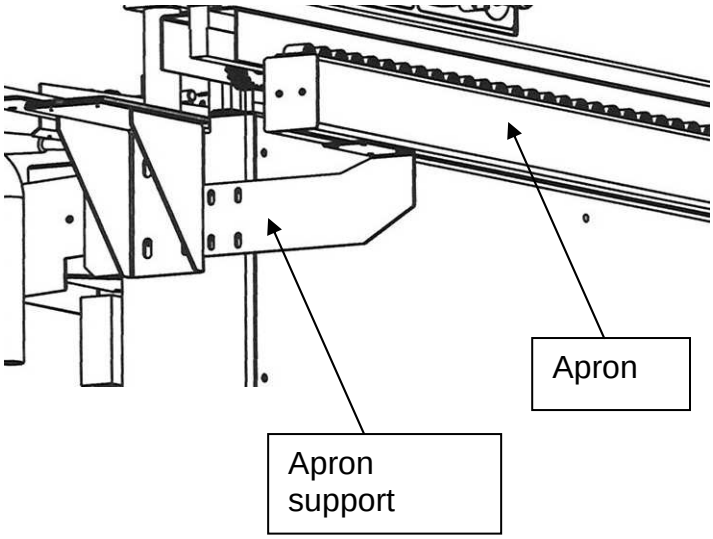
2.8 Fitting the roll-holder tray:

This accessory is supplied dismantled for transport purposes. Assembly consists simply of fitting the crosspiece to the angle, then inserting the roll-holder disc, securing it with the lever as shown in the figure.



2.9 Fitting the apron:

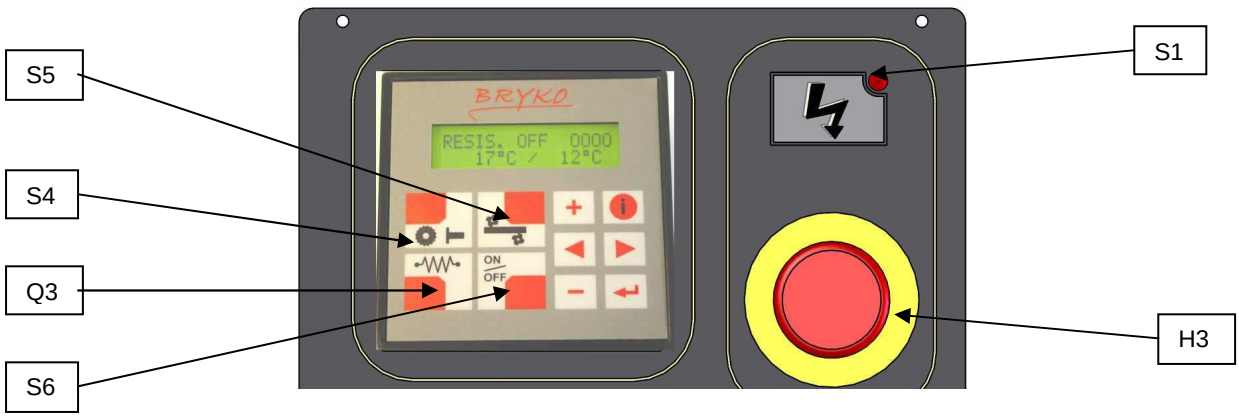
Fit the supports and finally fix the apron. Correct apron level is 1mm below the tops of the chain rollers, its function being to help to introduce the board. If at a level higher than the chain, it would put a slope on the board and spoil the finish on the final piece.



3 SETTING UP AND STARTING THE MACHINE:

3.1 Control devices on the button panel:

Emergency button (S1)
Main voltage pilot (H3)
Resistances On selector (Q3)
Glue thermostat (S4)
Reset button(once) High frequency motors stop-start button (S5)
End trimming station / trimming station selector (S6)



3.2 Start-up and stop the machine

To start the machine, turn the main switch to ON. The general voltage pilot lamp must be illuminated.

BEFORE CARRYING OUT ANY TASK AT OR AROUND THE MACHINE, MAKE SURE IT IS COMPLETELY STOPPED, THAT IT CANNOT POSSIBLY MAKE ANY MOVEMENT AND THAT THE MICROSWITCHES CANNOT BECOME ACTIVE: DO THIS BY PRESSING ANY OF THE EMERGENCY STOPS.

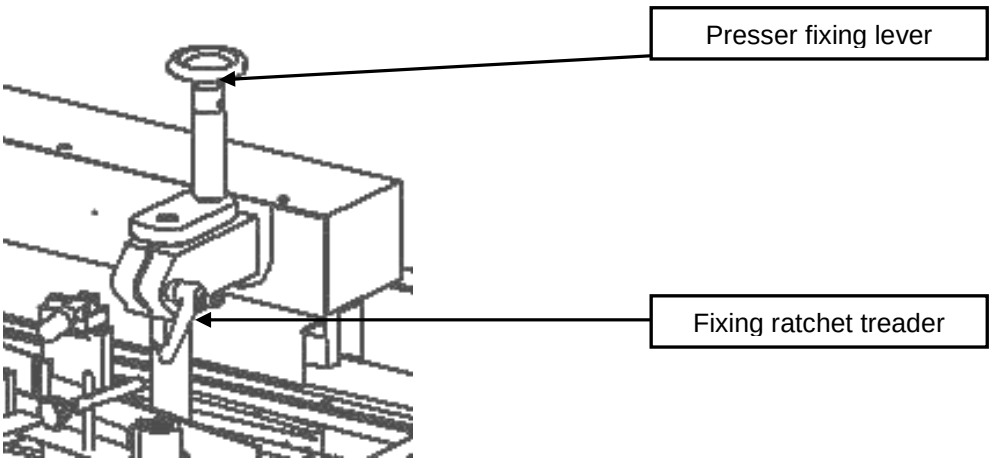
- Make sure there is enough glue in the container for the job to be done.
- Operate the resistances On selector. (Q3)
- Select the desired working stations.
- Insert the strip as far as the first pressure roller.
- Adjust the height of the presser to suit the panel to be passed through.
- When the heating pot temperature reaches the set point figure, reset the machine by deactivating the emergency stop, then pressing the green reset button. The motors may now be switched on by pressing the motor On and chain activated buttons.
- The machine is totally stopped by opening the cabin, operating any of the emergency stops or turning the main switch to OFF.

3.3 Adjusting presser height:

The height of the presser needs resetting every time the thickness of the board to be edged changes. This simply involves loosening the levers on the presser fixing pads, and using the lever to raise or lower the presser to the required value as indicated on the numerical counter.

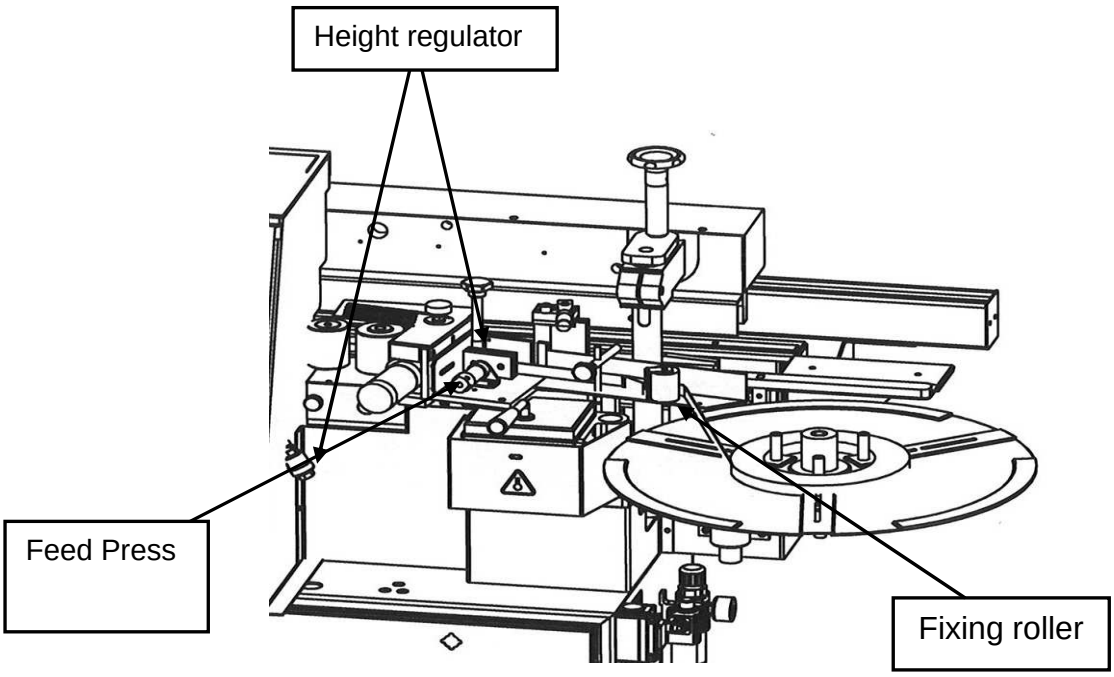
Beam Pressure regulation:

Standard regulation system



3.4 Loading and regulating the band in roll form:

To introduce the roll in the tray carries roll in having felt schedule, to go the first song by the fixation roller, until it surpasses the centre of pressure roller. To adjust the regulators of height of the song, leaving a small separation so that this it can move easily. Set the pressure on the feed press using the pressure regulator located on the door under the heating pot to a pressure of approximately 2,5 bar. To observe that so much the faucet of the piston of ribbon feeding as that of the cutter is open. Finally to adjust the pressure of the rollers of pressure by means of their regulators to the wanted value, for further detail to look at "rollers base. To adjust the pressure of the cutter according to the thick of the material 2-5 bar.



3.5 Regulating surplus strip:

AT THE FRONT: The amount of surplus may be adjusted via the feed time regulator timer in the PLC:

- More time: more surplus at the front.
- Less time: less surplus at the front.

AT THE BACK: This involves regulating micro S-13.

- Moving the micro to the left increases the surplus at the back.
- Moving the micro to the right decreases the surplus at the back.

4 WORKING STATIONS:

4.1 Glue pot station:

This consists of a roller to glue the band. It must trace 2mm on the board and with no type of extra regulation must dispense the exact amount of glue on the different sizes of board, in terms of both width and height.

Hot-mel adhesive for industrial applications, work temperature 100-200 ºC.

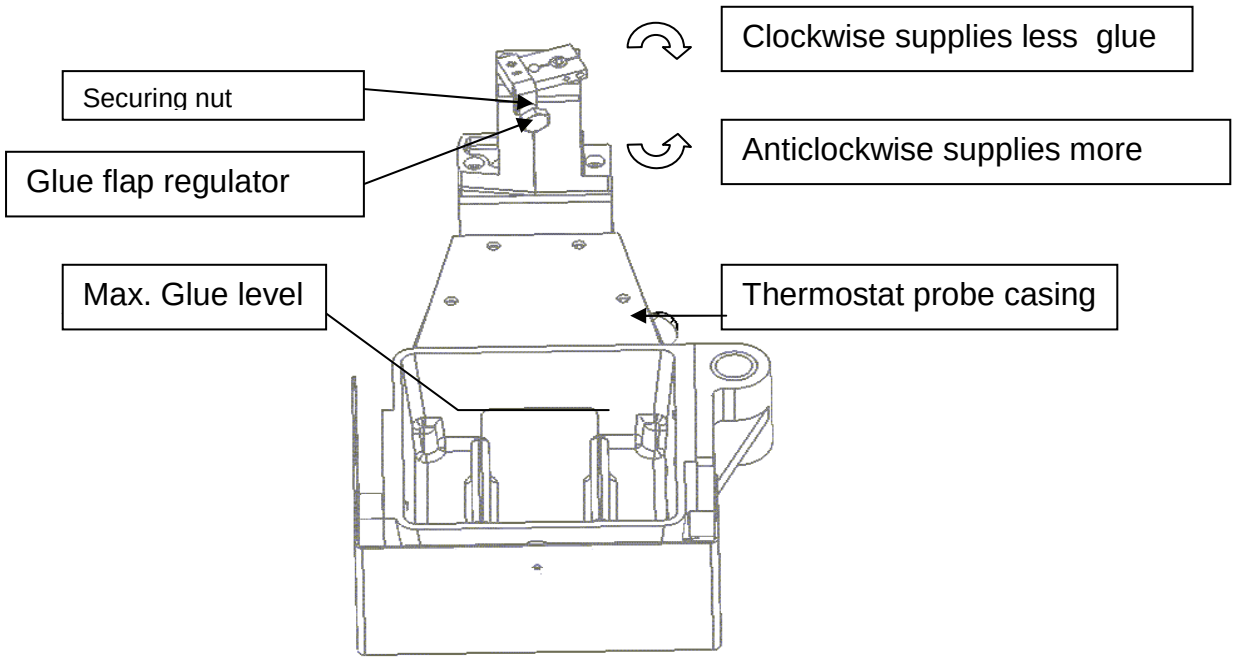
4.1.1 Dispensing glue:

The thickness of glue on the dispensing roller is regulated by the regulator finger on the glue flap.

- TURNING CLOCKWISE REDUCES THE AMOUNT OF GLUE.
- TURNING ANTI-CLOCKWISE INCREASES THE AMOUNT OF GLUE.

4.1.2 Glue level in the tank:

For correct operation, the level must not cover the access door to the inner tank, because if this happens the gases produced will only be able to escape through the glue nozzle, and this may cause irregularities in the amount of glue supplied to the edge. On the other hand, with a very low level the glue would burn, losing its properties and even forming a layer of encrusted glue that would insulate the glue from the heating resistances in good conditions, leading to an increase in heating time.

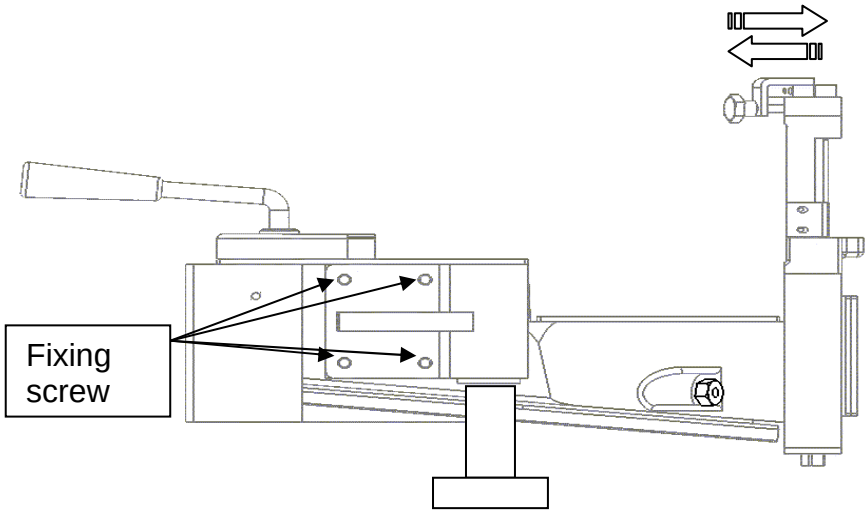


4.1.3 Setting up for correct gluing:

If the glue is not evenly dispensed after adjusting and checking the points above, for example if there are parts on the top without glue, the first thing to check is that the panel is being cut square. Then check that the scoring disc has not made too great an

incision in the board. If neither of these is the problem, turn the glue pot fixing screws and slope the station forwards if there is not enough glue on the top, and backwards if there is not enough on the bottom. In other words, attempt to get the glue roller and board parallel to each other.

The best way of doing this is first to take the distance between glue nozzle and the wall of the presser, then to slightly loosen the glue pot fixing screws and slope the station as necessary. Then retighten these four screws and measure the distance between nozzle and presser again to check the inclination that the station has been given.



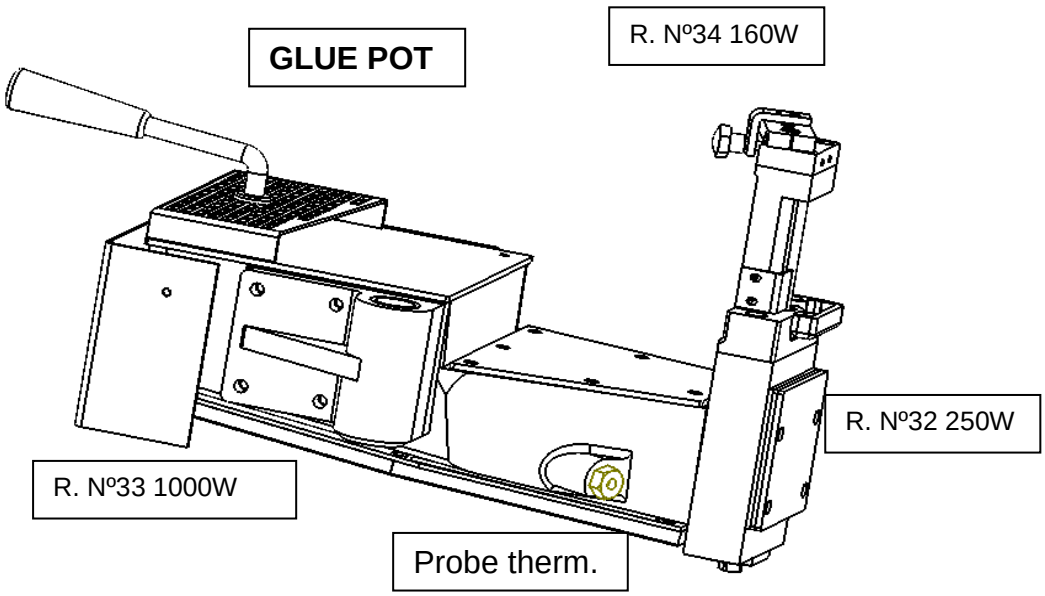
4.1.4 Replacing heating resistances:

Once the tray has been withdrawn, to remove the pot first unplug and take out the thermostat probe, then simply lift until it comes out from the pot swing pin.

GLUE POT M5: From outside it is easier to access the fixing cover for the bottom and front heating resistances (Nº19,22). Having extracted these and the cable through plate (nº42), there is full access to the resistances, which are protected by an asbestos sheet (Nº20,23).

RESISTANCE Nº	RESISTANCE VALUE
32	250 W
33	1000 W
34	160 W

The removal of any element of security installed in the machine absolve the manufacturer of liability for any damage.



4.1.5 Security:

When the edge banding machine alight, the glue pot station it is a high temperature, therefore misuse may cause severe burns. These burns could occur by direct contact with glue pot station or spill hot-melt glue. It may be recalled that the Hot-melt glue in a position to work is at a temperature of 200 °C approximately. Therefore it is necessary extra precautions when handling the glue pot station.

Only allow the use of the machine to authorized personnel. Glue pot station contains various safeguards to prevent inadvertent contact. These protections are in the machine properly marked in yellow.

4.2 Roller base:

This group has two rollers: one plane roller of larger diameter, and one plane roller smaller diameter.

Tracing on the panel with the edge already stuck must not be greater than 1.5mm.

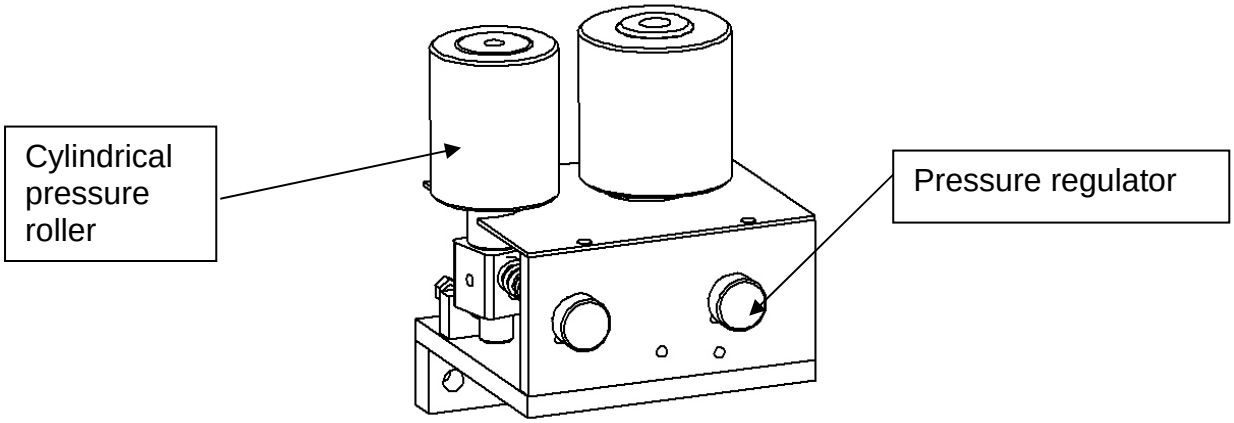
There are two regulators to adjust pressure, one for each roller. Turning clockwise reduces pressure, while turning anti-clockwise increases it. When you change the thickness of the edge gluing. You should act upon pressure regulation.

As mentioned above, for correct edge banding tracing must not be excessive, as excess tracing not only causes the board to move, but also produces a small arc at both the entry and exit of the edged panel. Another small maladjustment that can cause the

same problem is too much surplus edging band at the beginning and end of the panel; this should be the minimum possible (for adjustment, see “loading and regulating band in roll form”).

When the thickness of the glued edging band is changed, simply slacken the fixing lever and enter the new measurement in the numerical regulator. Turning clockwise moves the station back, while turning anticlockwise moves it forward.

To avoid the risk of damage, no type of rigid article (blades, chisels, etc.) should be used to clean the rollers. Any dirt that builds up should be removed with a cloth soaked in solvent or other cleaning product.



4.2.1 Security:

For proper handling and cleaning of roller base it is essential disconnection the drag chain, through the selector box controls. Otherwise can cause damage by trapping on the fingers. Roller base are protected to prevent damage by inadvertent contact.

The removal of any element of security installed in the machine absolve the manufacturer of liability for any damage.

4.3 V-2 end trimming station:

This is driven by a high frequency motor (200Hz, 12000 r.p.m.) rated at 0’20 Kw, and its task is to trim off the surplus edging band at both front and back.

4.3.1 Pneumatic regulation:

There are two pressure regulators for pneumatic regulation. These are MR1, supplied with a pressure of approximately 1.1 bar which enters at the top of the piston to press the station downwards, and MR2 set to approximately 2.5 bar, with the air working from the bottom upwards.

Operation is as follows:

- When the board activates micro S-14, pressure at approximately 2.5 bar from MR2 enters from the bottom pushing upwards. This is equivalent to the pressure through MR1 of about 1.1 bar from the top pushing downwards, plus the weight of

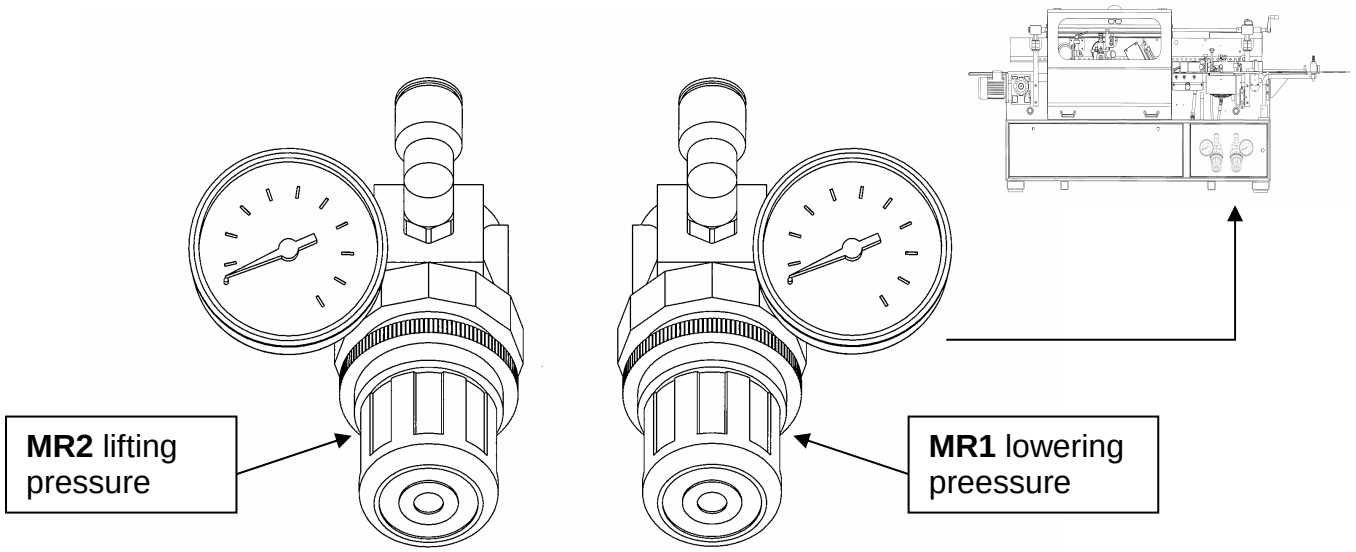
the motor; the result is that the station moves up slightly, waiting for the board to contact the tracer.

- The pressure exerted by the board on the tracer is minimal, it has to be just enough to ensure that the tracer and board remain in contact.
- The station moves up and the cut is made until the detector in the piston (S-30) is activated to indicate that the cut has been completed. At this point, the pressure of 1.1 bar (MR1) acting from the top down disappears, so that the motor rises much more quickly and separates the tracer from the board. This means that it is no longer the panel pushing and lifting the motor, thereby avoiding the risk of the end of the tracer damaging the edge of the board.
- The station retracts and moves down, waiting for micro S-15 to lose the signal (falls at the end of the board) so it can advance and start lifting pressure to trace and trim the back of the board.
- The station moves back to its original position.

It may be deduced from understanding the method of operation that the pressures are relative, that is to say there must be a difference in pressure of approximately 1.3 bar between the pressure MR1 entering at the top and pushing down, and pressure MR2 entering at the bottom and pushing up. If this pressure difference is HIGHER, it is the board that has to exert more pressure on the tracer so the latter makes its upward movement, with the risk of it marking the edge or even moving the board. If this difference is LOWER, on the other hand, when the board activates the micro S-14, the station will move upwards quickly without the board applying pressure on the tracer, and end trimming is not carried out properly.

IF THE DIFFERENCE IN PRESSURE BETWEEN MR1 AND MR2 IS GREATER THAN 1.3 bar, IT IS THE BOARD THAT HAS TO OVERCOME IT.

IF THE DIFFERENCE IN PRESSURE BETWEEN MR1 AND MR2 IS LESS THAN 1.3 bar, THE STATION LIFTS WITHOUT TRACING.



4.3.2 Security

End trimming station has two blades court under a misuse of the group could cause serious damage.

Therefore, for proper handling end trimming station it is essential disconnection of the same. The group incorporates within its programme of work some security systems, which assure us that in the case of having any improper working conditions annulling. **The removal of any element of security installed in the machine absolve the manufacturer of liability for any damage.**

4.3.3 Safety systems:

Within its work program, the station incorporates some safety systems which guarantee that in the event of an inappropriate working condition, the machine stops its task or even stops altogether to avoid damage.

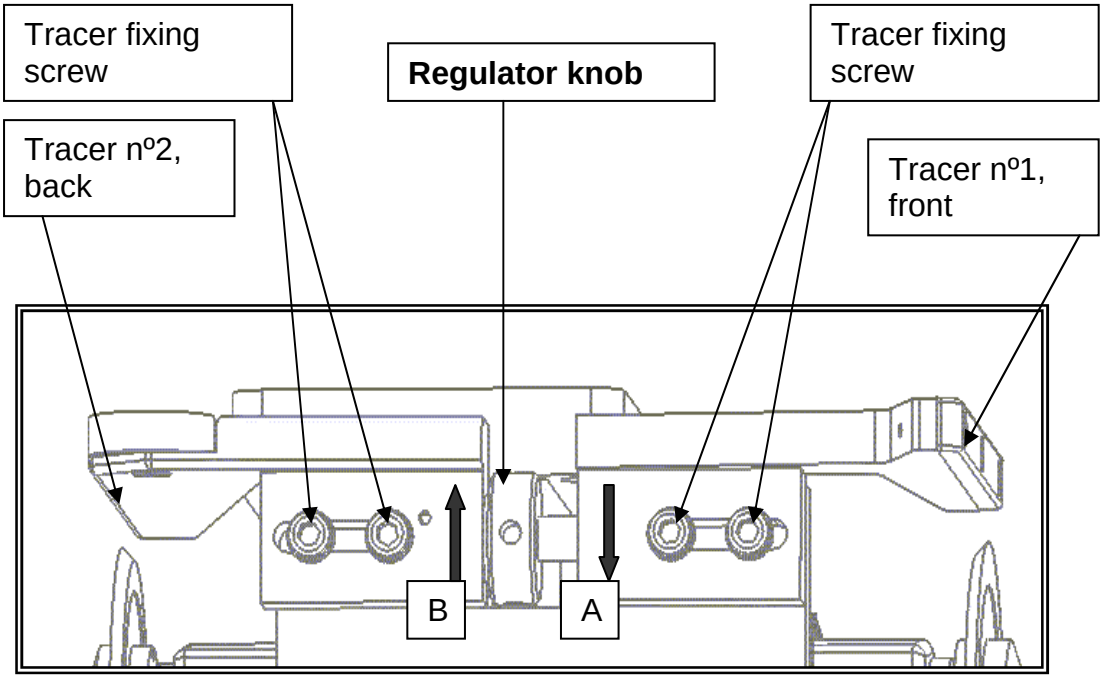
4.3.4 Working limits:

The minimum distance between boards must be respected. This is shown on the sticker on the side of the machine: when the back of the board reaches this sticker, the next board can be introduced.

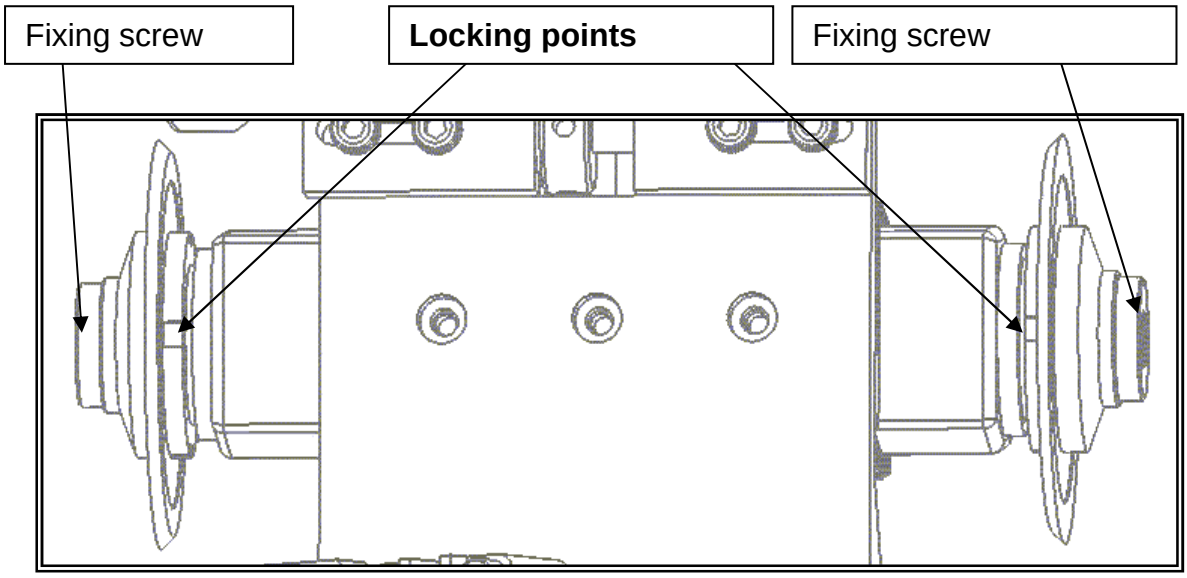
4.3.5 Mechanical regulation:

After pneumatic regulation, to make the cut attention must be given to the tracers, since the motor is fixed. If front trimming has to be adjusted, it is tracer nº 1 that has to be moved; first slacken the tracer fixing screws, then turn the regulating knob in direction “A” for the tracer to move in, so that the disc will cut more, or alternatively in direction “B” to move the tracer out and cut less. If adjusting the back cut, the fixing screws on tracer nº 2 must be slackened in order to turn the regulating knob “B” for the tracer to move in and cut more, or in direction “A” for the tracer to move in and cut less.

The fixing screws must always be firmly tightened after adjusting either of the two tracers. Also, never loosen the four fixing screws at the same time; first



adjust one tracer, then the other one.



4.3.6 Replacing the end trimmer discs:

First make completely sure that the machine is totally at rest and turned off at the main switch. Then lock the motor with the key supplied, and remove the fixing screw to free the bush and disc. After changing discs, always check that the fixing screws are firmly tightened.

4.4 Trimming station:

This is driven by two high frequency motors (200Hz, 12000 r.p.m.), each rated at 0'27 kW.

The station is used to trim the excess strip at both top and bottom exactly, and to provide a radiused or flat finish by a simple, easy adjustment.

4.4.1 Adjustment with flat cutters:

One must keep in mind that for the design of the group the motor will always remain in horizontal position, that is to say, 0º.

For the adjustment you must verify that the group makes so much the one copied vertical as horizontal when passing a panel. To adjust the one trim in the superior group you should act on the vertical regulator of the tracer one, the one which if one makes rotate in having felt clockwise it makes go up the tracer one with what the cutters trims more and if one makes rotate in having felt anti-clockwise the tracer one vertical low with what trims less. For the one recast inferior it should be kept in mind that when making rotate the vertical knob regulator of the tracer one in having felt clockwise the copying one vertical it ascends with what trims less and when making rotate in having felt anti-clockwise the tracer one vertical low with what trims more. next by means of the horizontal knob regulator of the tracer one to make it rotate in having felt schedule so that the tracer one is delayed, being the discovered cutters, with what trims more, or in the case that is wanted that it trims less to rotate this same knob in having felt anti-clockwise so that the tracer horizontal advance.

Due to the position of the motor the regulation of the one trim of radios it was carried out by means of the vertical adjustment of the tracer one and the knob regulator of the motor until getting the wanted radius.

4.4.2 Replacing cutters:

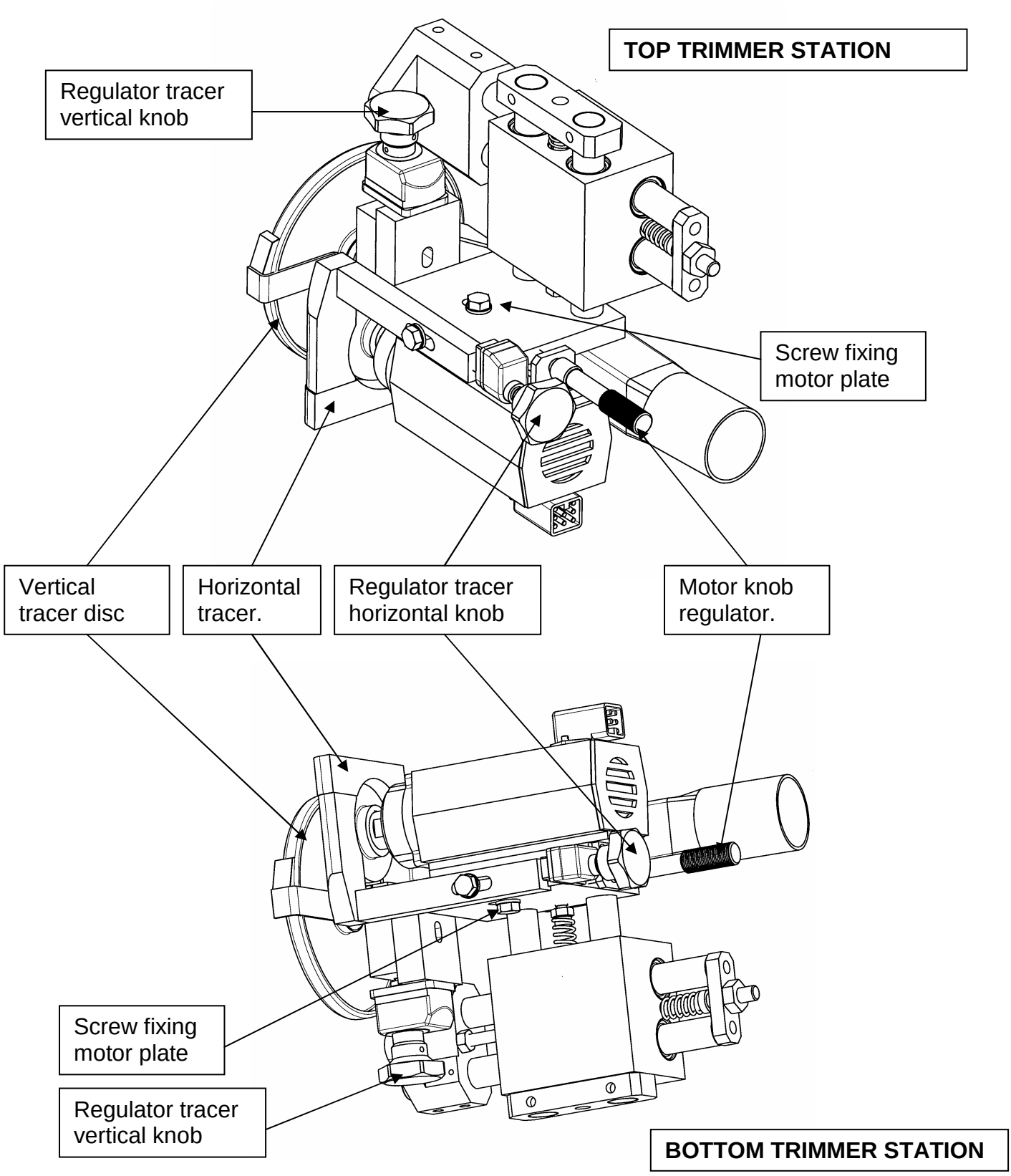
To replacing cutters, first disconnect completely the machine with the general switch, to remove the electrical connectors and come in the following way:

Hold the motor firmly with a hand and with the other one it loosens the Screw fixing motor plate completely.

Without loosing the motor it loosens the knob motor regulator completely and move away it following the plate guided to avoid the contact of the cutters with the tracer.

Once it left they can extract the cutters easily with the given tools.

Remember that when mounting the motor again after the cutters change it should make coincide the plate correctly of having guided to avoid a possible break of the cutters in the event of making contact with the tracer.



4.4.3 Security

Trimming station has two blades court under a misuse of the group could cause serious damage.

Therefore, for proper handling trimming station it is essential disconnection of the same. The group incorporates within its programme of work some security systems, which assure us that in the case of having any improper working conditions annulling. **The removal of any element of security installed in the machine absolve the manufacturer of liability for any damage.**

5 MAINTENANCE:

- **THE MACHINE MUST BE FULLY DISCONNECTED BOTH ELECTRICALLY AND PNEUMATICALLY BEFORE UNDERTAKING EITHER ROUTINE OR SPECIAL MAINTENANCE WORK.**

- **THIS PROCESS SHOULD BE CARRY OUT BY WELL EDUCATED WORKER.**

5.1 Routine maintenance:

The maintenance below is carried out daily before running the machine, and consists of:

- Before starting the machine, check that there is nothing obstructing movement of the station and motors that could lead to damage or personal injury.
- Check that pressures are correct.
- Make sure that all micros (the rods) are correctly positioned (vertically, waiting to contact the work piece), that they are firmly tightened and that they move as they should.

These maintenance points are carried out at the close of each working day:

- Clean the work zone.
- Make sure that the main supply cable shows no signs of cuts or burning.
- Check the condition of cutters and tracers.
- Check the oil level in the air service unit lubricator reservoir.

5.2 Special maintenance:

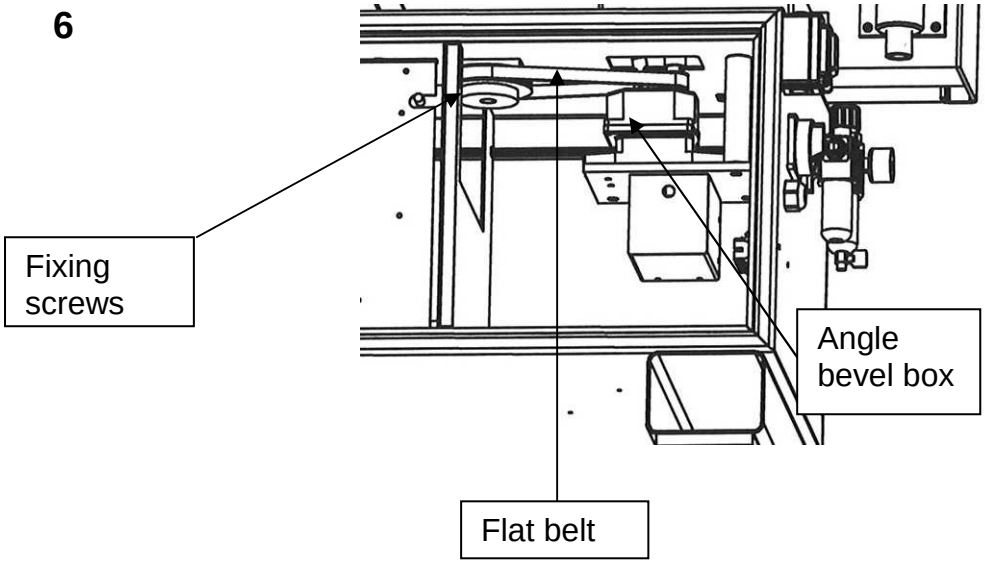
This maintenance is carried out weekly:

- Carry out all routine maintenance operations.
- Check the safety of the electrical installation.
- Check locking of mechanical components.
- Examine cable insulation, operation of devices and continuity of protective conductor.
- Check the cutters for wear.
- Clean the chain wheels and rubbers with a cloth dampened with neutral solvent (that damages neither silicon nor rubber). Do this after lifting the presser, having completely stopped the machine.

- Use a little machine oil (SAE-10) and a cloth to clean the tracer bearings, then dry off and apply a thin film of grease.
- Trimming station: apply oil to guide bars and support guide bars with a brush.
-
- Transport Chain: Take off protection of the chain and apply oil with brush on the chain pieces on contact with chain guide.
- Check the condition and tension of the transmission pulleys inside the cabinet under the tray and glue pot.
- Transmission set: This refers to all the equipment under the glue pot whose function is the synchronised transmission of chain movement to the glue roller, band feed system and first press roller. You need check the belt status. For tight belt you must loose the screws and move gearbox.
- Glue Pot: Old and burned scraps of glue must be eliminate. Process: “Clean Glue pot” Only for qualified personal.

Belt condition and tension needs periodic checking. The flat belt is tensioned by simply loosening the fixing screws and moving the angle bevel box to achieve the required tensioning.

6



TROUBLESHOOTING:

6.1 Machine does not start:

- Check the machine air inlet pressure (it must be between 6 and 7 bar). If it is lower than 4 bar for even a moment, the machine will stop or fail to start.
- Check that the emergency stops are not activated (the two at the presser ends). If so, turn them smoothly to deactivate them.
- The cabin must be completely closed for the cabin micro to allow machine start-up.
- Having checked these external points, access the electrical panel and first verify that the pilot on PLC 01 INPUT is illuminated. If not, it means the machine is not starting because one or more of the safety systems is activated. After checking these, the only remaining check is on the thermal cutout relays. To do this, press the reset buttons; any making a different noise indicates that this particular relay was activated. Make a note of the number (e.g. F-14), and check on the power diagram to see which motor it is protecting. Then examine the motor involved, as a thermal cutout trips because of overworking, unsuitable working or very poor tool condition (the relay is set to the rated consumption of the motor it is protecting, and trips if this consumption is exceeded to avoid damaging the motor).
- Check the fuses and input voltage.

6.2 Irregular band feed:

- First check that machine air inlet pressure is correct (between 6 and 7 bar).
- Carry out a feed and check that the pressure supplied to the pressure piston is approximately 0.9 bar as measured on pressure gauge MR-3 (bear in mind that this usually reads zero, and only gives a pressure reading when actually being supplied, for a time of about 1.5 seconds). If air pressure is too high, the edge is compressed so much that it cannot move forward properly, while insufficient air pressure means the weight of the strip can`t be pulled through.
- Check the condition of the angle bevel box transmission pulley, as it will very probably need tensioning (follow the instructions given in the special maintenance section).
- Feed rollers in poor condition or not correctly positioned (check they are properly fitted in their securing slots).
- Make sure the roll of edging isn`t obstructed in any way that prevents it moving normally (e.g. small strips of adhesive tape stuck to the bottom of the roll and difficult to see at first sight).

6.3 The end trimming station moves the piece when the board is passed through it:

- First read the “V-2 End trimming station” section carefully and check that all pneumatic pressures are correct.

- Disconnect air pressure from the machine and verify manually that the station makes all its movements smoothly.
- Clean the carriage guide bars and tracers with a cloth dampened with machine grade oil, then dry off to avoid dirt sticking to them.
- As described in the special maintenance section, the wheels and chain need cleaning to prevent any loss of adhesion.

6.4 Router trimming diminishes:

- If both chain and wheels are dirty and covered with a layer of dust, they lose their adherence, and bearing in mind that all the stations exert pressure on the board, in the end it is expelled and the tracing station is lost.
- If dirt on the chain and wheels or poor trimming station adjustment means that when the board arrives it is moved, then the start of routing will be traced (trimmed correctly) but as the board passes through it will lose the tracer due to following a non-parallel line. In the end the cutter will be so far separated that proper trimming will be impossible.

6.5 The board moves:

- As the above points have shown, keeping the chain and wheels clean is very important for the piece to keep to the same line. On occasions, when it moves the presser tends to drop. It is certainly possible to tighten a millimetre more with respect to the panel measurement, especially with small pieces, but more than one millimetre would mean overloading the drive motor, possibly to the extent that the thermal cutout trips due to motor overheating. The presser wheels and rubbers would also experience excessive wear, when the solution is simply to clean them.
- It is very important to keep the presser fixing levers tightened to avoid the presser lifting as the board passes through, leading to a loss in pressure making the board very liable to move.
- Check pressure roller tracing. See the “Pressure rollers” secion for further details.

6.6 Uneven gluing:

- Read the “Glue pot station” section carefully.
- Check the condition of the glue.
- Check tracing and glue pot pressure. If more tracing is needed, make sure that none of the stations is moving the board before touching the tracer stop screw (see “The board moves” section for further details).
- Process: “Clean Glue pot” Only for qualified personal.

7 INVERTER

TYPE: OMRON J1000 1’1 Kw

◆ LED Operator and Keys

The LED operator is used to program the drive, to start/ stop it, and to display fault information. The LEDs indicate the drive status.

■ Keys and Functions

Display	Name	Function
F50.00	Data Display Area	Displays the frequency reference, parameter number, etc.
ESC	ESC Key	Returns to the previous menu.
RESET	RESET Key	Moves the cursor to the right. Resets a fault.
RUN	RUN Key	Starts the drive in the LOCAL mode. The Run LED • is on, when the drive is operating the motor. • flashes during deceleration to stop or when the frequency reference is 0. • flashes quickly the drive is disabled by a DI, the drive was stopped using a fast stop DI or a run command was active during power up.
∧	Up Arrow Key	Scrolls up to select parameter numbers, setting values, etc.
∨	Down Arrow Key	Scrolls down to select parameter numbers, setting values, etc.
STOP	STOP Key	Stops the drive.
ENTER	ENTER Key	Selects modes, parameters and is used to store settings.
LO RE	LO/RE Selection Key	Switches drive control between the operator (LOCAL) and the control circuit terminals (REMOTE). The LED is on when the drive is in the LOCAL mode (operation from keypad).
ALM	ALM LED Light	Flashing: The drive is in an alarm state. On: The drive is in a fault state and the output is stopped.
REV	REV LED Light	On: The motor rotation direction is reverse. Off: The motor rotation direction is forward.
DRV	DRV LED Light	On: The drive is ready to operate the motor. Off: The drive is in the Verify, Setup, Parameter Setting mode.
FOUT	FOUT LED Light	On: The output frequency is displayed on the data screen. Off: Anything else than the output frequency is displayed on the data screen.

PARAMETERS INVERTER

	Index	Description	Value
	B1-01	Frequency Refer	0: Digital Operator
	C1-01	Acceleration Tim	3,0
	C1-02	Deceleration Tim	4,0
	D1-01	Frequency Refer	200,00
	E1-04	Max Output Freq	200,0
	E1-06	Base Frequency	200,0
	E1-07	Mid Output Freq	100,0
	E1-08	Mid Output Freq	125,0
	H2-01	Terminal MA, MB	10E: Rev. output of
	O4-01	Accumulated Op	17

FAILURE DETECTION (ALARMS)

LED Display	ALM	FLT	Cause
Heatsink Overheat oH or oH1	○	○	• Surrounding temperature is too high. • The cooling fan has stopped. • The heatsink is dirty. • The airflow to the heatsink is restricted.
Motor Overload oL1		○	• The motor load is too heavy. • The motor is operated at low speed with heavy load. • Cycle times of accel./ decel. are too short. • Incorrect motor rated current has been set.
Drive Overload oL2		○	• The load is too heavy. • The drive capacity is too small. • Too much torque at low speed.
DC Overvoltage ou	○	○	DC bus voltage rose too high. • The deceleration time is too short. • Stall prevention is disabled. • Braking chopper/ resistor broken • Too high input voltage.
Input Phase Loss LF		○	• Input voltage drop or phase imbalance. • One of the input phase is lost. • Loose wires at the drive input.
DC Undervoltage Uu or Uu1	○	○	The voltage in the DC bus fell below the undervoltage detection level. • The power supply failed or one input phase has been lost. • The power supply is too weak.
DC Charge Circuit Fault Uu3		○	The charge circuit for the DC bus is broken.

◆ General Fault and Alarms

Faults and alarms indicate problems in the drive or in the machine.

An alarm is indicated by a code on the data display and the flashing ALM LED. The drive output is not necessarily switched off.

A fault is indicated by a code on the data display and the ALM LED is on. The drive output is always switched off immediately and the motor coast to stop.

To remove an alarm or reset a fault, trace the cause, remove it and reset the drive by pushing the Reset key on the operator or cycling the power supply.

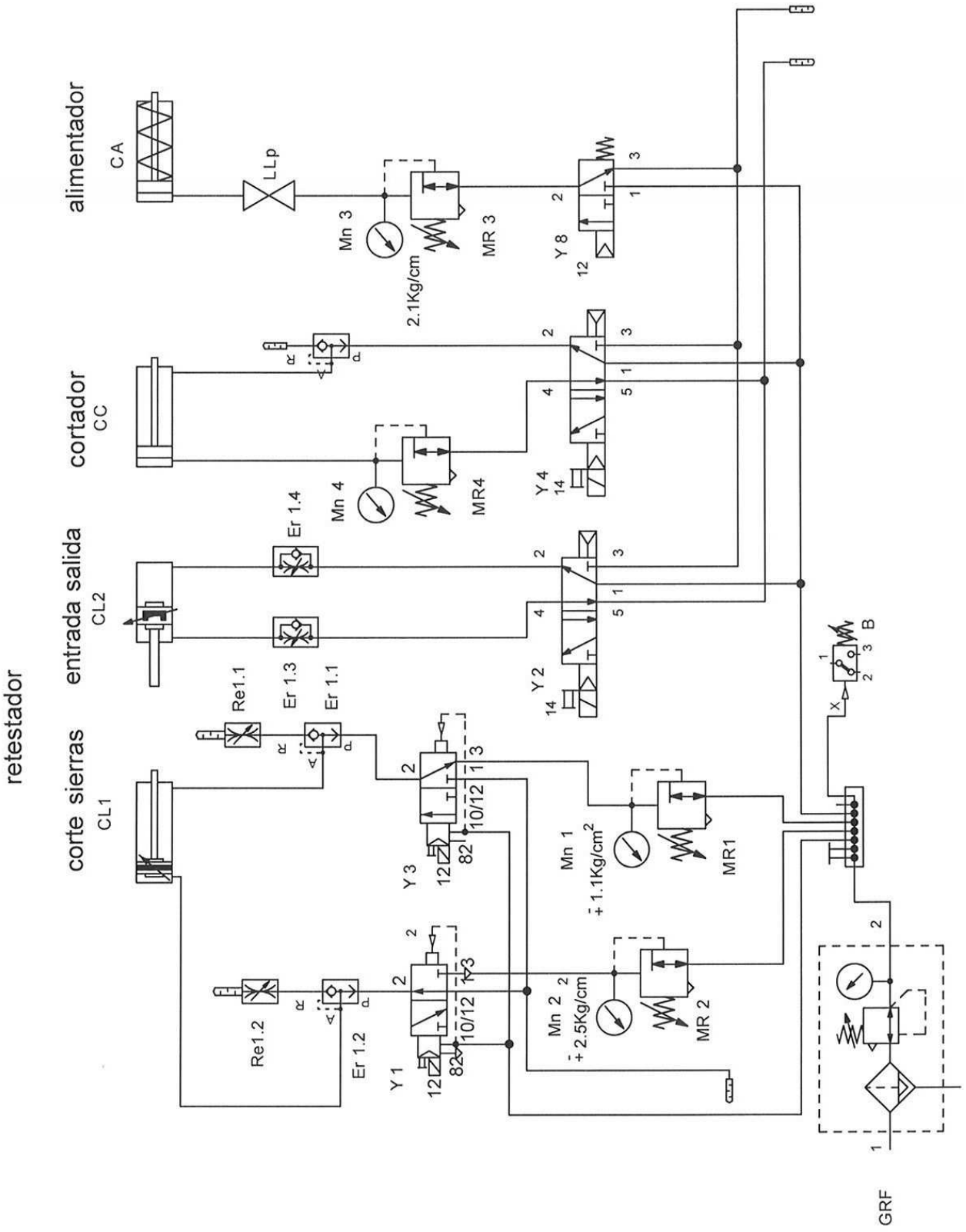
This lists up the most important alarms and faults only. Please refer to the instruction manual for a complete list.

LED Display	ALM	FLT	Cause
Base Block bb	○		The software base block function is assigned to one of the digital inputs and the input is off. The drive does not accept Run commands.
Control Circuit Fault CPF02 to CPF24		○	There is a problem in the drive's control circuit.
Cannot Reset CrSt	○		Fault reset was input when a run command was active.
Option External Fault EF0	○	○	An external fault was tripped by the upper controller via an option unit.
External Fault EF	○		A forward and reverse command were input simultaneously for longer than 500 ms. This alarm stops a running motor.
External Faults EF1 to EF5	○	○	• An external fault was triggered by an external device via one of the digital inputs S1 to S5. • The digital inputs are set up incorrectly.
Output Phase Loss PF		○	• Output cable is disconnected or the motor winding is damaged. • Loose wires at the drive output. • Motor is too small (less than 5% of drive current).
Overcurrent oC		○	• Short circuit or ground fault on the drive output side • The load is too heavy. • The accel./decel. times are too short. • Wrong motor data or V/f pattern settings. • A magnetic contactor was switched at the output.

7.1 PNEUMATIC SCKETCH NOMENCLATURE

NOMENCLATURA ESQUEMA NEUMATICO BRYKO

REFERENCIA	DENOMINACIÓN	FUNCION
CA	Cylinder	Press the strip against the feeding roller
CC	Cylinder	Activate the trim cutter
CL2	Cylinder	Up / Down end trimming
CL1	Cylinder	In / Out end trimming
LLp	Step Key	Short the step air of the cylinder to the feeding and the cutter
Er 1,3 Er 1,4	Speed Regulator	Regulate speed to the cylinder cutter
Re 1,1 Re1,2	Speed Regulator	Speed regulators to the cylinder In/Out end trimming
Mn 1,1 Mn 1,2	ManoReducer	Presión del cilindro corte de sierras del retestador
Mn 3	ManoReducer	Feeder cylinder presure
Mn 4	ManoReducer	Cutter cylinder presure
Er 1,1 Er 1,2	Fast Exhaust	Saw cutting cylinders
Er 1.6	Fast Exhaust	Cutter Cylinders
MR 1	ManoReducer	End trimming up to trim
MR 2	ManoReducer	End trimming down and pressure discharge
MR 3	ManoReducer	Feeding pressure regulator
MR 4	ManoReducer	Cutter pressure regulator
Y1	Electrovalve	End trimming up to trim
Y3	Electrovalve	End trimming down and pressure discharge.
Y2	Electrovalve	In / Out end trimming
Y4	Electovalve	Cutter trim conection
Y8	Electrovalve	Material feeding conection
S30	Magnetic Detector	Conection pressure discharge


retestador
corte sierras
CL1
entrada salida
CL2
cortador
CC
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CA
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MR4
Y 4
Er 1.4
Re1.1
Er 1.3
Er 1.1
Y 2
Re1.2
Er 1.2
Y 1
Y 3
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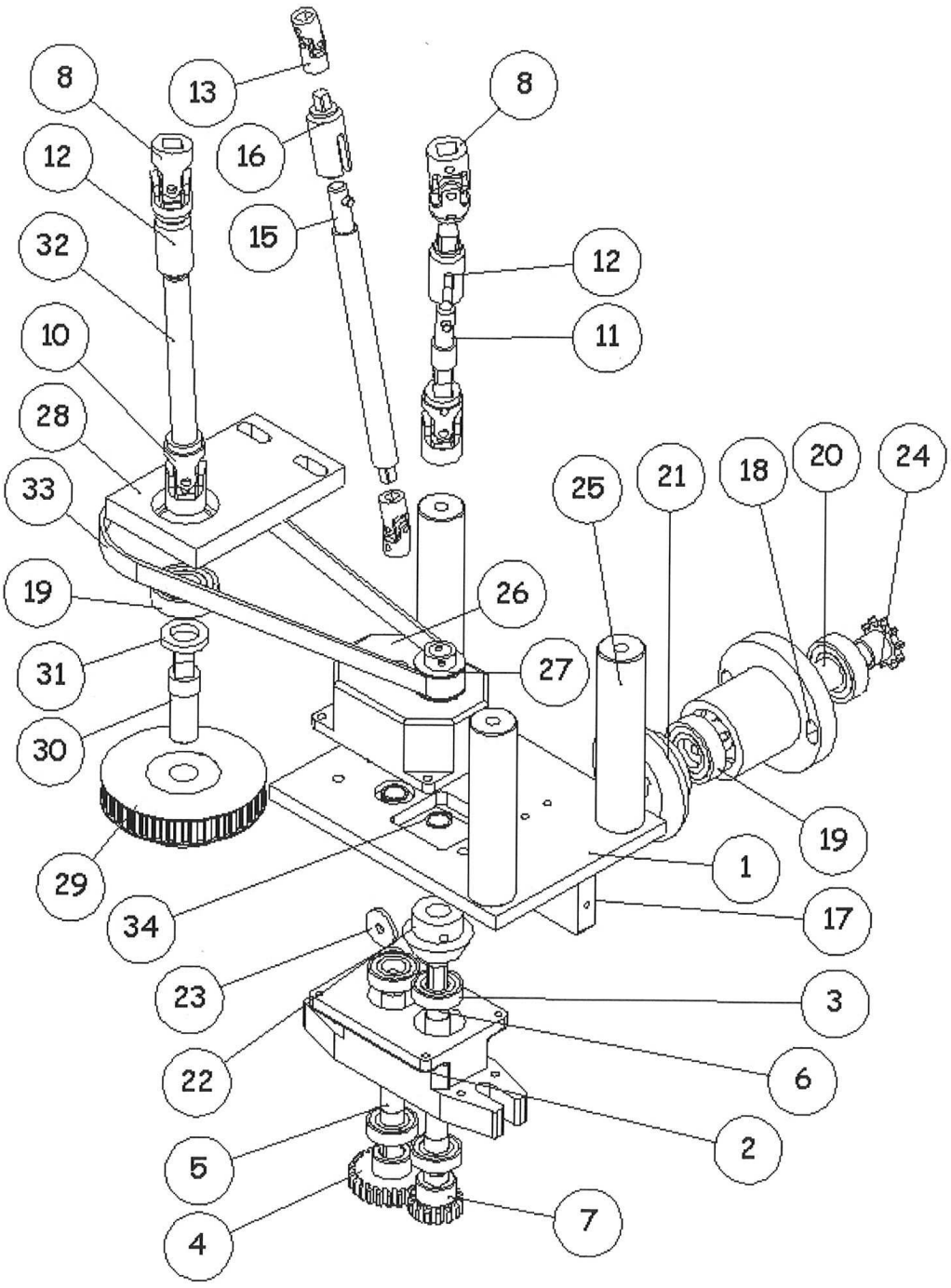
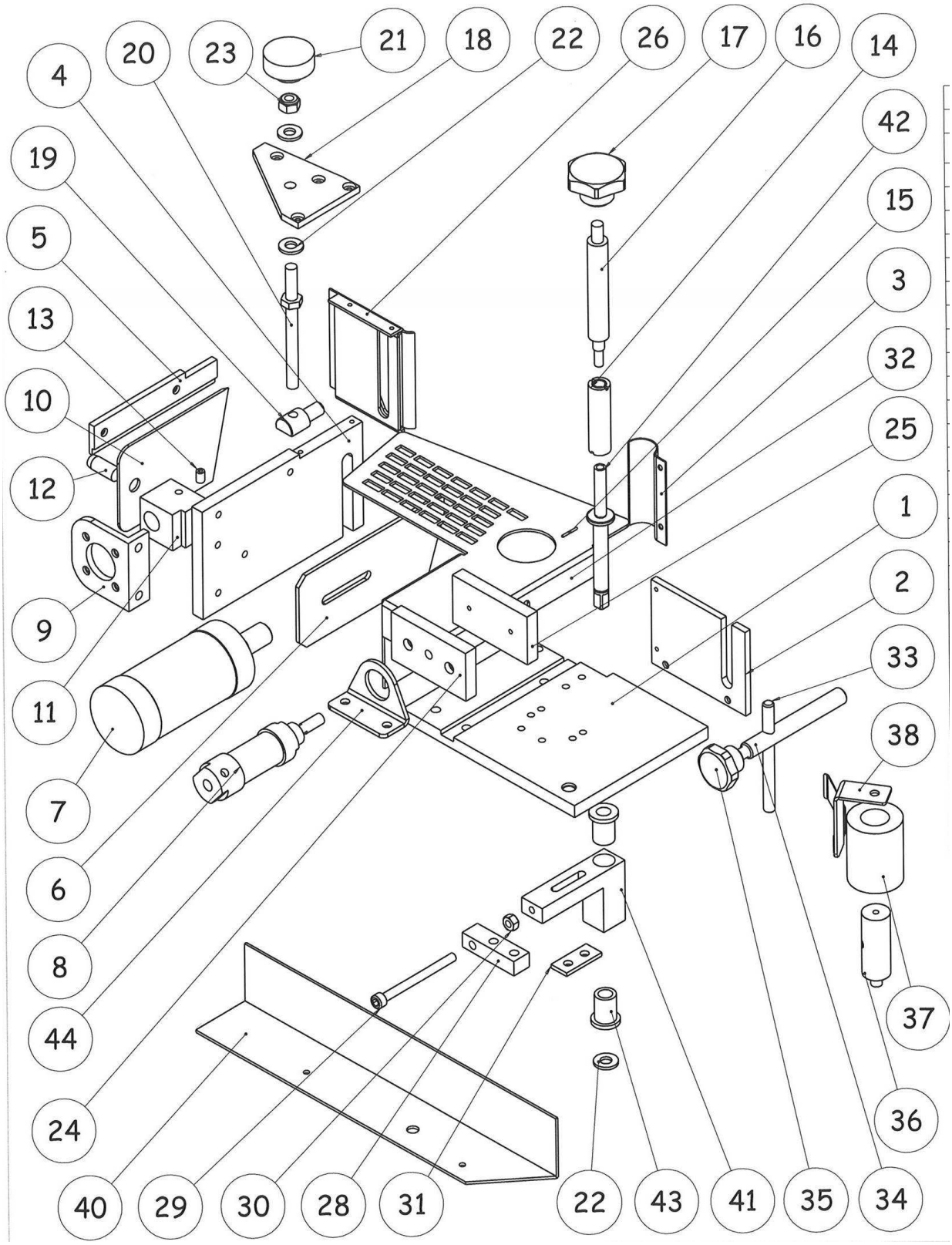
Mn 1
+ 1.1Kg/cm²
MR1
Mn 2
+ 2.5Kg/cm
MR 2
GRF

8 SPARE PARTS



SPARE PARTS GEARBOX

NUM.	QUANTITY	REFERENCE	DESCRIPTION
1	1	c020401	Driving Plate
2	1	c020424c	Roller-bearing forward-shaft
3	4	6002-2RS	Bearing
4	1	1000428	Gear Z-25 M2
5	1	c020410	Infeed roller drive shaft
6	1	c020407n	Glue rollerdrive shaft
7	1	1000427	Gear Z-15 M2
8	4	5412221201	Universal Joint
10	4	5412921601	Universal Joint
11	1	c020504n	Glue tank drive shaft
12	2	1000409	Glue tank slinding fit
13	4	5411620801	Universal Joint
15	1	c020414	Feeding roller driving shaft
16	1	1000413	Feeding roller sliding fit
17	1	c020612a	Support
18	1	1000401	Drag roller bearing support
19	3	6004-2RS	Bearing 6004-2RS
20	1	c020607a	Chain gear Shaft
21	1	1000107b	Drive Gear M2 Z20
22	1	1000107a	Drive Gear M2 Z40
23	1	0510613	Whaser
24	1	1010507	Gear 3/8 z10
25	3	c020402	Colum Separator
26	1	c020421	Drive gear box
27	1	c020412	Pulley L050 Z10
28	1	c020411	Presure gearbox board
29	1	c020430	Pulley LO50 Z34
30	1	c020404n	Roller drag gearbox shaft
31	1	1000403	Whaser distancing
32	1	c020402b	Drag roller driving shaft
33	1	belt 455 L050	Belt
34	6	elastic ring Ø15	elastic ring Ø15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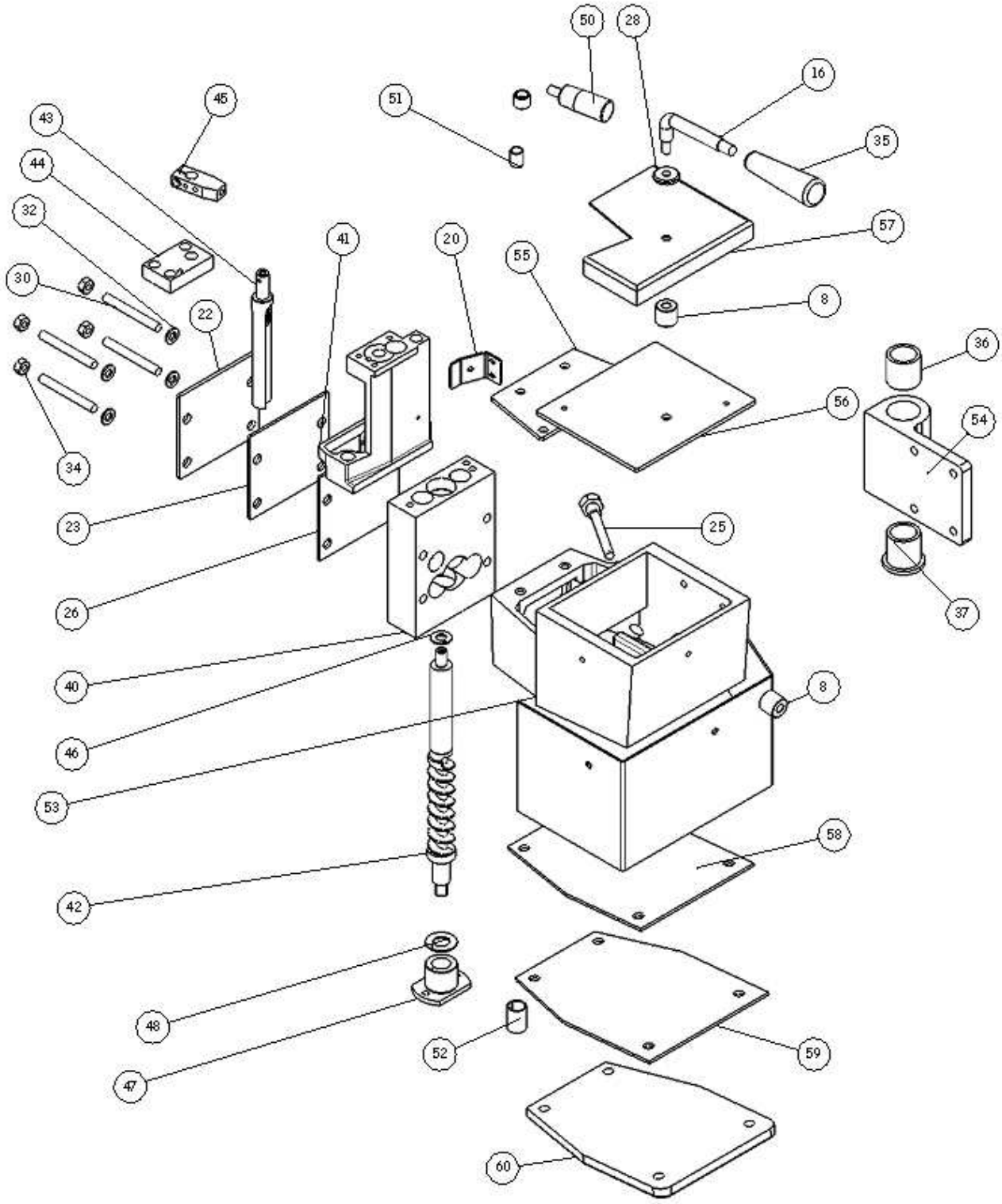
NUM.	QUANTITY	REFERENCE	DESCRIPTION
1	1	c020212	Infeed table
2	1	c020202	Infeed strap
3	1	2000208	Feeding bearing protection
4	1	0 700217	Guillotine base mount. Plate.
5	1	1000218	Guillotine blade guide
6	1	0 700216	Throttle
7	1	A27U2A50A0025	Cylinder
8	1	CF-006342	Cylinder
9	1	0 700281	Square fix
10	1	1000235	Blade cutting knife
11	1	0700236b	Blade cutting knife protector
12	1	0700236a	Rod connection
13	1	prisM6x8	Stud
14	1	1000239b	Feeding rubber roller
15	1	DIN1481	Shaft
16	1	1000283u	Whel extreme
17	1	1122	Handle
18	1	1000213	Mouthpeace support
19	1	1000214	Strip guide output
20	1	1000221	Output guide regulator
21	1	1000223	Adjust ing knob
22	3	1000250	Brass washer Ø17
23	1	autobloc M8	Nut
24	1	0 700203	Block
25	1	0 700204	Block nylon
26	1	0 700279a	Output mouthpeace
28	1	0 700237	Regulatory Guide
29	1	allenM6x70	Screw allen M6x70
30	1	hembra M6	Nut M6-DIN 934
31	1	0 700238	Square fix
32	1	0 700289	Protection Plate
33	1	1010404	Shaft
34	1	1010416	Handle
35	1	1147	Handle
36	1	1010422	Shaft Guide
37	1	1000230	Roller
38	1	1000229u	Strip guide roller
40	1	c020214	Aluminium square
41	1	0700205a	Fix shaft Square
42	1	1000238	Feeding Roller Shaft
43	1	B101520-203	Bearing
44	1	C020222	Fix cylinder Square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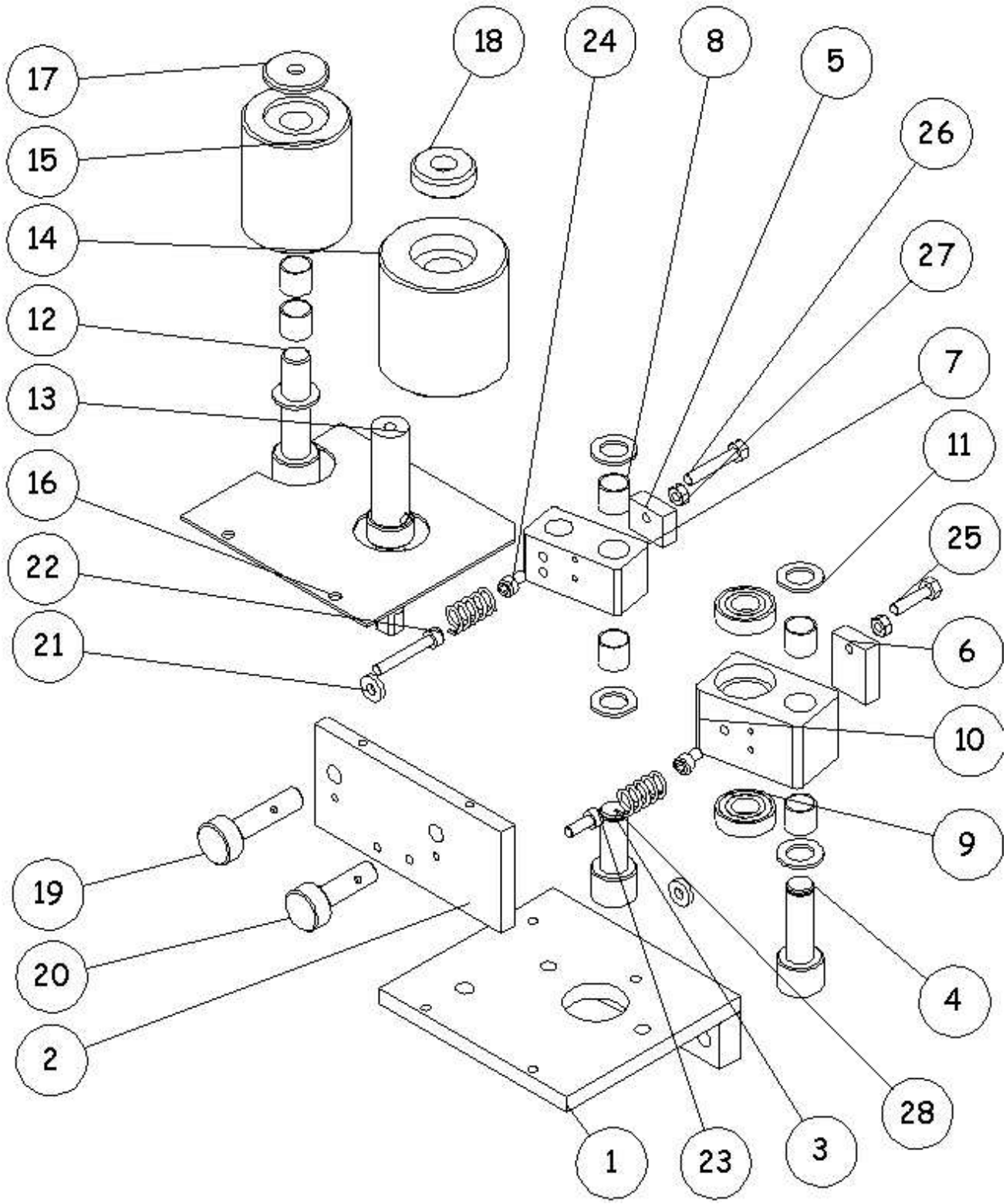
Num.	Quantity	Reference	Description
8	2	1000079	Glue pot protection bearing
16	1	1000513	Axle handle
20	1	1000521fr	Mouthpiece tracer
22	1	1000526	Front Heating element plate
23	1	1000527	Front Isulating plate
25	1	1000540	Feeler casing f/electr. Therm
26	1	1000542 250w	Heating element
28	1	1000918	Washer Ø25 x Ø8 x 4
30	4	M8x70	Threaded bar
32	4	Whaser M8	Washer
34	4	M8 laton	Brass nut M8
35	1	handle	Handle lid glue tank
36	1	porosoil25x32x30	Bush
37	1	porosoilB25x32x35	Bush
40	1	1000504m	Glue rolling bottom housing
41	1	1000506frm	Top glue roller housing
42	1	1000507m	Glue roller
43	1	1000511m	Glue scraping blade
44	1	1000517m	Bottom cover glue regulator
45	1	1000518m	Top cover glue regulator
46	1	WC 08 DU 10	Glue roller washer
47	1	1000519m	Bottom drive shaft housing
48	1	Washer WC 14 DU 16	Glue roller washer
49	1	1010421	Bush
50	1	Knob M8	Knob
51	1	MB1015DU	Bush
52	1	MB1625DU	Bush
53	1	c020501m	Glue pot protection bearing
54	1	C020502s	Mount bracket tipping-shaft
55	1	c020525	Glue pot top
56	1	c020531	Glue pot top
57	1	c020545b	Glue pot protection cap
58	1	C020542 1000w	Heating element
59	1	c020523	Insulating plate
60	1	c020522	Fix Plate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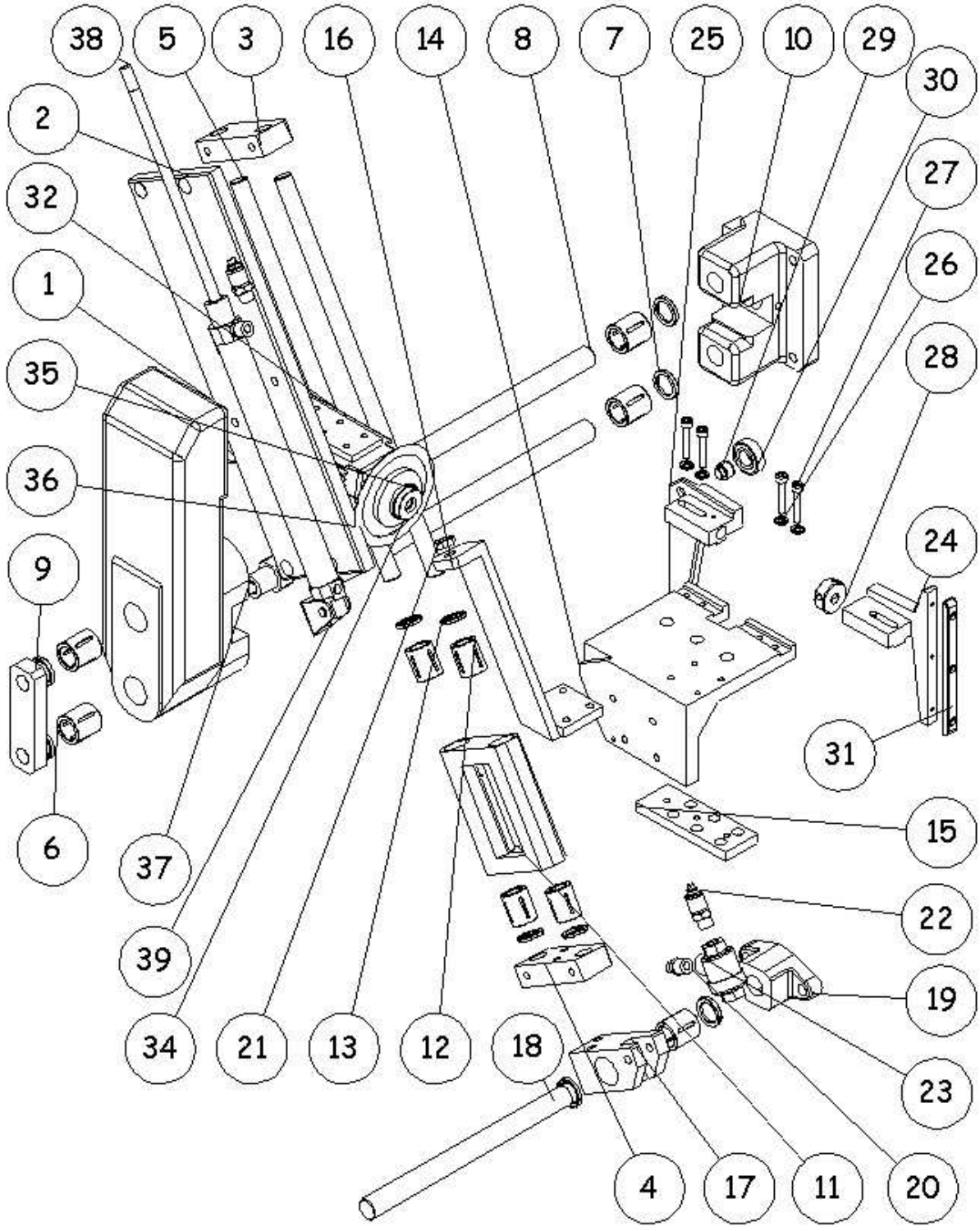
NUM	QUANTITY	REFERENCE	DESCRIPTION
1	1	c020328a	Base roller front
2	1	c020325	Base roller front
3	1	0600317	Axis tilt roller guide
4	1	0600316	Axis tilt roller pressure
5	1	0600309	Limit roller guide
6	1	0600310	Limit roller pressure
7	1	0600305	Swivel roller
8	6	MB1515DU	Bush
9	2	6002-2RS	Bearing
10	1	0600306	Pressure roller Swivel
11	5	0600315	Washer
12	1	0600314	Roller guide shaft
13	1	0600313	Feeding roller shaft
14	1	c020303	Pressure rollers
15	1	0600304	Cylindrical roller
16	1	c020302a	Base rollers protection
17	1	0600311	Roller guide lid
18	1	1000318	Fixation roller washer
19	1	c020368	Tensor Roller
20	1	c020368a	Tensor Roller
21	2	2000373b	Washer
22	1	allenM6x40	Screw allen M6x40 - DIN 912
23	1	allenM6x16	Screw
24	2	allenM6x10	Screw
25	1	screwM6x25	Screw
26	1	screwM6x35	Screw
27	2	M6	Nut M6 - DIN 934
28	2	2400315	Spring pressure 929401511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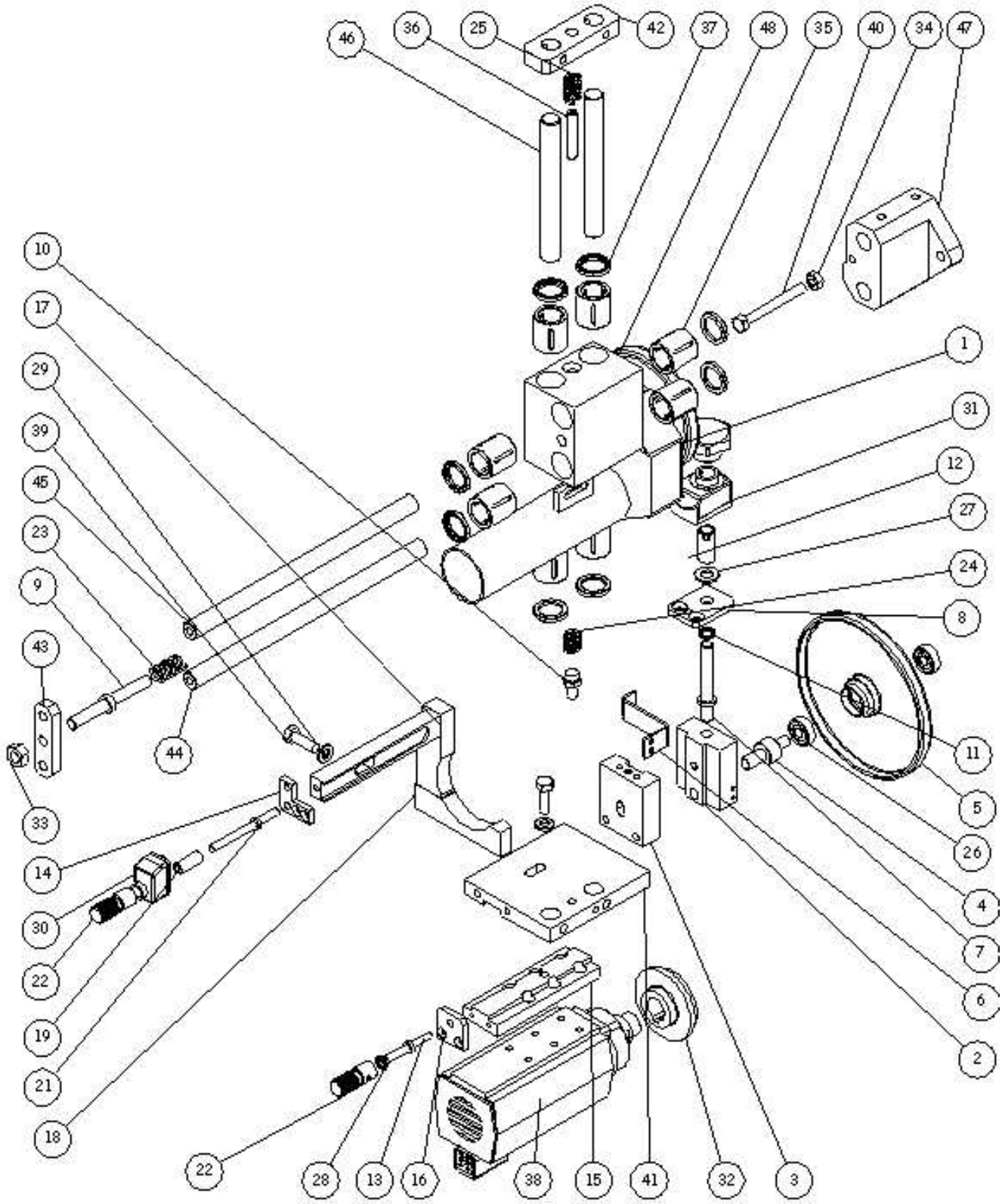
NUM	QUANTITY	REFERENCE	DESCRIPTION
1	1	c020601a	End Trim Support
2	1	c020617	Base Guide
3	1	c020611	Extrems bridle
4	1	c020611a	Cylinders support bridle
5	2	c020607	Column guide block
6	5	KH2030	Bearing
7	6	ret20x28x4	Retainer
8	2	c020612	Column
9	1	0600613n	Columns end
10	1	c020602	Column Support
11	1	c020618	Knife support block
12	4	KH1630	Bearing
13	4	ret16x24x3	Retainer
14	1	C020604b	Support Square
15	1	0600630	Motor Plate
16	1	c020609	Tight
17	1	c020625	Block Guide
18	1	0600627	Column Guide
19	1	0600626	Support Guide
20	2	r18-r14	Buttres
21	1	M10 baja	Nut
22	2	Filter	Filter
23	1	Filter	Filter block
24	1	0600605b	Limit for front cut
25	1	0600606b	Limit for rear cut
26	4	washer M6	Washer
27	4	allenM6x35	Allen Screw
28	1	0600610	Limit regulator
29	1	1852014	Limit bearings shaft
30	1	6002-2RS	Bearing
31	1	0600622a	Out of front limit skate
32	1	Elte V-4	Motor
33	2	Bush	Motor bush
34	2	Bush	Knife bush
35	2	Washer	Motor knife washer
36	2	0600621	Knife
37	1	25N2A25A040	Cylinder
38	1	25N2A25A200	Cylinder
39	1	Tilting I-25	Tilting Flange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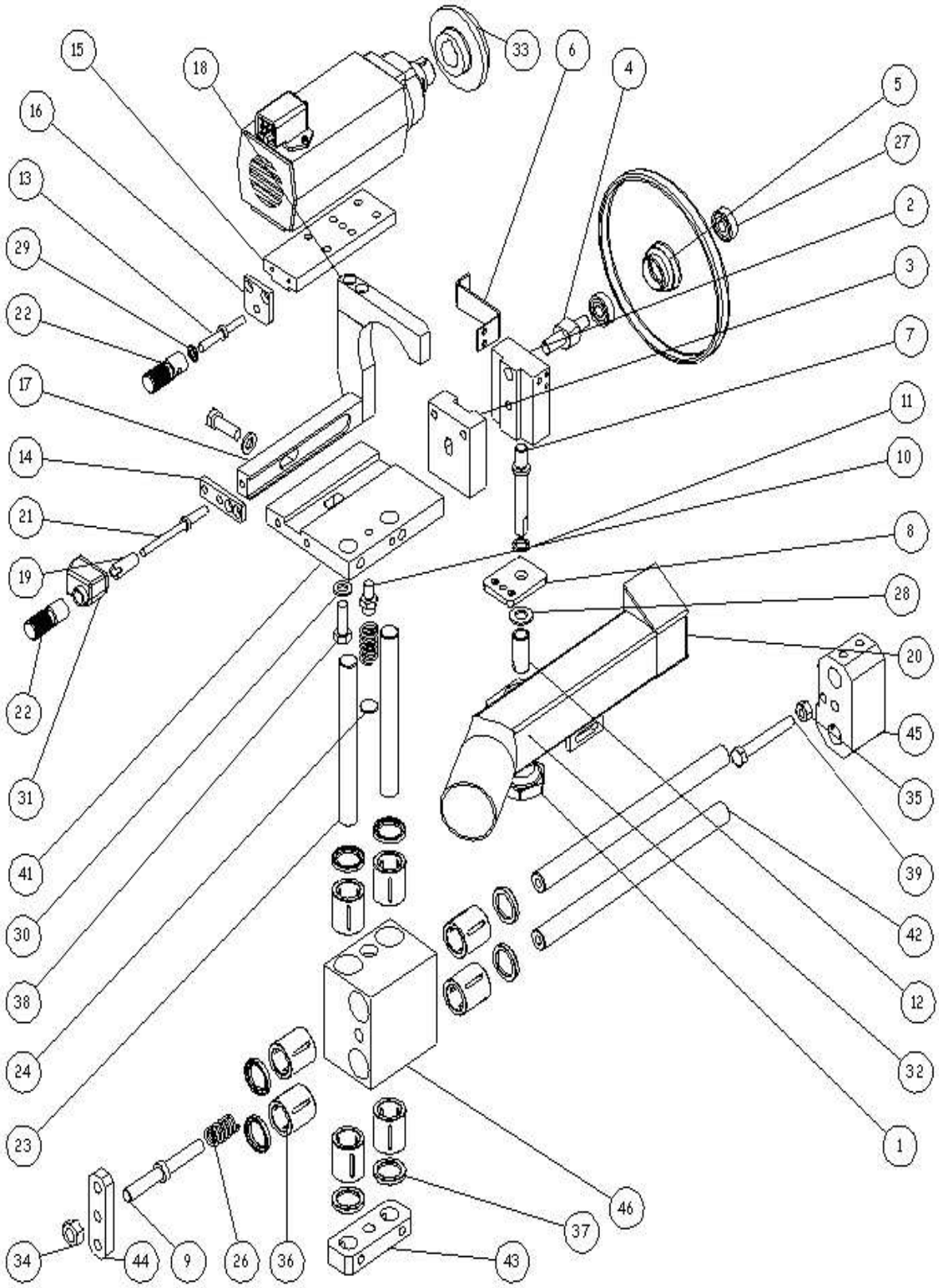
NUM.	REFERENCE	QUANTITY	DESCRIPTION
1	1122	1	Handle
2	0600728a	1	block vertical ajustment
3	0600728b	1	Support vertical copier
4	0600732a	1	Tracer shaft
5	0600737	1	Vertical tracer
6	0600753a	1	Cleaner copier
7	0600758a	1	Roller mounting reg. with siko
8	0600761	1	Siko vertical plate
9	0600768	1	Horitzontal regulation shaft
10	0600769	1	Vertical axis spring
11	0601237	1	Brass washer
12	0601430	1	Siko verical bush
13	0700729	1	Regulator board Motor
14	0700730s	1	Upper Regulation Deck
15	0700731	1	Motor plate
16	0700733	1	Pasamano regulacion guia motor
17	0700734	1	Handrail guide regulation motor
18	0700734a	1	Vertical tracer
19	0700736	1	Siko Bush
20	0700740	1	Nozzle aspirator
21	0700742	1	Tracer Horizontal regulator
22	0700744	2	Top horitzontal regulation support.
23	2400315	1	Spring pressure 929401511
24	2400336	1	Spring presure 929401501
25	2400336	1	Spring presure 929401501
26	609-2Z	2	Bearing
27	10.5x20x2	1	Brass Washer
28	M6	1	Brass Washer
29	M8	2	Washer
30	DA02	1	Siko
31	DA04	1	Siko
32	jc-5	1	Drill
33	M10	1	Nut
34	M8	1	Nut M8 - DIN 934
35	KH2030	8	Bearing
36	M8x45	1	Screw allen
37	ret20x28x4	8	Retainer
38	TDF-55C EP-11	1	Motor
39	M8x20	2	Screw
40	M8x70	1	Screw
41	c020760a	1	Vertical bridle
42	c020759	1	Horizontal bridle
43	c020743b	1	Top horizontal column
44	c020743a	1	Top horizontal column
45	c020755	2	Vertical column
46	c020703	1	Top unit support
47	c020764	1	Block
48	c020732i	1	Columns support plate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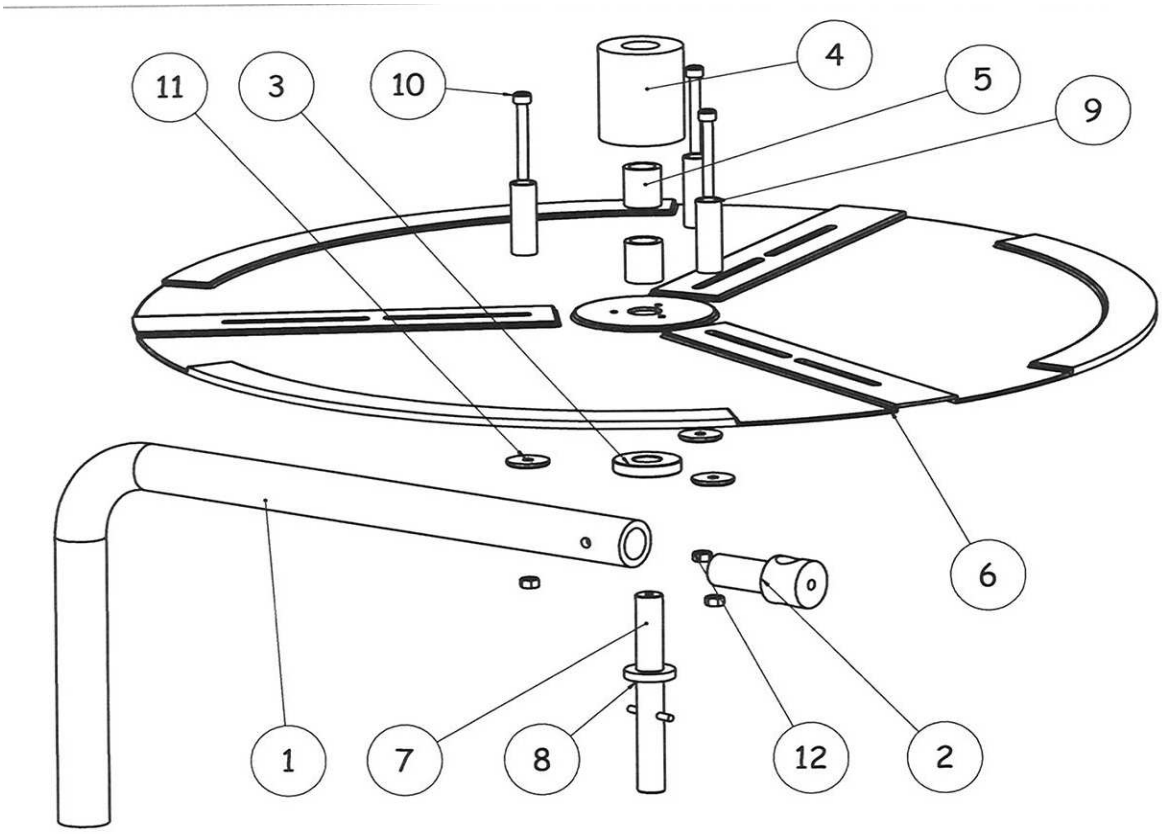
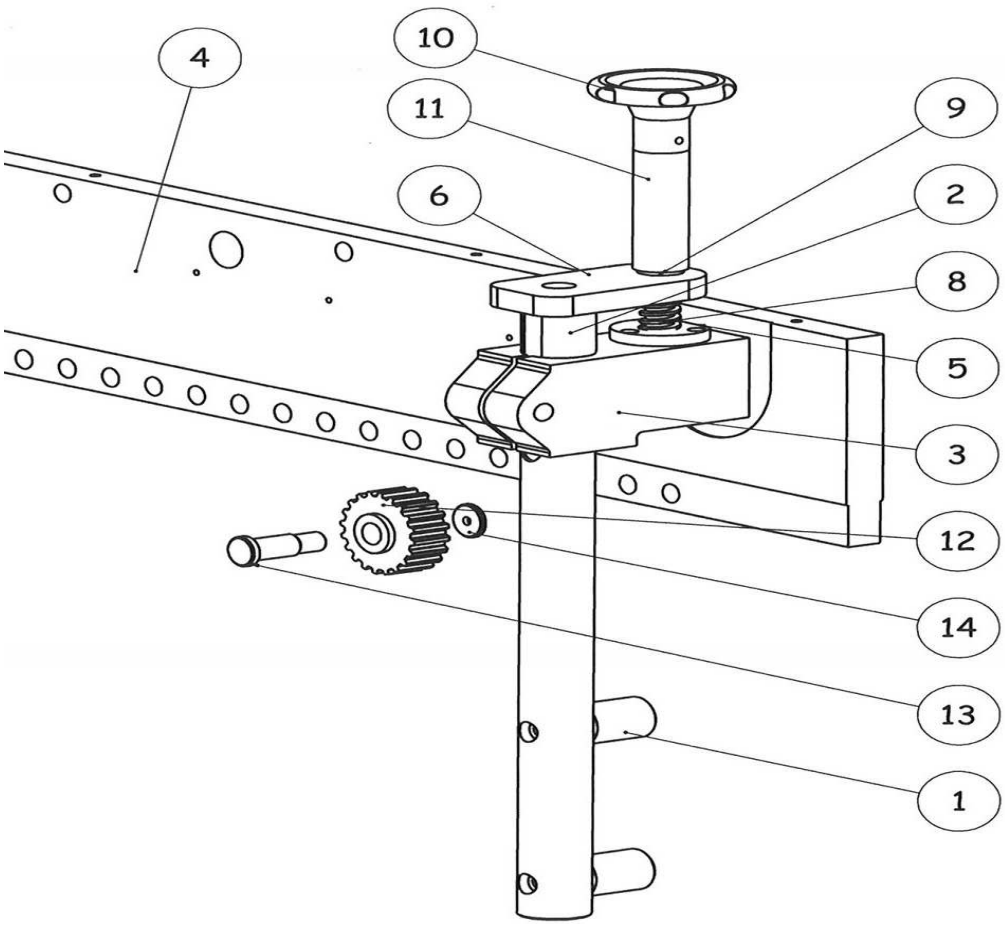
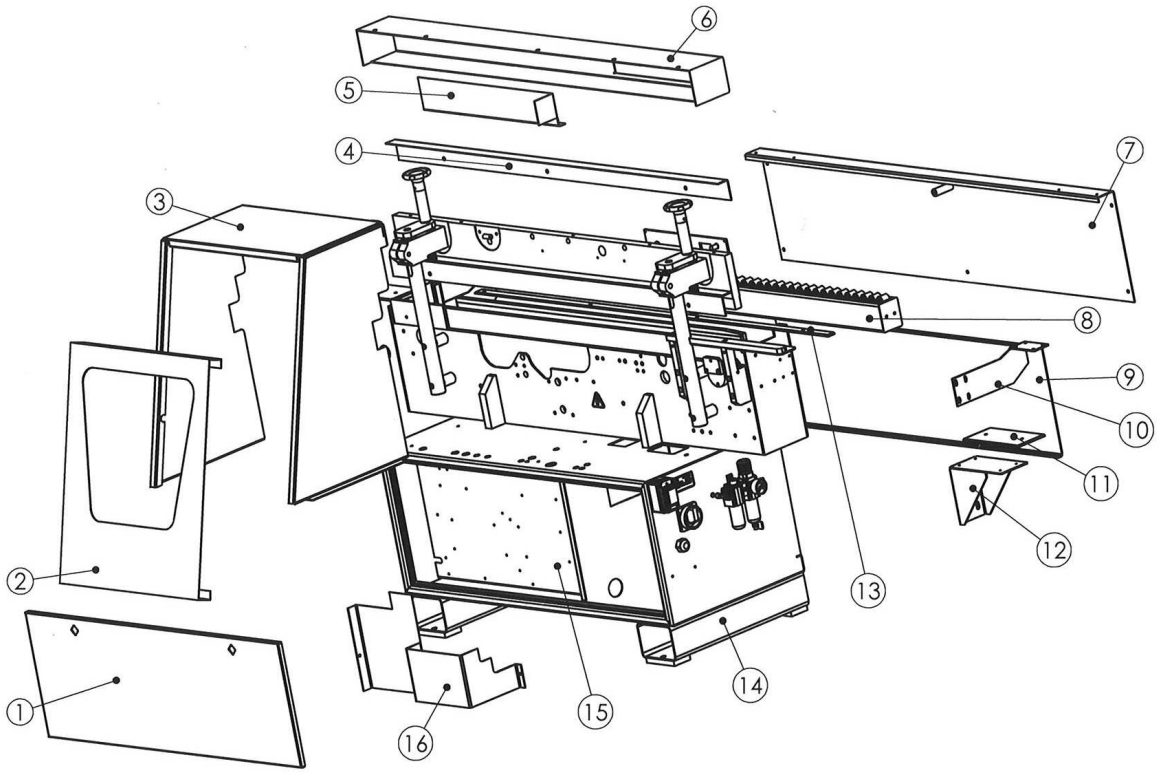
NUM	QUANTITY	REFERENCE	DESCRIPTION
1	1	1122	Handle
2	1	0600728a	block vertical ajustment
3	1	0600728b	Support vertical copier
4	1	0600732a	Tracer shaft
5	1	0600737	Vertical tracer
6	1	0600753a	Cleaner copier
7	1	0600758a	Roller mounting reg. with siko
8	1	0600761	Siko vertical plate
9	1	0600768	Horitzontal regulation shaft
10	1	0600769	Vertical axis spring
11	1	0601237	Brass washer
12	1	0601430	Siko verical bush
13	1	0700729	Regulator board Motor
14	1	0700730i	Regulation plate
15	1	0700731	Motor plate
16	1	0700733	Motor regulation guide
17	1	0700735	Support copier guide
18	1	0700735a	Tracer
19	1	0700736	Siko Bush
20	1	0700742	Tracer Horizontal regulator
21	2	0700744	Top horizontal regulation support.
22	2	c020755	Vertical column
23	1	0700746	Spring pressure regulation
24	1	2400315	Spring pressure 929401511
25	1	2400315	Spring pressure 929401511
26	2	609-2Z	Bearing
27	1	arandela latón 10.5x20x2	Brass Washer
28	1	arandela latón M6	Brass Washer
29	2	arandelaM8	Washer
30	1	DA02	Siko
31	1	DA04	Siko
32	1	fresa jc-5	Drill
33	1	hembraM10	Nut
34	1	hembraM8	Nut M8 - DIN 934
35	8	KH2030	Bearing
36	8	ret20x28x4	Retainer
37	2	tornilloM8x20	Screw
38	1	tornilloM8x60	Screw
39	1	TDF-55C EP-11	Motor
40	2	c020745	Top horizontal column
41	1	c020760	Vertical Bridle
42	1	c020759	Horizontal bridle
43	1	c020704	Suport
44	1	c020764	Block
45	1	c020732d	Motor Plate



NUM	Predeterminado /CANTIDAD	REFERENCIA	DESCRIPCION
1	1	c020041	Arm
2	1	2000216	Arm bolt
3	1	1000270	nylon washer
4	1	1000268	Roller
5	2	porosoil16x22x25	Bearing
6	1	0700271	Disk
7	1	2000214	Shaft
8	1	1000295	Washer
9	3	1010403	Bearing
10	3	allenM6x50	Screw
11	3	1000608	Washer
12	3	hembraM6	Nut M6 - DIN 934



NUM	Predeterminado /CANTIDAD	REFERENCIA	DESCRIPCION
1	2	0600013	Bush
2	1	c0200037	Column
3	1	0600801a	Beam support
4	1	c0200802n	Beam
5	1	1000609	Elevation nut
6	1	c030803	regulation plate
7	1	B1520-253	Bearing
8	1	1021305	spindle
9	1	arandela latón 25x15x3	Washer
10	1	pomo base grande	Handle
11	1	c0200038	Handle separator
12	1	1000606	Roller beam
13	1	1000607	Roller shaft
14	1	1000608	Washer



Num.	Quantity	Description
1	1	Electrical Cabinet Door
2	1	Door
3	1	Cabin
4	1	Wheel Protection
5	1	Rear Cabin Protection
6	1	Protection Panel
7	1	Rear Protection
8	1	Apron
9	1	Back Cover
10	2	Apron Support
11	2	Celotex Plate
12	2	Lateral Support
13	1	Celotex Handrail
16	1	Palier Protection
14	2	Machine Support
15	1	Electrical Sheet

GEARBOX

The gearboxes are supplied with lubricant with unlimited life. Synthetic oil ISO VG320