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## USE AND MAINTENANCE MANUAL



# TS-90

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## INTRODUCTION

### **CORRECT USE OF THE MACHINE**

The machine has been designed to saw and square one or more panels in a lengthways or crossways direction in manual way or following automatic cutting cycles that can be set up in a very flexible way by computer aid.

The machine can be used to cut wood or similar. Metals are excluded (on demand it's possible, without changings, the cutting of aluminum).

The machine is not suitable for working in the open air or in areas where there is explosion risk.

The allowed ambient temperature is from 5°C to 40°C, the relative air humidity is from 30% to 95%.

Only tools covered by EN847.1 standards may be used. The speed limits for the tools must NOT be exceeded.

The operator working position is in the front of the machine, near the loading/unloading worktables after the cutting line.

For safety reasons, arbitrary transformations of the machine are NOT allowed.

The manufacturer is not responsible for any damages due to incorrect use of the machine, coming from the non-observance of the instructions of this Use and Maintenance Book, and declines any responsibility for damages to people or things.

This Use and Maintenance Book is considered to be an integral part of the machine and must be kept in good condition until the machine is decommissioned. If you decide not to use the machine any more because it is obsolete or irretrievably damaged, decommission it so that it is not operative and there is no risk or danger. Disconnect the machine from the electrical and compressed air supplies and from the chips suction conduits. Seal up the machine inside a strong packaging and follow all the standards and legislation envisaged in the country where the machine has been installed.

### **DESCRIPTION OF THE MACHINE**

The machine is essentially composed by a panel saw containing the saw carriage, by a couple of bars before the line in the rear side of machine that support the positioning pusher that drives the panels towards the cutting line, and by a series of worktables after the cutting line on which the panels to be cut are loaded and that afterwards allow the manual unloading of the cut panels.

The blade carriage, built in the sawing unit, is composed by a main blade and an engraving one to avoid panel splintering in the lower side of wood-valued pieces. Both sawing devices are liftable through an electro-pneumatic system allowing for their disappearance under the worktable when cutting operation has been made. The saw carriage sliding system is possible by means of two thurcite-made guideblocks leaning on two guideways one round and one square. This system enables the saw carriage (having the machine a remarkable mechanical precision) to feed in a perfect rectilinear way and to avoid any vibration, being these basic features for the quality cut.

The positioning pusher beam consists of a firm carriage, whose parts have been mechanically worked, making possible the perfect use of sliding devices and motors unit. The sliding system is made up of wheels specially designed by us and keyed to special "O" play bearings with a working life of over 10 years. Sliding on a round reference guide and a support guide, this creates a high-quality, high-speed mechanical system that uses small motors, resulting in reduced energy consumption. To drive the unit, a Rack and Pinion and torque transmission shaft system is used, ensuring parallel linear movement; these characteristics allow great precision when positioning.

The full grasp clamps units (very firm electro-pneumatic devices) allow for a perfect clamping of panels .

The aligning device along the sawing axis for cross cuts (electro-pneumatic part sliding in a rectilinear guide) is formed by a carriage where we fit one independent and disappearing piston with roller made in nylon. This aligner working, with the possibility to adjust its working pressure electronically by the P.C., makes the panel always controlled, keeping a perfect squaring condition as regards the cutting axis.

The Numerical Control fitted on the main control board and a rack/encoder system monitor the pushing beam position,. In this way the pushing beam travels is managed and optimized by N.C. and no more by electro-mechanical parts.

## **WORKING DESCRIPTION**

It is a kind of machine that works in a semi-automatic way, complete with front manual loading and/or rear automatic loading (TSP) whose main feature is the considerable versatility in performing panels cutting.

Indeed the same sawing patterns for rip and cross cuts could be used for pre-cuts and Zeta and Double U (W) ones. We could get this result through a proper working schedule programming on the N.C. and turning the panel in the worktables after the sawing axis according to the programmed cuts.

After the panels loading, programmed according to the quantity of panels to be cut, and pushed against the pincers, the pushing beam feeds keeping in position for the first rip cutting. The first movement is the finger protection lowering fitted before and after the cutting axis, then the pressure beam lowers and presses upon the panel to avoid its shifting during the blade cutting.

Subsequently the pieces got from the rip cuts will be turned and moved toward the worktable placed after the sawing axis, then they will be approached to the guide beam and pushed against the pincers of the positioning pusher; at this point, pushing the proper switch, it brings cross cuts sequence to a conclusion.

Last working phase consists of the hand-made discharging of every group of cut panels, according to the beginning scheme.

## SAFETY PRECAUTIONS

In the manual are used, within every paragraph, the following symbols.



### **WARNING**



### **CAUTION**

**WARNING** informs that the failure observance of the indications provided below can damage both the equipment and the staff.

**CAUTION** informs that the failure observance of the indications provided below can damage the equipment.

The machine embodies all the safety devices in order to have a correct use of it without risks, in normal conditions. In particular environmental and operative situations it could be necessary the installation of other kinds of structures or devices to preserve the technician. The installation, the maintenance and setting of the machine, must be carry out respecting all safety rules and cautions which are suitable for each kind of intervention.

The environmental conditions, such as the correct dislocation of the machine in an appropriate position, the lightning and the cleaning of the environment , are conditions very important for the personal safety. If transport means or similar pass often near the machine, attention and awareness of operator would be altered, generating situation of danger for the operator and for the machine. Every possible measure must be realized to mantein the operator in a condition of safety and protection. The strict adherence to the standards of safety at work of every nation is recommended.

The manufacturer declaims any liability for damages to persons or property following the non-observance of the safety rules.



### **WARNING FOR TRANSPORT AND LIFTING.**

Transport and loading of the machine should be performed in strict conformity with the instructions provided.

Operations such as transport, installation and assembly must be carried out only by trained staff having technical skills and experience in each expected area. The presence of an assistant is very important it provides signals during the transport and physical help in the operations of installation and removal of bulky and/or heavy elements.

The assistant must watch over every step of the operations to avoid any kind of obstruction that can damage the normal executive cycle.

For the lifting and transport please take all cautions provided and recommended by the existing safety rules, in order to prevent possible damages to persons or property.

Nobody must stay near the suspended load or in any case in the range of action of the crane, the forklift or any other mean used for lifting and transport.

The transit lanes, in the building where the machine has been installed, must be kept free and without any obstacle which can make the forklift and the crane jolt. The load must be always firmly anchored to a load-bearing element of the lifting and transport mean, in order to prevent movements and displacements of the load itself.

The manufacturer declaims any liability for damages to persons or property following the non-observance of the safety rules.



### **WARNING FOR INSTALLATION**

The working area must be carefully lightning and must have a power socket of compressed air and electricity; this one must be located in a protected position and have a disconnecting switch. The electricity and compressed air supply cables must be protected by a metal tile, metal piping or similar that can not impede the work of the operator.

The electric connection of the machine to the supply chain and its testing must be carried out only by an electrical technician, who knows the EN60204.1 rules. The area surrounding the machine must be kept without obstacles, cleen and carefully lightened.

The working area must be bounded in an appropriate way, to prevent collision between the operator and transport means or movement of the pieces in production.

The manufacturer disclaims any liability for damages to persons or property following the non-observance of the safety rules.



#### **WARNING SELECTION OF THE OPERATOR:**

The selection of the personnel for the run and maintenance of the machine, is based on skills that must change according to the existing rules of each country and to the profiles listed below.

Operator of 1st level

Operator without any specific skill, able to carry out only simple tasks, that is the run of the machine through the use of controls on the panel control and load/unload of the materials used during the production cycle, protections must be installed and working.

Operator of 2nd level

Trained operator, able to carry out the 1st operator level's tasks and moreover able to solve tasks such as supervision, setting and control of the working cycle.

Mechanical technician

Trained technician, able to run the machine in normal conditions, to attend all mechanical aspects in order to provide to the settings, the maintenance and necessary repairs. Normally he's not qualified to attend the wiring.

Electrical technician

Trained technician, able to run the machine in normal conditions, to attend all electrical aspects in order to provide to the settings, the maintenance and necessary repairs. He's able to work with voltage in the cabinets and electric boxes, according to the rules EN 60204.1.

Manufacturer's technician

Trained technician, able to run the machine in normal and particular conditions, made available by the manufacturer to carry out mechanical, electrical, electronic or software operations, testings in agreement with the user.



#### **WARNING FOR THE OPERATOR:**

The operator's concentration should not be disturbed or interrupted in any way during the working cycle of the machine.

The working area in front of the machine must be kept always clean and free to allow the prompt and easy access, in emergency, to the main electric board.

Execute the starting sequence of the operating cycle only following the recommended way. Do not access in the operating area of the machine during the working cycle.

Do not put your hands or anything else near or inside the moving or tensioned parts of the machine or in the cabinets.

Do not change the parameter of the software to obtain different performances from the ones previewed and programmed during the design and testing phases.

Never work at the minimum and maximum range of the possibilities of the machine.

Arrange rationally the material to work without hindering the operative cycle.

Wear strong five-fingered gloves, which do not reduce the sensitivity and the holding, to manage the parts in progress.

Before starting to work check the working area looking for any dangerous conditions.

It's forbidden work in darkness, the working environment must be adequately enlightened in order to assure to the user a perfect vision of the operations to conduct.

The user must care about the non-existence of shadow zones, of annoying dazzles, neither stroboscopic effects.

Before starting to work make sure that there are not people in the working area.

Do not quit the installation or the machine leaving it unattended when it is working, except in the allowed cases.

Do not use flexible controls or pipes as handhold.

Keep always an adequate visibility in the working area.

For the safety of the staff do not try to get on or off while the machine is working.

Inform the maintenance staff about any operating irregularities of any installation.

It's absolutely forbidden open doors or protections when the machine or the installation are working.

During the stop of an operative cycle switch off the machine. If the stop continues, put to 0 (Zero) the general switch.

Be aware and adopt all the cautions before carry out any use of the machine.

It's suggested to the stuff to remove, before carry out any use of the machine, any garment or personal object which could get caught in the machine parts.

Tighten around the wrists the garment work sleeves, buttoning safely. Wear always garments, shoes and protections prescribed and recommended by safety regulations the world over.

Do not introduce inside the machine material different from the one previewed for its utility.

Before starting up the machine, ensure that no tool or foreign body have been left inside or on the top of the machine.

Wether, during the working cycle, the machine would stop for reasons which require to accede to the cabinet containing the electric devices, first put to 0 (Zero) the general switch.

Report to the person in charge of the factory and production line the accident and the conditions in which it has happened.

The perfect working of the emrgency controls must be always verified throu operator's direct driving.

The working area in front of the machine must be kept ALWAYS free, clean and good enlightened to avoid collisions with the moving parts of the machine.

Before starting up the installation, make sure that there are not people carrying out operations such as mantainance or cleaning.

It's absolutely forbidden to the operator to run the machine for a use different from those expressly previewed and described in the mounting and testing sections.

The use of the machine must be managed according to the ways, times and places under codes of practice, of law and welfare of each country, even if, in the specific country do not exist rules to regulate the sector.

Even if the electric board has its own protective system, the acces to the electric board is allowed only to authorized operators with experience in such operations.



**WARNING: IT'S FORBITTEN TO MINORS TO USE THE MACHINE!**

The manufacturer declaims any liability for damages to persons or property following the non-observance of the above safety rules.



**WARNING: ELECTRIC BOARD**

The access to the MAIN ELECTRIC BOARD is allowed only to the personnel specialized for such operations.

If you have the need of work on the machine, however with the board off (position"0"), the maintenance technician must put the lock in the loophole of the general switch and draw the key in order to avoid any maneuvering of voltage reinsertion by persons who don't know that there is a technician on the machine or in any case far from the board.

So it's recommended to the person in charge of the factory to deliver a key copy only to authorized personnel.

It's absolutely forbidden to leave the key inserted in the lock or the lock itself opened.

The manufacturer declaims any liability for damages to persons or property following the non-observance of the above safety rules.



**WARNING: TOOLS**

NEVER use cracked or deformed blades or tools, and make sure that they comply with the rules EN847.1

NEVER use the tools over the speed limit suggested by the manufacturers or recommanded by the rule.

Use exclusively tools which are adapt to the material to work, respecting the indications stated by the manufacturer of the tools.

Make sure of the balancing of the all rotary tools, of their sharpening, and tightening.

Before mounting any tool in its place or sharf make sure that the surfaces of each side are clean, without cracks and levelled.

Mount the tools just after having checked them with special equipment, such as meter and calibre.

To change the tools, stop the machine and put the keyswitch in change tools manual position, and draw the key.

The manufacturer declaims any liability for damages to persons or property following the non-observance of the above safety rules.



### **WARNING FOR THE MAINTENANCE**

Prevent unauthorized personnel to make repairs or any other maintenance operation. Read carefully the Use and Maintenance Book before starting up, carrying out the machine or installation maintenance.

Do not grease, repair or register a working machine, except when it's explicitly required by the Use and Maintenance book, to avoid entanglements with the machine parts.

Stop the machine according with the procedures provided by this manual, before greasing or carrying out interventions.

Every time you have to dismount or install units of the machine, you have to lift them through devices which should be suitable to the load they have to support.

Move immediately the load over 25 Kilos on suitable support or easels. Do not work under or near a tool of a machine or on units which are not adequately supported or blocked.

Keep away persons from tools when they are lifted, to prevent damages.

It's absolutely forbidden to use matches, lighters or torches as lightening means during operations because of the presence of flammable material.

If you have to carry out reparations in areas that are not accessible from below, use ladders or security platforms according to the local or national rules to get to the working area.

Carry out carefully all the maintenance and reparation operations. In this manual we have considered all setting and service operations which belong to the maintenance's practice. We recommend you not to carry out any reparation or intervention that are not suggested in this manual. All operations which require the parts' dismounting must be carried out only by authorized personnel of the local dealer or of the factory.

It's required to use only original spare parts. The manufacturer is not responsible for damages following the use of parts which are not produced by the firm.

Only the personnel of the manufacturer or trained by the company knows the machine, has the tools and experience to carry out in an effective and cheap way any intervention.

If the machine is not installed and started up, it's necessary put it in a safe place away from dust and humidity. Control periodically the glossy part's protective condition and in case renew it.

The manufacturer disclaims any liability for damages to persons or property following the non-observance of the above safety rules.



### **WARNING PLATES**

It's important pay attention to the rules on the plates put on the machine every time you want start up, repair or stay near the machine or the installation.

It's required to the user to keep all the plates readable.

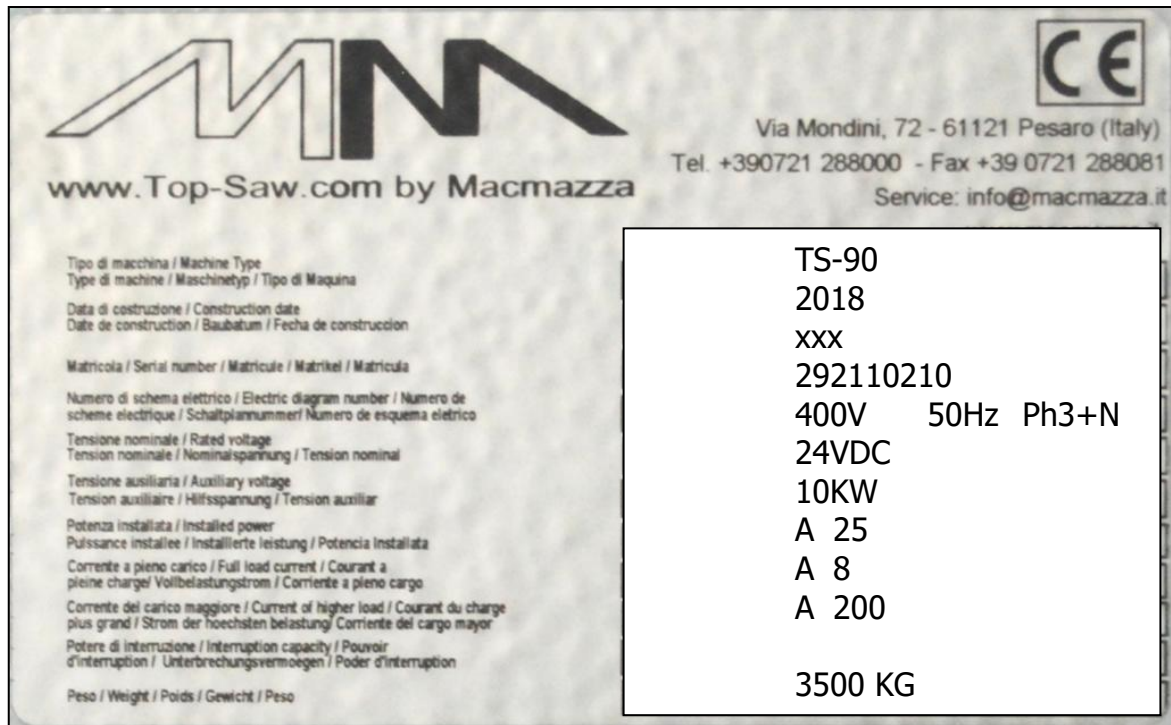
It's possible replace the spoiled plates, asking directly to the AFTER SALES DEPT. Specifying the relative code.

The manufacturer disclaims any liability for damages to persons or property following the non-observance of the above safety rules.



## TECHNICAL ASSISTANCE

On the electric board there is the identification plate of the machine.



When communicating with the zone dealer for any reason concerning to the machine, provide always this information:

model of the machine;

construction year

serial number;

a description of problem found

### How to take the data (input/output) from the machine through the software SEZ-

Check that date and hour in the PC are updated, then put the machine in the condition in which the problem/fault appears then:

1. Enter the Menu "Print"
2. Press the key "Save Machine State"
3. Insert a pen Drive USB" in one of p.c. plug
4. Press the key "Unload Machine State on USB"
5. Send the downloaded file to [info@macmazza.it](mailto:info@macmazza.it) or by fax +39/0721/288001

In this way a file inside the folder MACMAZZA is generated, having extension ".STA", which contains all the above described data to find out the problem.

This file must be sent to us by fax or e-mail along with the description of the corresponding problem/fault.

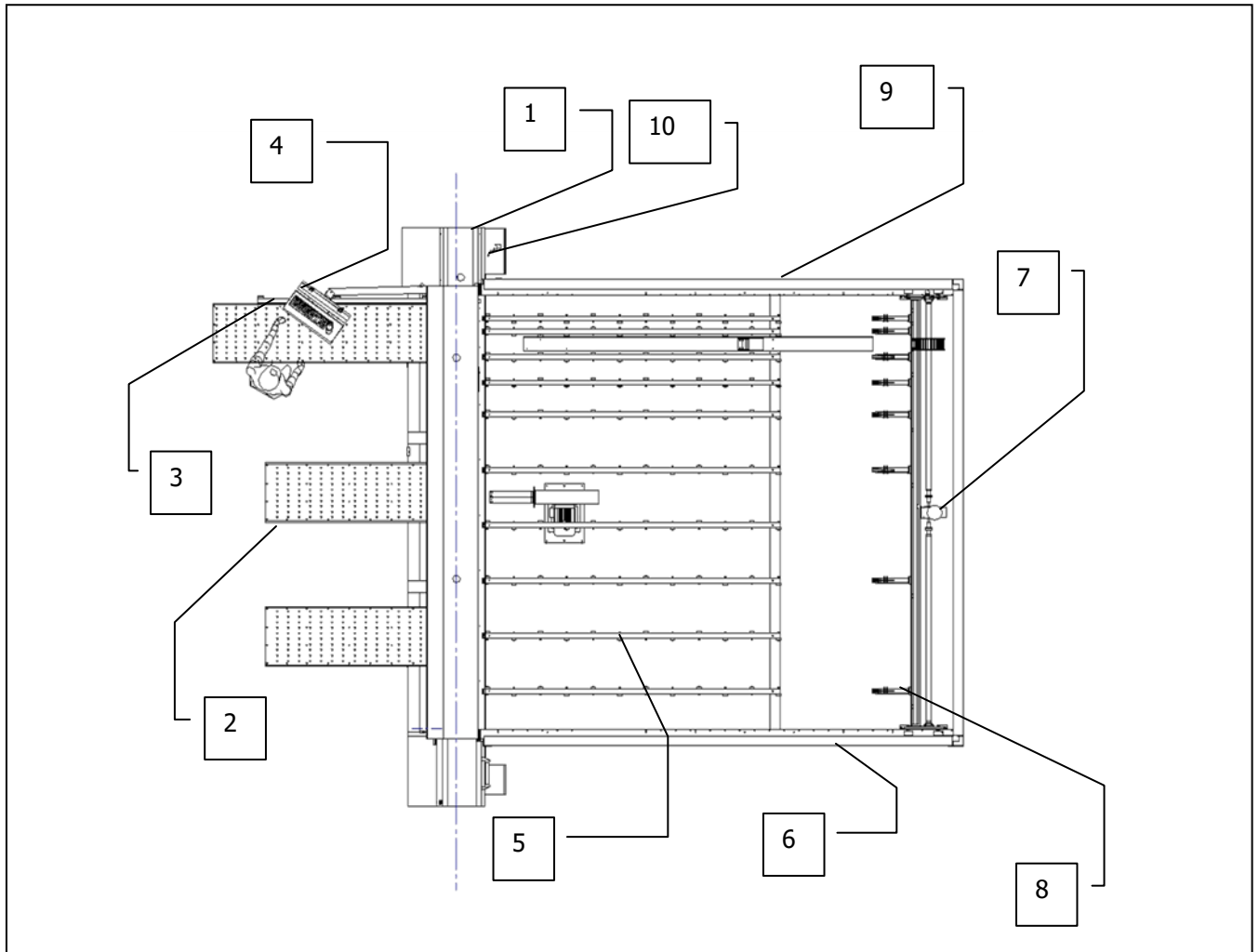
If you planning a Macmazza's remote connection be sure that the pc has a working internet connection. The bottom "TEAMVIEWER" icon must be shown as it appears here.



**CAUTION** Due to the continuous updates installation required by Windows operating system, we strongly suggest to connect the machine computer to internet very often. Infact, if you connect your computer to internet only after several months offline use, there will be a large quantity of data to download and install before you can proceed. resulting in a long waiting time.

## MACHINE DESCRIPTION

The machine can be divided in ten main parts:



1	Panel saw	6	Side support beams
2	Support benches downstream of cut	7	Positioning pusher
3	Side bench with squaring stops beams	8	Gripper group
4	Control Panel	9	Protective barriers
5	Support surface upstream of cut	10	Power Board

## TECHNICAL FEATURES

TOTAL WEIGHT (kg)	3500
MAX OVERALL LENGHT (mm)	7610
MAX OVERALL WIDTH (mm)	5860
MAX OVERALL HEIGHT (mm)	1650
SUPPLY VOLTAGE (V)	400
FREQUENCY (Hz)	50
MAX ABSORBED POWER (kW)	10
CUTTING LENGHT (mm)	4300
MAIN BLADE MOTOR CAPACITY (KW- HP)	9 KW -12,2 HP
MAIN BLADE ROTATION SPEED (RPM)	4300
MAIN BLADE DIAMETER (mm)	MAX- 320
SCORER BLADE ROTATION SPEED (RPM)	5800 RPM
SCORER BLADE DIAMETER (mm)	160
SAW CARRIAGE FORWARD SPEED (m/1')	0-30
SAW CARRIAGE RETURN SPEED (m/1')	30 - 50
CARRIAGE MOTOR DRIVE POWER (kW)	0.75
POSITIONING PUSHER SPEED (m/1')	25
POSITIONING THRUSTER MOTOR CAPACITY (kW)	1.2

PNEUMATIC GRIPPER ON PUSHER	7
WORKTABLES WITH BAKELITE	n.1 2200x600, n.2 1700x600
PNEUM. SYSTEM OPERATING PRESSURE (bar)	6 - 7
COMPRESSED AIR CONSUMPTION (NI/h)	3000
SUCTION INLETS	N. 3 d. 75mm / N. 1 d. 120mm
REQUIRED DUST SUCTION CAPACITY (m3/h)	2500
SUCTION PLANT DEPRESSION (kgf/m2)	1500
NOISE LEVEL (dBa)	< 85DBa
WORKING TEMPERATURE (°C)	0 - 40
RELATIVE ENVIRONMENTAL HUMIDITY	40 %



## SECTION A) HOW TO INSTALL

### A.1 TRANSPORT AND LIFTING



**WARNING:** Transport and lifting of all the elements making up this type of unit are delicate operations, to be performed exclusively by trained staff and in strict conformity with the instructions provided. For safe and easy transport, the unit should be divided up into its main components, which are the following (see Fig.):

- Panel saw (with front stops)
- Positioning pusher (complete with grippers)
- Pusher guide bars
- Support bench downstream of cut
- Support surfaces upstream of cut
- External guard netting

For most of these elements all the lifting and transport operations illustrated in the following can be carried out using a shunter of sufficient size , but the panel saw main body a crane system with ropes/chains is strongly recommended

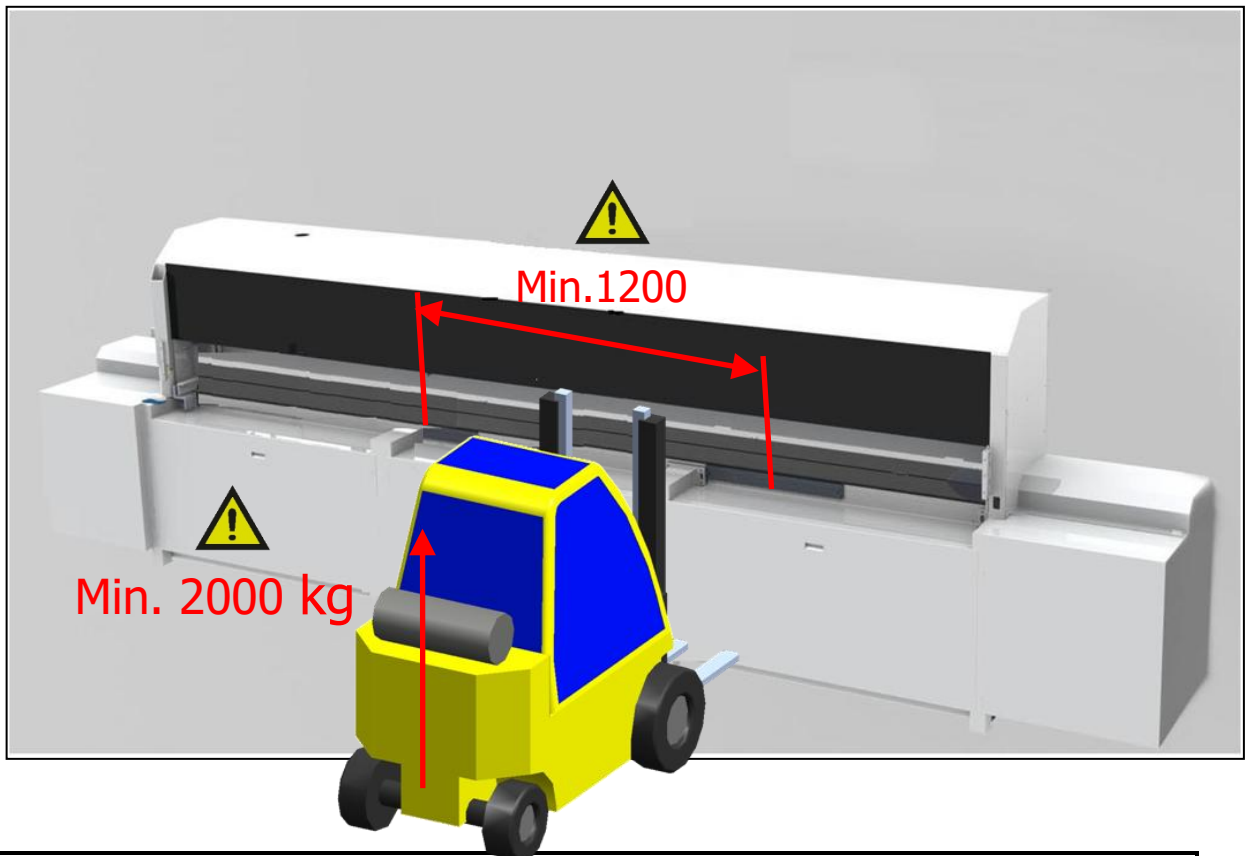
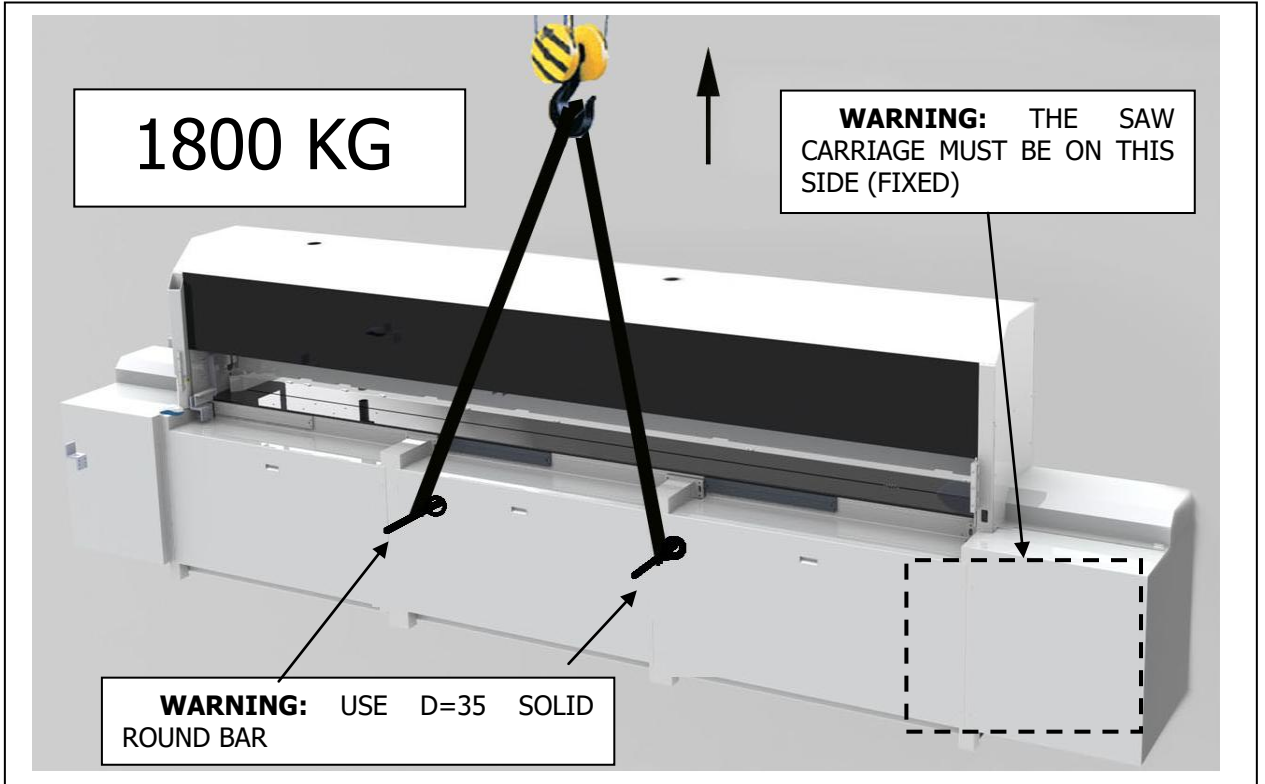
If the unit is to be stored, or if it has to undergo long periods of transport, these elements should be protected from rust by covering all unpainted surfaces with a layer of grease.



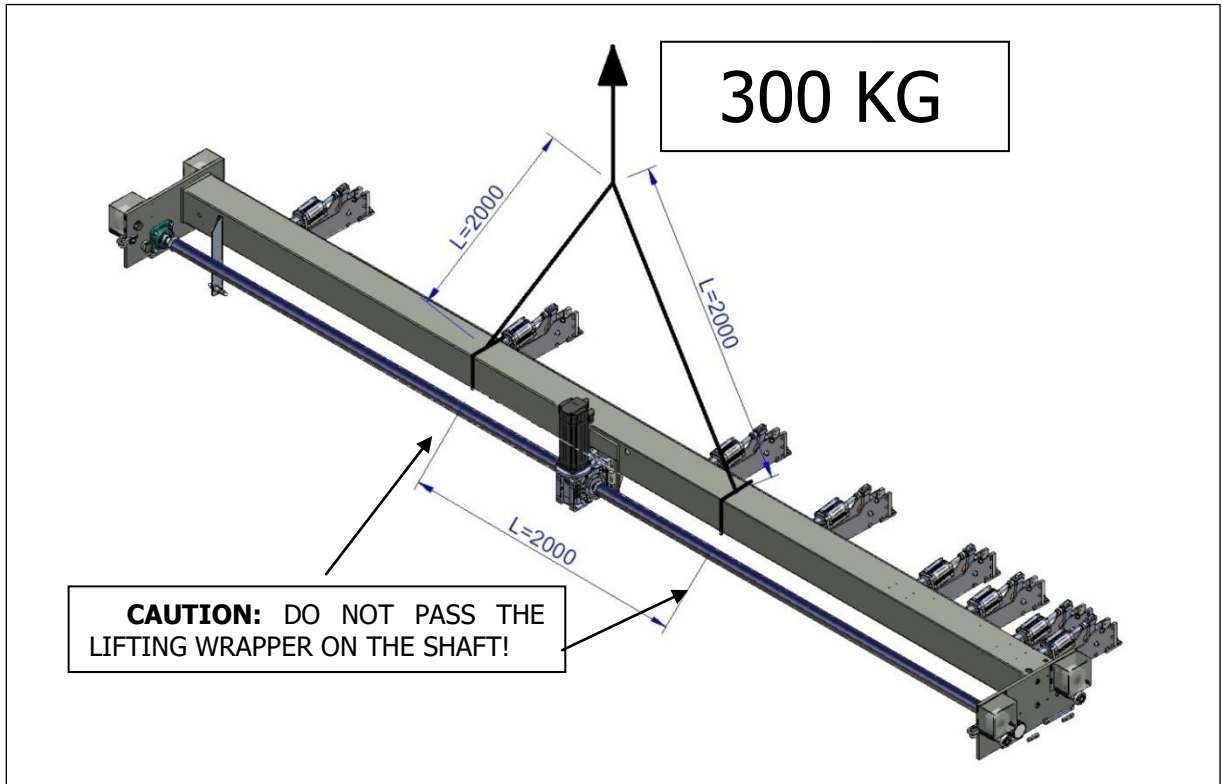
**CAUTION:** THE SAW CARRIAGE AND PUSHER GUIDE SHOULD BE DE-GREASE BEFORE THE MACHINE IS INSTALLED.



**WARNING:** MUST USE AT LEAST SOLID ROUND D=35 MM. LIFTING BARS

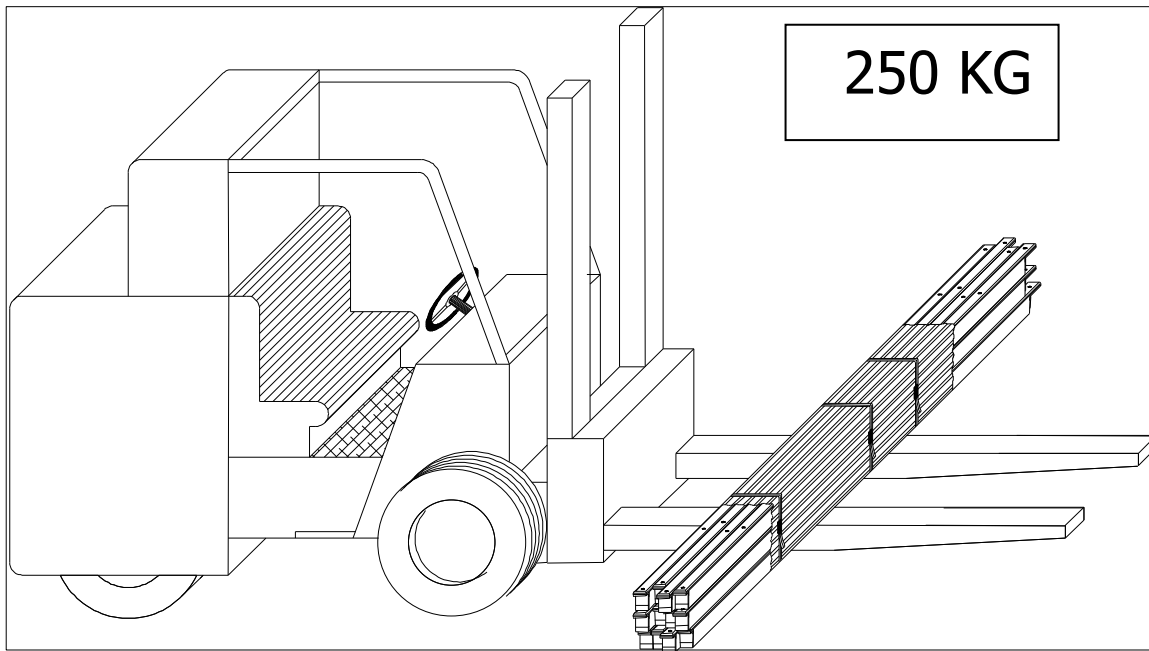


PUSHER

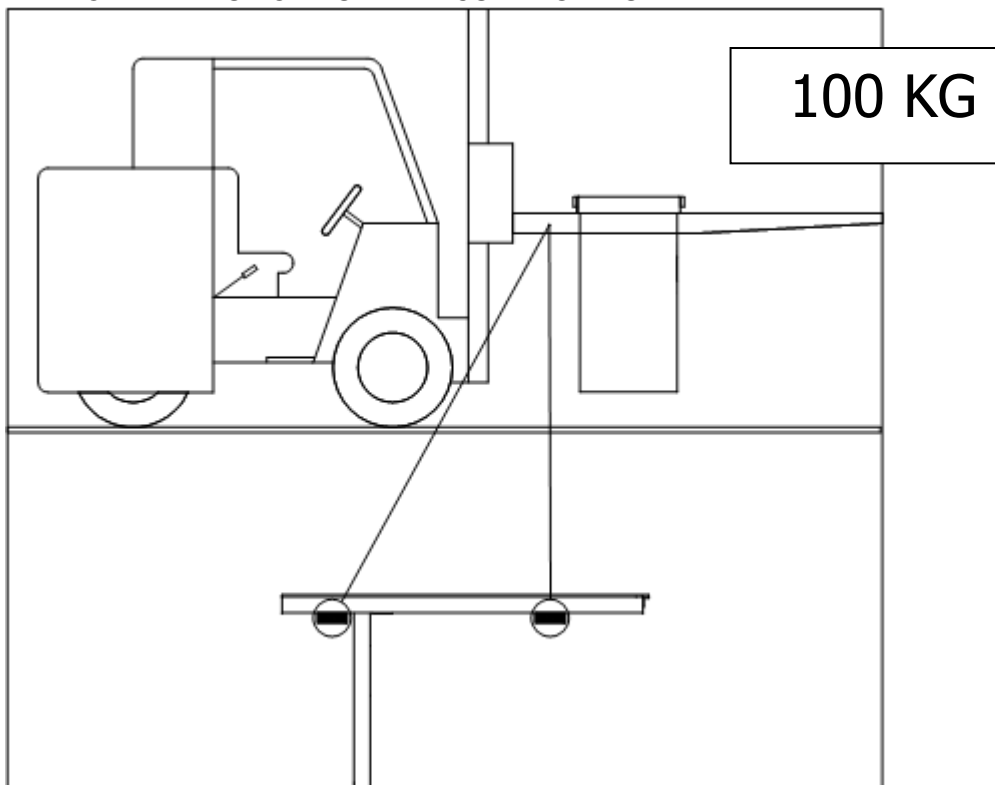




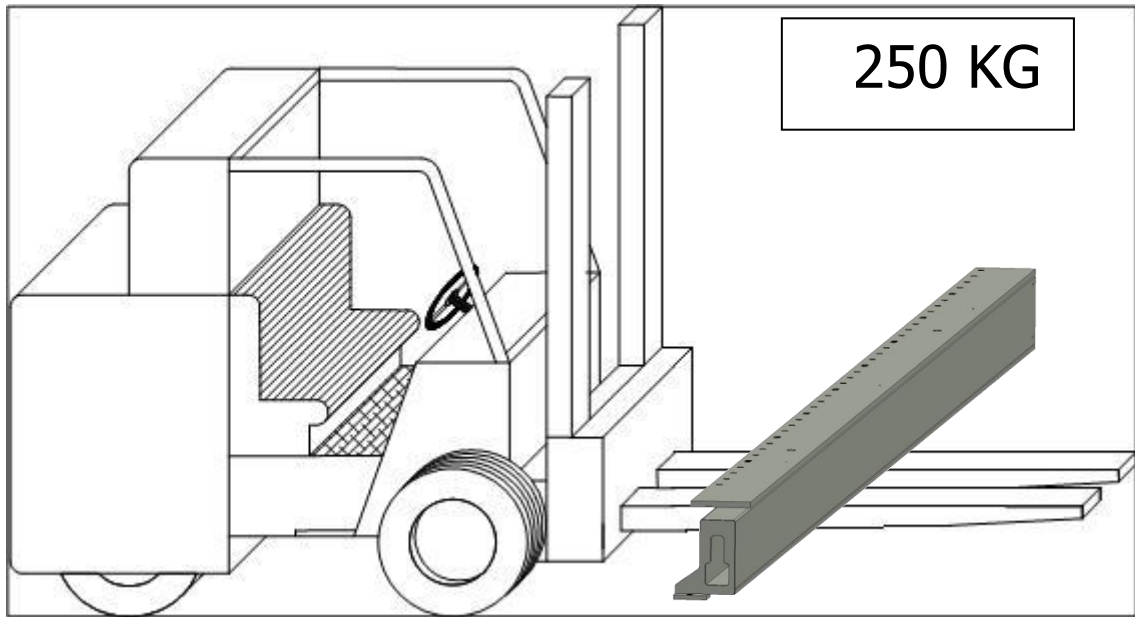
WORKTABLES UPSTREAM CUTTING AXIS



WORKTABLES DOWNSTREAM CUTTING AXIS

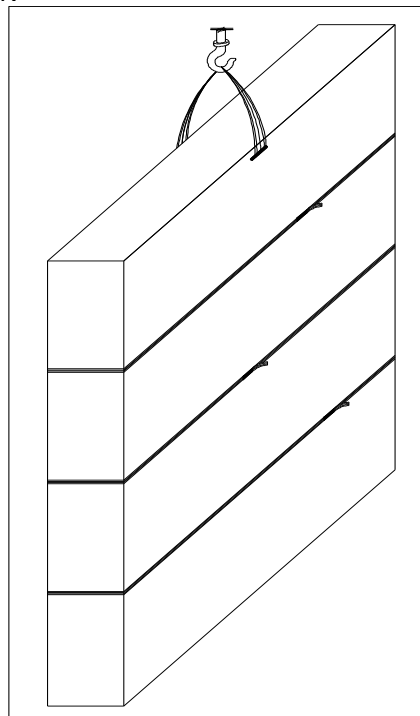


PUSHER GUIDE BEAMS



PERIMETRICAL PROTECTION

300 KG



## A.2 HOW TO INSTALL, TO LEVEL AND TO FIX TO THE FLOOR

### INSTALLATION:



**WARNING** install area has to respect following minimum dimensions referring the enclosed drawing "install area"

The installation sequence must be according the enclosed drawing "installation sequence"

1. Put in place the basement (check the leveling according to the following instruction)
2. Put on the side beams and the back bridge (including the back beam)
3. Check the side beams diagonals and distance (check the printed numbers on the beams themselves) Put on the rollers beams.(following the right order printed).
4. Put on the pusher: caution be sure to insert it perfectly parallel to the cutting line. make sure that the 2 pinions mesh the same tooth on both sides: in case of error re-extract the pusher and try again. Check the grippers level and inclination. If necessary adjust them following the instructions in C.9 GRIPPERS
5. Put on the front air-tables
6. Put on the computer and the side reference. fix the machine to the ground
7. put in the nets and cable covers.

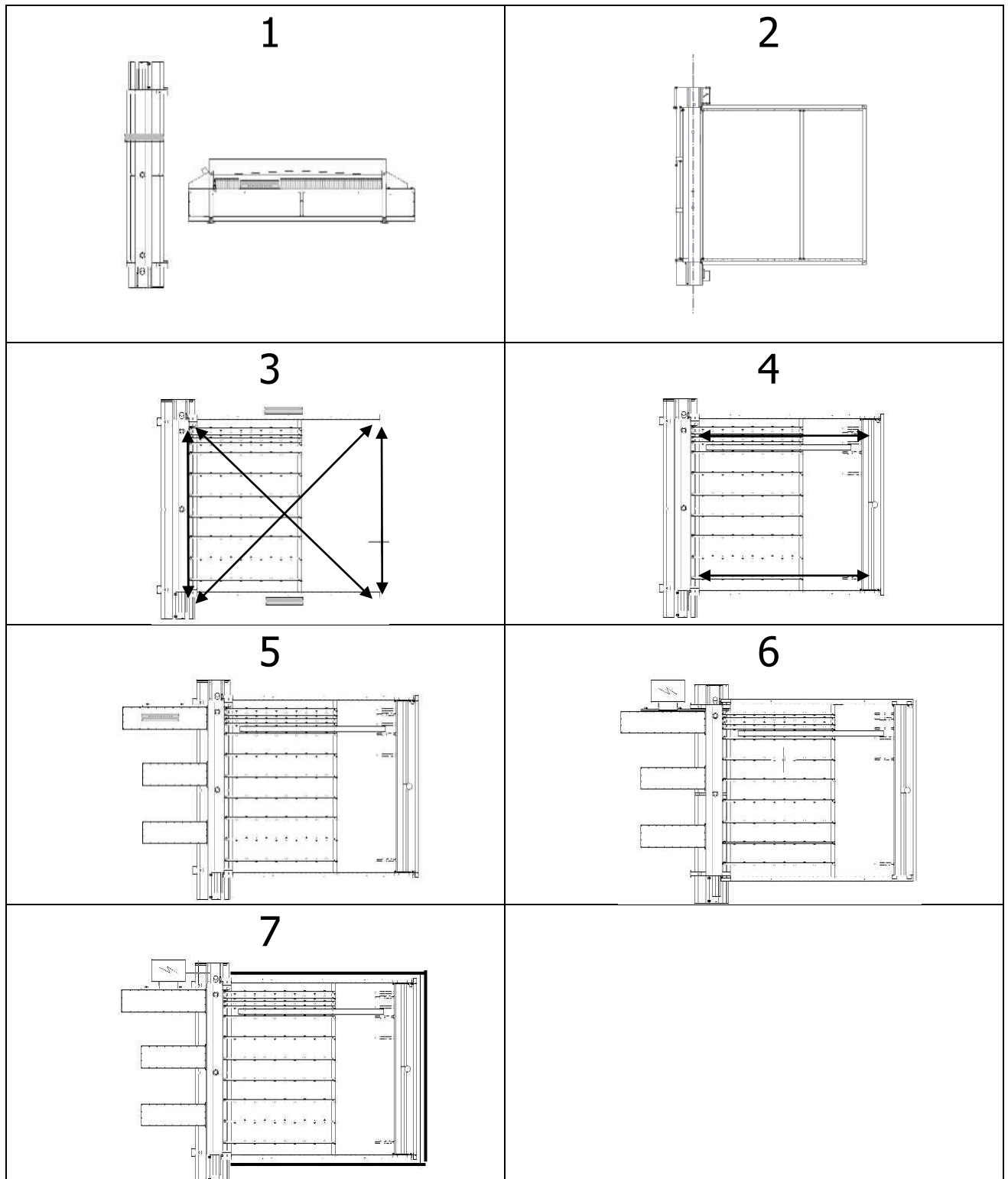
make the electrical / pneumatic / vacuum connection by following the instructions in Section A.5 CONNECTION TO THE PNEUMATIC SYSTEM AND TO THE PANEL BOARD A.6 DUST EXTRACTION follow very carefully the pusher beam axis set-up procedure in A.7 PUSHER BEAM SET-UP PROCEDURE

### Preliminary check:



**CAUTION:** when you turn on the power for the first time, check the right direction of rotation of the blades and the right rotation of the fan: in case of thermal protection triggered. slightly raise the threshold of intervention (normally set to 7.5 A)

### installing sequence



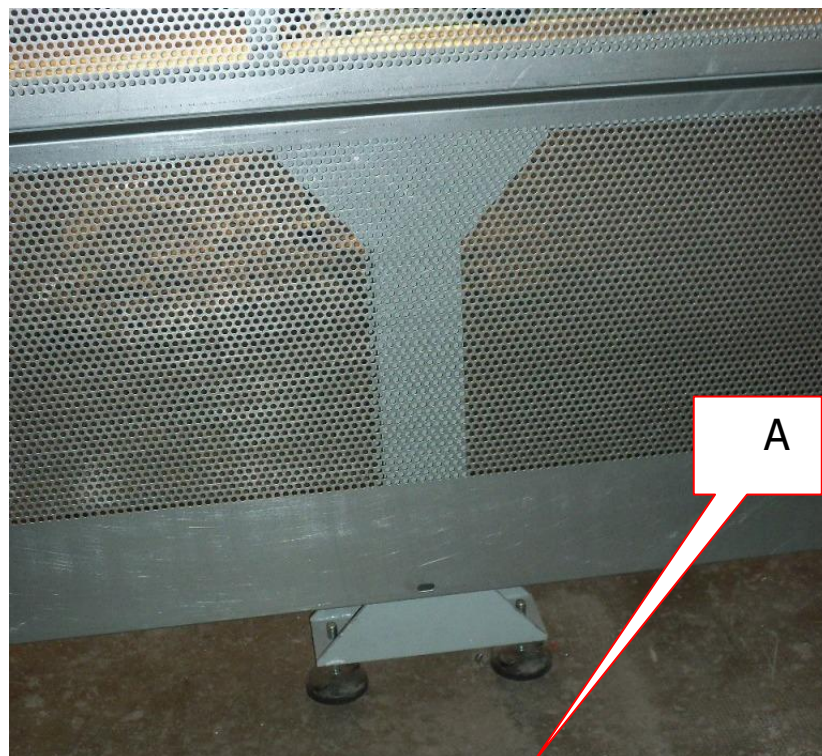
### LEVELLING AND TO FIXING:

Carry out the levelling of the machine and the beams regulating the screws fitted in the base of the machine which reach the floor (see pictures). Regulate the height of the parts of the machine through screws A .

### LEVELING AND FIXING



### UP-DOWN BEAM'S REGULATION

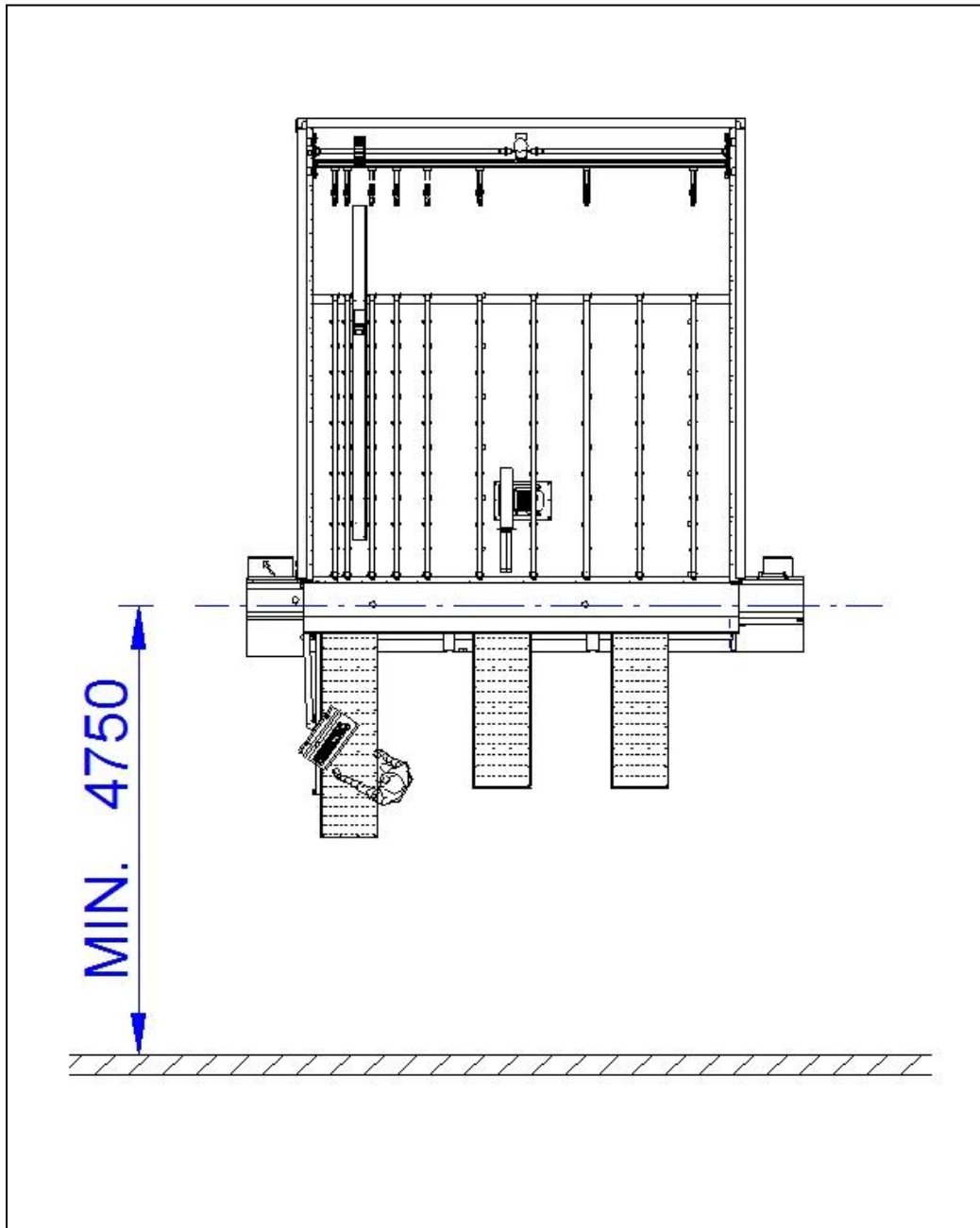


## INSTALLATION AREA



**WARNING:** INSTALL AREA HAS TO RESPECT FOLLOWING MINIMUM DIMENSION:

**DANGER OF CRUSHING!**



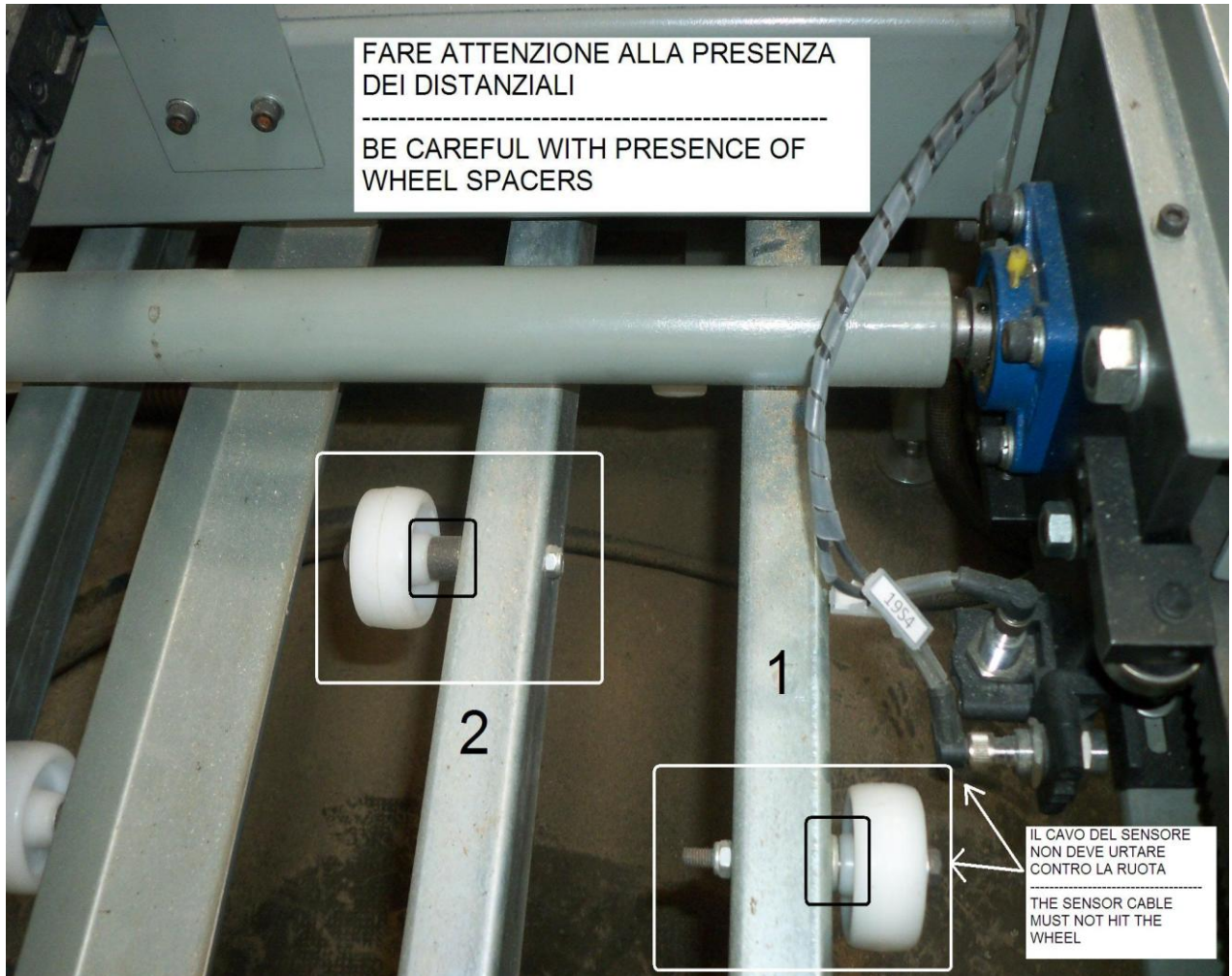
**WARNING:** INSTALL AREA MUST BE CLEAN. FREE OF TRIMCUTS, SAWDUST AND OTHER FLAMMABLE MATERIALS: CLEAN THE AREA EVERY DAY: **FIRE HAZARD!**

Control the lateral beams checking the diagonal and parallel measure referring to data printed on the beams themselves.





**CAUTION:** Assemble WHEELS TUBES observing the numerical order engraved on them. Make sure the first roller beam (side of square reference) does NOT have the wheel's spacers. The rollers MUST NOT touch the sensor cable!



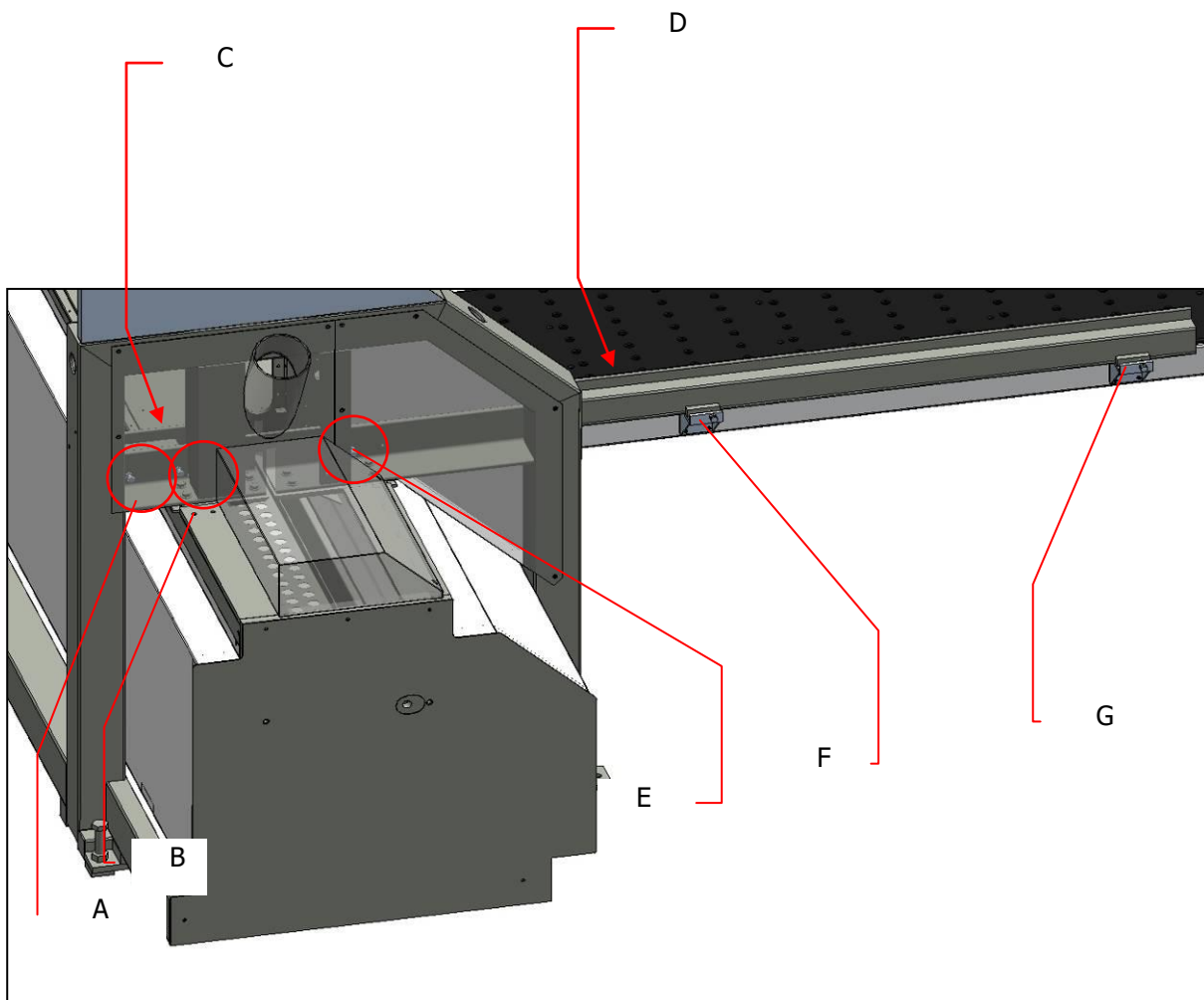
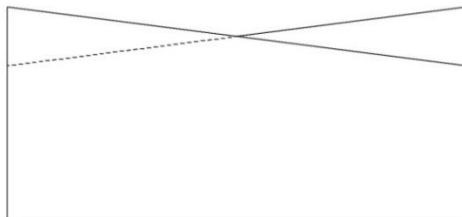


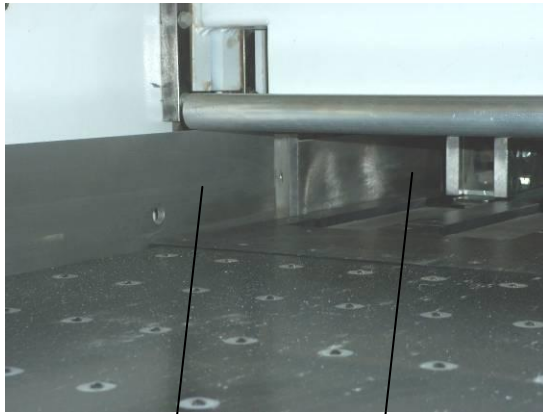
### A.3 HOW TO ADJUST THE SQUARE BETWEEN THE GUIDES AND THE CUT LINE

Cut a panel (about 1000x1000) to the half and put the two half parts one above the other. If the square is not perfectly at 90° with the cut line you have the same situation of the picture below (fig.1). Adjust the surface of the long square (D) turning the screws F and G, till you have eliminated the defect. After that make the short squared complanar (C) with (D) turning the screws A, and B. To access to the adjustments A, B and E F and G you may have to remove the upright's casing.

Control the square of (C) with the cutting test.

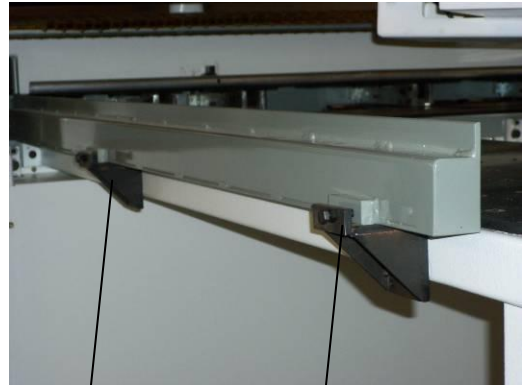
Fig.1





D

C



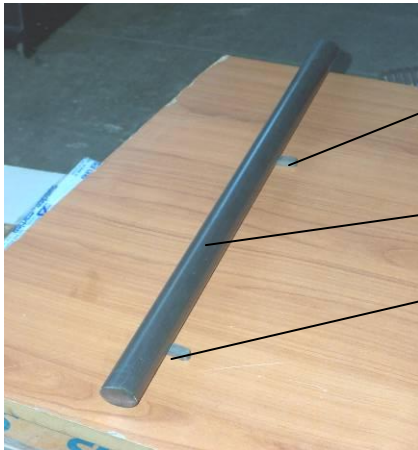
F



G

ALIGN!

## A.4 MACHINE FINE LEVELLING



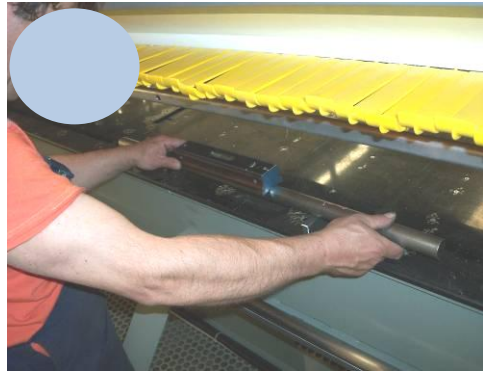
PRECISION THICKNESS

REFERENCE BAR (OUR SUPPLY)

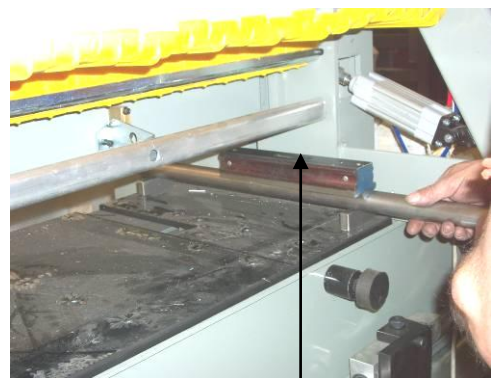
PRECISION THICKNESS

CHECK LONGITUDINAL LEVEL

CHECK TRASVERSAL LEVEL



CHECK LEFT SHOULDER

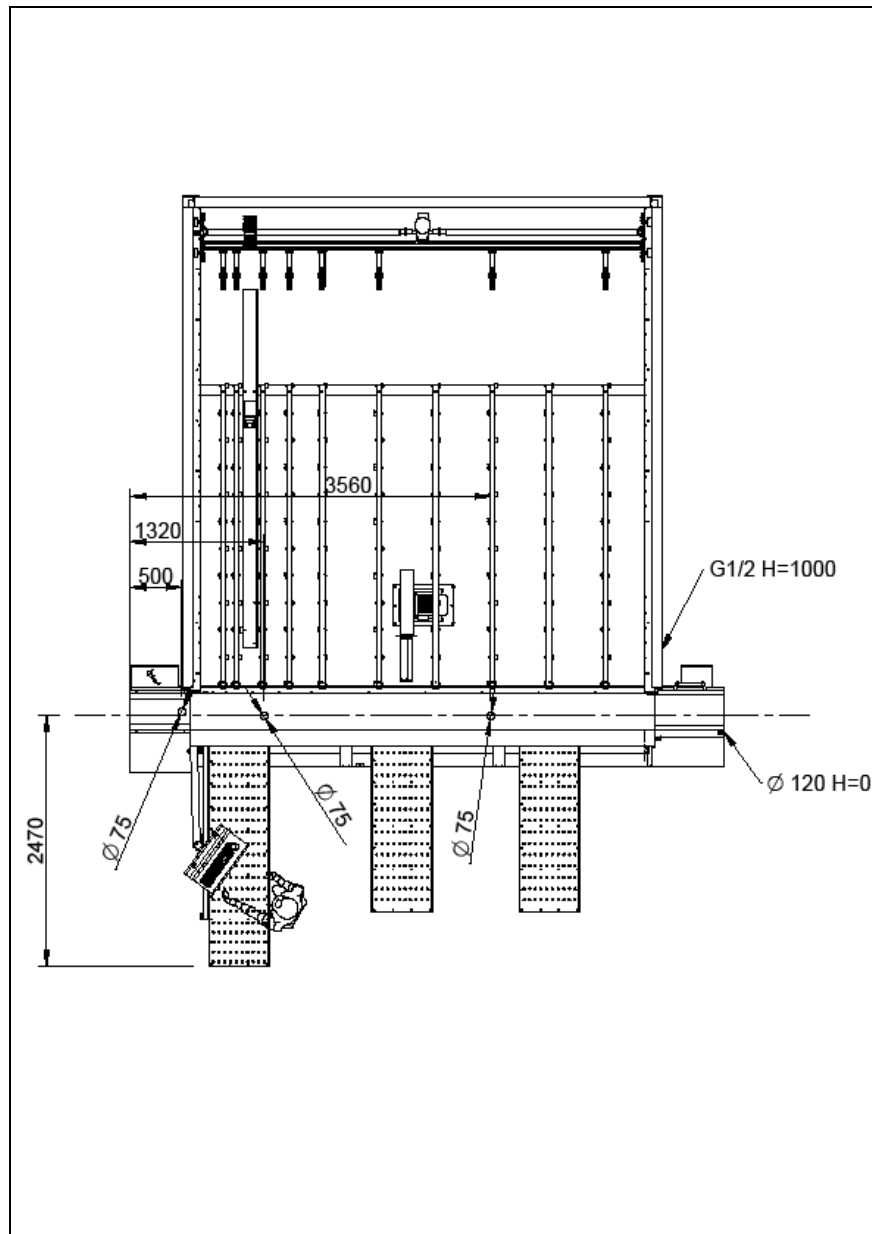


CHECK RIGHT SHOULDER

## A.5 CONNECTION TO THE PNEUMATIC SYSTEM AND TO THE PANEL BOARD

The plant requires an electric power supply and a pneumatic power supply. Specific connection points are therefore provided, with indications of the size of connection wires and pipes to be used, which should be followed by the Client when connecting up:

CROSS-SECTION OF ELECTRIC POWER CABLES	10 mm <sup>2</sup>
N° CONDUCTORS + NEUTRAL + EARTH	3+1+1
DIAMETER PNEUMATIC SUPPLY PIPE (input G=1/2)	15mm



### WARNING :

upstream of the power supply line it is advisable to install a fused switch to protect against short-circuiting so as to cut the plant off completely from the power supply.



**CAUTION:** In order to avoid electromagnetic interference control the ground circuit according to the following GROUND CHECK PROCEDURE

Unplug machine electrical cabinet

Measure the electrical resistance between the wires R S T and the ground cable using an appropriate instrument. The electrical resistance must be between 0,5 MEGA OHM up to 1 MEGA OHM.

Check the electric potential difference between the ground cable and the neutral cable: It should be very little: very few Volts (the ideal measure should be "0" (zero) VOLTS). This measure should be taken using a very good quality instrument in Volts scale. Check the current using an ammeter:  
Also in this case the ideal quote should be "0" (zero) Ampere, or very few mA at max.

#### **FIG.A - POSITION OF COMMAND PANELS AND JUNCTION BOXES**

Electric power cabinet, with connection to electric power supply A

Control board B

Positioning pusher group junction box E

Saw carriage group junction box C

#### **FIG.B - POINTS OF ADJUSTMENT FOR PNEUMATIC DEVICES**

POS. X - CONDITIONING GROUP comprising :

pneumatic filter with manual discharge of condensation

pressure adjuster with discharge

pressure gauge

adjustable pressure switch with electric contact

plant cut-off / discharge valve

POS. Y - ALIGNER REGULATION GROUP comprising :

"ALIGNER FORWARD" pressure adjuster

pressure gauge

"ALIGNER BACK" pressure adjuster

pressure gauge

POS. Z "PANEL PRESSURE BEAM DOWN" pressure adjuster

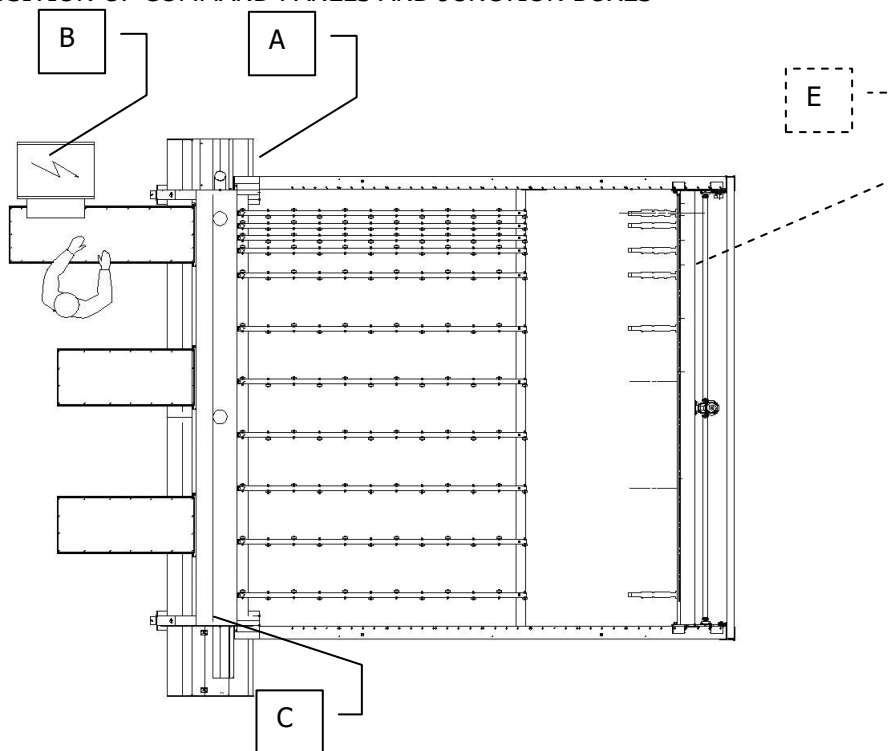
pressure gauge

POS. W Pneumatic board: it contains the pneumatic valves group, pressure regulator for "CLAMP CLOSING", flux regulators for: main blade up-down movement, scorer blade up-down movement, and safety flaps open-close movement.

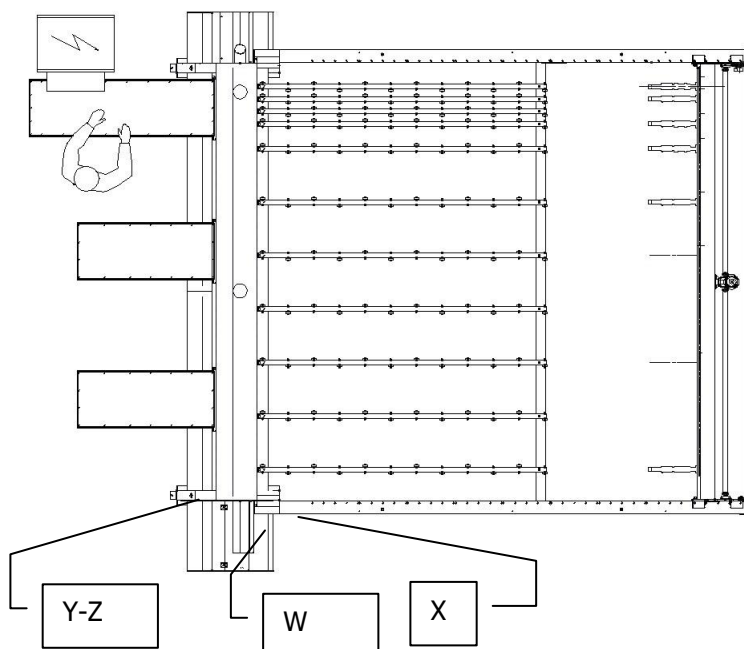
The disposition of the devices described in the context of the groups is visible in the following annexes

## ANEX 1

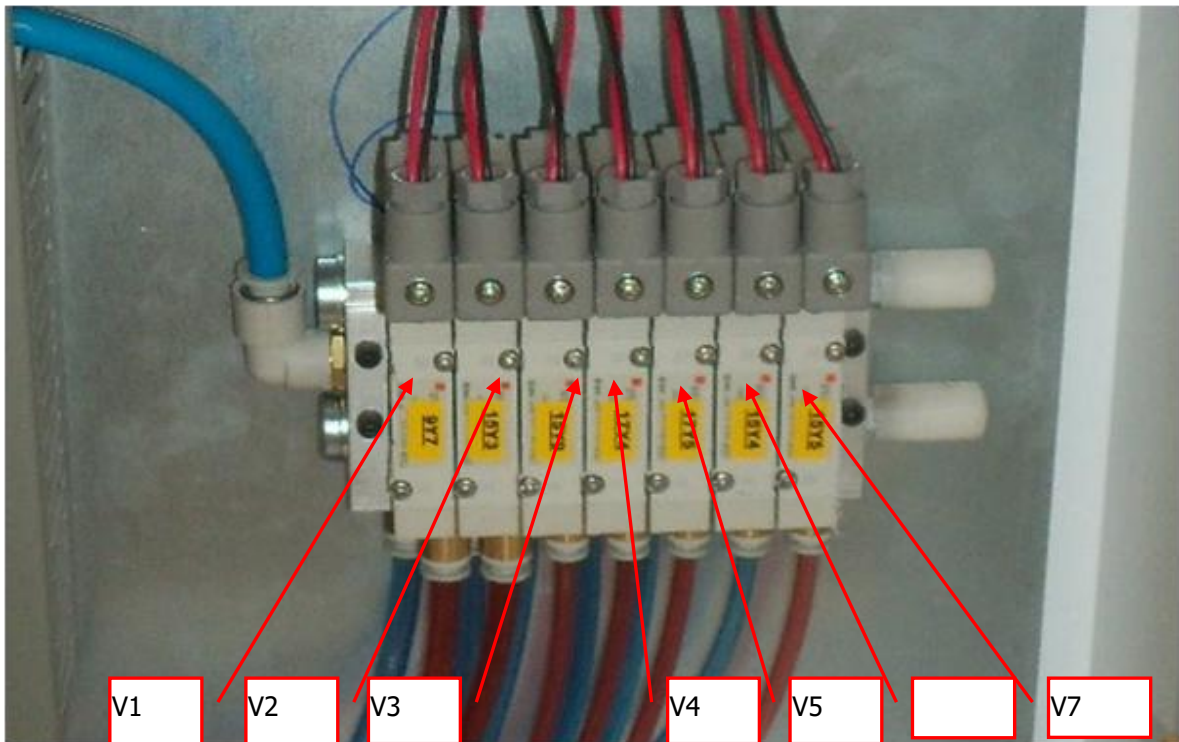
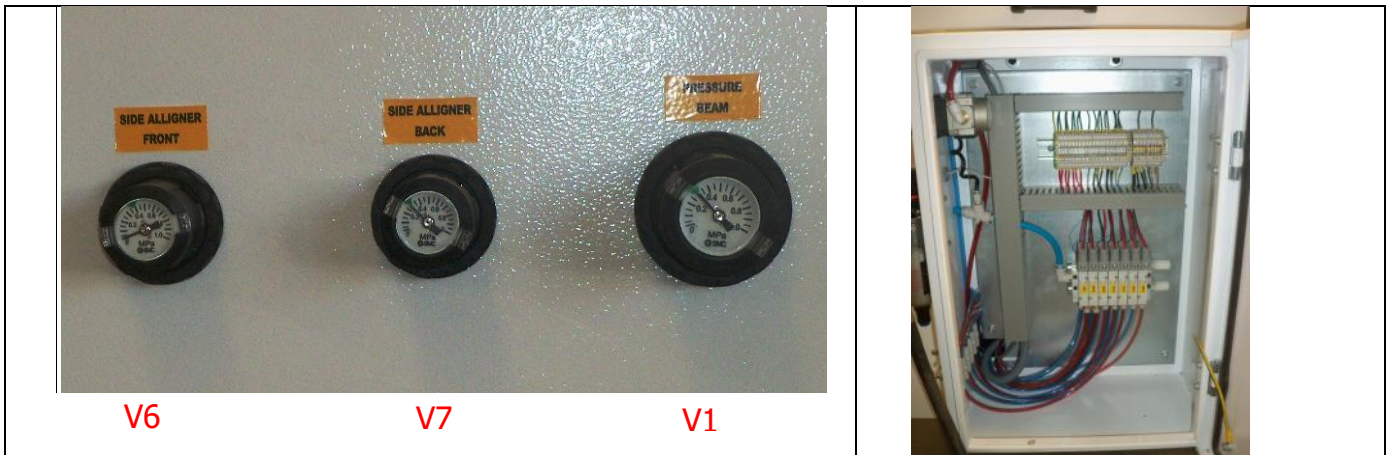
### A POSITION OF COMMAND PANELS AND JUNCTION BOXES



### B PNEUMATIC DEVICES ADJUSTMENT POINTS



(W-Y-Z) PNEUMATIC DEVICES INSIDE PRESSURE BOARD



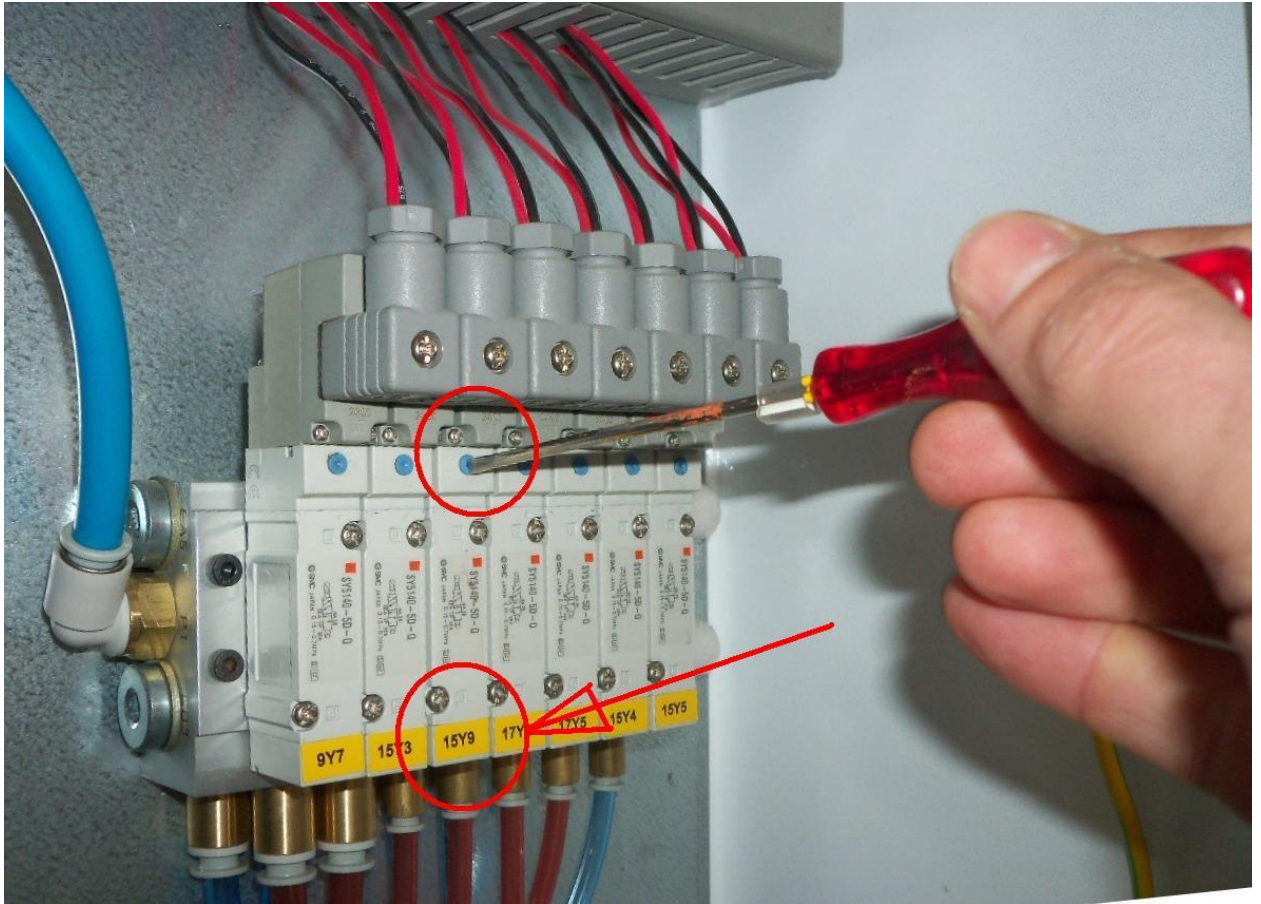


Rif.	Description	Value(*)
V1	"Up" and "Down" pressure beam in-line valve	-4 bar
V2	"Open" "Close" grippers in-line valve	-
V3	Finger Protection system in-line valve	-
V4	"Up" and "down" scorer blade in-line valve	-
V5	"Up" and "down" main blade in-line valve	-
V6	"Forward" aligner on cut line flow regulator and manometer	-4.5 bar
V7	"Reward" aligner on cut line flow regulator and manometer	4 bar

*(\*) Suggested value (normally imposed during assembly in factory)*

### VALVE MANUAL OPERATION:

It's possible, for service's operations, to operate any single valve using a screw driver (see picture). The electric code is written on the label. (see arrow). Using the code you can check the electric diagram for further reference.

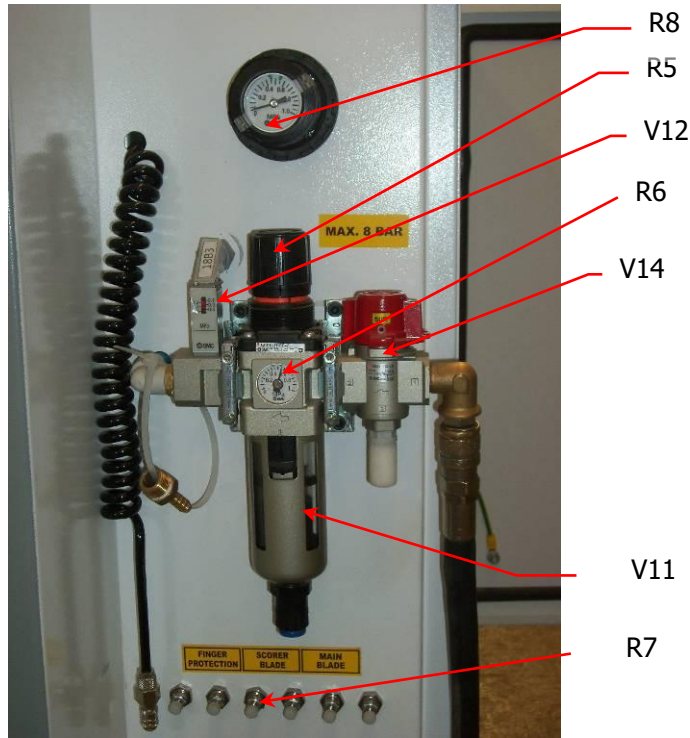


**WARNING:** Even if the air supply tube is disconnected, a few pneumatic zone should be still in pressure. To discharge all the compressed air, manually operate all the valves before operate any maintenance activity

(X) CONDITIONING GROUP (see chapt.A.5 CONNECTION TO THE PNEUMATIC SYSTEM AND TO THE PANEL BOARD)



**CAUTION :** compressed air supply: the air must NOT be lubricated and dry (free of moisture).



Rif.	Description	Valore (*)
V11	Pneumatic filter with manual discharge of condensation	-
V12	Adjustable pressure switch with electric contact	-
V14	Plant air manual discharge valve	-
R5	Pressure adjuster with discharge	$\cong 6\div 7$ bar
R6	Inlet Pressure gauge	-
R7	Flux regulators	-
R8	Gripper's clamping force regulator	$\cong 3\div 7$ bar

(\*) Suggested value (normally imposed during assembly in factory)

## A.6 DUST EXTRACTION

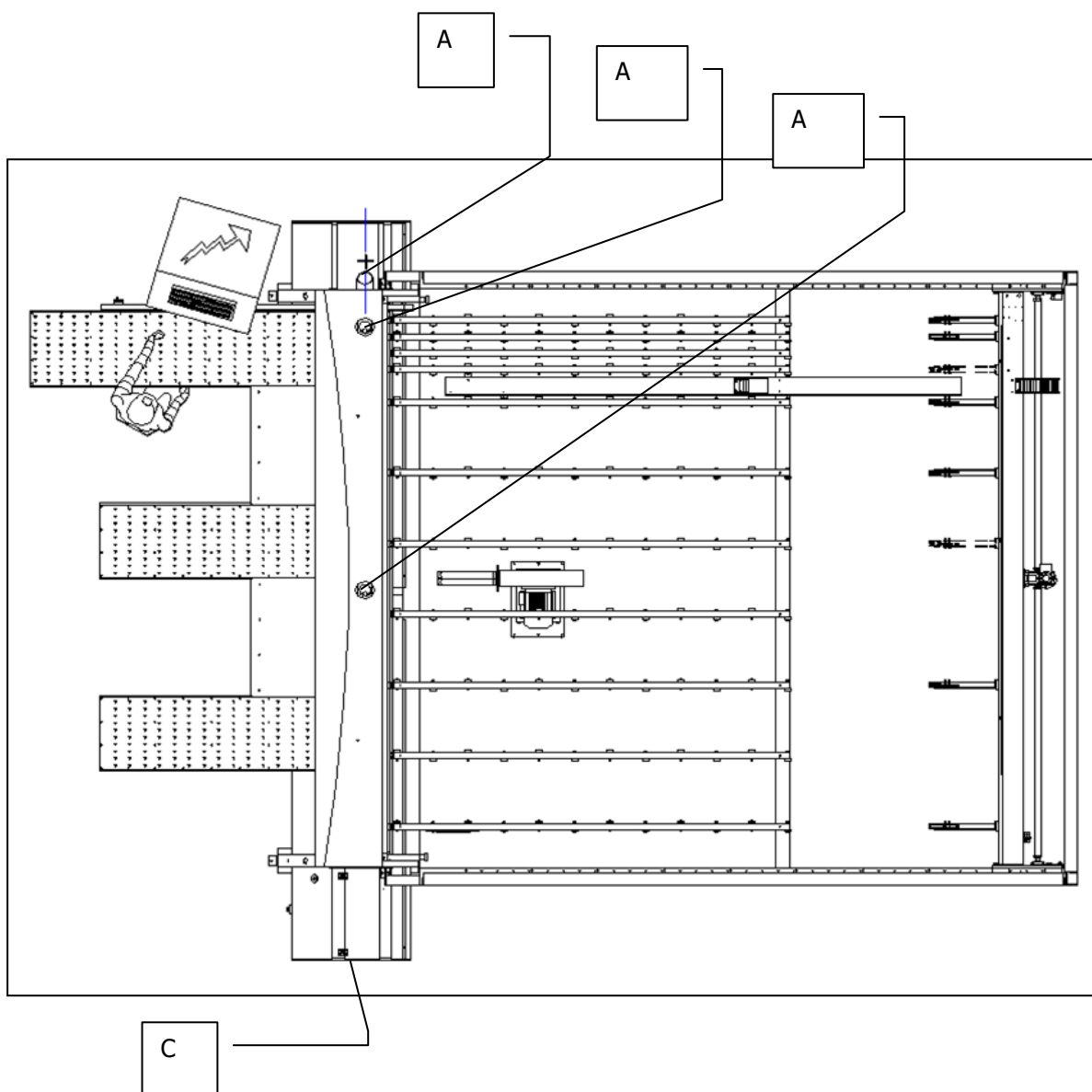
The machine has n. 4 points of chips suction to be connected to the suction plant as indicated and disposed as in the figure.

For the air consumption and the depression required to the suction plant, You have to refer to the data quoted in the paragraph "B.6. Advice on how to run the panel saw".



**WARNING:** Dusts and chips produced by the blades cutting can cause fires or skin/breath diseases. At every ignition of the machine, the suction plant has to activate. For this end, it is advisable to apply to the machine some devices usually sold that activate the suction system at every starting.

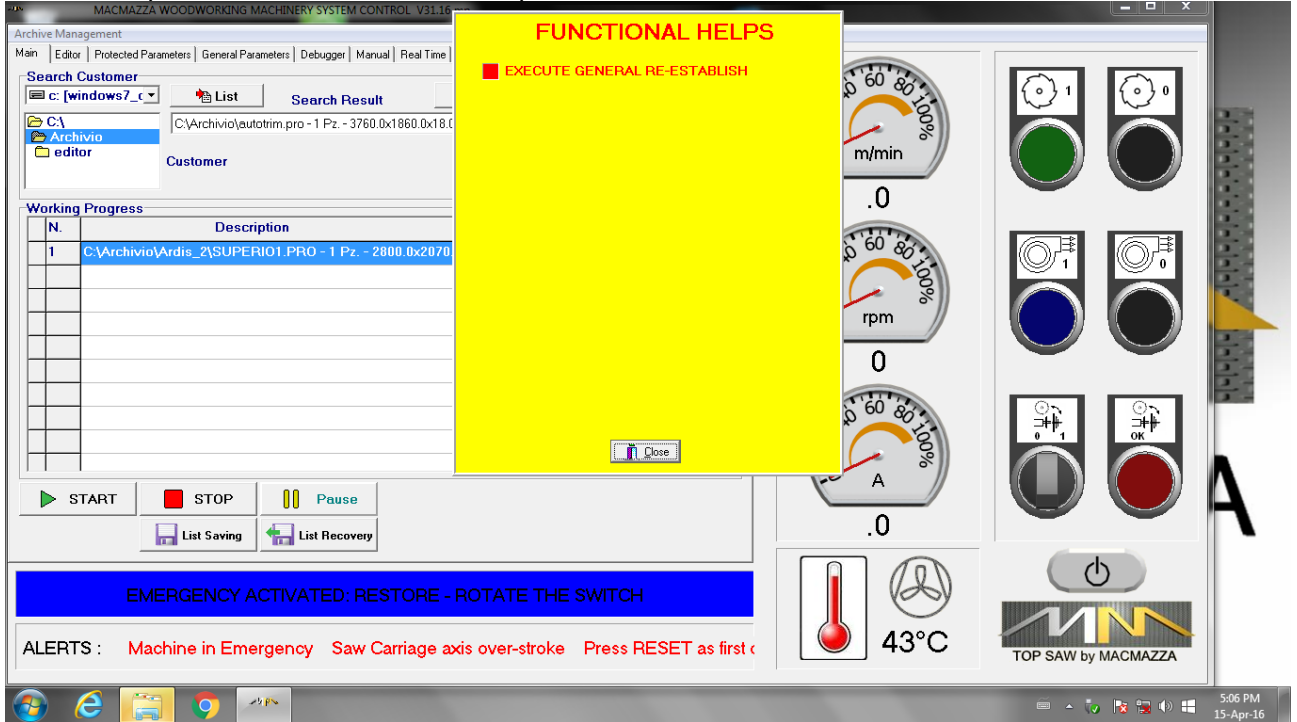
POSITION	PRESSURE BEAM	PANEL SAW (SAW CARRIAGE)
∅ (mm)	3 x 75mm (A)	120mm (C)



## A.7 **PUSHER BEAM SET-UP PROCEDURE**

After the saw beam machine is assembled it is necessary, before the first use, to reset the pusher beam axis.

Turn on the power. follow the functional help for first axis calibration.



**FUNCTIONAL HELPS**

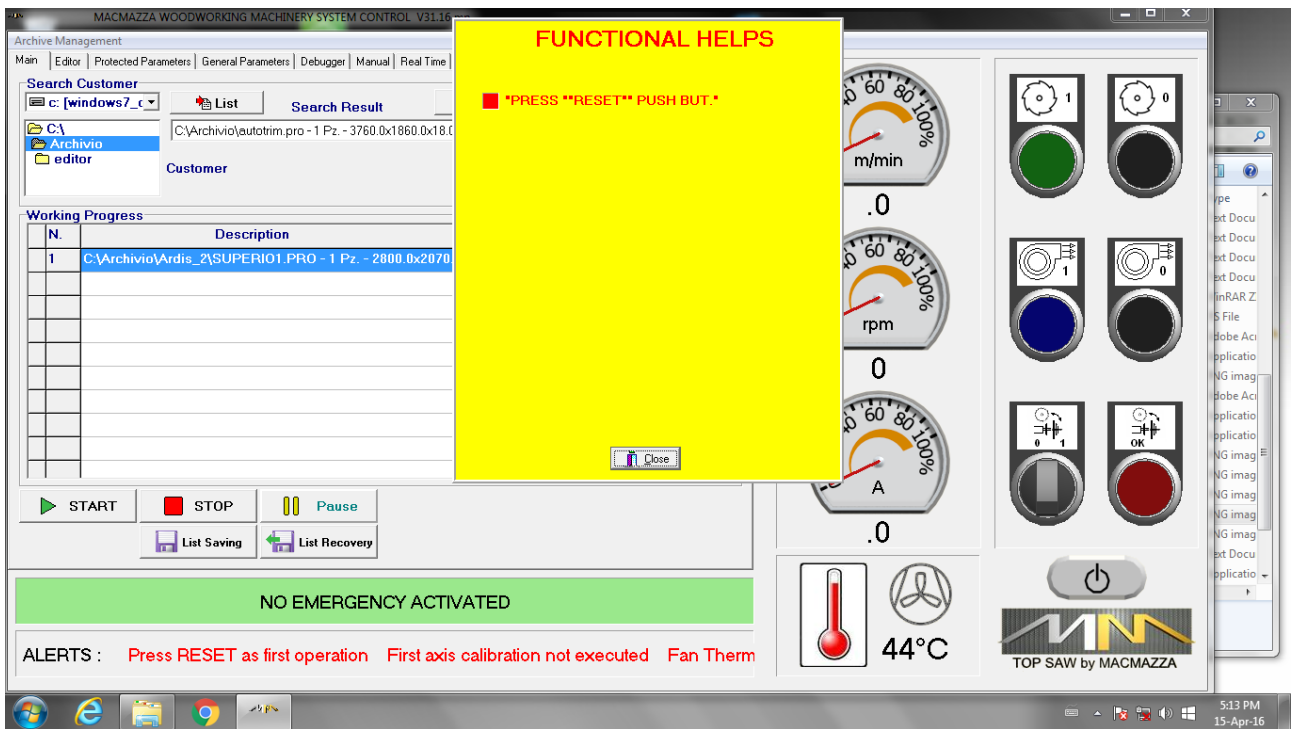
- EXECUTE GENERAL RE-ESTABLISH

EMERGENCY ACTIVATED: RESTORE - ROTATE THE SWITCH

ALERTS : Machine in Emergency Saw Carriage axis over-stroke Press RESET as first c

43°C

TOP SAW by MACMAZZA



**FUNCTIONAL HELPS**

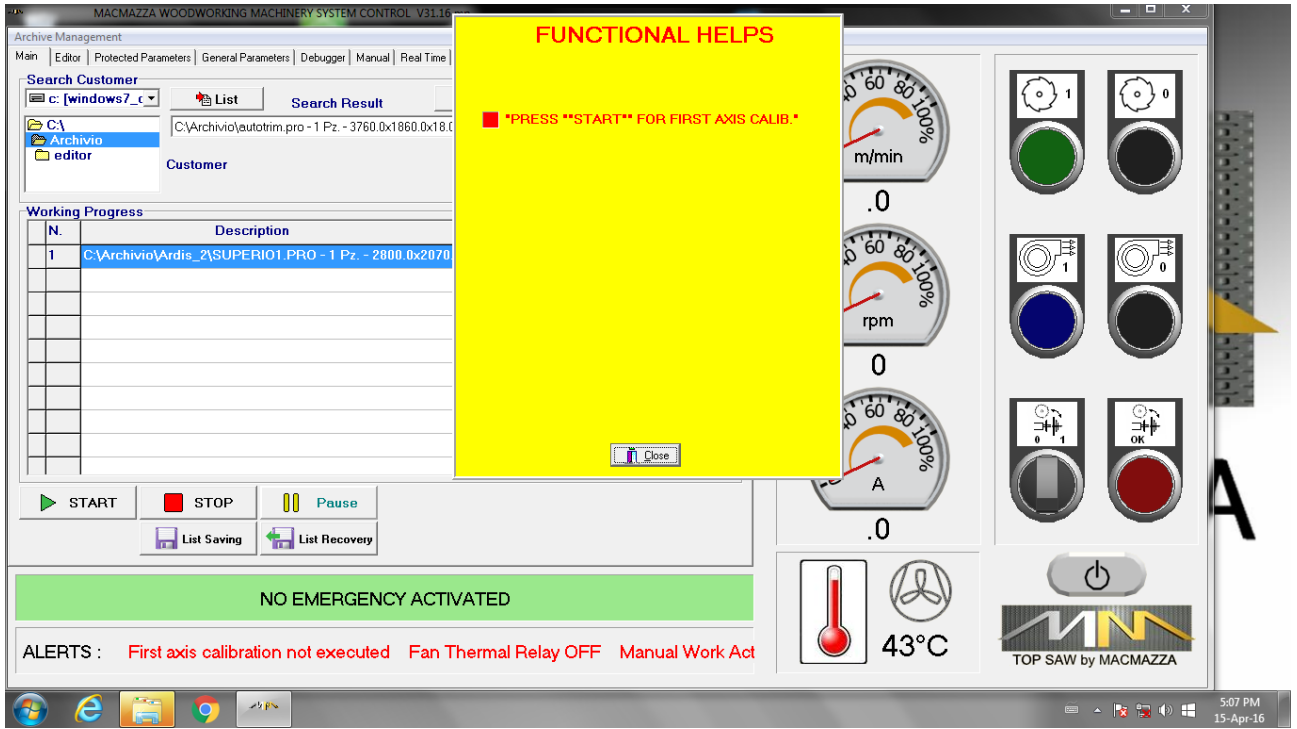
- \*PRESS \*\*RESET\*\* PUSH BUT.\*

NO EMERGENCY ACTIVATED

ALERTS : Press RESET as first operation First axis calibration not executed Fan Therm

44°C

TOP SAW by MACMAZZA



**FUNCTIONAL HELPS**

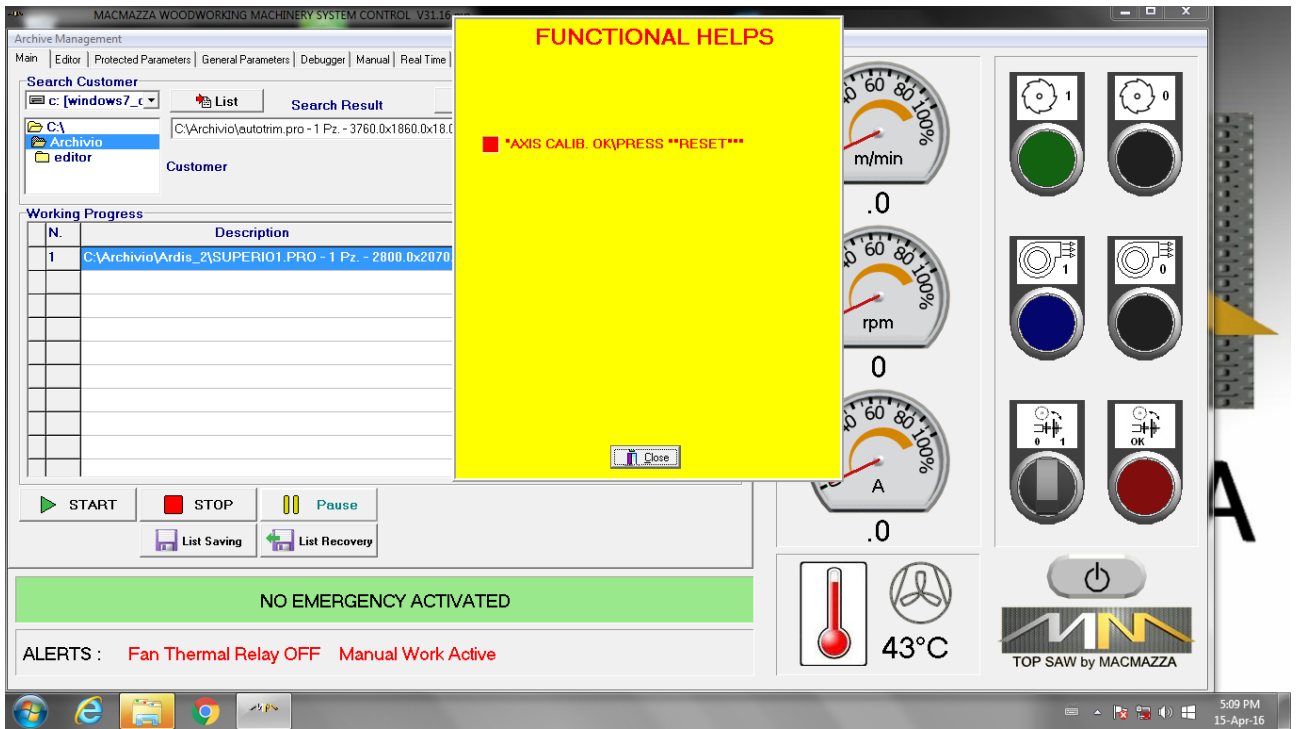
■ \*PRESS \*\*START\*\* FOR FIRST AXIS CALIB.\*

NO EMERGENCY ACTIVATED

ALERTS : First axis calibration not executed Fan Thermal Relay OFF Manual Work Act

43°C

TOP SAW by MACMAZZA



**FUNCTIONAL HELPS**

■ \*AXIS CALIB. OKPRESS \*\*RESET\*\*

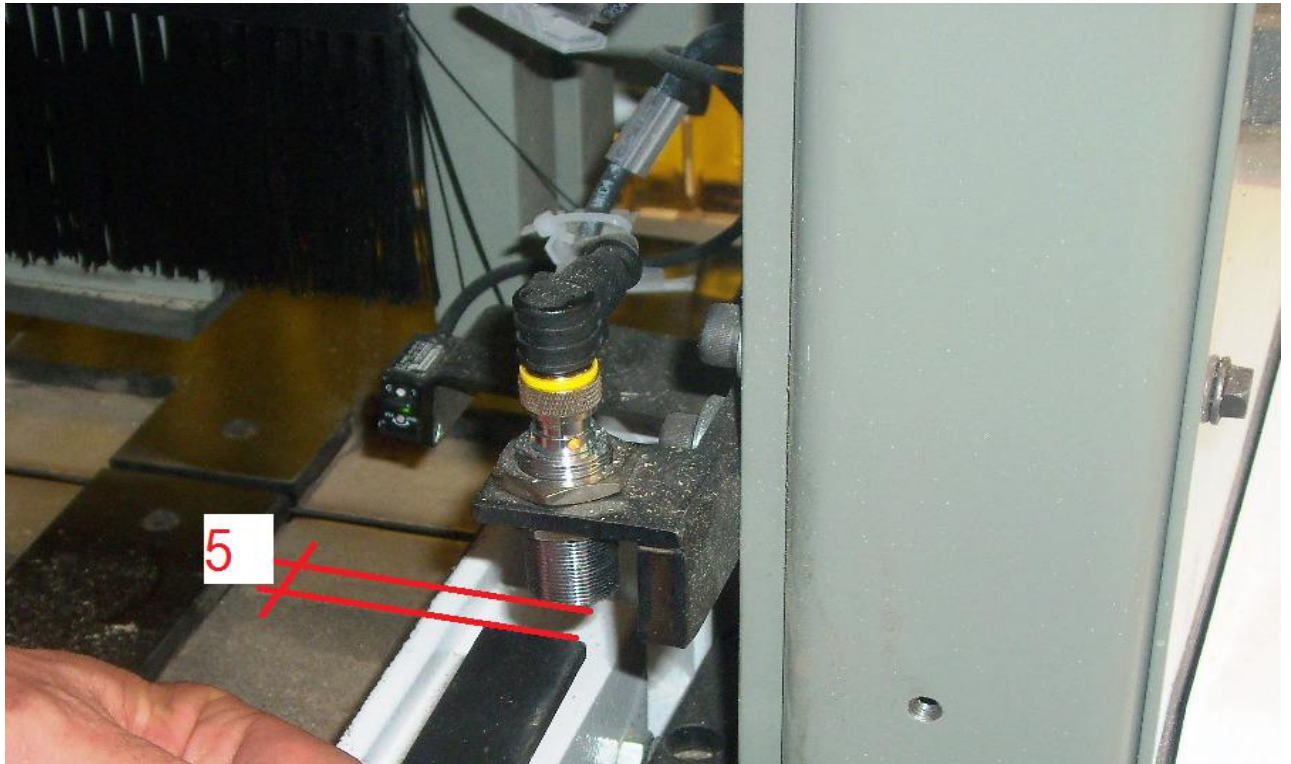
NO EMERGENCY ACTIVATED

ALERTS : Fan Thermal Relay OFF Manual Work Active

43°C

TOP SAW by MACMAZZA

When axis calibration is finished measure the distance between the zero sensor on the basement and the cam on the pusher: the distance must be APPROX 5 mm.



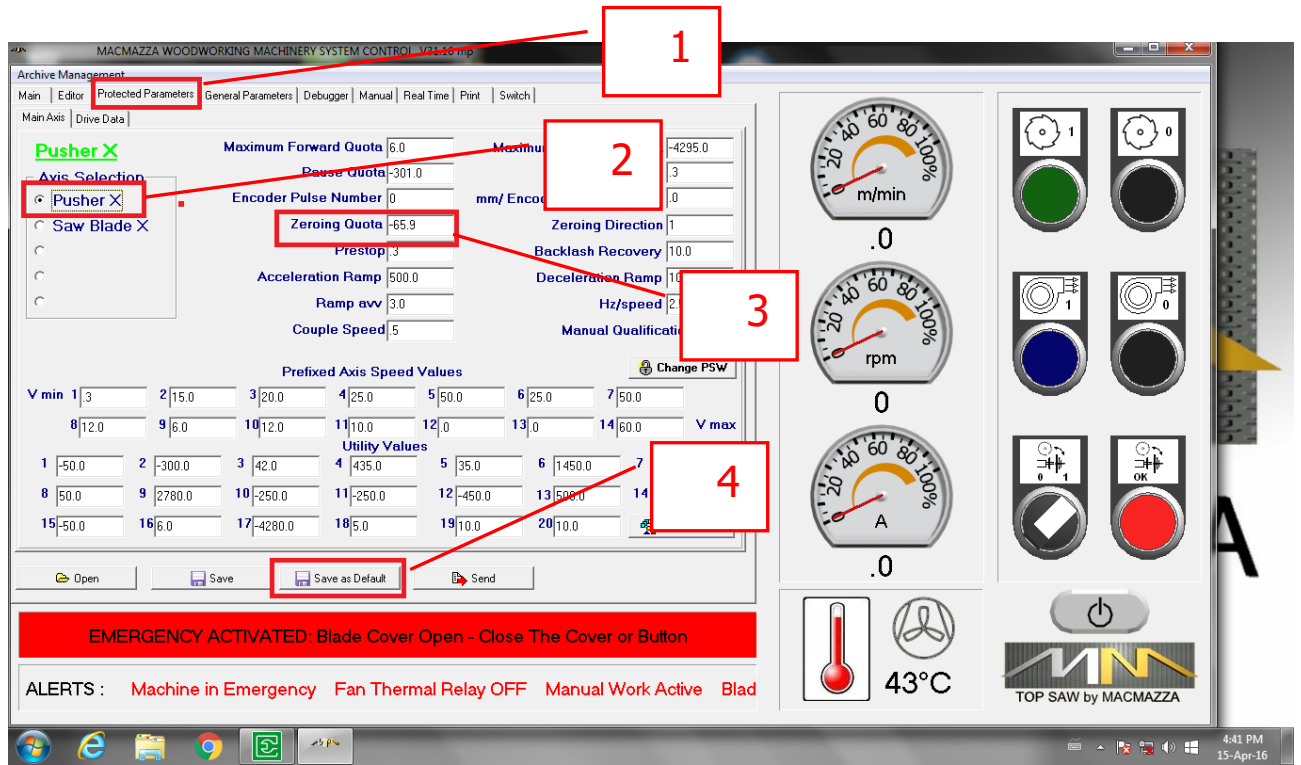
If the quota is less than 4 mm. or more than 6 correct the value adjusting a little bit the zero sensor position



restart the pusher beam reset. until you don't achieve a value around 5 mm.



x cut a testing panel of any dimension: (ex. 500 mm.)  
 measure the cutted panel. Suppose that the true measure is 503 mm.



access to protected parameters: CORRECT the parameter Zeroing Quota in this way:

programed measure -true measure - + zeroing Quota= New zeroing Quota

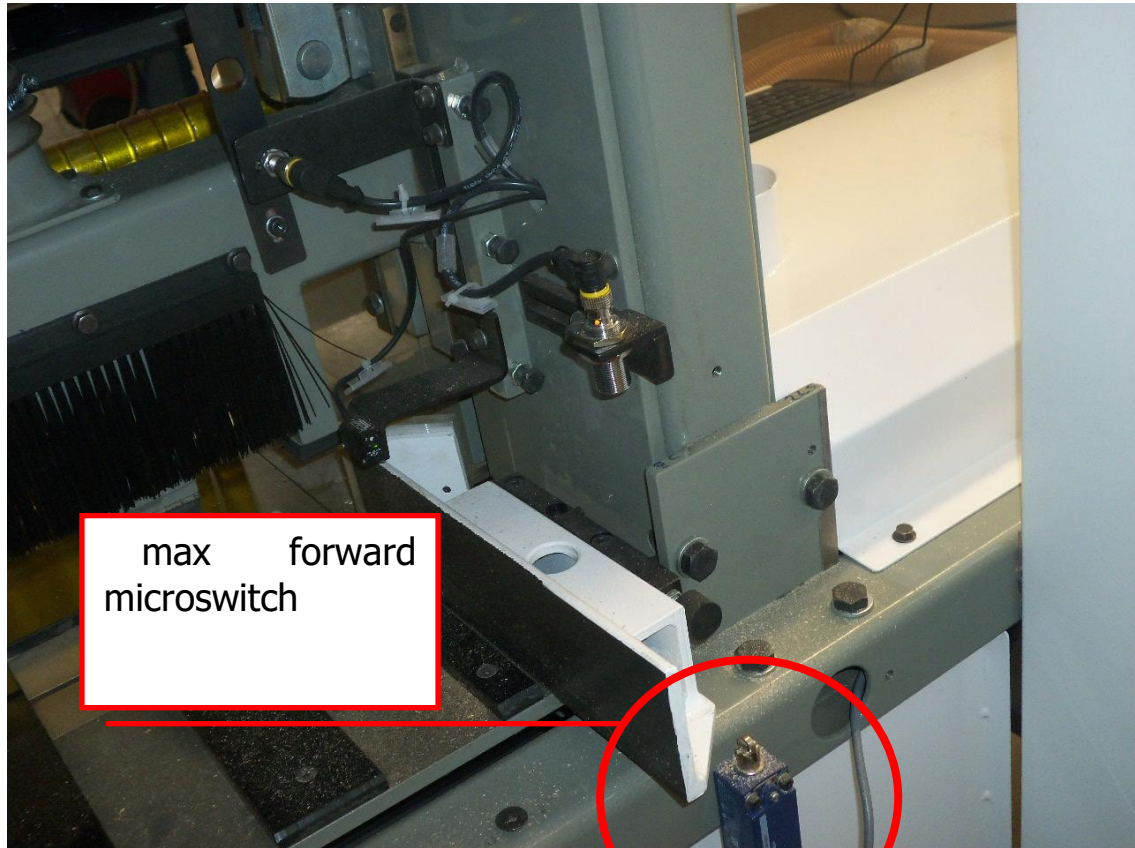
$$\text{ex: } 500 - 503 - 65.9 = -68.9$$

write this number in the right field and save as default!

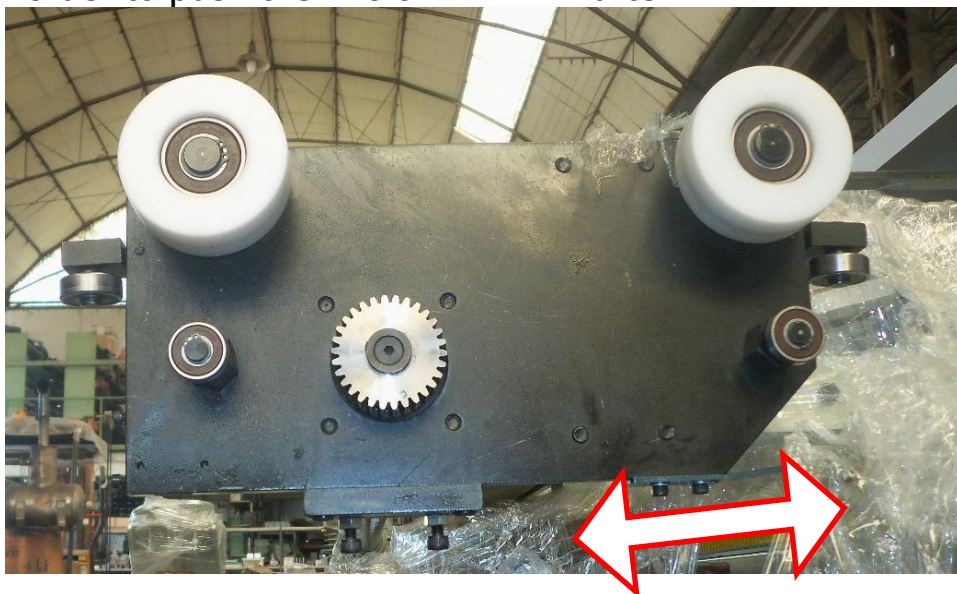
Check the measure: x cut a testing panel of any dimension: (ex. 500 mm.): now the true dimension should be 500!

When the measure is ok put the machine in : jog mode.

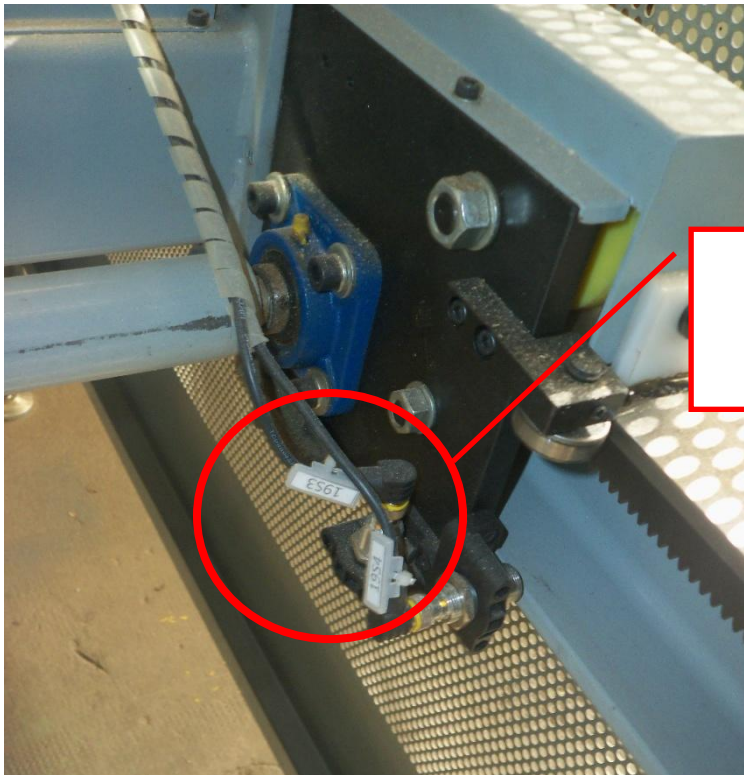
Point the quota to +6 mm. The pusher moves to the max forward position. You must check that the max forward microswitch is still NOT PUSHED



If it is PUSHED you must adjust the lower front pusher cam you must adjust it in order to push the micro 1-2 mm. further

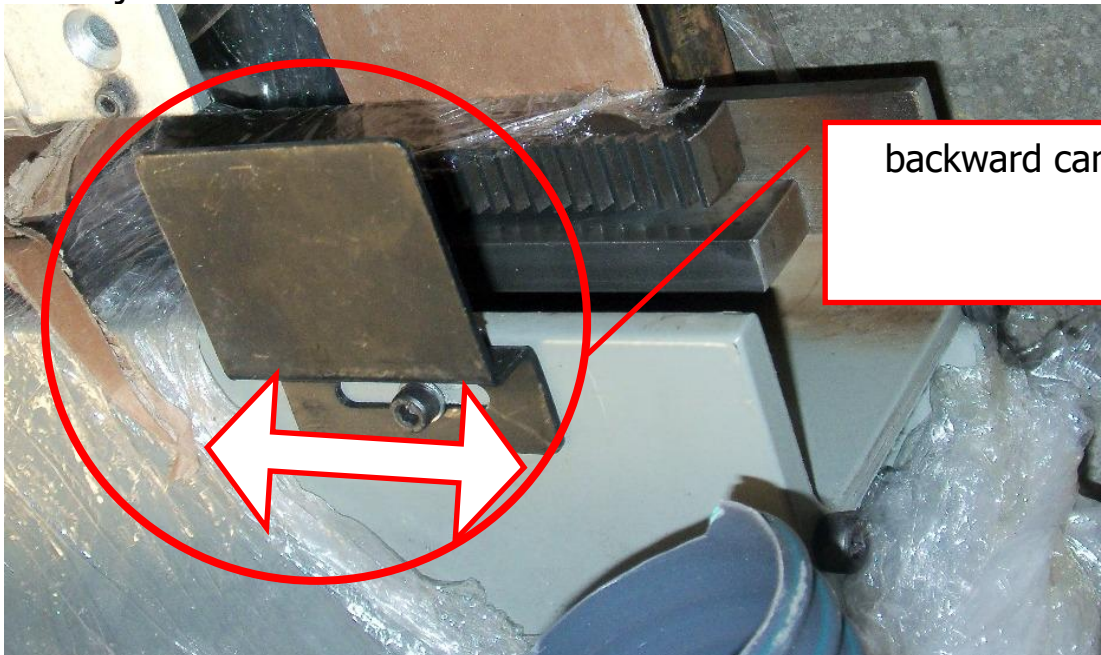


Point the quota to 4295 mm. The pusher moves to the max backward position. You must check that the max backward sensor is still not activated.



backward sensor

If it is lit you must adjust the backward cam fixed on the pusher side beam. adjust the cam in order to activate the sensor 1-2 mm. further

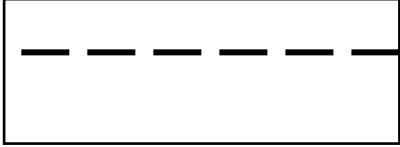


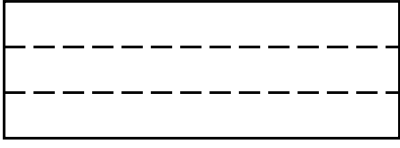
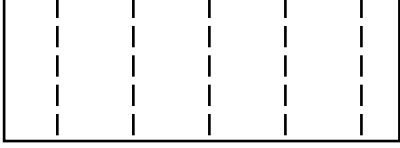
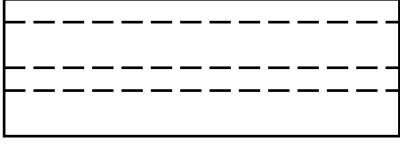
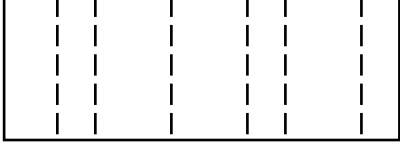
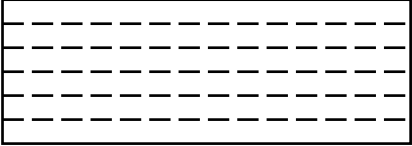


backward cam

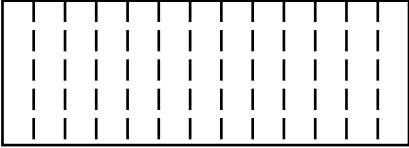
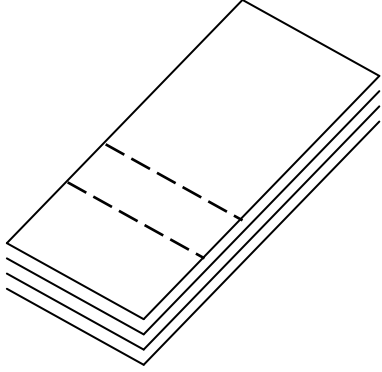
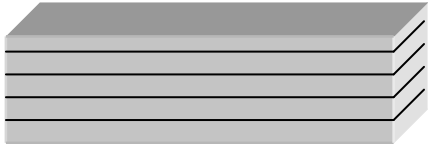
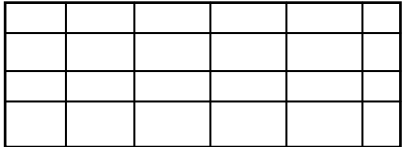
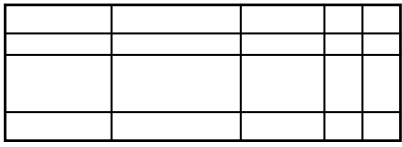
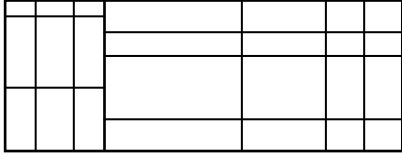
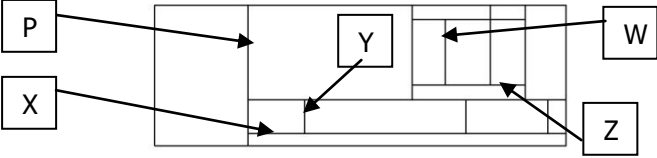
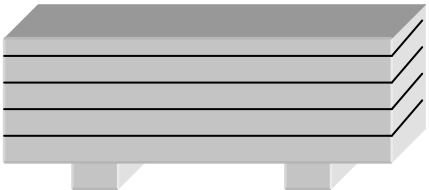
finished!

## SECTION B) HOW TO USE-

### B.1 NOMENCLATURE

Length cut	
Cross cut	
Trim cuts and squaring	
Length cutting with the same measure	
Cross cutting with the same measure	
Length cutting with different measures	
Cross cutting with different measures	
Length strip cutting	

\_\_\_\_\_

<p>Cross strip cutting</p>	
<p>One or more head-cuts (shortening of panel in length before starting of cutting pattern)</p>	
<p>Stack of panels</p>	
<p>Logical cutting pattern</p>	
<p>Cutting-pattern (off-set)</p>	
<p>Cutting-pattern (off-set) head-cuts</p>	
<p>Cutting-pattern with cutting P X Y Z W</p>	
<p>Pile of panels</p>	

## B.2 COMMAND DEVICES

### B.2/a COMMANDS ON OVER HEAD BUTTON

To have a checking of the functions of every control and signalling device put in the push-button of the control panel, see the "Lay out and the description of the control and signalling devices" quoted in the last pages of the electric diagram.

If some alarm signalling is on, consult the following table and, after having eliminated the problem, resume the operation. **Do not reset the alarm manually** with an external sequence.

The general control and signalling main devices are indicated in B.2-All.1; usually they are reported in the control push-button and electric boards.



H1

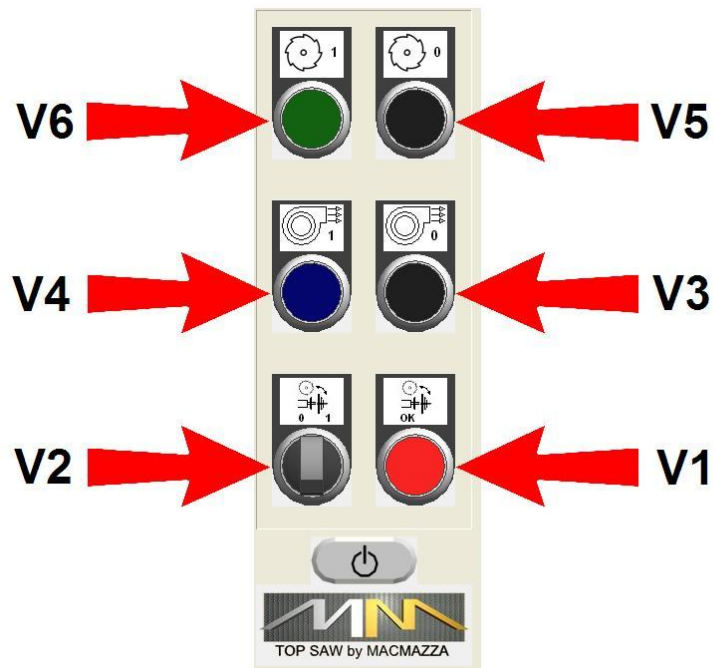
S4

T1

S2

S1

S3



V6

V5

V4

V3



V2

V1

CODE	TYPE (*)	COLOUR	DESCRIPTION
H1	L	White	NET DC 24V It indicates the presence, the type and the intensity of voltage in the control circuit/circuits
S1	PL	White	START CYCLE Control device used to confirm/enable the selected working mode
S2	PL	Orange	RESET CYCLE Control device used to stop the selected working modes (STOP IN PHASE). It is not an emergency stop.
V6	TS	Green	START BLADE Control device used to start the blades' turning.
V5	TS	Black	STOP BLADE Control device used to stop the blades' turning. It is not an emergency stop.
T1	PU		USB input connected to the Pc
S4	SL		Selector used for two functions: 1: stop pusher during machining cycle: turn LEFT 2: General machine Restore: turn RIGHT
V4	TS	Blue	START AIR FLOTATION WORKTABLES
V3	TS	Black	STOP AIR FLOTATION WORKTABLES
V2	TS	Black	ADJUSTING SCORING BLADE Brings the saw carriage in the position of adjustment
V1	TS	Red	BLADE CHANGE/ 0 – 1 ENABLE Control device used to enable the selected working mode
S3	F	Red	EMERGENCY Device for the emergency stop: the stop happens in 0 or 1 category according to the evaluation of risks. To restore the possibility of resetting the circuits, turn the red actuator in the arrow direction and unblock it.

(\*) PL= Luminous push-button; L= Light; F= Mushroom button; SL= Fixed 2 positions Selector.  
 TS= Softkey; PU= USB port

### B.3 MACHINE FUNCTIONS

MACHINE FUNCTION	DESCRIPTION AND OPERATING INSTRUCTIONS
<p><b>MACHINE START-UP</b></p>	<p>Turn on the "ON" position the main switch the Electrical Board          Switch on the P.C. and run the Macmazza's software</p>
<p><b>GENERAL RESETTING</b>          Procedure to be executed after the Machine Start-up and after a Stop for Emergency. It gives power to all the machine devices</p>	<p>Release the emergency red mushroom-shaped push-buttons on the control board (S3)          STOP Pusher axis (S4 TURN LEFT)          RESTORE machine (S4 TURN RIGHT)</p>
<p><b>FIRST AXIS CALIBRATION</b>          Procedure to be executed after the Machine Start-up. It enables the machine to the automatic working.</p>	<p>Press RESET orange button (S2)          Press START white button (S1)          Wait for the axis to complete the calibration movements, then press again "machine reset" black push-button (S2)</p>
<p><b>BLADES CHANGE/ADJUSTMENT</b></p> <p>Procedure that allows to replace and/or adjust the blades in complete safety conditions for the operator.</p> <p>SOFTWARE BUTTONS FOR BLADE CHANGE</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p><b>1</b></p> </div> <div style="text-align: center;">  <p><b>2</b></p> </div> </div> <p><b>MANUAL WORKING</b>          This function, for its use simplicity, is proper to</p>	<p><b>BLADES CHANGE DURING MANUAL WORKING:</b>          Left click on black button (nr.1) and then immediately left click on red button (nr.2)          Press the RESET button (S2) and START button (S1).          The change blade automatic procedures starts: the saw carriage goes to the "change blade" quota, the motor blade stops, and the carter's blades unlock countdown starts          After the blade change close the carter again then press the black button (nr.1) and then the blue RESET EMERGENCY button (S4 TURN RIGHT).</p> <p><b>BLADES CHANGE OR SCORER ADJUSTMENT DURING AUTOMATING WORKING:</b>          Left click on black button (nr.1): you Enable the "Blades change" and/or scorer adjust function. According to the cutting program, as soon as possible, the automatic procedures starts: the saw carriage goes to the "scorer regulation quota", the motor blade stops. A yellow window advice you when it's possible to adjust the scorer blade.(according to C4 all.2 instructions) When it's done you press the white START button (S1) to resume the cutting program. Otherwise you can choose to change the blade close the yellow window (clicking on "CLOSE" box) then left click on red button (nr.2), in order to start the carter's blades unlock countdown.          After the blade change close the carter again then press the black button (nr.1) and then the blue RESET EMERGENCY button (S4 TURN RIGHT).</p> <p><b>SCORER ADJUSTMENT DURING MANUAL WORKING:</b>          Left click on black button (nr.1), and then push black button RESET CYCLE (S2) and white button START (S1).          The automatic procedures starts: the saw carriage goes to the "scorer regulation quota", the motor blade stops. A yellow window advice you when it's possible to adjust the scorer blade. .(according to C4 all.2 instructions) When it's done you press the white START button (S1). Left click on black button (nr.1),</p>



### MANUAL WORKING

This function, for its use simplicity, is proper to execute the cuts in a precise and fast way also by operators who usually do not use the Panel Saw.

### USING PUSHER BEAM AS STOP REFERENCE:

Left click on black button RESET CYCLE (S2) Enable the "Manual Work" function of the Software Switches .Press the white button START (S1). Use the menù "Manual movement pusher" to move the pusher to requested quota (see also software user's manual). Load the panel to cut referring against the pusher's references. Click on "X cut" box in page "Manual movement" of pusher.

### SEMIAUTOMATIC CYCLE:

Press the black push-button of Machine Reset (S2)  
Enable the "Manual work " function of the Software Switches  
Press the white push-button of Machine Start (S1)  
Use the "Pusher Manual Movement" menu to set the measures to which execute the cuts on the panel (see also Software instructions manual)  
Load the panel to cut by putting it against the Pusher devices  
Click on the key "Grippers" of the "Pusher Manual Movement" page (the grippers close)  
Click on the key "Start" of the "Pusher Manual Movement" page (the Pusher takes the panel to the quote set in the number of cell indicated near the key "Start")  
Click on the key "X Cut" to execute the cut  
Click again on the key "Start" to execute the positioning to the next quote and on the key "X Cut" to execute the cut

### AUTOMATIC WORKING

This function presupposes the knowledge of the Panel saw management software from the operator, who has to have previously written and put into the execution list all the cutting schemes.

### NORMAL:



Press the black push-button of Machine Reset (S2)  
Deactivate the "Manual work" function of the Software Switches  
Click on the key "Start" of the main Menu  
Press the white push-button START of Machine (S1); at this point both the Pusher axis and the Saw Carriage go to the position of working according to the cutting program.  
Load the panel putting it against the Pusher devices and on the right side of the Panel saw, in order to execute Rip cuts, or on the left side, to execute Pre-cuts or Cross cuts.  
At the end of the same type cuts (P-X-Y-Z), in order to pass to the next cuts it is necessary to position the panel another time and press again the white push-button START Machine (S1).

### RIP CUTS ON CROSS STOP SIDE:

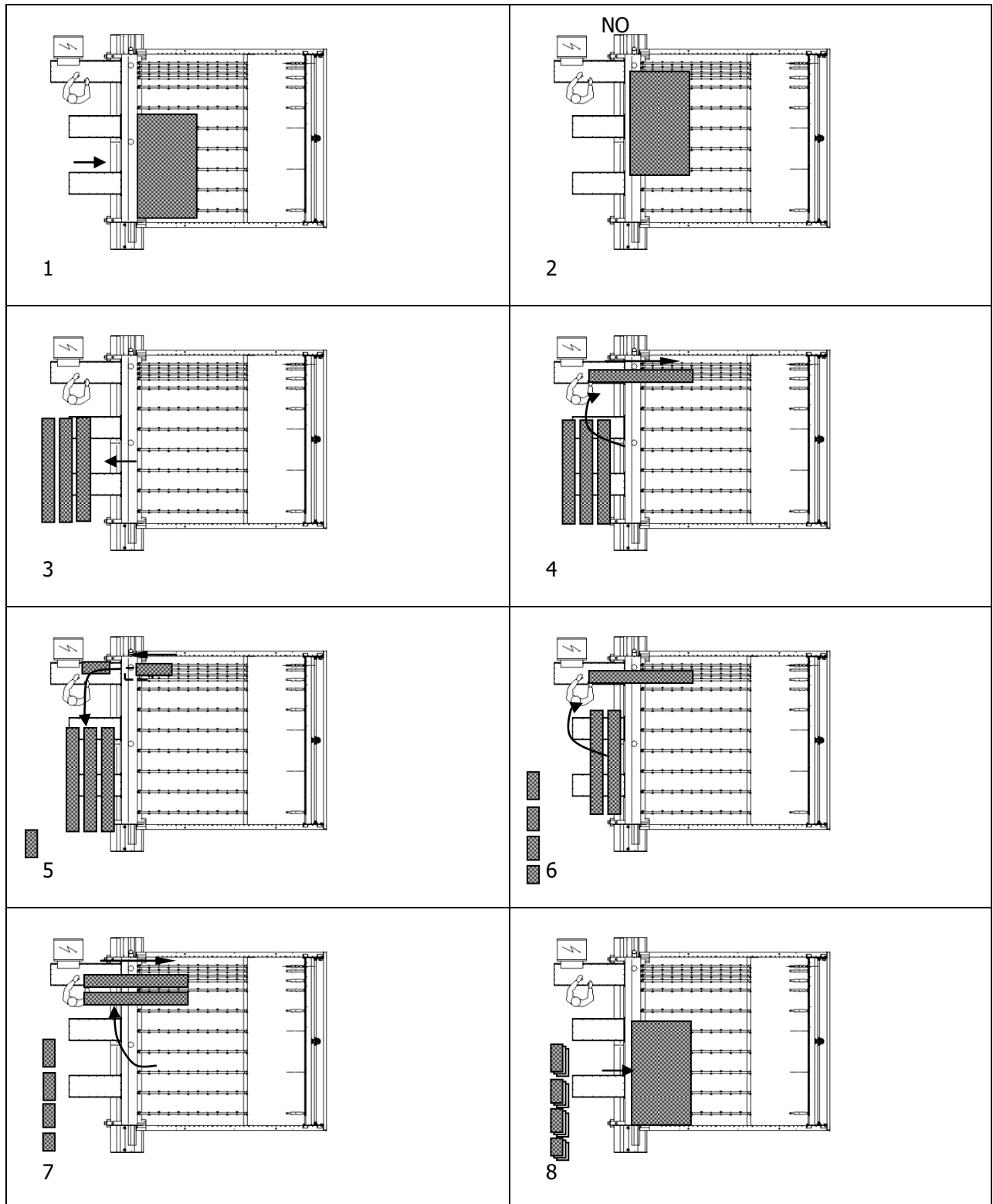
Enable this function from the menu "Switch Software" in the presence of panels with small dimensions (under the 1500mm) to which is however necessary to execute Rip cuts  
Follow all the procedure as for the NORMAL working, considering that this time also for the Rip cuts it is necessary to load the panel on the Left side

### PAUSE AUTOMATIC CYCLE FOR MANUAL CUTS:

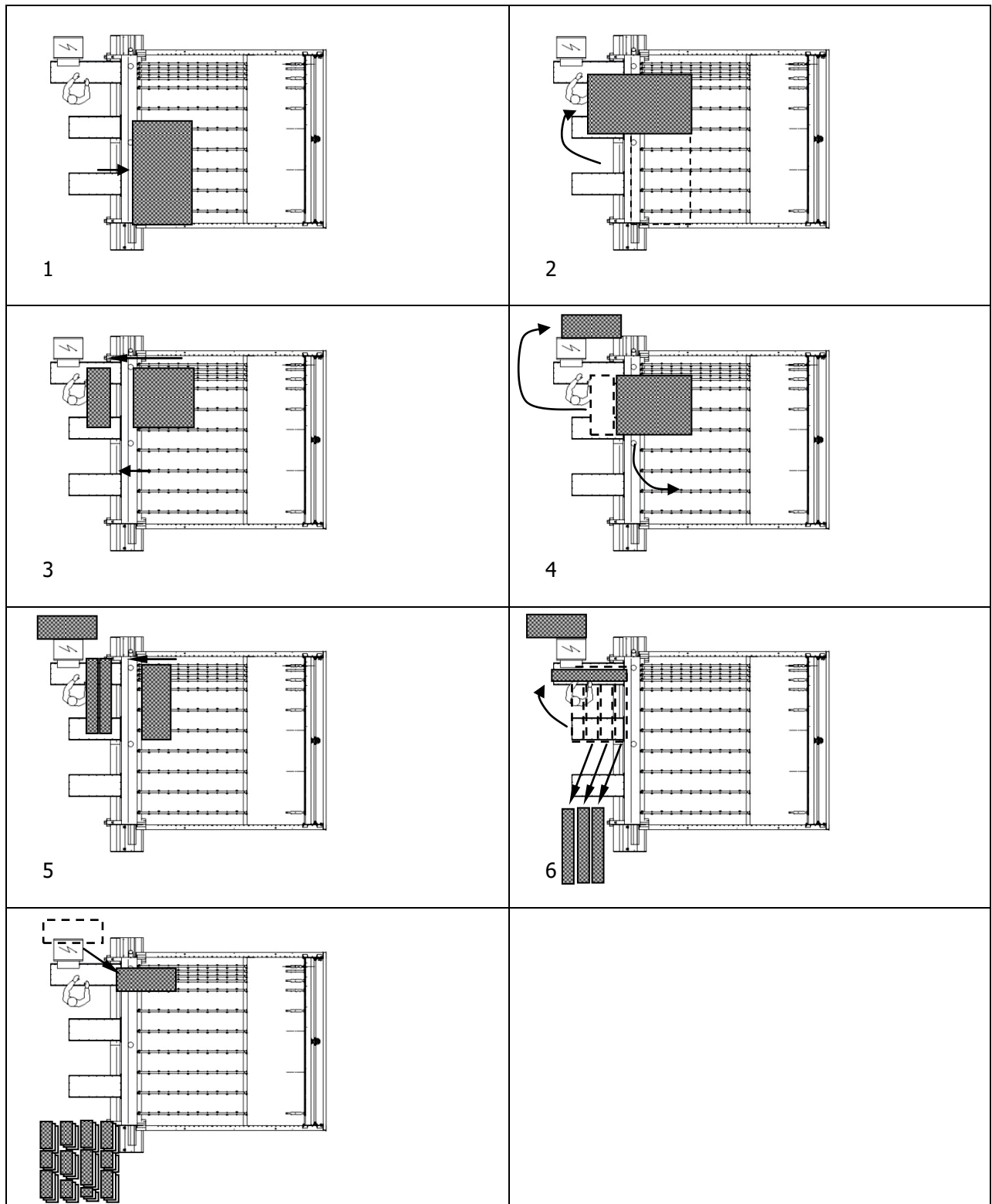
At the end of a sequence of same type cuts (P-X-Y-Z), in order to execute temporarily some manual cuts without cancelling the programs' sequence, click on the key "Pause" from the "Main" menu  
Go to the "Pusher Manual Movement" menu to position the axis to the desired measure (see also Software instructions manual)  
Load the panel to cut by putting it against the Pusher devices  
Click on the key "X cut" of the "Pusher Manual Movement" page  
At the end of the manual cuts, click again on the key "Pause" and

	<p>start again the automatic working.</p> <p><b>GROOVES:</b>        Enable this function from the "Switch Software" Menu        Follow the instruction in C3/c        Repeat the procedure for the NORMAL working, considering that at the measures set by the program in execution, will be realised on the panel some grooves of depth variable according to the adjustment and the diameter of the scoring blade, instead of full/complete cuts.</p>
<p><b>RESET AND MACHINE POWER-DOWN</b></p>	<p>Press the black push-button of Machine Reset (S2)        Double Click on software button</p>  <p>Switch off the P.C.        Turn on OFF the main switch of the Electrical Board</p>
<p><b>ACCESS TO PC</b></p>	<p>The computer is placed on the rear part of the command board. It's possible to acceded to it by removing the rear panel of the board (see photo).</p> 

## **WORK SEQUENCE WITH MANUAL FRONT LOADING**



## - WORK SEQUENCE WITH HEAD CUT



## B.4 ADVICE ON HOW TO RUN THE PANEL SAW

Saw blades must be very clean and well sharpened. If blade should not be well sharpened or have resin dirt, overheating may take place and consequent deforming of the blades might block the operation during function. All this would also cause bad running of the mechanical parts. Complete cleaning must take place during fitting of the saw blades.

When sawing thermo-setting materials, the sharpened blades will not last more than 3-4 hours. The sharpened scorer may last even 3 times longer than the main saw blades. When sawing materials which not require a finished cut, use of scorer may be avoided.

### AIR EXTRACTION

For good functioning of the machine the air extraction system must meet the following specifications:

SUCTION PRESSURE  $P=1500$  PASCAL

FLOW RATE  $Q/h=2500$  mc/h

In case of lack or insufficient suction we are not responsible for any damage that may be verified on the machine.



**WARNING:** A CONNECTION TO A DUST SUCTION SYSTEM IS ABSOLUTELY NECESSARY FOR OPERATING.



**WARNING:** THE OPERATOR MUST USE THE PADDLE (PROVIDED BY MACMAZZA) TO REMOVE THE SMALL TRIM CUTS. FROM MACHINE WORKTABLE! (SEE PICTURE) DO NOT PUT FINGERS DIRECTLY ALONG THE CUTTING LINE!





### COMPRESSED AIR

MINIMUM UTILIZED AIR PRESSURE	P=6 bar
MAXIMUM UTILIZED AIR PRESSURE	P=7 bar
MAXIMUM CAPACITY OF COMPRESSED AIR	Q=1000 NI/min

If you notice that the air cylinder movement is slowing down it should be due to air shortage feeding.

Pressure regulators should never be over 7 bar.

Pressure regulator for pressure beam descent should normally be kept at 2 bar.

Air cleaner water tanks must never be full.

**PLEASE TAKE CARE OF RECOMANDATIONS ON BOARD MACHINE (see below)**

**WARNING**

**IMPORTANT RECOMMENDATIONS AND SAFETY PROCEDURES TO READ AND APPLY CAREFULLY**

THIS SORTING MACHINE FOR PANELS MUST BE USED EXCLUSIVELY BY QUALIFIED PERSONNEL WHO HAVE BENEFITED FROM AN ADEQUATE PERIOD OF TRAINING FOR THIS SPECIFIC MODEL, HAVE CAREFULLY READ AND UNDERSTOOD THE INSTRUCTIONS FOR USE IN THE MANUAL AND POSSESS A GOOD OVERALL COMPETENCE AS WELL AS GOOD MANUAL COORDINATION.

THE MACHINE MUST ALWAYS BE USED IN FULL RESPECT OF THE RULES OF SAFETY AND PRECAUTION IN ORDER TO AVOID ACCIDENTS OR DAMAGE TO PERSONS AND THINGS.

CONSIDER CAREFULLY THAT WHEN USING ANY MACHINERY CERTAIN RISKS ARE ALWAYS PRESENT; IT IS NECESSARY TO BE CONSTANTLY AWARE, BEFORE BEGINNING ANY OPERATION, TO CONCENTRATE FULL ATTENTION ON WHAT YOU ARE SETTING OUT TO DO. ALERTNESS, WATCHFUL ATTENTION AND PROMPT REFLEXES ARE FUNDAMENTAL CONDITIONS FOR THE OPERATOR.

ABSOLUTELY AVOID USING THE MACHINE IF YOU ARE SUBJECT TO ANY DISCOMFORT OR UNFAVOURABLE PHYSICAL CONDITION HOWEVER SLIGHT WHICH COULD REDUCE YOUR ALERTNESS AND YOUR LEVEL OF CONCENTRATION.

DO NOT USE THE MACHINE IF YOU ARE UNDER THE INFLUENCE OF ALCOHOL OR DRUGS.

DO NOT PLACE HANDS, ARMS OR ANY PART OF THE BODY NEAR THE ROLLER OR ANY OTHER MACHINE PART IN MOVEMENT. USE SUITABLE EQUIPMENT OF SUFFICIENT LENGTH TO REMOVE ANY TRIMMINGS, SHAVINGS OR OTHER FOREIGN BODIES FROM THE CUTTING LINE OR WORK SURFACE.

WHEN USING THE MACHINE, ALWAYS WEAR SUITABLE PROTECTIVE GOGGLES AND A HEARING PROTECTION DEVICE. BEFORE COMMENCING WORK, FASTEN CUFFS, REMOVE SCARVES, TIES, RINGS, WATCHES, BRACELETS OR ANY OTHER LOOSE GARMENTS WHICH COULD GET CAUGHT IN THE MACHINE PARTS. KEEP HAIR TIED BACK AND WEAR STRONG WORKING SHOES PRESCRIBED AND RECOMMENDED BY SAFETY REGULATIONS THE WORLD OVER.

BEFORE BEGINNING TO CHANGE THE CUTTERS, SET THE MACHINE AS INDICATED IN THE INSTRUCTION MANUAL. IT IS ALSO RECOMMENDED TO WEAR PROTECTIVE GLOVES DURING THIS OPERATION TO AVOID CONTACT WITH THE SHARP TEETH OF THE CUTTERS.

WHEN THE MACHINE, ITS COMPONENTS AND ATTACHMENTS ARE IN FUNCTION, IT IS ABSOLUTELY FORBIDDEN TO REMOVE ANY PROTECTION, CARTER, HATCHES, COVERS AND OTHER PROTECTIVE AND SAFETY FEATURES. DO NOT TAMPER WITH THE SWITCHES AND OTHER SAFETY OR CONTROL DEVICES OF THE WORK CYCLE. ANY SUCH TAMPERING CAN CAUSE CONSIDERABLE DAMAGE TO PERSONS AND TO THE EQUIPMENT.

IT IS ABSOLUTELY FORBIDDEN TO CARRY OUT MECHANICAL ADJUSTMENTS OR MAINTENANCE, CLEANING OR ANY KIND OF OPERATIONS WHEN THE MACHINE IS IN FUNCTION. BEFORE CARRYING OUT ANY SUCH OPERATION, TURN OFF THE MACHINE AND INSTALL A PADLOCK ON THE MAIN SWITCH KEEPING THE KEY WITH YOU.

AT THE END OF ANY OPERATION INVOLVING THE REMOVAL OF CARTERS, COVERS, HATCHES OR OTHER SAFETY FEATURES, SEE TO THEIR GENERAL RE-INSTALLATION ENSURING THE CORRECT POSITIONING AND EFFECTIVENESS.

BEFORE STARTING UP THE MACHINE AGAIN, ENSURE THAT NO TOOL OR FOREIGN BODY HAS BEEN LEFT INSIDE OR ON TOP OF THE MACHINE.

CLEANING THE AREA AROUND THE MACHINE CONSTITUTES A DETERMINING FACTOR OF SAFETY. DUST, SHAVINGS AND PIECES OF PANELS MAKE THE FLOOR SLIPPERY, GENERATING DANGEROUS CONDITIONS. SUFFICIENT LIGHTING IS A DETERMINING FACTOR FOR SAFETY, FOR THE OPERATOR'S PERFORMANCE AND THE OVERALL PRODUCTION QUALITY.

EXCLUDE FROM THE MACHINE'S OPERATIONAL POSSIBILITIES THE CUTTING OF MATERIALS WHICH CAN PRODUCE SPARKS OR OVERHEATED SHAVINGS WHICH ENTERING THE SUCTION PUMP COULD CAUSE A FIRE OR EXPLOSION.

DO NOT CLIMB OR SIT ON THE MACHINE. ALL PROTECTION AND SAFETY DEVICES BOTH OF THE MACHINE AND OF ITS COMPONENTS AND ATTACHMENTS MUST BE KEPT IN CONSTANT AND PERFECT WORKING ORDER. THE IDENTIFICATION, INDICATION, RECOMMENDATION AND DANGER SIGNS MUST ALSO BE KEPT IN PERFECT CONDITION AND IN THEIR ORIGINAL POSITION.

**DO NOT REMOVE THIS SIGN**



**NON RIMUOVERE I DISPOSITIVI DI SICUREZZA**  
**DO NOT REMOVE SECURITY DEVICES**  
**KEINE SICHRHEIT VORRICHTUNGEN WEGNEHMEN**  
**NE PAS ENLEVER LES DISPOSITIFS DE SECURITE'**  
**NO QUITAR LOS DISPOSITIVOS DE SEGURIDAD**





## B.5 TESTING

### B.5/a SAWING TRIAL

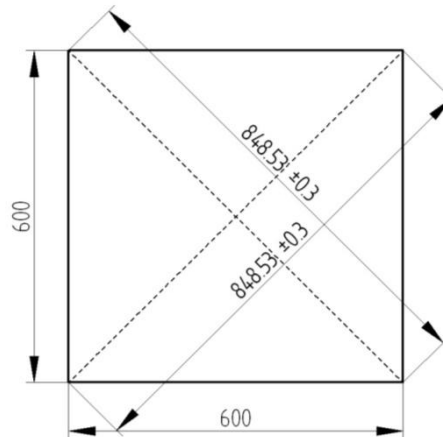
Hardly chipboard is a homogeneous composition. This causes tensions inside which may deform the board from the middle towards the edges (see fig.).

When sawing a board these tensions get free and especially the panels cut along the edges turn out deformed. if the boards are of good quality the deforming of the panels remains within acceptable tolerances.

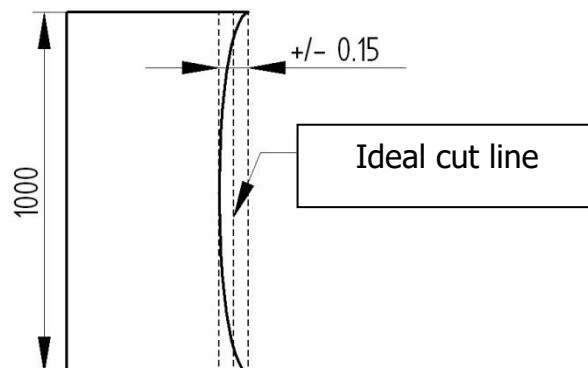
However all the trial cuts must be checked in the middle of the panels and not rear the edges.

In case to use ideal, perfect plane panels, without any tension inside, using high quality blades, you can archieve the following tolerance:

- pusher beam mechanical position tolerance: +/- 0.2 mm
- Squareness tolerance: cut a 600x600 panel; the diagonal measure difference must be less than +/- 0.3 mm.(see picture)



Linear cutting tolerance: the distance between the real cutting line from the ideal cutting line must be less than +/- 0.15 mm by meter of panel (see picture)



### **B.5/b SQUARENESS BETWEEN THE SAW BLADE AND THE WORKTABLE**

A perfectly running line gives absolutely rectangular edges compared to the worktable (see B.7-All.2, pic.2). For this the sawblade is to be adjusted in a 90° angle compared to both sides (see pic.1).

Check this by a trial cut on a 50mm thick panel (better if thicker). Turn one of the two panels by 180° compared to the cross axes and have the ends touching each other as shown on picture 2-3 and 4. If the ends touch the whole cut surface (see pic.2) the sawblade is exactly rectangular compared to the worktable.

If the ends do not touch the complete surface, as shown on pictures 3 and 4, adjust the sawblade perfectly rectangular to the worktable as stated in the instructions Nr. C.4.

### **B.5/c PARALLELISM BETWEEN SAWBLADE AND CUTLINE**

To get a clean cut without chips on both ends, the sawblade must be perfectly parallel compared to the cutline.

Check this by putting to coated, about 1000mm. long panels with a slight distance between each other in front of the cutline. Do now the cutting, if possible with a new blade. If the result is as shown on (see pic.3), panel B is cut without any chipping while panel A shows chipping on its top side. This is due to the fact that the sawblade cuts the panel B with its frontside and while going ahead compresses the material with its teeth. Panel A is cut by the sawblade backside: This means that the teeth push the chips towards upside which causes chipping. If the operations on the panel A and B are inverted, the cutting results are inverted as well.

As a second control check the cut edges of the panels. The edge which was cut by the sawblade backside shows traces of the sawblade and the cut done from down to upside.

As a third control check the noise of the sawblade while cutting. If the position is not perfectly parallel you will notice a noise from the sawblade backside which lasts as long as the blade has not come completely off the panel.

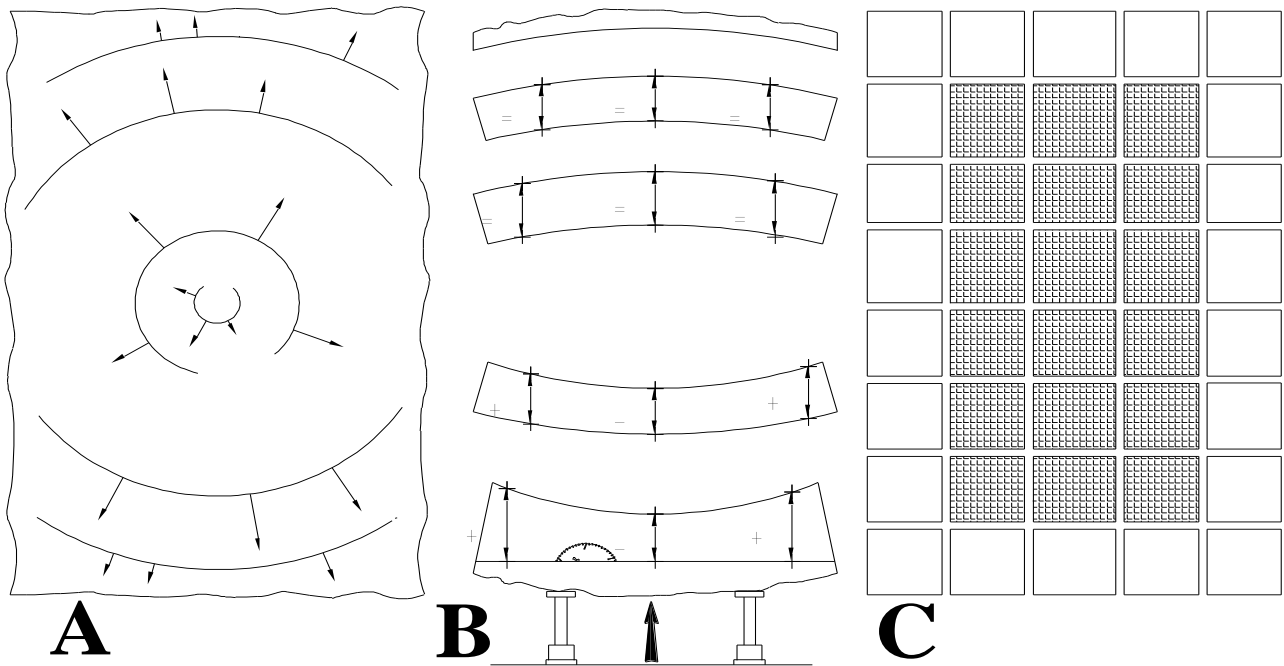
Do the parallel adjustment of the sawblade according to instructions in.C.4      MAIN      BLADE:  
GEOMETRIC ADJUSTMENTS

### **B.5/d LINING OF THE SCORER WITH THE MAIN SAWBLADE**

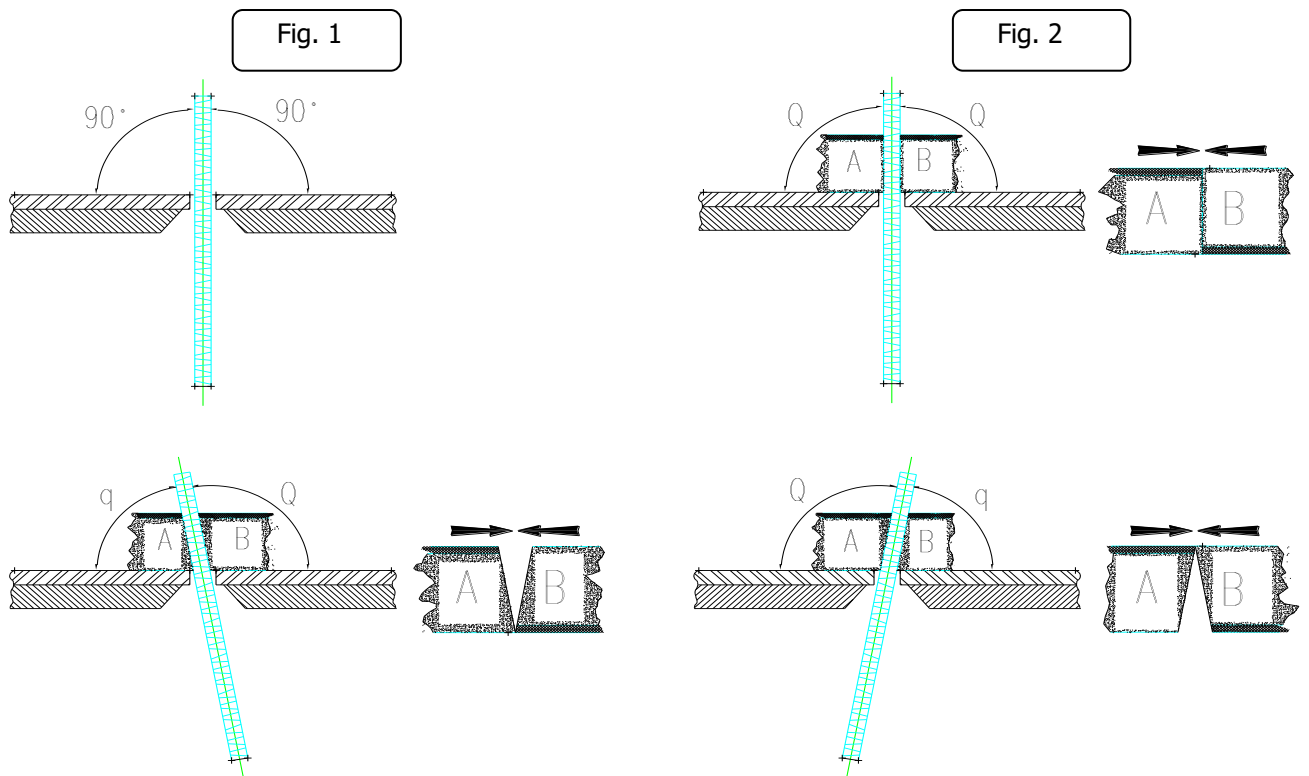
The main sawblade cuts from upside downwards and therefore compresses with its teeth the material. This leads to chippings when the blade comes off the panel bottom side. To avoid this, is installed on the saw chariot an additional cutting device, called scorer. This goes before the main sawblade, turns the opposite way and is equipped with trapezium shaped teeth with the narrow part upwards and the wide one downwards. Usually the narrow part is as wide, or slightly more narrow, as the one of the main sawblade. To assure perfect scoring (see pict,4) the scorer should penetrate neither too deep (see pic.4., ex,1) nor too little (see pic.4 ex.2) and be line exactly with the main sawblade (see ex.3).

For the height adjustments and the lining of the scorer refer to instructions .C.4 MAIN      BLADE:  
GEOMETRIC ADJUSTMENTS

pic.1

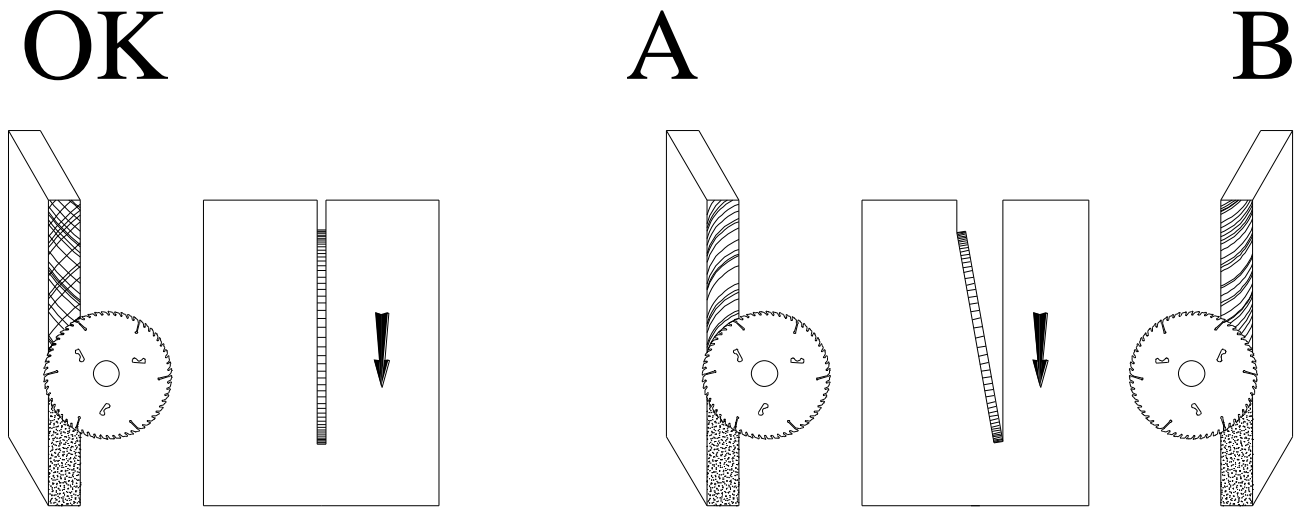


pic.2



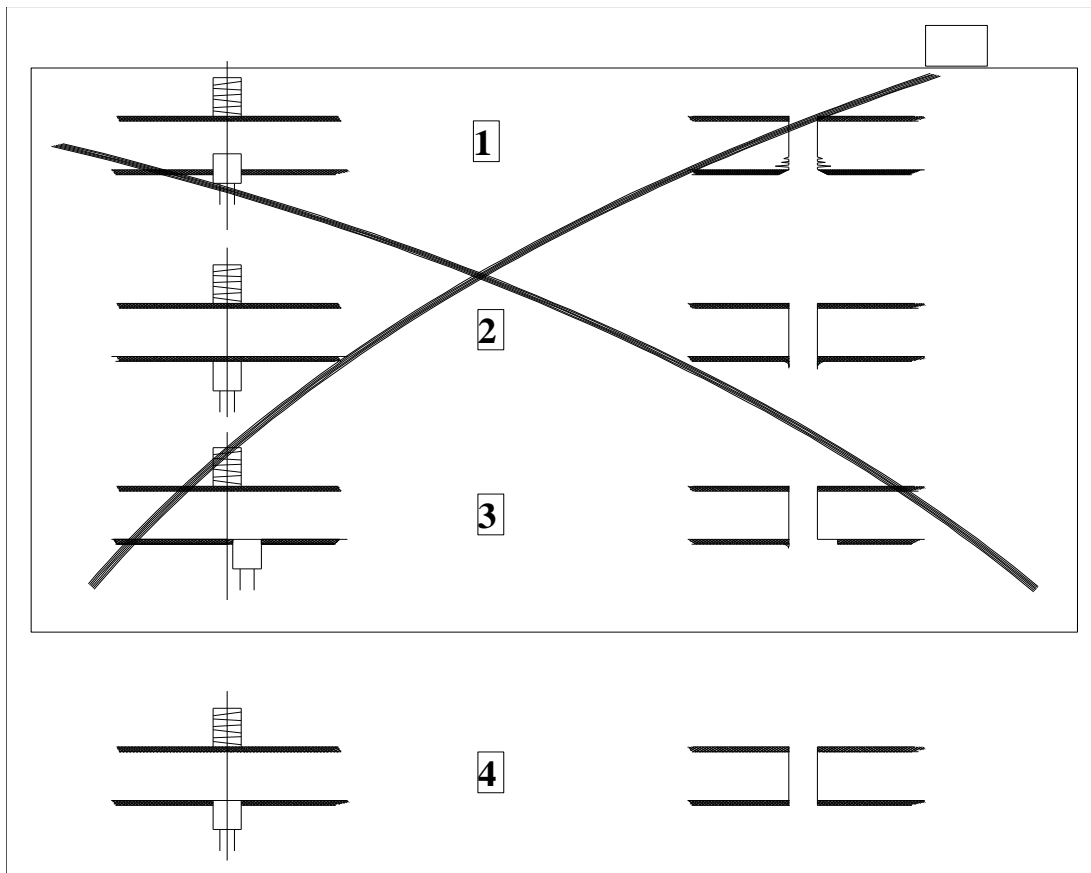
SQUARE BETWEEN THE SAW BLADE AND THE WORKTABLE

Pic.3



PARALLELISM OF THE SAW BLADE COMPARED TO THE CUTLINE

Pic.4



ALIGNMENT OF THE SCORER AS REGARDS AS THE MAIN SAWBLADE

### B.7/e LASER CUTTING MARK SYSTEM

Upon request the machine can be supplied with a laser cutting mark system (see Figure)



**WARNING:** refer to its manual for the safe use of laser



## SECTION C) MAINTENANCE

### C.1 GENERAL MAINTENANCE

Mechanical parts are protected from the filtering of wood dust. there are, however , parts of the machine that are no protected ( I.E. guides, racks, screws for lifting platforms and other mechanical parts that are easily identifiable).

At any rate, sliding parts must not be greased but cleaned using a dust extractor or a dry brush.

Any type of greasing is needed for mechanical groups assembled on sphere bearings, hermetically sealed.

#### **DAILY MAINTENANCE:**

Clean the air filters of the exhaust-fun on the electric panel board.

#### **ONCE A WEEK YOU HAVE TO CONTROL:**

The lubricating level and the quantity of grease existing in every lubricator and greasing box of the machine (you have to use grease Shell Alvania EP(LF) 2 o equivalent).

You must remove the cases in order to control if the cooling fans of the motors are working effici ently and the slits within the cooling fins are clean.

#### **AT LEAST EVERY 80 WORKING HOURS IT IS NECESSARY:**

Clean the inside of the pressure beam and its columns, using a dust extractor and also a brush.

Put the grease back in the proper lubricator of the pressure beam and in the lifting platform screw nuts.

Check the tension in the draft chains (e.g. the draft of the blade carriage)

#### **IT IS NECESSARY CONTROL PERIODICALLY (EVERY 200/400 WORKING HOURS):**

The dust cover of the running system (sliding shoe) and of the guides, as well as their state and position. When the condition, which they are in, does not assure its utilisation aim you have to substitute them immediately.

The stretched and wearing state of belts.

The inside of this part must be well cleaned to keep the suction operation efficient.

### C.2 ELECTRIC PANEL BOARD MAINTENANCE

The necessary ordinary maintenance regards mainly the airfilters cleaning.

After every working day (8 hours) we advise you in cleaning the air-filters as follow:

Draw out the ventilator protection; it has been installed by fitting in and you have to take it out drawing it toward the outside

Take the air filtering component out

Clean the air filtering with a dust extractor, pushing the exhausted dust toward the external side of the filter, and never toward the internal one

Do not turn round the filtering component during the assembling phase, otherwise the dust, deposited on the external side, could be exhausted inside the electric panel board

The filtering components can be cleaned as follow:

Wash them with water (max temperature 40 centrigade degrees) together with a common detergent, if necessary

You can beat them or it is possible to clean up the dust with an extractor

If the dust is greasy, you can wash them with petrol, trichloro-ethylene or with a solvent diluited in hot water.

### C.3 BLADES FEATURES

The table 1 shows the geometric characteristics for the circular blades used by the panel saw and tooth shapes than they must have in relation to cut quality which wants to obtain.



**WARNING:** You Must Use only blades which comply the technical standard EN 847-1 and subsequent amendments

#### C3/a: SAW BLADES SHARPENING

It is recommended to sharpen the blades when their edges 1 and 2 (see enclosed pics) are 0,2 mm. Max rounded off (this is approx. After 2 or 3 hours of sizing of coated boards. Before sharpening it is necessary to eliminate all incrustations caused by the sized material, which would, originate the clogging of the grinding stone. At this purpose, keep the blade immersed in a bath of water and caustic soda (very diluted) for some hours.

N.B.: The blades, when in the bath, have to be free in such a way that the liquid reaches all parts of the bits.

#### C3/b: HOW TO CHANGE THE MAIN SAWBLADE AND THE SCORER BLADE



**WARNING:** Cutting danger: To carry this operation you must wear protective gloves.

To change the blades (main and scorer) is very simple through the practical fixing device of the spindels' flanges.

First of all bring the saw carriage to the position "blades change".

Open the machine casing. By acting on the opposite switch, put the saws in the upper position. The removal of the pneumatic flanges A (see inclose fig.) from their own spindles is made through a rapid pneumatic clutch with spiral pipe that is located under the movable case and it must be inserted on the proper fitting A1. Turn the flange A to 60° to allow the release and remove it, please follow the opposite procedure to fit it again.

The new blade B must be placed on the spindle C, taking care that the pins of the spindle slip into the holes. At this point the flange must be inserted again with a pressure of 6 bar.

Respect the assembly position aligning the dot on the flange F to the one on the spindle C. Relieving the pressure to the flange the blade is fixed to the spindle. Check whether the flange is well located: shaking the blade it must be locked.

Please take always care that the sawdust don't go between the supporting surfaces.

When the scorer blade is replaced the alignment controls are recommended to avoid possible defects (see the chapter about it).

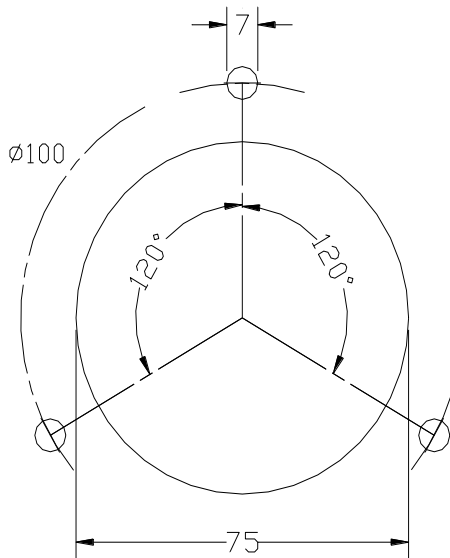


Table.1

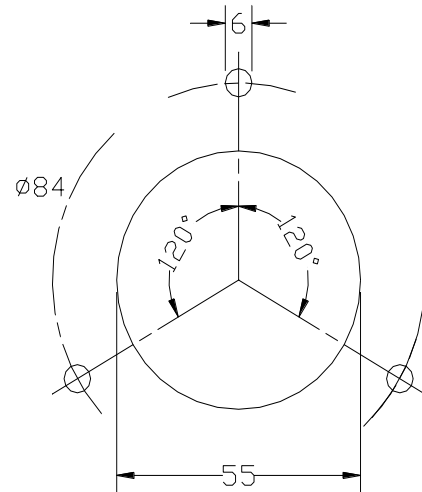
BLADES' FEATURES	DIAMETER "D":	QTY. OF TEETH:	INT. BORE "d":	THICKNESS "S":
TS 90 MAIN BLADE	300mm. Max320	...	75mm	4.4mm
SCORER BLADE	160mm	...	55mm	4.4÷5.6 conic
	FINISHED CUT		STANDARD CUT	
MAIN BLADE				
SCORER BLADE				

### DRIVE PIN HOLES AND INTERNAL BLADE BORES

MAIN BLADE

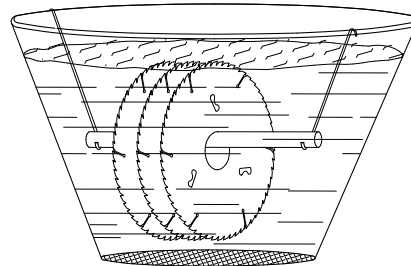
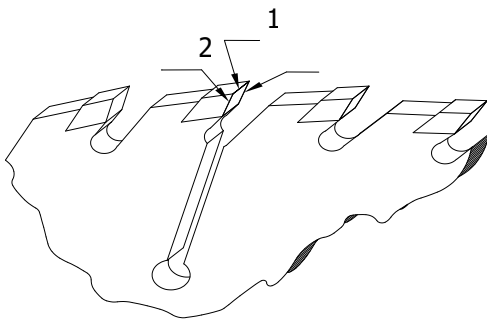


SCORER BLADE



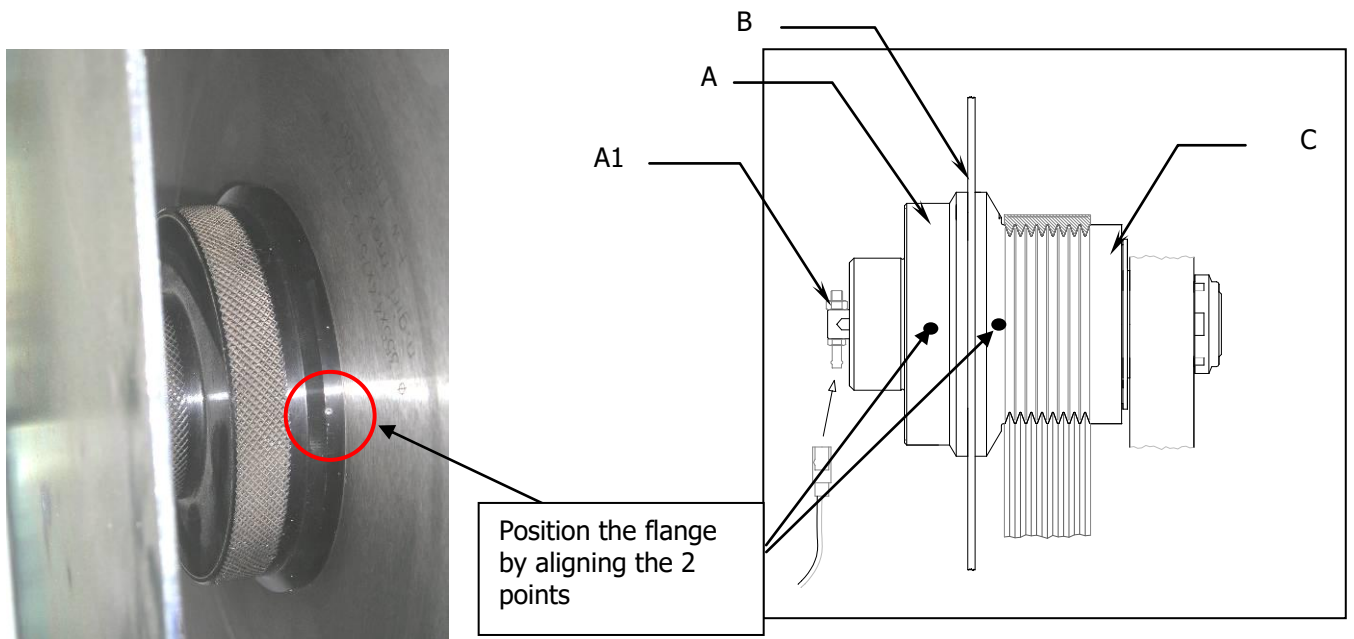
### Annex 2

### SAW BLADES SHARPENING



Annex.3

PNEUMATIC BLADE CHANGE SYSTEM



### C.4 MAIN BLADE: GEOMETRIC ADJUSTMENTS



**CAUTION:** this operation must be carried out with the utmost care

#### C4/a: SETTING THE BLADE POSITION AS TO THE WORKING TABLE

**(parallelism between the blade and the cutting line, perpendicularity between the blade and the working table, alignment of the blade with the cutting line; see also par.B7/b)**

The alignment of the blade with the cutting line and the adjustment of the main blade perpendicularity as to the cutting surface are made by acting on the positioning of the saw carriage with respect to the guides of the carriage on the frame (see -Annex.1).

Take the saw carriage to the position "BLADES CHANGE". Remove the front right casing (opposite side of the square fence).

#### PARALLELISM OF THE BLADE WITH THE CUTTING LINE.

Loose the screws A (see Annex.1). Use the screws/nuts B to adjust the parallel blade/cutting line.

#### PERPENDICULARITY OF THE MAIN BLADE WITH THE WORKING SURFACE

You must put calibrated thicknesses between the aluminium plane and the squared support in "Z" surface.

## C4/b: SCORER BLADE: GEOMETRIC ADJUSTMENTS

Alignment of the scorer with the main blade (see Annex.2)

Activate the key "BLADES CHANGE" and press START: the saw carriage goes to position max. backward.

*When the saw carriage is in the right position, by means of the Allen key n.10 supplied with the machine loosen the scorer locking system -see hole 1 (see Annex .2). By using the same key act on the screw corresponding to hole 2 (see Annex 2).*

*Considering that one screw turn corresponds to 0.5mm side shifting of the scorer, act accordingly (clockwise or anti-clockwise).*

*When the scorer adjustment is done, tighten the screw corresponding to hole 1 (C.4 All.2).*

Adjustment of scorer cutting depth (see Annex.2):

Activate the key "BLADES CHANGE" and press START: the saw carriage goes to position max.backward.

*When the saw carriage is in the right position, by means of the Allen key supplied with the machine loosen the screw corresponding to hole 3 (see Annex.2), thus adjusting the cutting depth.*

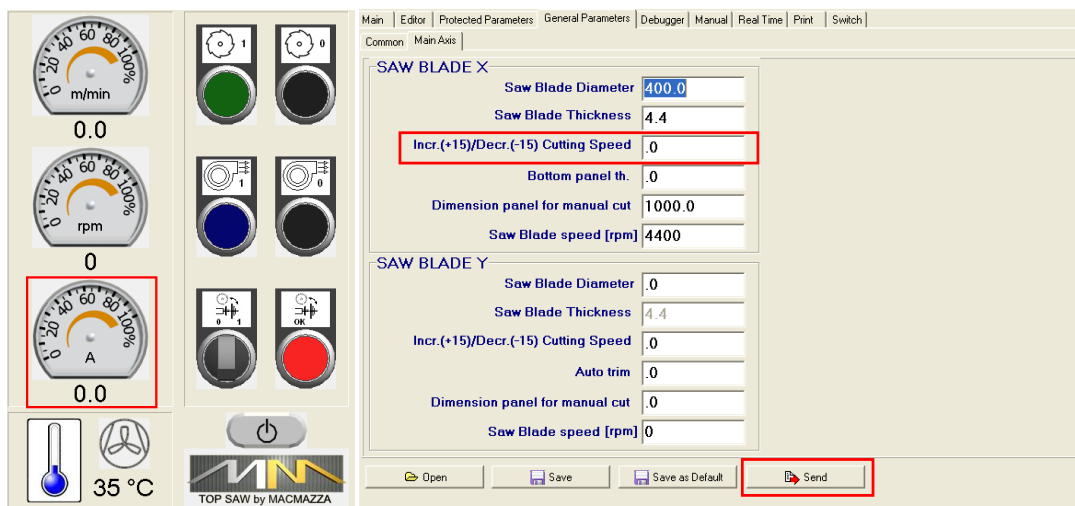


**CAUTION:** ALWAYS REMEMBER to tight the scorer locking screw at the end (hole 1)

**WARNING:** Remove the key from the adjustment/locking holes when the job is over.

## C4/c: CONTROL DEVICE AMPERAGE BLADE

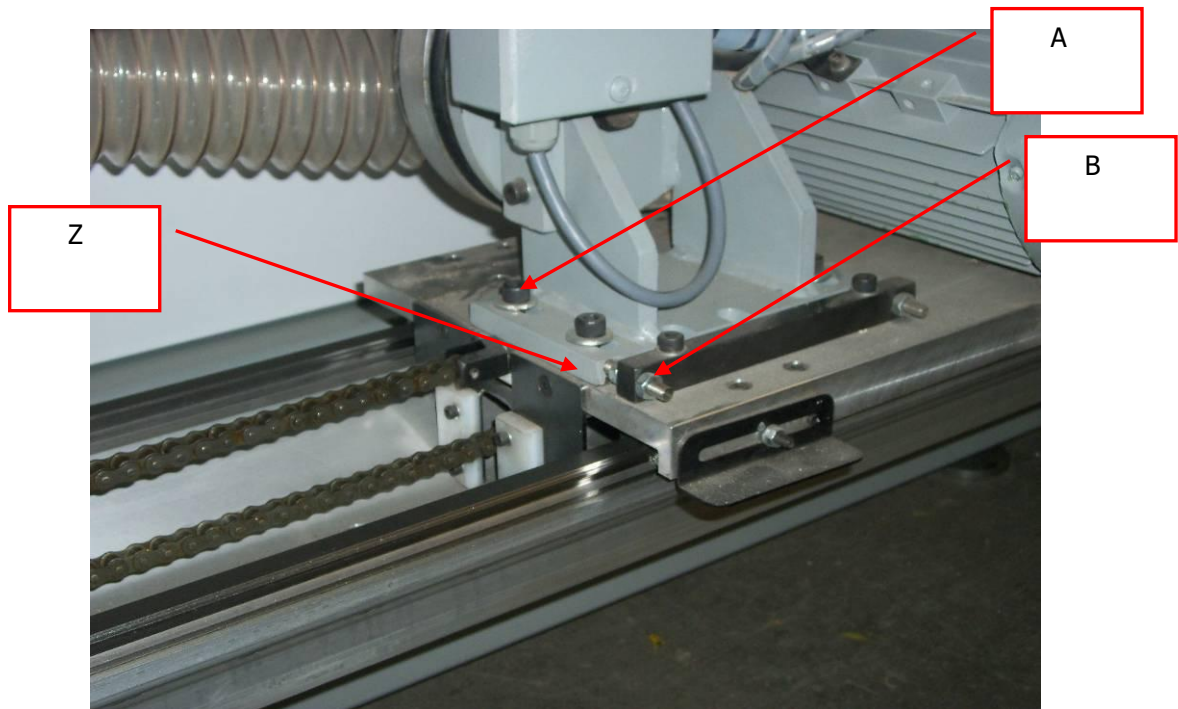
The ammeter display in the interface of the machine, reduces the speed of the blade carriage to step automatic in the event of excessive consumption of current (to guarantee an optimal quality 'of cut and not to damage the blades and work plans of the machine, enlarging dangerously. In this condition, the trim may fall upon the delicate organs of the saw carriage causing vibration and possible deviations blade, thus creating the risk of damaging other important and expensive overlying organs - clamps, pressure, aligner, aspirations, etc. - in contact with the blades).



The screenshot displays the machine's control interface. On the left, there are three analog gauges: a speed gauge (m/min) showing 0.0, a RPM gauge showing 0, and an ammeter (A) showing 0.0. Below these are a temperature gauge (35 °C) and a fan icon. In the center, there are several control buttons and indicators, including a power button and a 'TOP SAW by MACMAZZA' logo. On the right, a software window titled 'SAW BLADE X' and 'SAW BLADE Y' is open, showing various parameters for blade configuration. The 'SAW BLADE X' window has a red box around the 'Incr.(+15)/Decr.(-15) Cutting Speed' field, which is set to 0. The 'SAW BLADE Y' window has a red box around the 'Send' button at the bottom right.

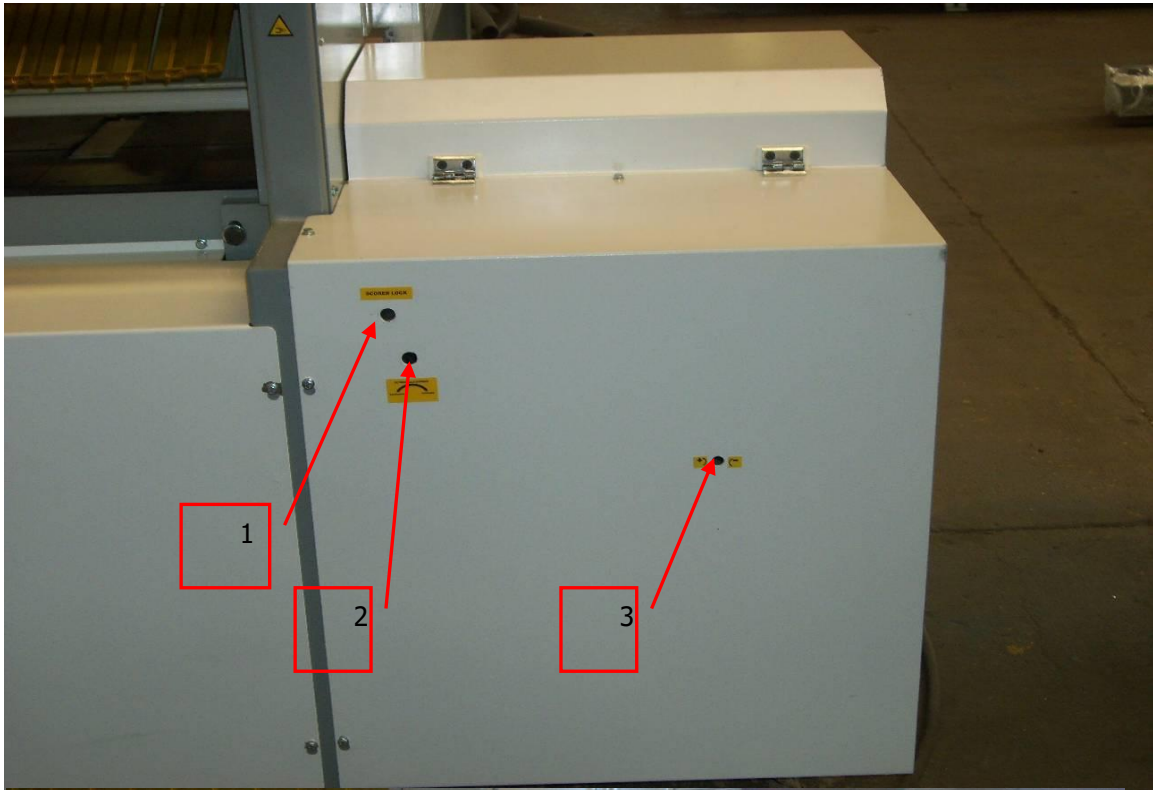
Annex 1

MAIN BLADE ADJUSTMENTS



## Annex 2

### SCORER BLADE ADJUSTMENT.



**CAUTION:** NEVER TURN the unlock screw MORE than 180 anticlockwise!

## C.5 TRASMISSION BELTS

The motion transmission from the motor to the blades is due to a couple of belts making the **blades spindles rotate**.

The features of the belts are shown in tables 1



**CAUTION:** As far as their working life is concerned, the belts' wear and tear is related to the following:

- Bad working and/or inadequacy of the dust suction system
- Use of not sharpened and/or spoilt blades.
- Worn time pulleys.



**CAUTION.** In order to know when it's time to replace the blades, you can check the ammeter placed on the control panel; You must not exceed 11/12 Ampere absorption for a long time.

### C.5/a CARRIAGE BELTS REPLACEMENT

#### MAIN BLADE BELT REPLACEMENT

1. Take the saw carriage to "BLADES CHANGE" position.
2. Remove the blades from spindles, as indicated in the proper section of the manual.
3. Remove the front and rear machine casings on the blades change side.
4. Loosen the motor group fixing nuts C by means of an Allen key.
5. Loosen the jam nut D, and the screw E, thus slackening the belt, in order to make the motor raise.
6. Replace the main belt (CP).
7. Lift the blade by acting on the pneumatic device on carriage board: use the "E" screw to tight the belt. The right tension is the one that, applying a 20 Newton force in the middle of free branch (use a dynamometer (see ORANGE arrow) a 5 mm. displacement appears. Then tighten the screws C, E and the jam nut D.
8. Go back to point 4 and follow the backward procedure until point 2.

#### SCORER BLADE BELT REPLACEMENT

1. Take the saw carriage to "BLADES CHANGE" position. Remove the front and rear machine casings on the saw carriage side. Remove the blades from spindles, as indicated in the proper section of the manual. Remove the item 3 and the top casing protecting the spindles (.Annex.1)
2. Loosen the screws H locking the scorer plate.
3. Replace the belt CI .
4. tighten the belt applying a 4 Newton force in the middle of free branch (use a dynamometer (see BLU arrow) a 5 mm. displacement appears
5. Tighten the screw H locking the scorer plate.
6. Follow the backward procedure showed at point 1.

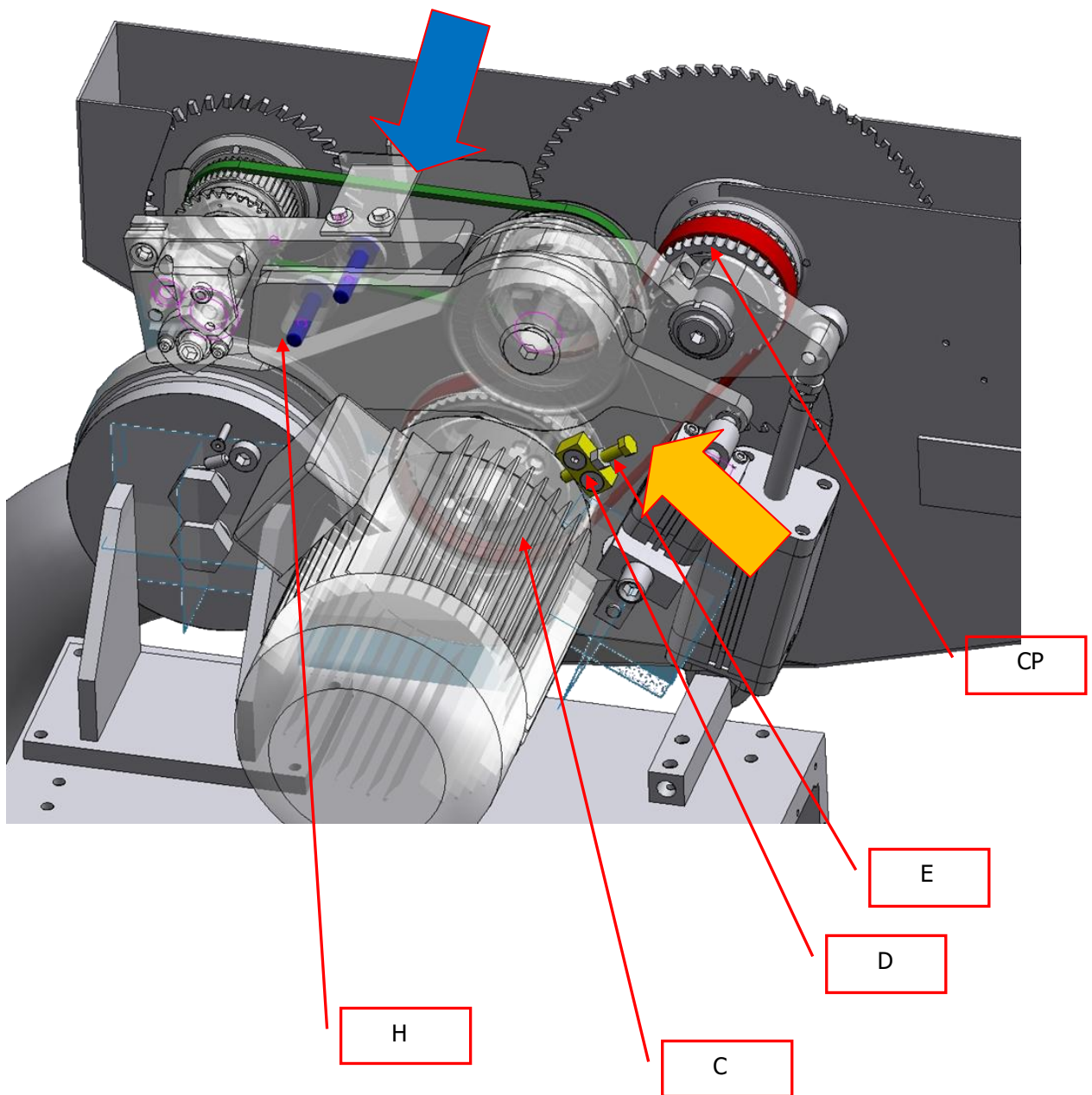
Table 1

SERIE TS90	MAIN BLADE	SCORER
BELT	Power Grip GT 880 8M 20DD	POGGI HTD 740 5M 9

If the blade motor is driven by inverter (\*) the belts are

SERIE TS90 inverter	MAIN BLADE	SCORER
BELT	Power Grip GT 800 8M 20DD	POGGI HTD 740 5M 9

ADJUSTING DEVICES FOR BELT





dynamometer



## C.5/b BLADE MOTOR INVERTER PROGRAMMING

(\*) **NOTE:** You can easy check the presence of the blade motor inverter looking the side of machine: a second electric board is present.



The following table contains the parameters and the related standard values to be put in the inverter:

PARAMETER NAME	DESCRIPTION	VALUE
acc	Acceleration Time	5
dec	Deceleration Time	15
frq	Frequency Setting Mode	6 (int 485)
drv	Setting Of Start / Stop Commands	3 (int 485)
Ad08	Stop Mode	0 (deceleration)
Ad24	Frequency Limit	1 (attivo)
Ad25	Lower Frequency	50
Ad26	Higher Frequency	90
Ad50	Energy Saving	2 (automatic)
Ba11	Motor Pole Number	2
Ba13	Motor Current	21
Ba15	Motor Voltage	0 (Vin=Vout)
Ba19	Supply Voltage Of Inverter	400
Cm1	485 Inverter Address	1
Cm2	Communication Protocol	0 (modbus)
Cm3	Communication Speed	4 (19200)
Cm4	Communication Setting	0
Cm73	Virtual Input	3
Cn4	Adj. Engine Noise	2
Dr09	Control Mode	0 (v/f)
Dr14	Motor Power	7.5
Dr18	Base Frequency	87
Dr19	Starting Frequency	0.5
Dr20	Maximum Frequency	90
In68	Multi-Purpose Input Terminal.	0
Pr04	Setting Load Level	0
Pr18	Overload Level	150
Pr19	Overload Time	30



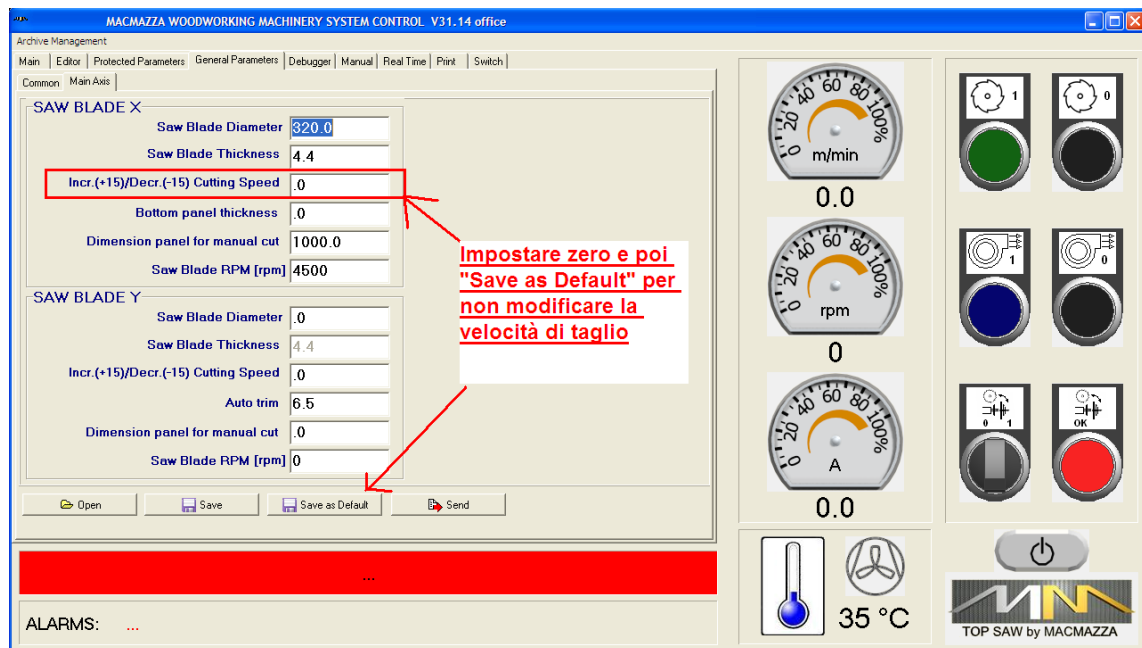
**CAUTION: RISK OF INVOLUNTARY CHANGE OF INVERTER PARAMETERS!**

If you change the "BA10" parameter regarding the inverter supply frequency (60Hz = 0/1 = 50Hz) (even if you only access the field and confirm), automatically the inverter changes the freq. the motor base and the freq. limit. of work. If you must change this parameter you need to change it as the very first, and then re-check all the parameters listed!

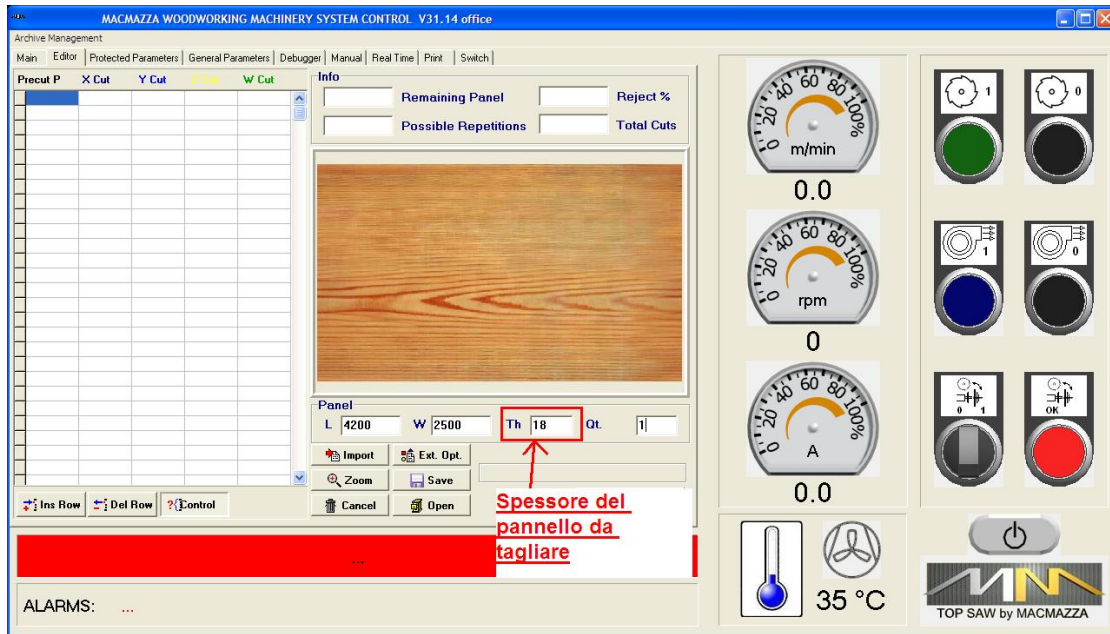


**CAUTION:** In case of blade motor over power you need to check the following:

1. Even if the saw blade is new and of expensive/ high brand, it may be defective / not properly sharpened , and not cut properly, causing an abnormal absorption, so the customer must try more different saw blades brands and types
2. Check the direction of the saw blade rotation: it must be according that one indicated by the adhesive arrows on the crankcase of the machine;
3. The voltage supply of the motor saw blade: the three phases must arrive correctly to the terminals
4. Check the following parameters: ALLOWED MAX. CONSUMPTION VALUES AND OF THE SPEEDS THAT ARE NOT CORRECT into page "General Parameters -> Main Axis"  
 - SET VALUE TO ZERO AND THEN PRESS "SAVE AS DEFAULT" IN ORDER TO NOT CHANGE THE CUTTING SPEED



5. Working in "automatic mode" set the working thickness correctly in this page. saving the cutting program



#### THICKNESS OF THE PANEL TO BE CUT

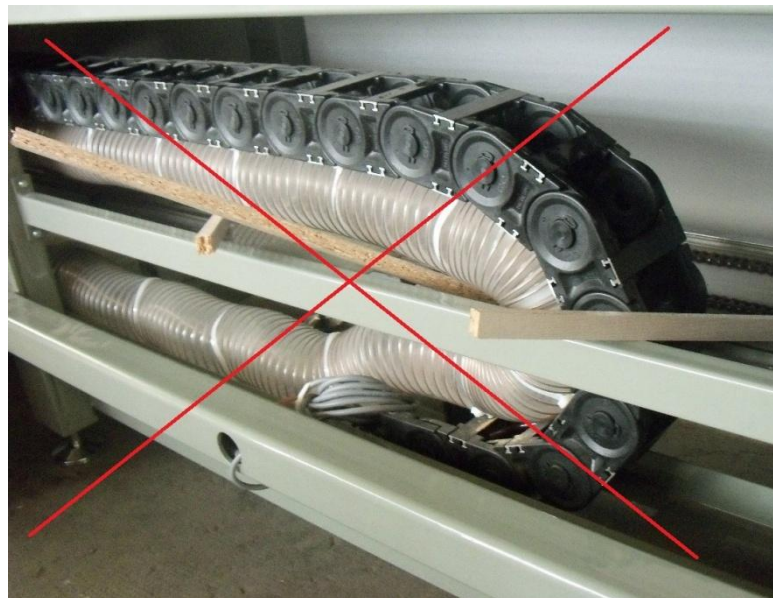
6. To Verify that an incorrect dust extraction installation and machine cleaning and maintenance has not caused an abnormal wear of pulleys and belts because of the presence of big pieces of trims
7. Even if one of these conditions had worn out some mechanical parts and / or motor, it is clear that saw blade over absorption would be permanent in case of not replacing / repairing the same broken parts.

## C.5.5 MAIN BODY ACCESS

Every time you need to go inside the machine you must remove the front panels. (see fig.)

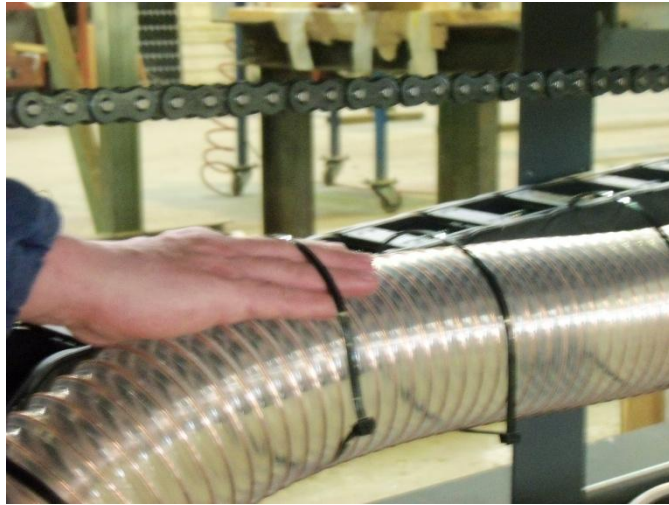


**CAUTION:** You must perform this cleaning/inspection operation every 80/100 working hours.  
If trim cuts do fall inside the machine getting stuck between the energy chain/ dust suction tube/ and saw carriage guides, they can lead to damage something. In particular, in case of replace, the data sheet page of the suction tube dust D = 100 INTERNAL machine is inclosed.





**CAUTION** To prevent damage of the suction pipe the fixing clamps should be left LOOSE (see photo)



**WARNING:** Once the job is done, you MUST re-assembly all the carters before restart the standard production. The LACK OF CARTERS LEADS TO THE RISK OF CRUSHING AND/OR ENTANGLEMENT AGAINST THE SAW CARRIAGE.

The LACK OF CARTERS ALSO MEANS GREATER EXPOSITION TO WOOD DUST.

## Tubi flessibili per l'aspirazione

### FLEXADUX® P2 PU

Diametro mm	Peso kg/m	Spessore parete mm	Raggio di curvatura mm	Pressione di esercizio bar	Depressione bar
25	0.13	0.4	18	0.65	0.30
30	0.17	0.4	21	0.60	0.30
40	0.23	0.4	28	0.50	0.25
50	0.30	0.4	35	0.40	0.20
60	0.34	0.4	42	0.40	0.16
70	0.40	0.4	49	0.35	0.14
75	0.43	0.4	53	0.30	0.10
80	0.46	0.4	56	0.28	0.10
100	0.51	0.4	70	0.20	0.09
120	0.60	0.4	85	0.20	0.08
125	0.65	0.4	88	0.20	0.08
140	0.71	0.4	95	0.15	0.06
150	0.78	0.4	105	0.10	0.06
175	0.90	0.4	123	0.09	0.05
200	1.05	0.4	140	0.08	0.05
250	1.25	0.4	175	0.05	0.04
300	1.55	0.4	210	0.03	0.03
350	1.80	0.4	245	0.02	0.02
400	2.10	0.4	280	0.02	0.02
450	2.35	0.4	315	0.01	0.01
500	2.62	0.4	350	0.01	0.01
600	4.60	0.4	400	0.01	0.01



#### CARATTERISTICHE TECNICHE

**Materiale:** poliuretano - poliestere, trasparente, con spirale ramata

**Lunghezza standard:** 10 mt

**Temperatura d'impiego:** -40 °C / +100 °C

**Applicazioni:** aspirazioni di aria, polvere, fumi di oli e di idrocarburi, adatto per applicazioni nell'industria alimentare e farmaceutica

**Proprietà:** eccellente flessibilità, buona resistenza all'abrasione, buona comprimibilità assiale

#### Costruzioni speciali:

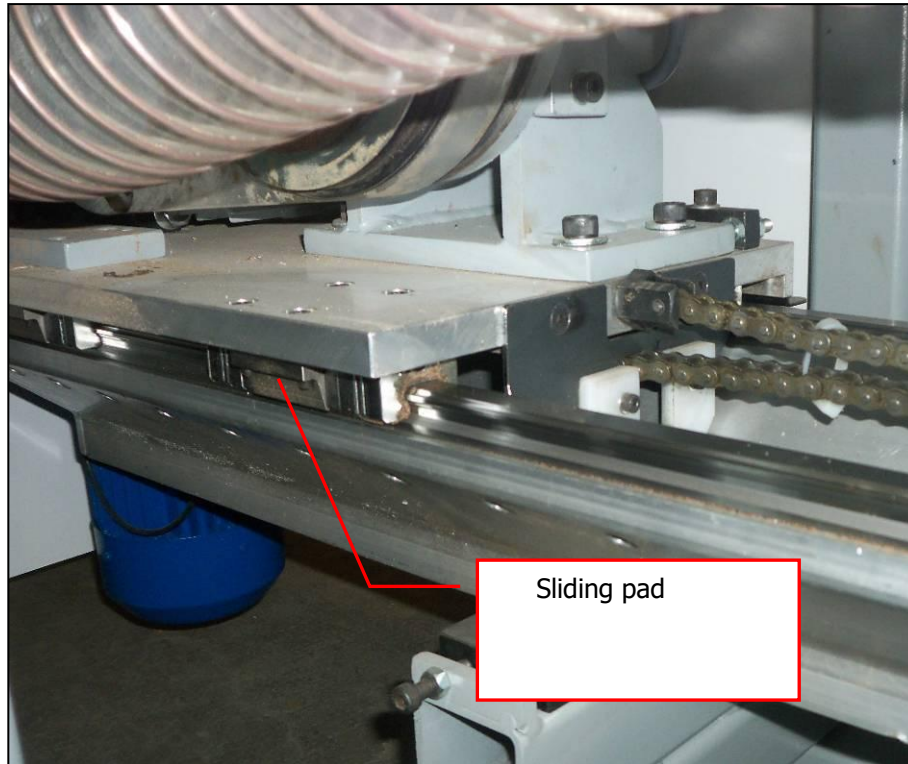
**P.2.PU.AE** - poliuretano-poliuretano, resistente all'idrolisi e ai microbi, non tossico, alimentare secondo le normative FDA ed EU

**P.2.PU.AS** - antistatico (R ≤ 10<sup>9</sup> Ohm), conforme alla TRBS 2153

**P.1.L.PU.SEA** - ritardante alla fiamma secondo DIN 4102 B1



## C.6 SAW CARRIAGE MAINTENANCE



The blade carriage slides on liner ball guide. No freeplay regulation is needed. The sliding system is self lubricated for about 5000km (it means approx 4-5 years of standard work 8 hours a day). After It is necessary to replace the lubrication cartridges or the whole pad.



**CAUTION:** this operation must be carried out with the utmost care



**CAUTION:** The carriage slides are self lubricant on the guides so DO NOT GREASE THEM!

### CONTROLS:

Control of the state of wear and the freeplay, replace the pads or the pads and rail if needed.

## C.7 MAINTENANCE AND REGULATION OF CHAIN TENSION

### SAW CARRIAGE CHAIN TENSION REGULATION

The translation of the saw carriage inside the panel saw is controlled by a roller chain ISO 126, thread 1/2X5/16". The gear motor group is assembled on the side of machine

#### PERIODICALLY CONTROL TENSION OF CHAIN:



**CAUTION:** excessive tension causes wear-out and anomalies to specific mechanical parts; if tension is insufficient, this can cause an uneven translation of trailed parts, with negative, sensitive consequences to the precision of the movements and harmful vibrations.

Machine is registered with optimal tensions. This is obtained through experiences and studies followed up by the company and may vary depending on a series of factors and on type of movement and transmission requested.

In case of chain replacement or registrations due to wear-out, please follow these general indications:

VERIFY ALIGNING OF TOOTHED WHEELS

VERIFY TENSIONING OF CHAINS

VERIFY TENSIONING OF CHAINS

Verification of chain tensioning is done by putting the saw carriage to the end of stroke on the side estimated for the blades change opposite to the panel saw stop), and by measuring the maximum chain arrow "F" in the free distance . The measure must be about 50mm

To execute the chain tensioning adjustment (see Annex1), disassemble the casing of the standard in the stop side; loosen the jam nut (A). Tighten the nut (B)

At the end, remember to tighten the jam nut A again, before reassembling the casing.

After tighing the chain. correct the development of the chain as follows:

A - bring the saw carriage at quota 200 (manual operation)

B - check the real position of the saw carriage using a tape-measure

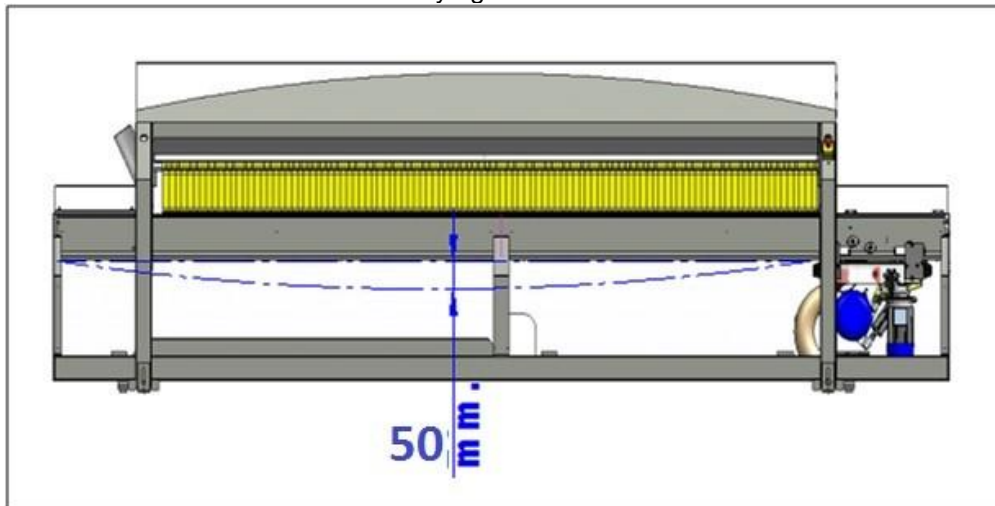
C - bring the saw carriage at 2200 (maual operation)

D - check if the real displacement of the saw carriage is 2000 mm. In case of a negative result, you must correct the development of the chain as follows:

A - Protected parameters (macmazza's interface)

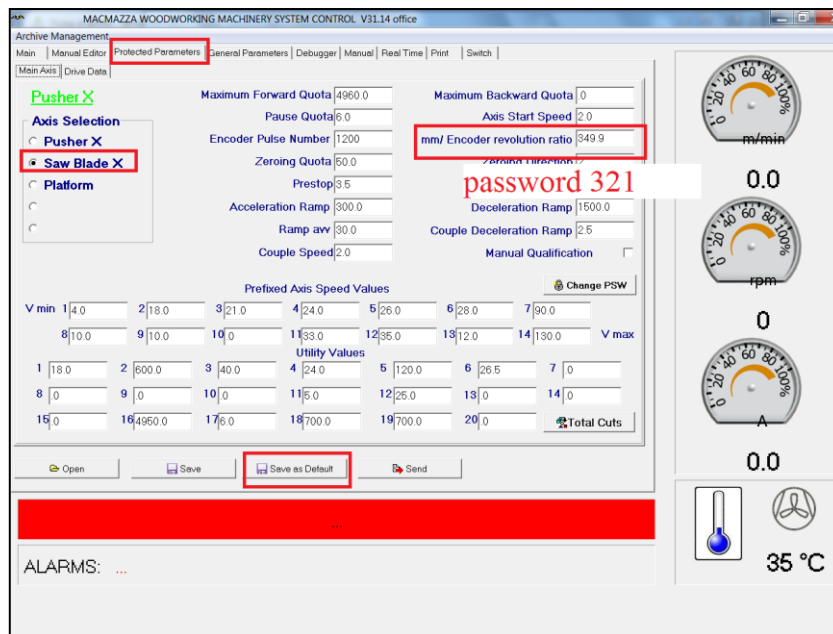
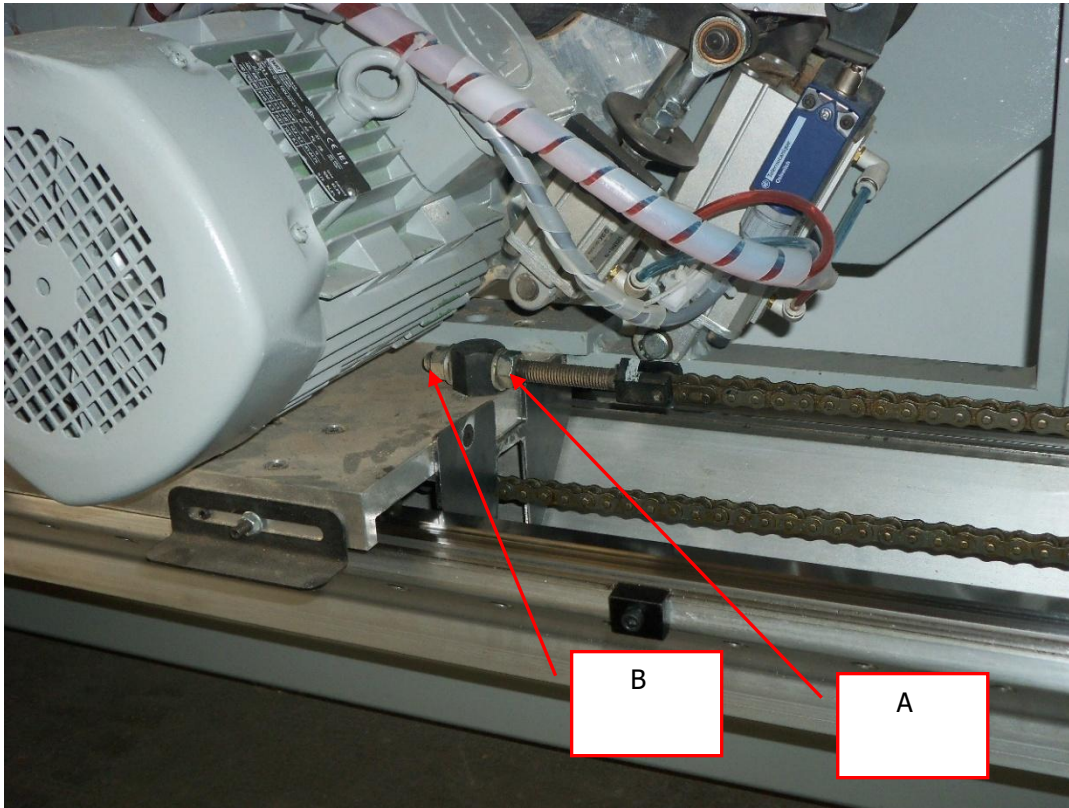
B- saw Blade - Password 321C (see fig.) - Decrease the value encoder mm/Revolution Ratio (for example if it is 178.3 change it in 178)

D - Save as default - Calibration - Try again



Annex.1

TRACTION DEVICES FOR SAW CARRIAGE



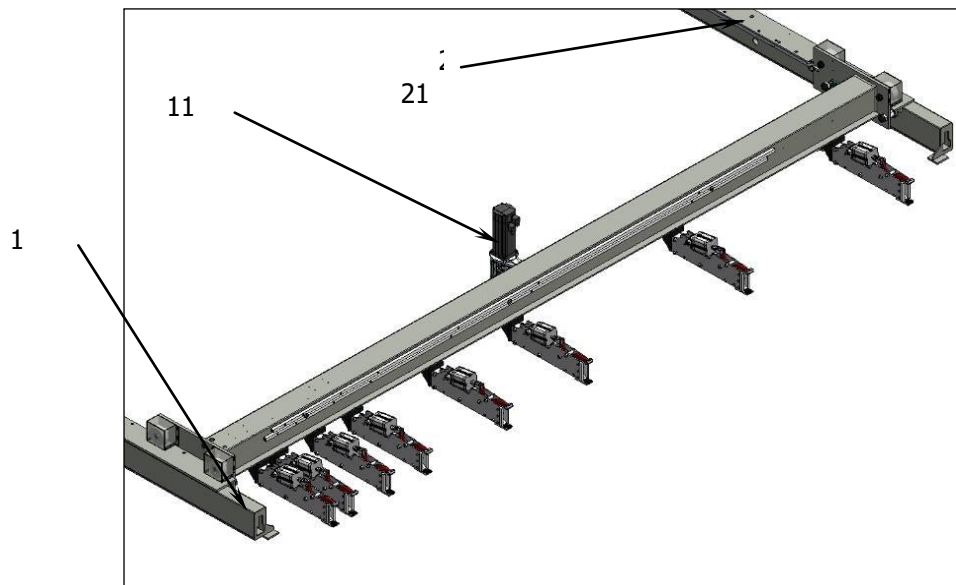
## C.8 PUSHER

The pusher "Medium" has the aim to feed automatically the cut line by pushing ahead as much as required the panel to be cut, according to an electronic or electromechanical programm.

The equipment is installed above the panels support and does include a guide and a support as well as a support with the motorgear and the drive device and the grippers

Each singular equipment will be described in agreement with the machine type, in a special chapter of the using instructions.

The pusher is a mechanical system designed to position the panels on the line of cut automatically and with maximum precision. The elements from which it is formed are illustrated in - Annex.1. The pushing and drawing devices have the job of gripping the panels tightly and holding them firmly against the frame, made up of a mechanically worked pipe for maximum precision of shape. This pipe slides parallel to the line of cut by means of two straight guides. The guides are obtained using two longitudinal beams "1-21" on which slide wheels "7-15" fixed to the frame. The two wheels have a convex profile "7". To prevent disturbances to this system, containing wheels "2-20" are applied to prevent the frame from losing its adherence to the guides. Great care has been taken in the drive system, as it is upon this that the precision of position and parallel set of cut depend. The motor "11", digitally controlled, allows constant torque and thus enables the speed of the pusher to be altered instant by instant. This gives optimal acceleration and deceleration and results in extreme precision of positioning. The motor is fixed to an endless screw reduction/driving gear "10" (maximum performance), which requires no maintenance. This is geared to a shaft "9" driving both the longitudinal beams. Movement is transmitted by means of a pinion system on the shaft "3-19", toothed wheel "4-18" on the longitudinal beam; both with rectified teeth to give the best possible matching tolerance. To ensure that the pusher is parallel to the line of cut, a transmission joint "12" has been inserted on the shaft for angular adjustment.

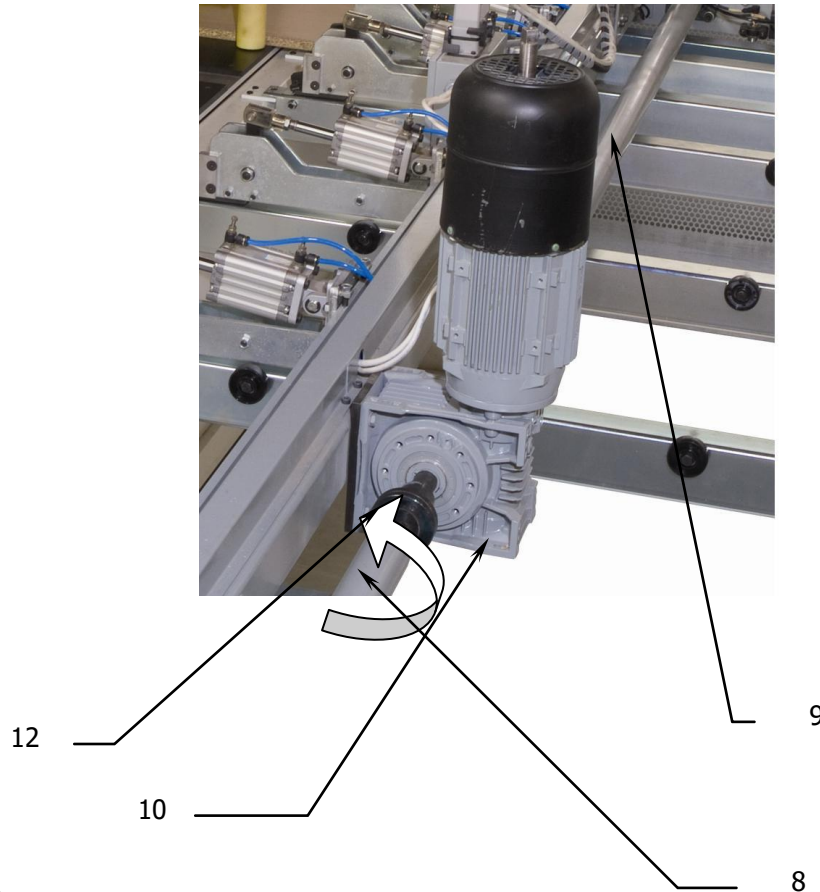




## SETTING THE PUSHER PARALLEL WITH RESPECT TO THE LINE OF CUT

**CAUTION:** this operation must be carried out with the utmost care

This is done, if necessary, at the time of assembly of the unit, after checking the distance between the ends of the pusher and the line of cut. If there is any differences in the quote, adjust the special connection joint clumper "12". The connection joint is next to the gearbox "10". By loosening the joint clumper screws it is possible to move one shaft "8" forward or backward with respect to the other "9" in order to restore the correct alignment. When the alignment is achieved tight the screws using an allen Key the correct torque is approx 17Nm. Remember after this job is done, to check the gripper's alignment with respect to the line of cut.



### CONTROLS

The pusher system, like all sliding systems, is subject to wear. Every 200 working hours, check the freeplay between rack "4-18" and pinion "3-19". During installation of the unit the pusher is calibrated by our technical staff. Any freeplay that may arise due to wear may cause errors in the measurement and parallel setting of cuts. Check whether it is necessary to replace wheels "7-15", noting the track that has formed. If the external surfaces is still intact, the wheel is still in a condition to be used. If the track has formed a continuous arch, both wheels must be replaced. The correct freeplay between the pinion teeth and rack is 0.05mm, but play of up to 0.5mm can be tolerated. To check this rapidly, grasp the pusher firmly at one end and push it vigorously in the two directions of movement: if the movement exceeds 1mm it is necessary to restore the correct amount of play.

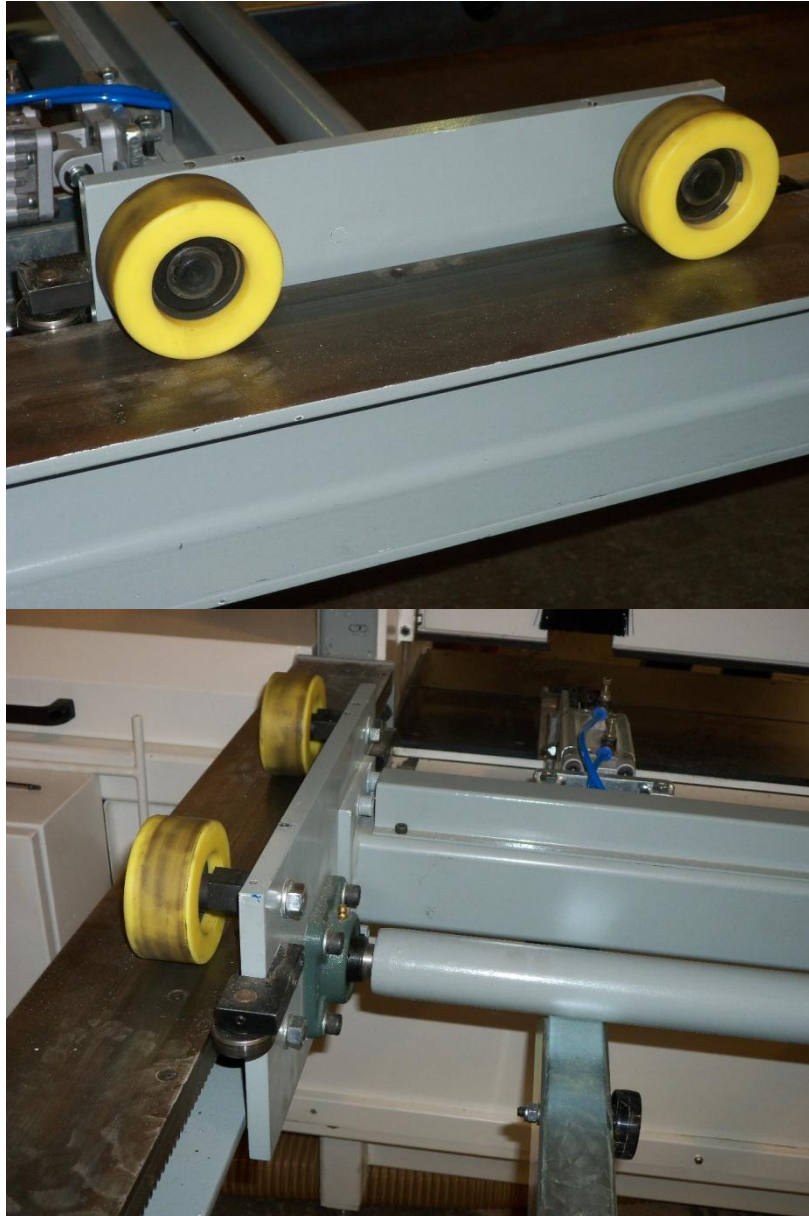
### ADJUSTMENTS:



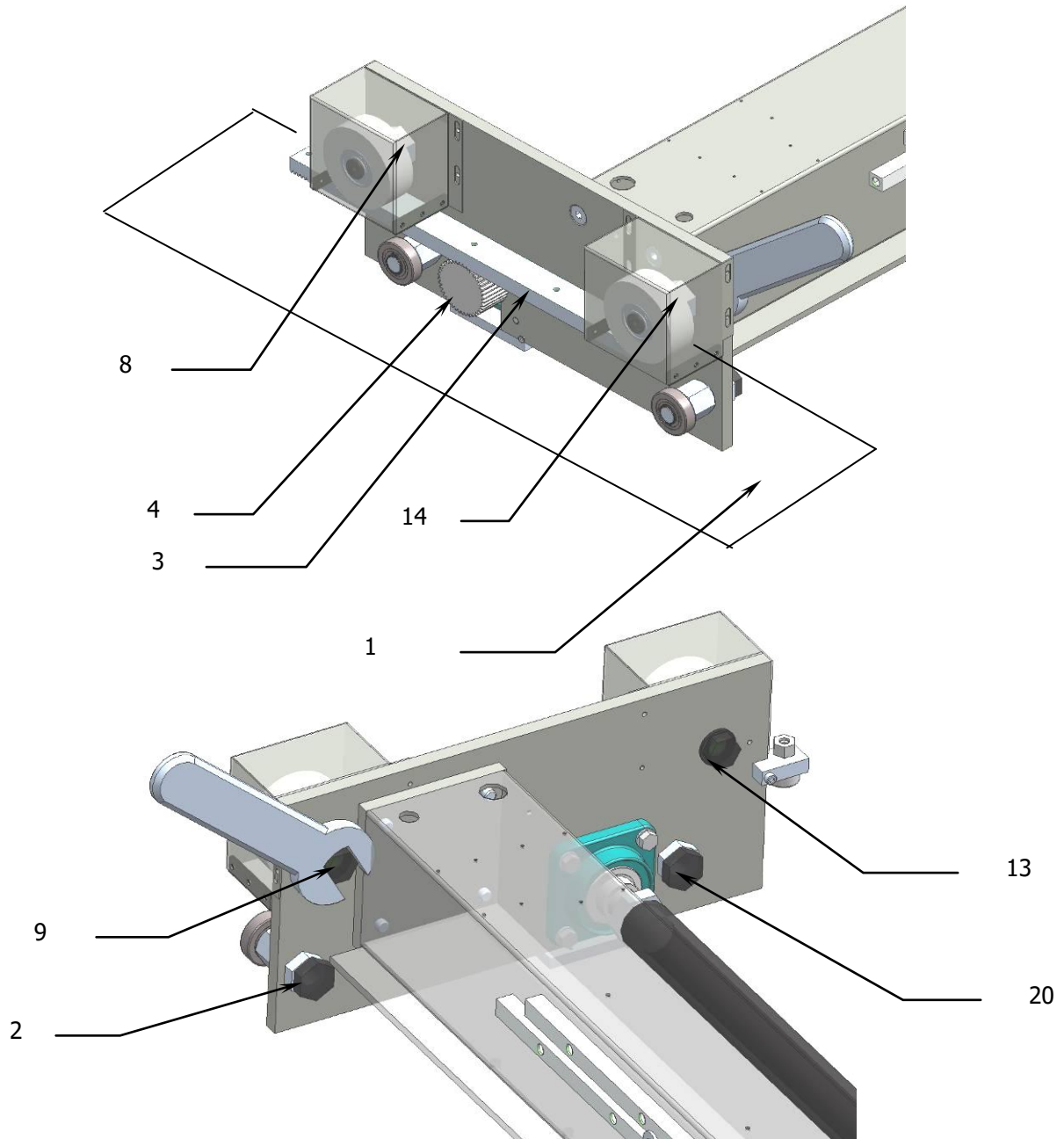
**CAUTION:** this operation must be carried out with the utmost care

Remove the casing wheels. Loosen the nuts locking the counter-wheels "2-20". The pinion should be taken as a point of reference, as it cannot be adjusted. Loosen the screws locking wheels "9-13", by adjusting the cams "8" the pusher can be moved vertically by an amount sufficient to restore the correct

play of 0.05mm between the rack and pinion “4-18” and “3-19”, lock the screws; take care not to cause interference. The operation must be carried out on both side. The traverse frame must traverse vertically in a strictly parallel manner, so check that the lower surface of this member (where the grippers are positioned) is parallel to the top surface of the longitudinal beam “1-21”. Loosen the screws fixing the counter-wheels “2-20”, bring the counter-wheels to a distance of 0.1mm by means of the adjusting cams “5-17” and lock the screws again. It is essential that a test traverse be carried out in order to ensure that all movements take place without requiring force.



Annex 1      **PUSHER**



## C.9 GRIPPERS

The grippers are those parts of the pusher that are used to grasp, move and position the panels on the machine during the cutting.

The position and the number of the grippers are chosen so as to allow working with different panels dimensions and operating correctly during the different cutting phases (cross cutting and rip cutting).

The gripper's functional parts (see figure C9-All.1) are the upper (1) and lower (2) nails used to grasp with security the stack of panels to be cut (3), and they move through a pneumatically driven system of levers.

On the grippers front part there are the aluminium stops (4) whose faces turned towards the cutting line all lie on a plane parallel to the cutting plane, that is the table on which the panels are aligned before grasping the nails (the stops are trimmed at the moment of the machine trial by the panel saw blade itself).

The range of Macmazza panel saws essentially adopts 2 kinds of grippers, both of full grasp kind: those with a single cylinder and those with a double one.

In the single cylinder grippers, only the upper nail movement is driven while the lower nail moves only to adjust itself to the stack of panels it has to grasp. These grippers are adopted on the pusher of the machines devoid of lifting table, for example the TS panel saw.

On the contrary, the double cylinder grippers have the lower nail which is retractable and are adopted on the machines with lifting table. The upright movement of lifting allows to eliminate the interference between the gripper and the stack of panels during the phase of loading from the lifting table.

The plane with the upper face of the fixed nails has to be positioned to a lower quote of 0.3÷0.5mm as regards the machine worktable.

### GRIPPERS ADJUSTMENT

The grippers' setting-up essentially consists in 3 operations:

adjustment of the lower nail position as regards the worktable;

adjusting right-left and up-down inclination of the gripper with respect to the direction of feed pusher.

adjustment of the parallelism between the cutting plane and the plane containing the faces of the aluminium stops for the panels turned towards the cutting plane itself.

The operation of the adjustment of the lower nail position (that is usually carried out by our technicians at the moment of the assembling in the factory), consists in positioning the pusher in such a way as to have the grippers nails inside the guides obtained on the machine plane, and in adjusting the space between the plane and the upper face of the lower nail up to 0.3÷0.5mm with the proper system of screw, nut and jam nut (5).

The up-down clamp right angle / left is adjusted with another double screw system, nut and nut (6) present on both sides.

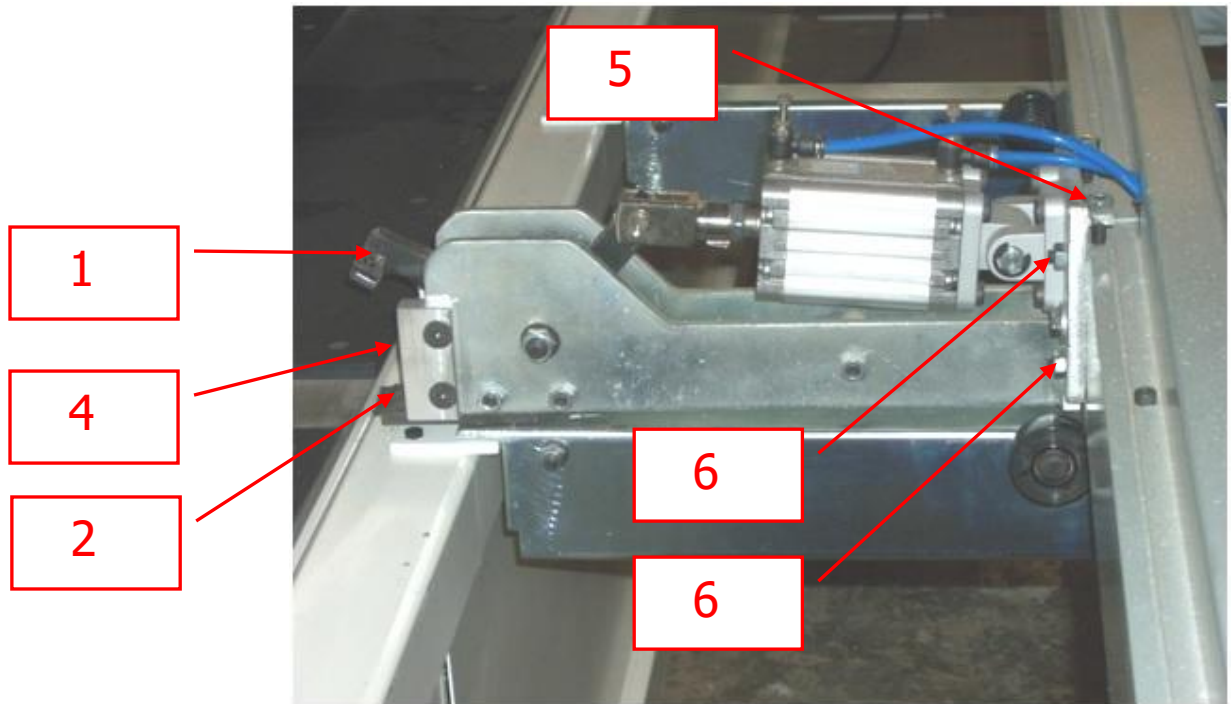
The parallelism between the cutting plane and the plane with the grippers' stops is carried out by the panel saw itself, by imposing to the pusher a cutting quote such as to "trim" the aluminium stops all together, of course after having disassembled the lower grippers, that otherwise would be cut. At the end of the operation it is necessary to assemble the fixed lower nails again. This operation has to be repeated every time a gripper (or even simply a stops) is fitted on the pusher, and it has to be carried out by qualified personnel under our technicians' supervision.



**CAUTION:** This operation must be repeated every time a gripper is mounted ( or even just a side aluminium bar) on the pusher, and must be carried out with the utmost care.



## GRIPPERS



## C.10 SIDE ALIGNER ALONG THE CUTTING LINE

The side aligner on cut line (see -Annex.1) is a device mounted near the line of cut which guarantees the approach towards the pressure beam column of the stack of panels on which one wants to execute a cross cut, before the pressure beam goes down.

It is essentially composed by a roller mounted on a carriage with a limited run (1,6 m) with respect to the length of the cut line. After the approach of roller with stack of panels, a pneumatically controlled lever system moves the roller upward.

The system is anyhow adjusted in the building firm at the moment of the machine test. Such operations, necessary for the correct working of the system, essentially consist regulating the maximum working pressures on the pneumatic cylinders, and regulating the position of the roller of the aligner in low position.

Recommended values on the pressure regulators for pneumatic commands are the following:

*Max. pressure on cylinder for forward run of carriage* = 4,5 bar

*Max. pressure on cylinder for reward run of carriage* = 4,0 bar

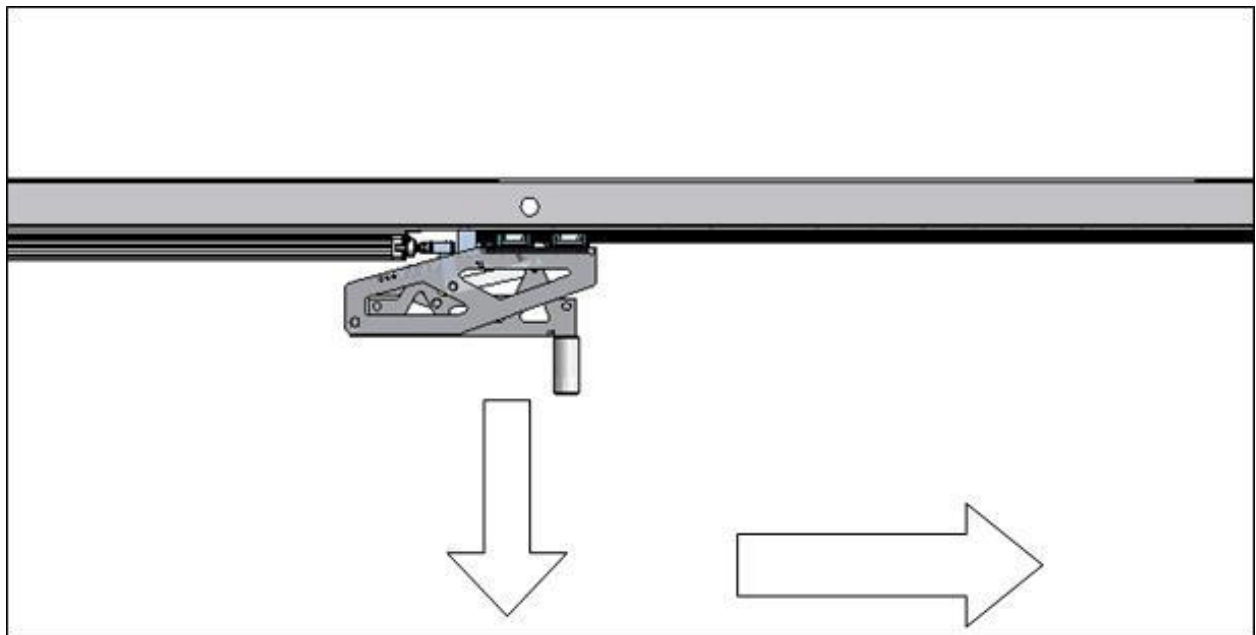


**CAUTION:** If you need to vary the working pressure of the device (in the case of delicate panels or other) you must always adjust BOTH FORWARD-and BACKWARD regulators maintaining pressure of BACKWARD regulator always 0.5 bar +lower than forward.

If it becomes necessary to execute the set-up again, the position of the lowered aligner roller can be adjusted by acting on the screw and jam nut A system: the distance from the worktable has to be of about 1,5mm; moreover it is possible to adjust the angle between the roller axis and the worktable, through the screw and jam nut system B: often it is better to have the lower end of the roller a little bit more advanced (ex. 2-3mm) as regards as the higher end, in order to compensate the deformations during the alignment and to avoid the upper chipping of the panel.

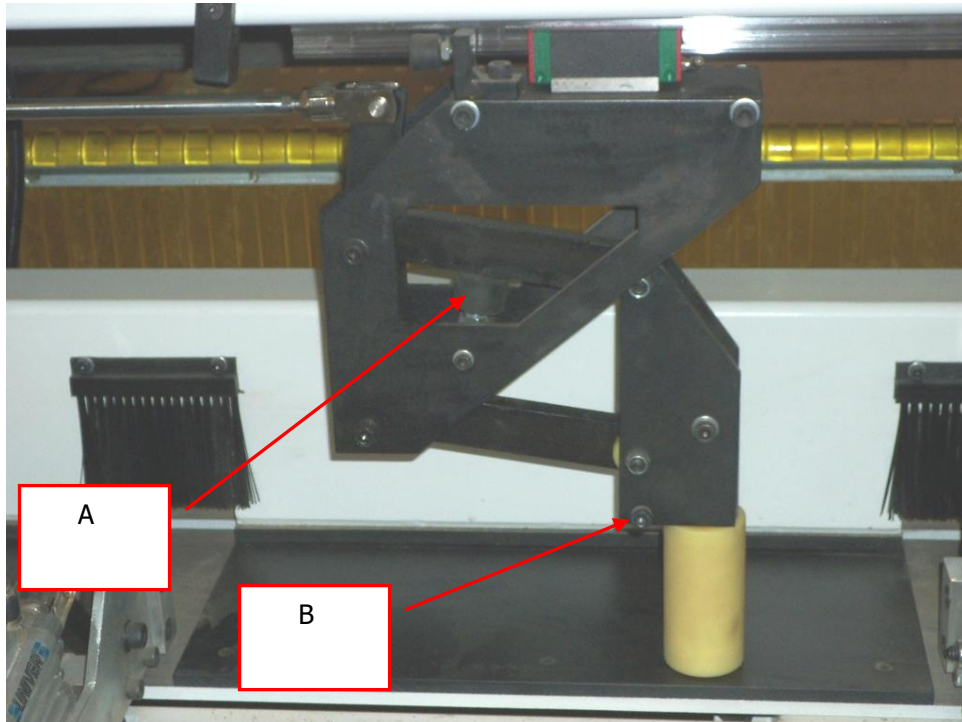


**CAUTION:** The operator must clean/check the side roller In order to let it turn freely. Must change the surface gum when worn in order to avoid to damage the roller itself.

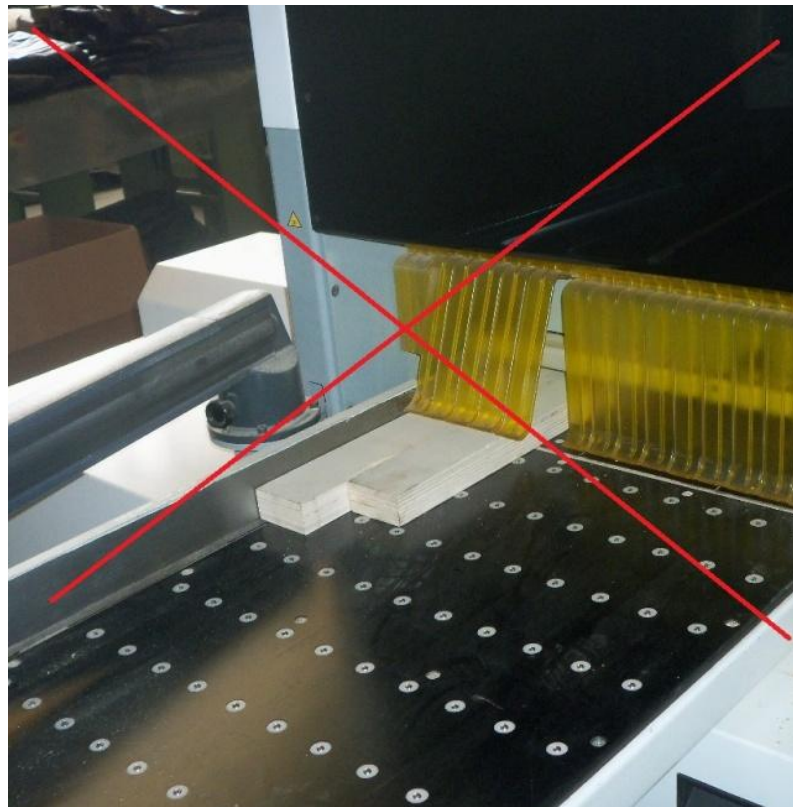


- Annex 1

### ALIGNER ON CUT LINE



**CAUTION:** You can not use the side aligner for aligning strips of different lengths: in this case EXCLUDE the device in order not to damage it.



## C.14 PRESSURE BEAM MAINTENANCE

The pressure ("1",-Annex .1) beam is the device that stops the strips during the cutting phase.

It is set by two or more pneumatic cylinders and kept parallel to the working table by two gears synchronism "2" integrated to each other and gear to the rack "3".

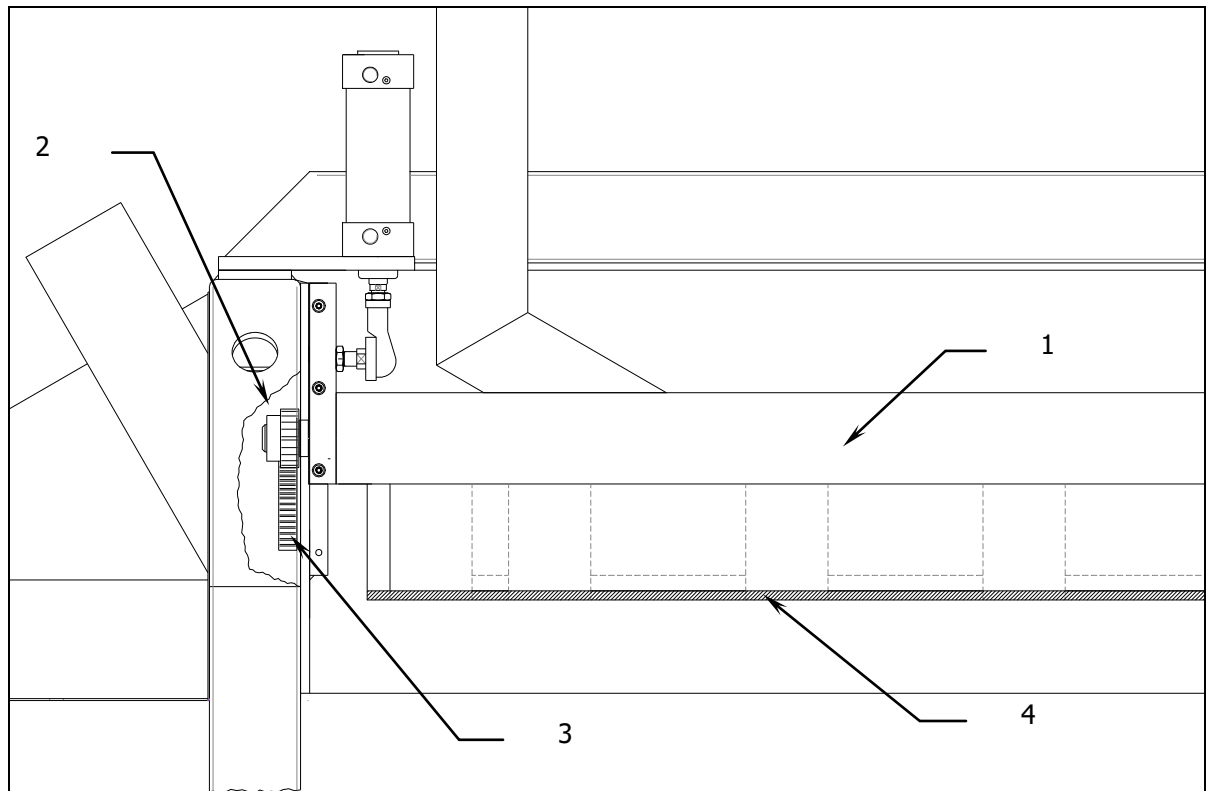
Every 80 working hours you have to clean inside the pressure beam, the pinion-rack coupling and the column, using a dust extractor or a brush.

Every 200 working hours you have to check the wear condition of the rubber fixed on the part of contact with the panels "4".

In case of replacement of rubber, you need to remove the old rubber using a scraper and a solvent (eg. Acetone) (for glue residue ) the surface must be perfectly clean and dry before bonding of the new rubber.

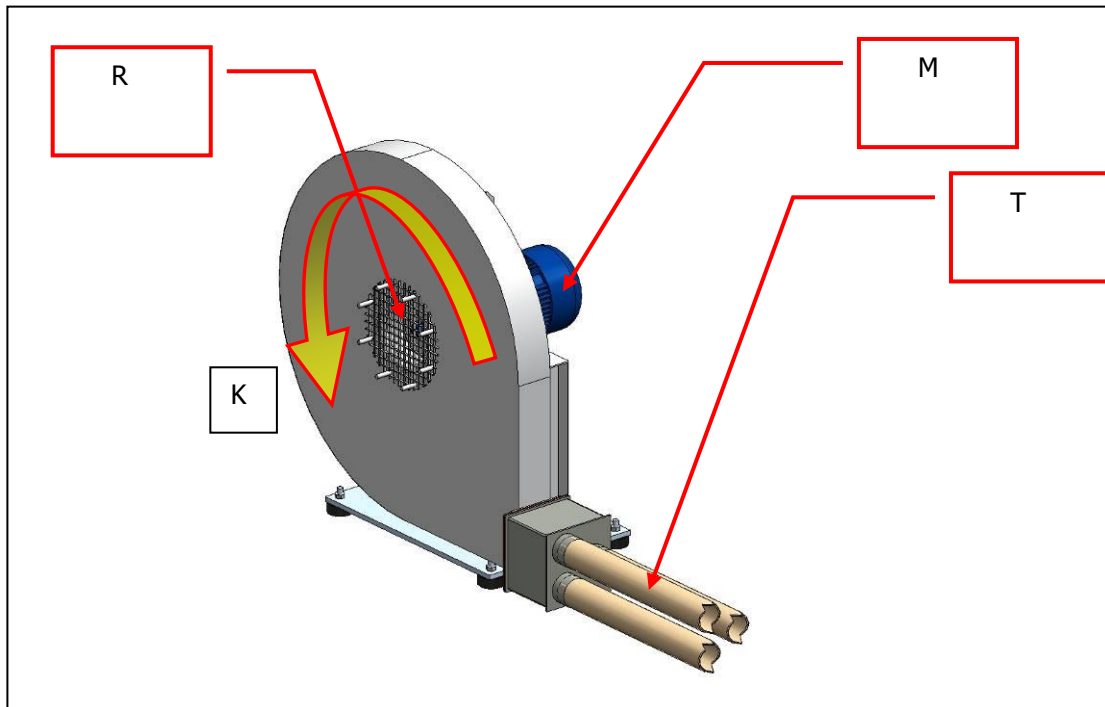
- Annex 1

### PRESSURE BEAM



## C.15 AIR TABLE BOARDS

The machine is standard equipped equipped with 3 fixed front air table or 1 fix and and 1 rotating table (apon request). In Anyway the electricfan feeds the air table by a manifold. 3 tubes exiting reaches the air tables..



**CAUTION:** Do not start the fan if the air tubes (T) are broken or disconnected: Risk to overheat the electric motor (M).



**CAUTION:** Check the inlet opening cleaning periodically (R ); Risk of vibrations, flow loss, air tables clogging



**CAUTION:** In case of Motor's overheat; check the fan's direction of rotation (according to arrow K)



## SEZIONE D) SAFETY

### D.1 DESCRIPTION OF SAFETY DEVICES

A series of valid and reliable safety devices allow safe use of the unit without in any way reducing its functionality and design characteristics.

The term safety devices is used to indicate the following:

- Mechanical protective cover for transmission elements
- Surrounding nets preventing access to the unit
- Emergency stop devices at command and control positions
- Devices stopping the unit if removable covers are opened
- Devices cutting off the power supplies.

Position of safety elements around the machine are shown in -Annex.1.

#### **(20) Mechanical safety cut-outs protecting the openings for access to the blade change zone.**

These are to provide a safe interruption of the emergency circuit, keeping the contacts open so that the protective device does not close. In this specific case, electromagnetic block cut-outs are installed, provided with an interlock mechanism that prevents extraction of the activator, locking the guards in the safety position for as long as the danger continues. In fact, a timer, sealed and installed inside the electric panel, automatically sets the blade stoppage time and consequently opening of the covers.

#### **(27) Safety red button command stoppage from the manual loading/unloading areas.**

This provides safe interruption of the emergency circuit each time the red button is pushed by hand. The system is made up of a red button on yellow screen.

#### **(28) Safety cut-out with mechanical device (hand guard bar) commanding stoppage due to danger in the cutting area.**

This provides safe interruption of the emergency circuit each time the bar is operated manually. The system is made up of a mechanical cut-out with forced aperture contacts, installed in position on a mechanical system integral with the panel pressure bar, in order to safeguard the machine operator, who might accidentally find himself working with his hands in the cutting area as the pressure bar descends.

#### **(21) Safety cut-out commanding stoppage in the absence of the correct working pressure in the compressed air system.**

This serves to interrupt the emergency circuit at the moment in which the pressure in the compressed air system reaches the minimum level for safe operation.

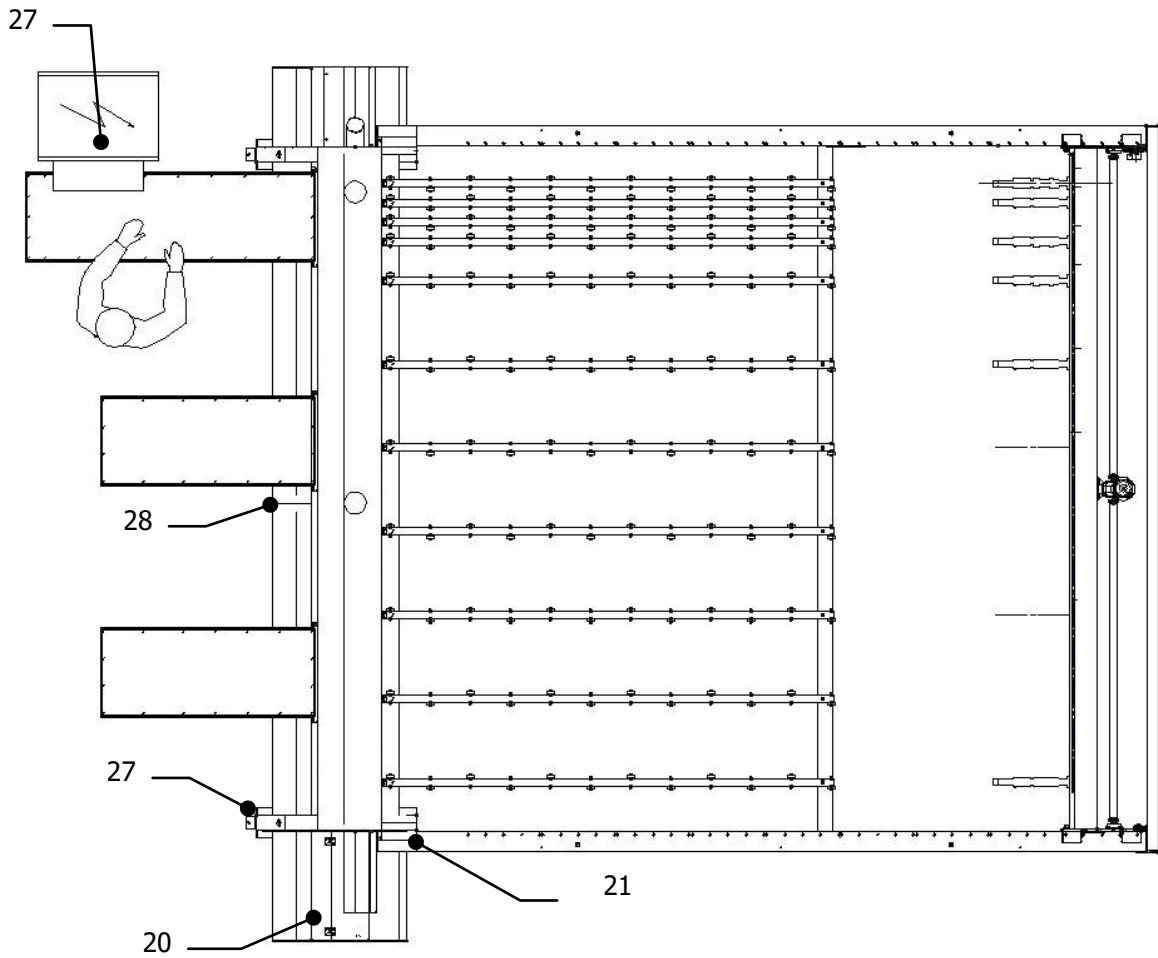
The system is made up of an adjustable pressure gauge (sealed), installed between the cut-off tap and the pneumatic conditioning unit, which operates mechanically on an electric contact positioned in series with the emergency line.



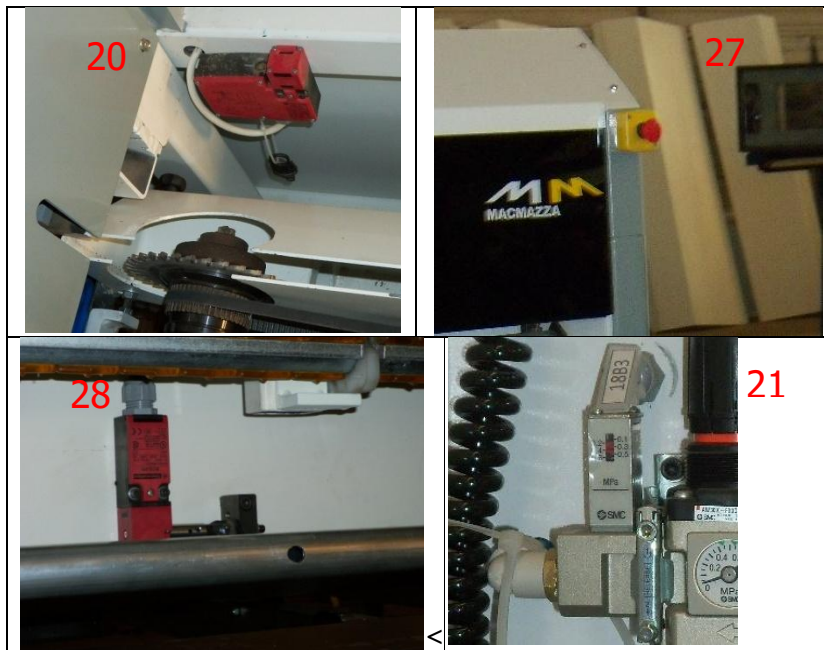
#### **WARNING:**

IN CASE THAT THIS MACHINE IS BEING USED IN LINE WITH OTHERS, IT IS NECESSARY THAT THE OWNER REQUIRES ASSISTANCE FROM THE MANUFACTURER TO HAVE THE NECESSARY INTERLOCKS BETWEEN MACHINES AND SAFETY SYSTEMS.

- Annex 1



POSITION OF MACHINE'S SAFETY DEVICES





## D.2 CHECKING THE SAFETY DEVICES

EVERY 200 HOURS IT IS NECESSARY TO CARRY OUT A SERIES OF TESTS TO ENSURE THAT THE SAFETY DEVICES ARE FUNCTIONING CORRECTLY.

REQUIRED MACHINE STATUS: START-UP PROCEDURE COMPLETED.

### 1) TESTING MAIN POWER SWITCH

ACTION: Turn the switch handle to the "OFF" position .

EXPECTED RESULT: Total shut-down of unit.

TO EXIT ALARM MODE: Turn the switch back to the "ON" position.

### 2) TESTING FULL EMERGENCY MUSHROOM-SHAPED BUTTONS

ACTION: Press the red mushroom-shaped button on the control panel and/or on the external button board.

EXPECTED RESULT: Total stoppage of all moving parts.  
control reporting "EMERGENCY STATE "

TO EXIT ALARM MODE: Unlock the mushroom-shaped button and restart the start-up sequence.

### 3) TESTING BLADE CHANGE COVER MAGNETIC LOCK SAFETY STOPS

ACTION: Check that the covers protecting access to the blade change areas are mechanically blocked, then proceed according to the instructions given for changing the blades.

EXPECTED RESULT: It is impossible to open the covers for a set time after the blade change command has been given (around 20-30 seconds).  
Total stoppage of all moving parts.

TO EXIT ALARM MODE: Close the covers again and deactivate the blade change command, then restart the start-up sequence

### 4) TESTING STOPS ON HAND GUARD PROTECTING AGAINST DESCENT OF PRESSER DURING CUTTING.

ACTION: During simulation of cutting without using a panel, lift the hand guard bar behind the protective screen.

EXPECTED RESULT: Total stoppage of all moving parts.  
The panel pressure bar will only rise after the blade group has completely disappeared under the working surface.

TO EXIT ALARM MODE: restart the start-up sequence

### 5) TESTING PRESSURE SWITCH PROTECTING PNEUMATIC SYSTEM WHEN NOT AT WORKING PRESSURE.

ACTION: Using the special tap, cut the machine off from the compressed air supply, then perform several manual cutting cycles.



**EXPECTED RESULT:** After a few cutting cycles, as a result of the drop in air pressure caused by disconnection from the main supply, all moving parts will stop.  
control reporting " AIR SUPPLY FAULT"

**TO EXIT ALARM MODE:** Re-connect the unit to the compressed air supply and restart the start-up sequence.

FOR A CORRECT USE OF THIS MACHINE IT IS FORBIDDEN ANY WAY OF WORKING DIFFERENT FROM THE ONES PREVIEWED AND DESCRIBED IN THIS MANUAL.

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