SEGATRICE A NASTRO PER METALLI FERROSI BAND SAW FOR FERROUS METALS BANDSAEGEMASCHINE FÜR EISENMETALLE SCIE A RUBAN POUR METAUX FERREUX SIERRA DE CINTA PARA METALES FERROSOS ЛЕНТОЧНЫЙ РАСПИЛОВОЧНЫЙ СТАНОК ДЛЯ МЕТАЛЛОВ

MANUALE DI ISTRUZIONI PER L'USO - INSTRUCTION MANUAL FOR OPERATION BETRIEBSANLEITUNG - MANUEL D'INSTRUCTIONS POUR L'EMPLOI

MANUAL DE INSTRUCCIONES DE USO
РУКОВОДСТВО ПО ЭКСПЛУАТАЦИИ И ТЕХОБСЛУЖИВАНИЮ

COSTRUTTORE:
MANUFACTURER:
ERBAUER:
CONSTRUCTEUR:
MACC s.r.I. SCHIO ( VI ) - ITALY
CONSTRUCTOR:
ИЗГОТОВИТЕЛЬ:

MODELLO:
MODEL:
MODELL:
MODELE:

## SPECIAL 411 A

MODELO:
МОДЕЛЬ:

MATRICOLA:
SERIAL NUMBER:
KENNNUMMER:
MATRICULE:
MATRICULA:
СЕРИЙНЫЙ НОМЕР:

ANNO DI COSTRUZIONE:
YEAR OF CONSTRUCTION:
BAUJAHR:
ANNEE DE CONSTRUCTION:
AÑO DE COSTRUCCION:
ГОД ИЗГОТОВЛЕНИЯ:



> DICHIARAZIONE DI CONFORMITA' 'CE' CERTIFICATE OF CONFORMITY 'EEC' KONFORMITÄTSBESCHEINIGUNG 'EWG' DECLARATION DE CONFORMITE 'CE' DECLARACION DE CONFORMIDAD 'CE' ДЕКЛАРАЦИЯ О СООТВЕТСТВИИ 'СЕ'

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- Dichiara, sotto la propria responsabilità, che la macchina nuova descritta in appresso:
- Declares, by its own undertaking, that the new machine described below:
- Erklärt auf eigene Verantwortung, daß die nachstehend beschriebene neue Maschine:
- Déclare sous sa propre responsabilité, que la machine neuve décrite de suite:
- Declara, bajo la propia responsabilidad, que la nueva màquina descripta a continuaciòn:
- Заявляет под личную ответственность, что описанная новая машина под названием:


# SEGATRICE A NASTRO PER METALLI <br> BAND SAW MACHINE FOR METALS <br> BANDSAEGEMASCHINE FÜR EISENMETALLE SCIE A RUBAN POUR METAUX SIERRA DE CINTA PARA METALES ЛЕНТОЧНЫЙ РАСПИЛОВОЧНЫЙ СТАНОК ДЛЯ МЕТАЛЛОВ 

TIPO - TYPE - TYP - TYPE - TIPO - ТИП

## SPECIAL 411 A

MATRICOLA - SERIAL NUMBER - KENNNUMMER - MATRICULE - MATRICULA - СЕРИЙНЫЙ НОМEP

ANNO DI COSTRUZIONE - YEAR OF CONSTRUCTION - BAUJAHR - ANNEE DE CONSTRUCTION AÑO DE COSTRUCCION - ГОД ИЗГОТОВЛЕНИЯ

- E' CONFORME ALLA DIRETTIVA MACCHINE 2006/42/CE, ALLA DIRETTIVA COMPATIBILITA' ELETTROMAGNETICA 2014/30/UE ED ALLA DIRETTIVA BASSA TENSIONE 2014/35/UE.
- IS IN COMPLIANCE WITH THE 2006/42/EEC MACHINERY DIRECTIVE, 2014/30/UE DIRECTIVE ON ELECTROMAGNETIC COMPATIBILITY, 2014/35/UE LOW VOLTAGE DIRECTIVE.
- DEN NORMEN BEZÜGLICH DER MASCHINEN-RICHTLINIE 2006/42/EWG, 2014/30/EWG RICHTLINIE ZUR ELEKTROMAGNETISCHEN KOMPATIBILITÄT, 2014/35/EWG RICHTLINIE FÜR NIEDERSPANNUNG ENTSPRICHT.
- EST CONFORME A LA DIRECTIVE MASCHINES 2006/42/CEE, 2014/30/CEE DIRECTIVE SUR LA COMPATIBILITÉ ÉLECTROMAGNÉTIQUE, 2014/35/CEE DIRECTIVE BASSE TENSION.
- HA SIDO FABRICADA CONFORME A LA DIRECTIVA MÁQUINAS 2006/42/CEE, 2014/30/CEE DIRECTIVA COMPATIBILIDAD ELECTROMAGNÉTICA, 2014/35/CEE DIRECTIVA BAJA TENSIÓN.
- ОТВЕЧАЕТ ТРЕБОВАНИЯМ ДИРЕКТИВЫ ПО МАШИНАМ 2006/42/СЕ, ДИРЕКТИВЫ ОБ ЭЛЕМКТРОМАГНИТНОЙ СОВМЕСТИМОСТИ 2014/30/СЕ И ДИРЕКТИВЫ О НИЗКОМ НАПРЯЖЕНИИ 2014/35/СЕ.

Nome del Rappresentante Legale - Name of the Legal Representative - Name des Gesetzlichen Vertreters Nom du Représentant Légal - Apellido del Representante Legal - Фамилия, имя законного представителя:
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MACC Costruzioni Meccaniche s.r.I. - Via Lago di Albano, 10 - 36015 Schio (VI) Italy Tel.: 0445/575005 Fax: 0445/575006
Firma - Signature - Unterschrift - Signature - Firma - Подпись:


> E' SEVERAMENTE VIETATO UTILIZZARE LA MACCHINA SENZA LIQUIDO DI TAGLIO.

## IT IS STRICTLY FORBIDDEN TO USE THE MACHINE WITHOUT CUTTING FLUID.

> ES IST STRENG VERBOTEN, DIE MASCHINE OHNE SCHNEIDFLÜSSIGKEIT IN BETRIEB ZU NEHMEN.

## IL EST SEVEREMENT INTERDIT D'UTILISER LA MACHINE SANS LIQUIDE DE COUPE.

SE PROHÍBE TERMINANTEMENTE UTILIZAR LA MÁQUINA SIN LÍQUIDO DE CORTE.

É SEVERAMENTE PROIBIDO UTILIZAR A MÁQUINA SEM LÍQUIDO DE CORTE.

Категорчески запрещена эксплуатация машины без смазочноохлаждающей жидкости


SISTEMA DI MICROLUBRIFICAZIONE: SE INSTALLATO SULLA MACCHINA, È OBBLIGATORIO L'USO DI MASCHERINA PROTETTIVA DELLE VIE AEREE. SI CONSIGLIA DI MANTENERE AREATO IL LOCALE.

MICRO-LUBRICATION SYSTEM: IF INSTALLED ON THE MACHINE, THE USE OF PPE (AIRWAYS PROTECTION MASK) IS NECESSARY. KEEP THE PLACE AERATED.

## MIKRODOSIERGERÄT: FÜR MASCHINEN MIT

MIKRODOSIERGERÄT IST ES STRIKT ERFORDERLICH EINE ATEMMASKE ZUM SCHUTZ DER ATEMWEGE ZU TRAGEN. BITTE DAS GERÄT NUR IN GUT BELÜFTETEN RÄUMEN ANWENDEN.

SYSTÈME DE MICRO-LUBRIFICATION: SI LE SYSTĖME EST INSTALLÉ SUR LA MACHINE, IL EST IMPÉRATIF DE PORTER UN MASQUE DE PROTECTION POUR PROTÉGER LES VOIES RESPIRATOIRES. LES LOCAUX DOIVENT ÉGALEMENT ÊTRE VENTILÉS.

SISTEMA DE MICROLUBRICACIÓN: SI ESTÁ INSTALADO EN LA MÁQUINA, ES OBLIGATORIO EL USO DE UNA MÀSCARA PROTECTORA DE LAS VÍAS RESPIRATORIAS. ES ACONSEJABLE MANTENER LA SALA VENTILADA.

SISTEMA DE MICRO-LUBRIFICAÇÃO: SE INSTALADO NA MÁQUINA, O USO DE UMA MÁSCARA PROTETORA DAS VIAS AÉREAS É OBRIGATÓRIO. É ACONSELHÁVEL MANTER O LOCAL VENTILADO.

СИСТЕМА МИКРОСМАЗКИ: ЕСЛИ СИСТЕМА УСТАНОВЛЕНА, ОБЯЗАТЕЛЬНО ИСПОЛЬЗОВАТЬ ЗАЩИТНУЮ МАСКУ И ПРОВЕТРИВАТЬ ПОМЕЩЕНИЕ.



## 1. INTRODUCTION

This operation instruction manual conforms to the requirements of the Machine Directive 2006/42/EEC . In this light, special attention has been given to safety aspects and accident prevention in the work-place for each stage in the machine's "life" . Information which could be of particular assistance to the operator has been highlighted .
The "Operating instructions" are an integral part of the machine and should be consulted before, during and after the start up of the machine and whenever else required. The content of these instructions should always be carefully observed.
The observance of the above is the only way to achieve the two fundamental aims of this manual :

- Optimization of machine performance
- Prevent damage to the machine and injury to the operator

The index of the chapters and the index of the drawings, diagrams and tables is contained in chapter 3 and can be used to help the location of specific information

## CAUTION : BEFORE INSTALLING THE MACHINE , READ THE OPERATING INSTRUCTIONS CAREFULLY

## 2. INFORMATION ABOUT MAINTENANCE ASSISTANCE

### 2.1 GUARANTEE

- MACC S.r.l. products are guaranteed against material and manufacturing defects for a period of 12 months from the date of delivery or , if the machine is installed by MACC employees , from the date of machine start up .
- The buyer is only entitled to the replacement of parts which are acknowledged as faulty : carriage and packing are at the buyer's expense. In the event of the above, the following information should be supplied :

1. Date and number of purchasing document
2. Machine model
3. Serial number
4. Code of any relevant drawings

- Requests for compensation for the inactivity of the machine will not be accepted .
- The guarantee does not cover uses which are not in line with these operating instructions which are an integral part of the machine . Nor is maintenance covered if the instructions supplied are not observed .
- The guarantee will not cover machines which have undergone unauthorized modifications .
- Modification or tampering with the safety devices is strictly forbidden.


## 3. INDEX

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| Chap 4 | Description of the machine |
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|  | Description of the machine and its components |
|  | Intended and unsuitable uses of the machine |
| Chap 5 | Main technical data |
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## 4. DESCRIPTION OF THE MACHINE

### 4.1 SAFETY STANDARDS COMPLIED WITH DURING THE DESIGN AND CONSTRUCTION OF THE MACHINE

The machine produced by us is in compliance with :

- 2006/42/EEC Machinery Directive .

The following Standards apply:

- EN ISO 121002010 Safety of machinery - Basic concepts and general principles for design . Basic terminology and methods
- EN ISO 160932017 Safety of machinery. Basic concepts and general principles for design . Specifications and technical principles.
- EN ISO 138502015 Safety of machinery . Emergency stop devices, functional aspects - design principles .
- EN ISO 4413-14 2012 Safety requirements related to systems and components for hydraulics and pneumatic transmissions
- EN 10372008 Safety of machinery. Isolation and energy dissipation. Prevention of unexpected start-up .
- EN 141192013 Safety of machinery - Interlocking devices with and without guard - locking. General principles and provisions for design .
- EN 60204-1 2016 Safety of machinery . Electrical equipment of machines . Part 1: General requirements Sa
- EN 138572008 Safety of machinery. Safety distances to prevent danger zones being reached by the upper limbs.
- 2014/30/UE Directive on electromagnetic compatibility .

The following Standards apply :

- EN 55014-1 2017 Electromagnetic compatibility - Requirements for household appliances , electric tools
- EN 61000-3-2 2018 Electromagnetic compatibility ( EMC ) -- Part 3-2 : Limits - Limits for harmonic current emissions
- EN 61000-3-11 2017 Electromagnetic compatibility (EMC ) -- Part 3-11: Limits - Limitation of voltage changes , voltage fluctuations and flicker in public low-voltage supply systems .
- EN 550322015 Electromagnetic compatibility of multimedia equipment - Emission requirements

EN 61000-4-2 2008
Electromagnetic compatibility ( EMC ) -- Part 4-2 : Testing and measurement techniques Electrostatic discharge immunity test

- EN 61000-4-4 2012 Electromagnetic compatibility (EMC ) -- Part 4-4 : Testing and measurement
techniques - Electrical fast transient/burst immunity test
- EN 61000-4-6 2013 Electromagnetic compatibility (EMC ) -- Part 4-6 : Testing and measurement techniques Immunity to conducted disturbances, induced by radio-frequency fields


## - Low Voltage Directive 2014/35/UE .

Directive 2003/11/EC Directive 2003/11/EC of the European Parliament and of the Council of 6 February 2003 amending for the 24th time Council Directive 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations ( pentabromodiphenyl ether, octabromodiphenyl ether )
Directive 2002/44/EC of the European Parliament and of the Council of 25 June 2002 on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents ( vibration ) ( sixteenth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC ) .

### 4.2 DESCRIPTION OF THE MACHINE AND ITS COMPONENTS

The Special 411 A band sawing machine produced by MACC has a sturdy frame made from welded and painted sheetsteel. The upper surface is designed to allow the complete draining away of the cutting fluid. The band support bow is made in cast iron, with a suitable dimension to provide the necessary stiffness and precision to the cutting unit. The vice unit is made of cast-iron and clamps the material to be cut securely. The numerical control device allows the required length to be present and provides high repeated-cut precision.
The bar-stop device allows setting a desired length and a remarkable accuracy with repetitive cutting in manual/semiautomatic. The bow is firmy connected to a reduction unit attached to the motor and to the bottom casting by a hinge allowing a rotation $60^{\circ}$ right $-45^{\circ}$ left and the cutting movement in manual mode o in automatic with hydraulic cylinder.

The coolant pump is fitted to the machine base. A electromechanical device with pressure switch for band tightening, prevents the band from advancing in the event of insufficient tension and moreover allows ideal operation conditions to be restored at any moment. The main switch is located on the front panel. The blade is protected by a guard with interlock which covers the upper area and the handwheels and by two adjustable lower guards which protect the operator from ejected shavings and coolant. The machine is supplied with a set of service spanners and rod support .

### 4.3 INTENDED AND UNSUITABLE USES OF THE MACHINE

The SPECIAL 411 A band sawing machine has been designed and built to cut bars, structural steel and ferrous metal pipes in accordance with the instructions contained in this manual. Therefore, the cutting of other materials is not permitted : if the above recommendations are not observed, the machine could be damaged and the health and safety of the operator put at risk. Cutting is not permitted, if the bar has not been first locked in the vice .

## 5. MAIN TECHNICAL DATA

Under no circumstances should the following data be altered, this is in order to protect the correct functioning of the machine and to avoid creating safety risks for the operator .

|  | Three phase power supply |
| :--- | ---: |
| Motor power | $2,2 \mathrm{~kW}$ |
| Motor revolutions | 1430 rpm |
| Cutting speed (Inverter) | $0-90 \mathrm{~m} / 1^{\prime}$ |
| Control unit motor | 0.55 kW |
| Electric pump | 0.09 kW |
| Fly wheel dimensions | 350 mm |
| Blade size (length $\times$ width $\times$ thick) | $3200 \times 27 \times 0.9 \mathrm{~mm}$ |
| Cutting thickness | $1,2 \mathrm{~mm}$ |
| Cutting angle | $60^{\circ} \mathrm{dx}-45^{\circ} \mathrm{sx}$ |
| Material clamping vice max opening | 300 mm |
| Jaws height | 150 mm |
|  |  |
| Bed height | 850 mm |
| Coolant tank capacity | 50 litri |
| Machine weight | $\sim 10800 \mathrm{~N} \mathrm{(1100} \mathrm{~kg} \mathrm{\sim}$ ) |

## 6. HANDLING AND TRANSPORTATION

For safe handling and transportation use a lift truck for movement indoors Encl. 3. Keep the machine in its normal position

All handling and transportation operations should be carried out by trained staff .

## 7. MACHINE INSTALLATION

## A. MACHINE CHECK

The machine should be checked to make sure that it has not been damaged during transportation and handling. If the machine appears to have been damaged, contact MACC immediately .

## B. FASTENING OF THE MACHINE

The machine will be able to operate in keeping with the technical parameters supplied by MACC if it is positioned correctly and fastened securely to the bench or the factory floor so that vibrations are minimal during operation. Consult drawing SPECIAL 411 A. Installation plan Encl. 4.

## C. BAND ASSEMBLY

Remove the bow guard cod.056/42 by unscrewing the screws and the washers. Fit the band by inserting it first between the bearings of the blade guide heads and then on the two pulleys, tighten the blade slightly by means of the hand wheel cod.058/35 and replace the bow guard. Check that the band is fitted with the correct direction of teeth , as shown in enclosed document 9 . Make sure that the band type (dimensions $3200 \times 27 \times 0.9$ ) and its teeth pitch are suited to the material to be cut

## D. ELECTRICAL CONNECTION TO THE MAINS

## Install a differential thermomagnetic switch with characteristics suited to the mains .

Make sure that the power supply voltage corresponds to the voltage on the motor plate . Connect the cable to the power supply line observing the colour codes of the individual wires, pay particular attention to the earth wire . Connect the machine, make sure that the rotation of the circular blade is in the direction shown by the arrow on the guard .

## E. CUTTING COOLANT

For the cooling of the circular blade, fill the tank with emulsion oil obtained from a mixture of water and AGIP AQUAMET 700 EP oil with a percentage of $5-7 \%$.
F. SPRING TENSIONING ADJUSTMENT

Wind the spring by turning screw up to 47 mm as shown in ENCL. 8 .

## 8. MACHINE START UP AND OPERATION

### 8.1 DEVICES AND THEIR LOCATION

( The location of the devices described is shown on the SPECIAL 411 A installation plan )
Cod. 314/90 (Encl. 5 )
LOCKABLE MAIN SWITCH
Cod. 089/90 (Encl. 5 )
Cod. 085/90 (Encl. 13 )
Cod. 145-C/36 (Encl. 15 )
Cod. 011/44 (Encl. 9 )
Cod. 320/17 (Encl. 9 )
Cod. 059/36 (Encl. 11 )
Cod. 216/37 (Encl. 6 )
ELECTRIC PUMP
EMERGENCY BUTTON
ROLLER CONVEYOR
LOCKING VICE
CYLINDER FIXED VICE
CYLINDER VICE CARRIER
CYLINDER BOW

### 8.2 TOOLS SUPPLIED

1 Allen wrench size 3
1 Allen wrench size 5
1 Allen wrench size 6
1 Allen wrench size 8
1 Allen wrench size 10

### 8.3 OPERATION

## CHECKS TO CARRY OUT BEFORE EACH CUT

A. Tension the band by rotating the handwheel $058 / 35$ till the end of the traverse. On the display does not blink the signaling "Broken Blade". Remember at the end of the operation to loosen the hand wheel to avoid the slackening of the band.
B. Check that the hand indicates the required cutting angle (vice scale).
C. Make sure that the bow and the vice are locked by means of the lever 044/09 (ENCL. 6).
D. Stroke adjusting headband: follow the instructions of the manual tool MACC4.
E. With the motor off, lower the bow and check that at the end of stroke, the band does not touch the rotating plate 26/42. If the band does touch, adjust the screw located on the rotating plate ( ENCL. 8 ). By adjusting screw, the width of the working stroke can also be established.
F. Make sure that the piece to be cut is properly secured in the vice;
G. Make sure that the cooling liquid is circulating in the machine. Use the taplocated on the guide shoe to regulate the flow of liquid.
H. When starting the motor, make sure that the band rotates in the direction of the arrow shown in Encl.9.
I. To obtain maximum cutting accuracy, the unit must be located the nearest possible to the workpiece. Clamp the work piece with the vice, release the mobile blade guide plate $027-\mathrm{A} / 32$ with screw and move it near the vice jaw so that it doesn't touch it during the cutting operation, then secure it again. When carrying out this operation, make sure that the blade guide guard does not come out of the bow guard leaving a part of the blade exposed.

## CUTTING OPERATION

A. Before starting to cut, if the cutting inclination is not as required, correct it or change it by pulling the knob 103/11 and turning the rotating plate 026/42 until the required position is reached. If the position is not one of the normal set positions, fasten the rotating plate using the hand wheel 044/09 ( ENCL. 6 ).
B. For other information regarding the cutting operation and machine programming, follow the supplied MACC4 instructions carefully.
C. To replace the band, carry out the same operations used to assemble the band (chapter 7c).
D. For the choice of blade see table ENCL.1.

## ATTENTION!!!

-WE STRONGLY DISCOURAGE THE USE OF BLADES WITH RUINED OR INSUFFICIENTLY SHARP CUTTING EDGES.
-IT IS NOT POSSIBLE TO CUT AT $60^{\circ}$ ON MACHINE WITH VERTICAL PRESSING DEVICE.
-ON MACHINE WITH HYDRAULIC VERTICAL PRESSING, REMOVE THE ROLLER DEVICE FOR THE FRONT PACK CUTTING BEFORE MAKING CUTS AT $45^{\circ}$

### 8.4 SPECIAL SAFETY CHECKS

A. Before using the machine, check carefully that the safety devices are in good working order, that the mobile parts are not blocked, that no parts are damaged and that all the components are installed correctly and are functioning properly.
B. Make sure, before operating the machine, that the screws of the guards and other protective devices are adequately secured, especially the screws of the bow guard.
C. Check that the safety microswitches and the emergency button are functioning correctly. Test them during a loadless machine cycle.
D. Pay attention to environmental conditions. Do not expose the machine to rain ; to not use it in damp environments, position the machine on a clean dry floor that has no oil or grease stains.
E. Before using the machine , the operator should make sure that all tools and service spanners used for maintenance or adjustment have been removed .

### 8.5 GENERAL SAFETY RULES

A. Wear appropriate clothing . The operator's clothing should not be loose or dangling nor should it have parts which could easily get caught. Sleeves should contain elastic .
Belts, rings or chains should not be worn. Long hair should be kept in a net .
B. Avoid unstable operating positions. Find a safe and evenly balanced position to operate the machine .
C. Keep the work area tidy, untidiness increases the risk of accidents .
D. Do not use the power supply cable to disconnect the plug from the socket. Protect the cable from high temperatures, oil or sharp edges. For outdoor use, only use extension cables which are in line with current regulations .

### 8.6 MEASURES TO PREVENT RESIDUAL RISKS

A. The removal of guards and tampering with the safety devices is strictly forbidden.
B. Gloves should always be worn .
C. Standard work clothing should be used and kept closed and should not have flapping parts .
D. The machine should not be cleaned with liquids under pressure .
E. In the event of fire, extinguishers should not be used unless they are the powder type. The electric power supply to the machine should always be disconnected in these circumstances .
F. Do not insert foreign bodies into the motor cover and to not supply the machine with voltage by tampering with the safety microswitches or main switch .
G. Take the necessary precautions to avoid the machine being started by other people during loading , adjustment, piece changing or cleaning.

Safety, Guidance, Notice Labels on the Machine

mettere in tensione la lama ruotando IL VOLANTINO FINO A FINE CORSA.
PUTTENSION ON THE BL ADE BY ROTATING THE PUT TENSION ON THE BLADE BY ROTATIN
HANDWHEEL TO THE END OF STROKE.
das sageband spannen indelu das OAS SAGEBAND SPANNEN. INDEA DAS
HANDRAD BIS ZUH ENDE GEDREHT WIRD MEITRE ENTENSION LA LAME EN TOURNANTLE
VOLANT JUSOUA LA FIN DE COURSE.
TENSIONAR LA CINTA GIRANDO EL VOLANTE
HASTA EL FINAL DE CARRERA.


COLLEGATO CONNECTED 400 volt

## 9. MAINTENANCE AND REPAIRS

### 9.1 GENERAL SAFETY MEASURES

A. Lockable main switch. Use the padlock in the event of machine failure or replacement of the band. The padlock key should be entrusted to a responsible person.
B. Before carrying out any work on electrical equipment, remove the power supply plug from the control panel ( disconnect voltage).
C. Only use cables to supply power, which have a cross-section suited to the power of the machine .
D. Opening key. The keys of the machine should be kept by authorized personnel. Do not leave the keys for doors which provide access to the hydraulic or electrical parts or keys to lockable switches in easy of reach of unauthorized personnel.
E. Repairs should only be carried out by authorized personnel. Only spare parts made by the original manufacturer should be used, otherwise these could cause damage or injury .
9.2 ROUTINE CHECKS AND MAINTENANCE

| FREQUENCY <br> (working hours ) |  |
| :---: | :--- |
| 1000 hours | Adjustment blade guide bearings |
| 1000 | Lubrication of mobile parts in the piece locking vice . (GREASE AGIP MU2 ) |
| 1500 | Blade drive reduction unit |
| 50 | Cleaning of the coolant tank and filter check |
| Monthly | Check oil in the control unit |
| if necessary | Add hydraulic unit oil with AGIP ARNICA 32 |

### 9.3 Description of routine maintenance

## A. Adjustment of the blade guide bearings

Loosen the screw, rotate the cams cod.027/35, so that the blade guide bushings vertically position the blade in axis ( ENCL. 10 ). Tighten the dowels until the blade secured. Loosen the dowels slightly ( about $1 / 10$ of a turn ). The front blade guide must be positioned as near as possible to the piece to be cut. Check every 3 months the existing tolerance between the blade guides, making sure that it does not exceed the blade thickness of one tenth of a millimetre, so as to avoid inexactnesses in the cut squaring. Periodically check with mounted blade that the blade guide bearings rotate freely.

## B. Lubrication of mobile parts of piece locking vice

Remove jaw 010/42 (ENCL. 7 ), withdraw vice 005/038 completely by lowering the lever 044/09. Clean and grease the mobile parts of the vice 005/38_028/42. In case of sliding difficulties or play the clamp guides carry out the following operations : loosen nut, adjust dowel and secure.

## C. Blade drive reduction unit

First oil change after 500 working hours, other changes after 1500 hours ( AGIP BLASIA 220 ) .
D. Cleaning of the coolant tank .

To clean the coolant tank, simply remove the tank with the filter which is situated at the back of the machine. Empty the coolant from the tank and collect the coolant in a container for future disposal. Clean away the shavings and the metallic powder, taking care not to scatter this over the machine especially around the motor and the box containing the electrical equipment. Fill the tank with the amount and liquid stated earlier.

## E. Checking of bench lever functioning

Check regularly that the rotation release - locking lever is working properly.

## F. Check oil in the control unit

Check the level oil in the control unit tank and add the amount necessary .

### 9.4 POSSIBLE INCONVENIENCES

A. Automatic cycle does not function
-If this cycle does not function, make sure that all the limit switches are energized.
B. Oblique cutting

Check the inclination of the blade using the comparator located near the saw blade guide and use the hexagon socket headless screwswhich regulate the saw blade guide, to reset the correct inclination .
C. Undulated - concave - convex cutting
-Make sure the blade is not worn .
-Adjust the blade rotation speed in relation to the material , using the speed selector ( or the variator, if fitted ) .
-Adjust the bow down stroke speed in relation to the material, using the cutting feed regulator .
-Check the exact alignment of the saw blade guide with the mobile guide in different positions ( adjust the hexagon socket headless screws).

## 10. INFORMATION REGARDING ENVIRONMENTAL NOISE

An environmental noise test carried out on the SPECIAL 411 A band saw machine, identical to the machine to which these operation instructions refer, has given the following results :

## ACOUSTIC RADIATION PRESSURE

1. $\quad L_{\text {Aeq }}=76,7 \mathrm{~dB}(\mathrm{~A})$
2. $\quad L_{\text {peak }}=82,7 \mathrm{~dB}$ ( the maximum acceptable value is 140 dB ).
3. The level of background noise has no influence $=48.5-54,2 \mathrm{~dB}(\mathrm{~A})$

The considerable data are the result of tests made under the D.lgs. 277/1991 in the implementation of the directives nr.
80/1107/CEE , nr. 82/605/CEE , nr.84/477/CEE, and 88/642/CEE .

## 11. LAYING OFF AND DISMANTLING

### 11.1 LAYING OFF

If the machine is to be laid off or left idle for a long period, the following operations must be carried out :

1. Disconnect the machine from the electricity mains
2. Empty oil from the gear box and cooling liquid from its tank
3. Clean carefully the machine by getting rid of all traces of grease, especially on the worked parts that must be protected with anti-oxidants
4. Cover the machine with a sheet, preferably not plastic as it can cause rust due to the humidity condensation .
5. Store the machine in a closed, dust-free place

### 11.2 DISMANTLING

If the machine must be definitively dismantled, its components must be sub-divided for the purpose of a possible recycle of the materials and for the environment safety. The following table is given for your guidance :

| Steel | Electrical <br> Components | Light alloy | Cast iron | Bronze <br> Copper | Plastic and <br> rubber | Various |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Shaft | Motors winding | Gear boxes | Structural <br> parts | Bushings | Seals |  |
| Rollers | Push button and Control system <br> (relais - transformer ) | Cylinders |  |  | Cable chain |  |
| Base | Electronic panel |  |  |  |  |  |
| Spring |  |  |  |  |  |  |

Used oil and materials must be disposed of according to 87/101/EEC Directives and to country specific regulations.
The disposal of electrical components is provided for by European Directives 2011/65/CEE .

## LEGEND

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We recommend to strictly follow the instructions indicated in this manual during any type of intervention on the program. In case of doubt, please contact the company:

## MACC Costruzioni Meccaniche s.r.I.

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E-mail: info@macc.it
Web site: www.macc.it

## PRODUCT CONFIGURATION

## SOFTWARE INSTALLED $\quad$ EACKAC0 version 2903

## HARDWARE CONFIGURATION:

- Nr. 16 inputs PNP
- Nr. 16 outputs PNP
- Nr. 1 encoder input
- Nr. 1 analog input from potentiometer, serial RS485

DESCRIPTION OF THE FRONT PANEL
The MACC4 is equipped with a front panel including a keyboard with 30 keys and an alphanumeric display, with backlight, 4 lines by 20 columns.

## KEYBOARD

The MACC4 has a keyboard of 30 keys; some of them perform the same function in any application, while specific functions are associated to other keys, for the software installed in the programmer:
The numeric pad of the MACC4 allows to enter all necessary
numeric data.
The key < " allows to enter the decimal part, while < $/$ /-> allows
to enter negative numbers.
It rejects the request of zeroing start for the axis position; it allows
to exit all the environments (but does not allow to toggle from the
"AUTOMATIC" <-> "SEMIAUTOMATIC"environment, and vice
versa); it cancels an introduction not yet confirmed and interrupts
the execution of a cycle (either in "AUTOMATIC" or in
"SEMIAUTOMATIC").
It commands the closing of the fixed jaw, in the
"SEMIAUTOMATIC" environment.
IS commands the slow advancement of the carriage, in the
"SEMIAUTOMATIC" environment. If accompanied by the key
It commands the closing of the mobile jaw, in the
"SEMIAUTOMATIC" environment.
It commands the descent of the blade, in the "SEMIAUTOMATIC"
environment.
the movement of the carriage is accelerated.

## SYSTEM EACKACO - DESCRIPTION OF THE CONNECTIONS

| POWER SUPPLY |  |  |
| :---: | :--- | :--- |
| Name | Function | Description |
| +24 V | Power supply +24Vdc | 1 TO stabilized +- 10\% |
| 0 V | Mass |  |
| Ground | Ground | Protected |

The system must be power supplied with +24 V DC (+-10\%), 1A and must be connected to the protected ground of the plant through a cable with suitable diameter.
The inlet of power supply is supplied with the programmer.

| ANALOG CONNECTOR |  |  |  |  |
| :---: | :--- | :--- | :--- | :---: |
| Number <br> POLO | Name | Function | Description |  |
| 61 | Sheath | Pin of connection for screen <br> sheath |  |  |
| 62 | Vref | Power supply of potentiometer |  |  |
| 63 | GNDB | OV Power supply |  |  |
| 64 | IN B | Analog input B | Not used |  |
| 65 | IN A | Analog input A | Eventual blade potentiometer |  |
| 66 | Sheath | Connection pin of screen sheath |  |  |
| 67 | OUT B- | $+/-10 \mathrm{~V}$ Axis Y (Ref -$)(*)$ | Not used |  |
| 68 | OUT B+ | $+/-10 \mathrm{~V}$ Axis Y (Ref +$)$ | Not used |  |
| 69 | OUT A- | $+/-10 \mathrm{~V}$ Axis X (Ref -$)(*)$ | Not used |  |
| 70 | OUT A+ | $+/-10 \mathrm{~V}$ Axis X (Ref +$)$ | Not used |  |

${ }^{*}$ ) Connect to GNDB if the differential analog output is not used

## CONNECTOR FOR ENCODER INPUTS

|  | Name | Function |
| :--- | :---: | :--- |
| 1 | CAX | Channel A axis X |
| 2 | CAXN | Channel /A axis X |
| 3 | CBX | Channel B axis X |
| 4 | CBXN | Channel /B axis X |
| 5 | CZX | Not used |
| 6 | CZXN | Not used |
| 7 | +5V | Power supply voltage of Encoders at 5V |
| 8 | +12 V | Power supply voltage of Encoders at 12V |
| 9 | GNDB | Mass |
| 10 | Sheath | Connection pin of screen sheath |
| $\mathrm{N}^{\circ}$ | Name | Function |
| 11 | CAY | Not used |
| 12 | CAYN | Not used |
| 13 | CBY | Not used |
| 14 | CBYN | Not used |
| 15 | CZY | Not used |
| 16 | CZYN | Not used |
| 17 | $+5 V$ | Power supply voltage Encoders at 5V |
| 18 | +12 V | Power supply voltage Encoders at 12V |
| 19 | GNDB | Mass |
| 20 | Sheath | Connection pin of screen sheath |

INPUTS type PNP - n.c.: normally closed disp.: available
Connectors to extractable terminals lof 10 poles

| POLE number | DESCRIPTION | TEST I/O |
| :---: | :--- | :---: |
| 41 | EMERGENCY (n.c.) | 1 |
| 42 | MOTOR THERMAL SWITCH (n.c) | 2 |
| 43 | BLADE BREAKAGE (n.c.) | 3 |
| 44 | CARTER OPEN (n.c.) | 4 |
| 45 | Not used | 5 |
| 46 | Not used | 6 |
| 47 | Not used | 7 |
| 48 | END OF STROKE FORWARD CARRIAGE | 8 |
| 49 | +24 VoIt ( common of the inputs ) |  |
| 50 | Mass | 10 |
| 51 | END OF STROKE BACKWARDS CARRIAGE | 11 |
| 52 | END OF STROKE BLADE HIGH | 12 |
| 53 | END OF STROKE BLADE LOW | 13 |
| 54 | EMERGENCY - BAR MISSING | 14 |
| 55 | EMERGENCY - HANDLE (n.c.) | 15 |
| 56 | OIL THERMAL SWITCH (n.c.) | 16 |
| 57 | Not used |  |
| 58 | FAN/CHIPS THERMAL SWITCH(n.c.) |  |
| 59 | +24 Volt ( common of the inputs ) |  |
| 60 | Mass |  |

## OUTPUTS type PNP - disp.: available

## Connectors to extractable terminals of 10 poles

| POLE number |  | DESCRIPTION |
| :---: | :--- | :---: |
| 21 | CARRIAGE FORWARD SLOW | TEST I/O |
| 22 | CARRIAGE BACKWARD SLOW | 2 |
| 23 | Not used | 3 |
| 24 | OPENING/CLOSING CARRIAGE JAW | 4 |
| 25 | BLADE UP | 5 |
| 26 | BLADE DOWN | 6 |
| 27 | BLADE MOTOR ACTIVATION | 7 |
| 28 | OIL PUMP ACTIVATION | 8 |
| 31 | Not used | 9 |
| 32 | OPENING/CLOSING FIXED JAW | 10 |
| 33 | WATER PUMP ACTIVATION | 11 |
| 34 | CARRRIAGE FORWARD FAST | 12 |
| 35 | CARRIAGE BACKWARD FAST | 13 |
| 36 | CHIPS CLEANING | 14 |
| 37 | Not used | 15 |
| 38 | Not used | 16 |
| 29 | External power supply +24 Volt |  |
| 30 | Mass |  |
| 39 | External power supply +24 Volt |  |
| 40 | Mass |  |
| 99 | External power supply +24 Volt |  |
| 100 | Mass |  |


| Test <br> number |  | POLE <br> number |
| :---: | :---: | :--- |
| 1 | 41 | Upon the de-activation of this input, it is interrupted the working cycle and <br> signaled the message "Emergency Button". |
| 2 | 42 | Upon the activation of this input it is interrupted the working cycle and <br> signaled the message "Motor thermal switch". |
| 3 | 43 | Upon the de-activation of this input, it is interrupted the working cycle and <br> signaled the message "Blade rupture". |
| 4 | 44 | Upon the de-activation of this input, is is interrupted the working cycle and <br> signaled the message "Carter Open". |
| 8 | 48 | The de-activation of this input signals that it has been reached the <br> maximum limit forward of the carriage. |
| 9 | 51 | The de-activation of this input signals that it has been reached the <br> maximum limit backward of the carriage. |
| 10 | 52 | The de-activation of this input signals that it has been reached the <br> maximum limit up of the blade. |
| 11 | 53 | The de-activation of this input signals that it has been reached the <br> maximum limit in descent of the blade. |
| 12 | 54 | The de-activation of this input signals that a piece in the jaw is not existing. <br> 13 55 |
| 14 | 56 | Upon the de-activation of this input, it is interrupted the working cycle and <br> signaled the message "HANDLE". |
| 16 | 58 | Upon the activation of this input is is interrupted the working cycle and <br> signaled the message "OIL THERMAL SWITCH" |
| Upon the activation of this input it is interrupted the working cycle and <br> signaled the message "FAN/CHIP THERM." |  |  |


| DESCRIPTION OF THE OUTPUTS |  |  |
| :---: | :---: | :--- |
| Test <br> Number | POLE <br> number | Output Description |
| 1 | 21 | Command carriage FORWARD SLOW |
| 2 | 22 | Command carriage BACKWARD SLOW |
| 3 | 23 | Not used |
| 4 | 24 | Not used |
| 5 | 25 | Command blade up |
| 6 | 26 | It commands the descent of the blade |
| 7 | 27 | It commands the activation of the blade motor (enabling) |
| 8 | 28 | It commands the activation of the oil pump |
| 9 | 31 | Not used |
| 10 | 32 | It commands the opening / closing of the piece-blocking jaw |
| 11 | 33 | It commands the activation of the water pump |
| 12 | 34 | It commands the carriage fast forward |
| 13 | 35 | It commands the carriage fast backward |
| 14 | 36 | It commands the chips cleaning. |
| 15 | 37 | Not used |
| 16 | 38 | Not used |

## SOFTWARE INSTALLED : EACKACO

## ZEROING

Upon the switching ON, the program asks if you wish to perform the zeroing.
Press:

| START | to send the carriage to the rebate and perform the zeroing; |
| :--- | :--- |
| STOP | to skip this phase; |
| Sta | to reach the test environment of the instrument. |

## TEST

This environment allows to test all the components of the program. Press:

| (1) | To test the inputs and the outputs of the MACC4. (TEST I/O). Here it is possible to scroll the number of the outputs to be tested, pressing the arrows right and left, and change their status pressing <START>. The line "IN :" indicates continuously the status of the inputs detected. |
| :---: | :---: |
| (2) | To test the correct operation of the keyboard. (TEST KEYBOARD) Pressing a key, it is displayed the function of the key itself. Caution: the key <STOP> is ALSO the output key: it is displayed "STOP", until it is pressed; when releasing it, it is performed the exit from the environment. |
| (3) | Sets to zero all data existing in the memory. (ZEROING RAM) |
| (4) | Allows to read the software version loaded in the clock. (SOFTWARE VERSION) |
| (5) | Allows to test the contrast of the display. (CONTRAST) Inside, press "RIGHT" and "LEFT" |

## MANUAL / SEMIAUTOMATIC

In this environment you have the possibility to:
-command all the parts of the machine in manual mode:

- open and close the jaws (fixed and mobile);
- move the carriage in the direction of the blade or in the opposite side;
- move the carriage to an insertable level;
- move the arc of the blade to the top or to the bottom;
switch OFF/ON the oil central unit;
-perform a cutting cycle that foresees the sequence:
- blade motor switching ON;
- blade descent ;
- blade up;
- blade switching OFF (according to the configuration forecast in the fixed data);
-wash the machine, de-activating all the outputs, except the pump of water and that of oil (if previously activated).

The first operation "mode", may be obtained by using the upper left part of the keyboard.
Each of the pushbuttons located in this part of the panel, in fact, as explained in the introduction of the keyboard, performs one and only one specific function. You just need, then, to press the pushbutton to obtain the desired effect, e.g. a manual movement of the carriage, instead of the blade or of the jaws. Of course, during the execution of any movement, the possible emergencies are continuously monitored; if one of them is activated, the action shall be interrupted. In this environment it is possible to manage the switching ON and the switching OFF of the oil pump always through the customized key <OIL>.

To perform a cutting cycle, it is necessary to press the key <START>. In this way, the blade starts to turn, then it descends until it reaches the end of stroke, or the minimum calibration point if the blade is managed with a potentiometer. Upon its triggering, the opposite movement to the top is started.
It is possible to interrupt the cycle, besides with the emergencies, by pressing the key <STOP>. After stopping the cycle with the key <STOP> it is then possible to resume it by pressing <START>.
The correct execution of the cycle is signaled through the blinking message "Cycle correctly performed" at the end of the same.

To perform the shifting of the carriage to an $X$ level, it is necessary to press the key <ENTER>. In this way, appears a text line on the display for the introduction of the level which you wish the carriage to reach. Pressing <START>, it is performed a check about the correct position of the level just entered, compared to the maximum level stored in the "FIXED DATA". If from this check an "impossible" movement comes out, the positioning shall be cancelled and the level ignored.
If, on the contrary, this check does not involve cancellations, the programmer starts the movement up to the level programmed, to continue then with the execution of the cutting.

In the end, if the cycle has correctly come to an end, it shall be displayed the message of correct execution of the cycle.
The movement speed of the carriage may be checked through the key <FAST / SLOW> represented by the iconography hare/turtle: it is not possible to perform an adjustment "on the fly" but only to book, before the movement of the carriage LN a slow movement, and VL for a fast one.

In order to wash the machine, keep pressed <REFRIGERATING> for about five seconds. It appears the message "WASHING ENABLING", so that all output activations are removed.
To exit, press <STOP>. During this phase, the emergencies are checked, and an eventual presence of them shall stop the pump. Pressing it, but not keeping pressed the key of <REFRIGERATING> it is possible to book the use of the refrigerating during the semiautomatic cutting.

We remind, furthermore, that from this environment it is possible to:
-Shift to the "AUTOMATIC" mode, by pressing:

-Enter the programming environment "FIXED DATA", by pressing:


## FIXED DATA

From the "SEMIAUTOMATIC" environment, it is possible to enter in the "FIXED DATA" . Here the working data of the machine that can be modified are shown.
Here below we list such parameters:

1) Parameter for the correction of the carriage positioning error (level of clearances recovery)
2) BrakeUP: inertia of the carriage in the forward movement
3) BrakeDown: inertia of the carriage in the backwards movement.
4) Distance from the arrival level upon which the carriage shall slow down during the forward movement
5) Distance from the arrival level upon which the carriage shall slow down during the backwards movement
6) Blade thickness
7) Maximum level the carriage may reach
8) Minimum level the carriage may reach
9) Tolerance on the encoder resolution.
10) Operation of the blade motor during the uprise and descent of the blade
11) Level slowly run when the carriage reaches the rebate
12) Language: allows to select the language of the messages displayed
13) Tolerance of the positioning of the blade at the maximum height during the use of the potentiometer
14) Measuring unit for the quotations on the axis ( $\mathrm{mm} / \mathrm{cm} / \mathrm{inches}$ )

The data entering may be obtained, once the cursor is positioned with the arrows on the data to be written, by keying-in directly the new value and confirming it with <ENTER>. If this is not possible, for the parameter selected, perform a numeric entering; just pressing the key <ENTER> you will have the possibility to scroll all possible settings (e.g. during the setting of the language).

## AUTOMATIC ENVIRONMENT

The "AUTOMATIC" environments allow to load a program (which can be set from the "PROGRAMMING" environment) and to perform it. This operation involves the command of the jaws, of the carriage movement and of the actual cutting performance (including the heading cutting).

The programmer keeps constantly under control the status of the emergencies, blocking the execution of the cycle and informing the operator about the type of alarm which has been detected.

At the entrance of the "AUTOMATIC" environment, through the key <AUTO-MAN>, the programmer shows a screen made of:

- Number of the program currently selected (variable from 1 to 10) ("PROG N:");
- Number of the next line which shall be performed if it is launched the automatic cycle ("LIN. N:");
- Length of the next piece ("QP");
- Actual level at which the carriage is located ("QR");
-The number of missing pieces to complete the execution of the line in progress ("Pz TO BE MADE:");
-The number of cut pieces in the current line ("Pz MADE :")
- Bypressing the button 1 you enter into the enviroment height pieces, where you set the real height of the workpiece, press ENTER to confirm ( this function is only for vertical machine ) .

The machine logic of movement is the following: the machine performs the calibration on the forward and of stroke and from there it performs all positionings operating backwards, for each single piece to be performed; we should imagine, for example, to perform a piece of 100 mm and one of 200 mm : the machine reaches level 100 and brings forward the piece to be cut until the rebate, then it is ready to go backwards to level 200 to get again the following piece and bring it forward until the rebate. And so on...

In this environment, it is possible to perform the following actions:

- Return to the "SEMIAUTOMATIC" environment, by pressing the key <AUTO-MAN>;;
- Start the program currently selected, by pressing the key <START>;
- Stop the execution of the cycle currently in progress (key <STOP>);
- Scroll the current number of program (keys <UP> to increase, <DW> to decrease);
- Scroll the number of current line (keys <RH> to increase, <LF> to decrease;
- Shift to the programming environment, through the key <PROG-INS DATA>.

Caution: if it is started a cycle previously stopped, the program asks if you wish to resume it. Pressing <START> the cycle is resumed. Pressing <STOP> it starts from the beginning. It is possible to resume a cycle after it has been interrupted, with the key <STOP>, due to an emergency or if there was a power failure. In case the cycle has been interrupted due to "MATERIAL MISSING" the cycle restarts from the point in which it was interrupted, performing automatically the heading cutting. If on the contrary, a heading cutting was interrupted, the cycle restarts from the beginning.

## PROGRAMMING

From "AUTOMATIC", it is possible to enter in the "PROGRAMMING" environment, pressing the key <PROG-INS DATA>. Here, it is possible to set the program which is currently selected in "AUTOMATIC" to program its twenty lines.

The screen shows a first line containing the number of the program currently selected; other three lines to shows to the user the lines of program which allow to define the automatic cutting cycle. They are structures in the shape: length of the piece to be cut by number of pieces of that size.

It is possible to scroll the various elements with the keys of direction <UP>,<DW>,<LF> and <RH>, to reach the numeric level you wish to modify.
Using, then, the numeric pad, you may enter the new data. To confirm them, press <ENTER>.

MACC4 provides 10 programs with 20 configurable lines for each program. The programs are stored in memory even though MACC4 is switched OFF.
To return to the automatic environment press <STOP>.

## EMERGENCY MANAGEMENT

Immediately after the switching ON (then, immediately after "responding" to the request of axis zeroing") until the switching OFF, the programmer performs a continuous monitoring of the status of emergency inputs.

In all the environments in which it is contemplated the movement of any part of the machine, the detection of an emergency involves the instantaneous interruption involves the instantaneous interruption of all the outputs and the display of a blinking string which identifies which emergency has been detected.
This status remains until the emergency shall be restored, (and from this moment the string stops blinking) until it is pressed the key <STOP> (to indicate to the programmer that you wish to effectively return from the status of emergency).

## Caution:

- in the "MANUAL/SEMIAUTOMATIC" environment the emergencies of "BROKEN BLADE" , "CARTER OPEN" and "HANDLE ON" are not signaled. This is made to give the possibility to continue to operate through manual operations in order to allow more easily the reset of the emergency. In this case it is also blocked any attempt to perform the automatic cutting cycle accessible through the key <START>.
In the "AUTOMATIC" environment the previous three emergencies block the automatic cycle programmed.
In both cases, simply pressing the key <STOP>, you return to the "MANUAL/SEMIAUTOMATIC" environment to allow to reset the emergency with the manual movements.
- In the "AUTOMATIC" environment the emergency of "MISSING BAR" (material end) may be managed in two different ways according to how you set the hidden fixed data "Eme.barra" which may have two values: <FORWARD> or <BACKWARD>.
In the first case, upon the emergency signaling, the carriage of the fixed mobile jaw is brought in position of zeroing and the jaw is open, while in the second case the carriage remains stopped and the jaw is open. Furthermore, in both cases, no matter which is the setting of the blade motor management, this is stopped until the emergency reset. To reset the emergency, the specific instructions are shown on the display.


## CAPACITA' DI TAGLIO - Special 411 A

| CAPACITA' DI TAGLIO CUTTING CAPAITY - CAPAITE DE COUPE SCHNITTKAPAZITAET - CAPACIDAD DE CORTE | (0) | 署 | L |
| :---: | :---: | :---: | :---: |
| $90^{\circ}$ | 290 | 280 | $280 \times 300$ |
| $45^{\circ}$ Sinistra - left - links - gauche | 180 | 160 | $110 \times 180$ |
| $45^{\circ}$ Destra - right - droite - rechts | 240 | 220 | $120 \times 240$ |
| $60^{\circ}$ Destra - right - droite - rechts | 140 | 140 | $140 \times 140$ |

## SCELTA DELLA LAMA

SCELTA DELLA LAMA SELECTION OF BLADE CHOIX DE LA LAME WAHL DES SAEGEBLATTS SELECCION DE LA HOJA

|  | L mm |  |  |
| :---: | :---: | :---: | :---: |
|  | $\leqq 40$ | 8 | 6/10 |
|  | $>30<80$ | 6 | 5/8 |
|  | $>60<90$ | 4 | $4 / 6$ |
|  | $\leqq 100$ | 3 | 3/4 |


|  | $S \mathrm{~mm}$ |  |  |
| :---: | :---: | :---: | :---: |
|  | §1,5 | 14 | - |
|  | $>1<2$ | 10 | 10/14 |
|  | $>2<4$ | 8 | 8/12 |
|  | >4<8 | 6 | 6/10 |
| S | >6<12 | 6 | 5/8 |
|  | $\leqq 12$ | 4 | 4/6 |

Allegato / Encl. 1 - Dis. / Draw. 1

| Velocitd di faglio <br> La macchina è dotała di due velocità di taglio | 38-77 m/1' |
| :---: | :---: |
| Cutting machine <br> The machine is equipped with two cutting speeds | 38-77 m/1' |
| Vitesse de coupe <br> La machine est dotée de deux vitesses de coupe | 38-77 m/1' |
| Schnittgeschwindigkeit <br> Die maschine ist mit zwei Schnittgeschwindigkeiten ausgetattet | 38-77 m/1' |
| Velocidad de corte <br> La maquina esta dotata de dos velocidades de corte | 38-77 m/1' |
| Materiale Material Materiel Material Material | Velocita di taglio $m / 1^{\prime}$ <br> Cutting machine $m / 1^{\prime}$ <br> Vitesse de coupe $m / 1^{\prime}$ <br> Schnittgeschwindigkeit $m / 1^{\prime}$  <br> Velocidad de corte $m / 1^{\prime}$  |
| Acciai da costruzione <br> Fe37+Fe42 <br> Structural steel <br> Fe37+Fe42 | Pieni  <br> Solid  <br> Pleins  <br> Volles Material 77 <br> Pies  |
| Baustahl $F e 37+F e 42$ <br> Acero de costruccion $F e 37+F e 42$ | Profilati <br> Structural steel <br> Profilés <br> Profile <br> Perfiles |
| Acciai da costruzione Fe50+Fe70 <br> Scructural steel Fe50+Fe70 <br> Aciers de costruction Fe50+Fe70 <br> Baustahl Fe50 Fe70 <br> Acero de costruccion Fe50+Fe70 | 77 |
| Acciai al carbonio C40+C60 <br> Carbon steel C40+60 <br> Aciers au carbone C40+C60 <br> Kohlenstoffstahl C40+60 <br> Acero de carbono $C 40+C 60$ | 77 |
| Acciai legati Alloyed steel Aciers allié Legierter Stahl Acero aleado | 38 |
| Acciai inox Stainless steel Aciers inoxydables Rostfreier Stahl Acero inoxidable | 38 |
| Ghisa grigia Grey cast iron Fonte grise Grauguß Fundiciòn gris | 77 |
| Leghe d'alluminio Alluminium alloys Allieges d'aluminium Legierungen aus Aluminium Aleaciòn de Aluminio | 77 |
| Bronzi <br> Bronze <br> Bronze <br> Bronze <br> Bronces | 77 |

Allegato / Encl. 1 - Dis. / Draw. 2



| DIMENSIONI <br> D'INGOMBRO ED <br> INSTALLAZIONEOVERALL <br> DIMENSION AND <br> INSTALLATION | DIMENSIONS <br> HORS-TOUT ET <br> INSTALLATION | AUSSENABMESSUNGEN <br> UND INSTALLATION | DIMENSIONES <br> MAXIMAS EXTREMAS <br> EINSTALACION |
| :---: | :---: | :---: | :---: | :---: |











| CRUSCOTTO <br> COMANDI | CONTROL <br> PANEL | BOÎTIER DES <br> COMMANDES | STEUERKASTEN | CAJA DE <br> MANDOS |
| :---: | :---: | :---: | :---: | :---: |






| DEUTSCH |
| :--- |
| THERMISCHES RELAIS OIL PUMPE MOTOR |
| THERMISCHES RELAIS SÄGEBLATTMOTOR |
| THERMISCHES RELAIS ÜHLMITTELMOTOR |
| THERMISCHES RELAIS CHIP EXTRACTORMOTOR |
| THERMISCHES RELAIS Motor Führungsstück |
| Photozelle Werkstoff Anwesenheit. |
| SICHERUNG TRAFO SCHUTZ |
| SICHERUNG MOTOR SCHUTZ |
| SICHERUNG KÜHLMITTELPOMPE SCHUTZ |
| SICHERUNG ZUFÜHRER SCHUTZ |
| SICHERUNG 24 V dc SCHUTZ |
| SICHERUNG 24 V ac SCHUTZ |
| GESCHWINDIGKEITUMRICHTER SICHERUNGSDRAHT |
| SCHWIMMER |
| LINE PRÄSENZ LAMPE |
| BLATT TENSION LAMPE |
| ZYKLUS START LAMPE |
| KONTAKTGEBER WIDERSTANDSTHERMOMETER |
| Fernschalter Frequenzumrichter Versorgung |
| KONTAKTGEBER ZENTRALHYDRAULIK MOTOR |
| KONTAKTGEBER SÄGEBLATTMOTOR |
| KONTAKTGEBER KÜHLMITTELPUMPE |
| KONTAKTGEBER SPÄNE AUSZIEHER |
| KONTAKTGEBER Motor Führungsstück |
| KONTAKTGEBER KUEHLMITELPUMPE |
| ZENTRALHYDRAULIKMOTOR |
| SÄGEBLATTMOTOR |
| KÜHLMITTELPUMPE MOTOR |
| SPAENEAUSLASSVORRICHTUNG MOTOR |
| DREHUNGS KOPF MOTOR |
| FÜHRUNGSSTÜCK MOTOR |

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RELE' TERMICO MOTORE LAMA
RELE' TERMICO MOTORE REFRIGERANTE
 RELE' TERMICO MOTORE GUIDA PEZZO FOTOCELLULA PRESENZA MATERIALE
 FUSIBILI PROTEZIONE MOTORI

FUSE MOTOR PROTECTION FUSE FEEDER PROTECTION FUSE 24 V dc PROTECTION FUSE 24 V ac PROTECTION FUSE INVERTER PROTECTION FUSE INVERTER PROTECTION
FLOAT SPY BLADE IN TENSION INVERTER FEEDING CONTROL SWITCH BLADE MOTOR REMOTE CONTROL SWITCH COOLANT PUMP REMOTE CONTROL SWITCH
CHIP EXTRACTOR CONTROL SWITCH CHIP EXTRACTOR CONTROL SWITCH

THERMAL RELAY GUIDA-PIECE MOTOR CONTROL SWITCH COOLANT RECYCLE PUMP THERMAL RELAY \begin{tabular}{l}
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BLADE MOTOR <br>
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OIL PUMP MOTOR <br>
BLADE MOTOR <br>
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COOLANT PUMP MOTOR THERMAL RELAY OIL PUMP MOTOR THERMAL RELAY BLADE MOTOR THERMAL RELAY COOLANT MOTOR RELAY THERMAL CHIPS EXTRACTOR THERMAL RELAY GUIDA-PIECE MOTOR MATERIAL PRESENCE PHOTOELECTRIC CELL FUSE TRANSFORMER PROTECTION FUSE MOTOR PROTECTION
FUSE COOLANT PUMP PROTECTION
SPY LINE PRESENCE
SPY BLADE IN TENSION
SPY CYCLE START SPY CYCLE START
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INVERTER FEEDING CONTROL SWITCH
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| INTERRUTTORE POMPA REFRIGERANTE |
| RELE＇COMANDO MARCIA ROTAZIONE LAMA |

 SENSORE ROTAZIONE LAMA POTENZIOMETRO VELOCITA＇LAMA POTENZIOMETRO POSIZIONAMENTO LAMA MOTORE AVANZAMENTO MATERIALE


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TIMER RELAY BLADE REMOTE CONTROL SWITCH COMMAND RELAY VERTICAL VICE RELAY OIL PUMP REMOTE CONTROL SWITCH COMMAND RELAY ROTATING BLADE COMMAND RELAY COOLANT PUMP SWITCH SWITCH／SPEED CHANGE OVERSWITCH MAIN ON／OFF SWITCH BLADE ROTATION SENSOR BLADE SPEED POTENTIOMETER BLADE POSITIONING POTENTIOMETER MATERIAL FEEDING OTOR

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| ENDSCHALTER FÜHRUNGSSTÜCK NACH HINTEN |
| HEBEWERK NACH OBEN ENDSCHALTER |
| ENDSCHALTER SCHUTZGEHÄUSE |
| SPANNDRUCK TASTE |
| ENDSCHALTER WAGEN VORNE |
| $-45^{\circ}$ UMDREHUNG ENDSCHALTER |
| ENDSCHALTER WAGEN ZURÜCK |
| ENDSCHALTER BÜGEL NACH OBEN |
| ENDSCHALTER BÜGEL NACH UNTEN |
| ENDSCHALTER STANGENENDE |
| STÜCKANWESENDHEIT ENDSCHALTER |
| ENDSCHALTER GRIFF |
| ENDCSHALTER MANUELL START |
| ZEITGEBER |
| TRANSFORMATOR |
| THERMOSTAT |
| THERMO-WIDERSTAND |
| ELEKTROVENTIL WAGEN LANGSAM VORNE |
| ELEKTROVENTIL MANUELL AUFHEBUNG |
| SAEGEBLATT ENTSPANNUNG MAGNETVENTIL |
| ELETRISCHESVETIL SAEGEBLATT ENSPANNUNG |
| SAEGEBLATT SPANNUNG MAGNETVENTIL |
| ELETRISCHESVENTIL SAEGEBLATT SPANNUNG |
| LADEMAGAZIN HEBEWERK ELEKTROVENTIL |
| LADEMAGAZINSPANNSTOCK ELEKTROVENTIL |
| $E L E K T R O V E N T I L ~ Z A U N ~ N A C H ~ V O R N E ~$ |
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