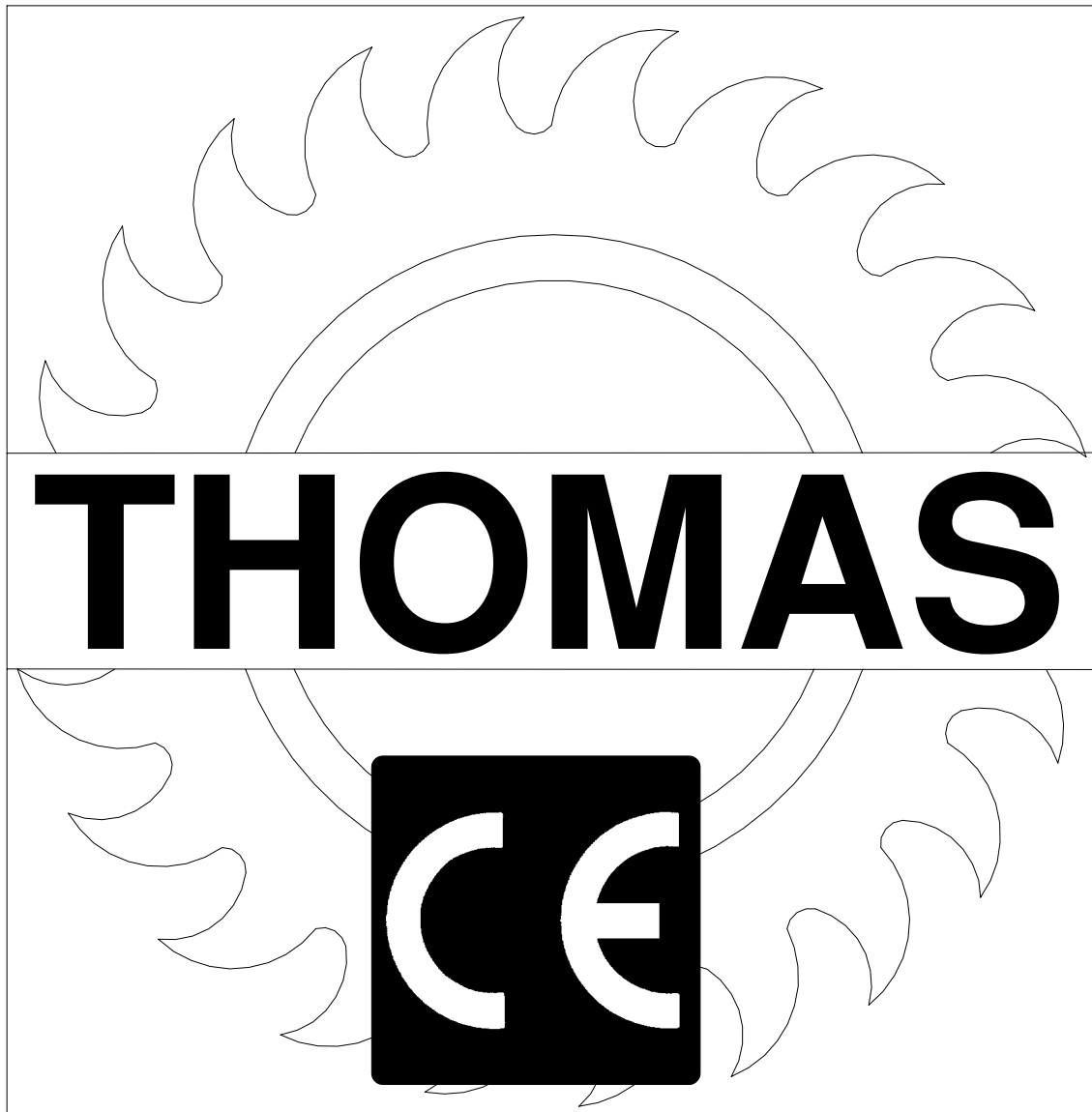




# THOMAS

*USE AND MAINTENANCE MANUAL*

***TRAD 300 AO GT***



**10/2004**



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## Ordering spare parts

- When ordering spare parts you must state:  
MACHINE MODEL  
SERIAL NUMBER  
PART REFERENCE NUMBER

Without these references WE WILL NOT SUPPLY the spares. See point 10.1 - list of spare parts -

## Guarantee

- The Company guarantees that the machine, described in this manual, has been designed to meet safety requirements. As for machine functionality, inspection has been successful.
- The machine is guaranteed for 12 months: the guarantee does not cover the electric motors, electric components, pneumatic components or any damage due to dropping or to bad machine management, the failure to observe maintenance standards or bad handling by the operator.
- The buyer has only the right to replacement of the faulty parts, while transport and packing costs are at his expense.
- The serial number on the machine is a primary reference for the guarantee, for after-sales assistance and for identifying the machine for any necessity.



## Machine certification and identification marking

### MACHINE LABEL

<b>THOMAS S.p.A.</b> via Pasubio, 32 36033 ISOLA VIC. - ITALIA	<b>CE</b>
MODEL	TRAD 300 AO GT
TYP	
SERIAL NUMBER	
YEAR OF MANUFACTURE	

(Space reserved for the NAME and STAMP of the DEALER and/or IMPORTER)

# 1 REFERENCE TO ACCIDENT - PREVENTION REGULATIONS

This machine has been built to comply with the national and community accident-prevention regulations in force. Improper use and/or tampering with the safety devices will relieve the manufacturer of all responsibility.

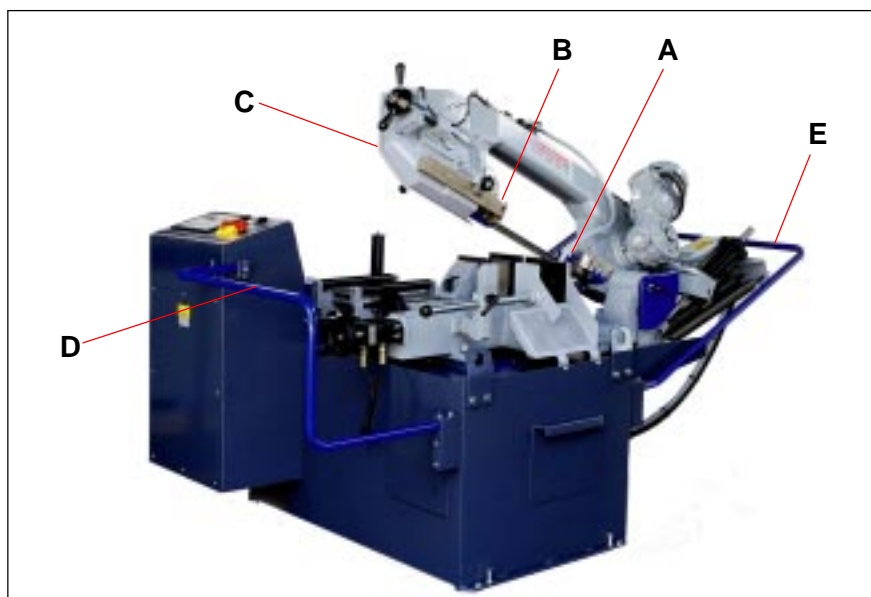


## 1.1 - Advice for the operator

- Check that the voltage indicated on the plate, normally fixed to the machine motor, is the same as the line voltage.
- Check the efficiency of your electric supply and earthing system; connect the power cable of the machine to the socket and the earth lead (yellow-green in colour) to the earthing system.
- When the saw frame is in suspend mode (up) the toothed blade must not move.
- Only the blade section used for cutting must be kept unprotected. Remove guarding by operating on the adjustable head.
- It is forbidden to work on the machine without its shields (these are all white, blue or grey in colour).
- Do not use any artful system or device (for ex. shim) to prevent the vice from locking the workpiece. Do not hold the workpiece with your hand during the cutting process.
- Do not charge the workpiece from the right to the left-hand side with respect of the machine front.
- Always disconnect the machine from the power socket before blade change or carrying out any maintenance job, even in the case of abnormal machine operation.
- Always wear suitable eye protection.
- Never put your hands or arms into the cutting area while the machine is operating.
- Do not wear loose clothing with sleeves that are too long, gloves that are too big, bracelets, chains or any other object that could get caught in the machine during operation; tie back long hair.
- Keep the area free of equipment, tools or any other object.
- Perform only one operation at a time and never have several objects in your hands at the same time. Keep your hands as clean as possible.
- All internal and/or internal operations, maintenance or repairs, must be performed in a well-lit area or where there is sufficient light from extra sources so as to avoid the risk of even slight accidents.

## 1.2 - Location of shields against accidental contact with the tool

- Blue, grey right and left hand metal shields, fastened with screws onto the guide blade stationary head ( RIF. A ).
- Metal guard blue or grey fastened on the front with screws to the blade guide fixed head ( Rif. A ).
- Blue or grey metal shield fastened with screws onto the blade guide adjustable head, ensures covering of blade section not used in cutting operation ( RIF. B ).
- Metal guard white or grey fastened to the saw frame to protect blade drive flywheels ( RIF. C ).
- Blue front metal guard ( RIF. D ).
- Blue rear metal guard ( RIF. E ).



### 1.3 - Electrical equipment according to Euro-pean Standard "CENELEC EN 60 204-1" which assimilates, with some integrating modifications, the publication "IEC 204-1 "

- The electrical equipment ensures protection against electric shock as a result of direct or indirect contact. The active parts of this equipment are housed in a box to which access is limited by screws that can only be removed with a special tool; the parts are fed with alternating current (24 V). The equipment is protected against splashes of water and dust.
- Protection of the system against short circuits is ensured by means of rapid fuses and earthing; in the event of motor overload, protection is provided by a thermal relay.
- In case of power failure or removal of the flywheel guard, the specific start-up button must be reset.
- The machine has been tested in conformity with point 20 of EN 60204.

### 1.4 - Emergencies according to European Standard "CENELEC EN 60 204-1 "

- In the event of incorrect operation or of danger conditions, the machine may be stopped immediately by pressing the red mushroom button.
- The accidental or willingly removal of the guard protecting the flywheels or the stock feed unit will cause the stepping in of the microswitch that actuates all the machine functions.
- In case blade breaks, the band tightening microswitch disconnects all machine.

NOTE: Resetting of machine operation after each emergency stop is achieved by reactivating the specific restart button.

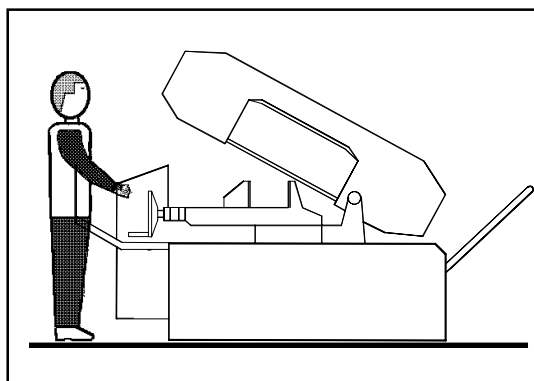
### 1.5 - Other risks

- As the machine is running, any intervention from the operator within the "dangerous zone" or cutting area must be considered a risk for his own safety.

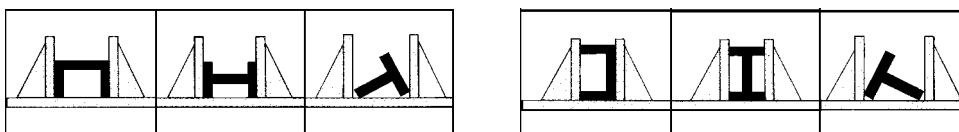
## 2 RECOMMENDATIONS AND ADVICE FOR USE

### 2.1 - Recommendations and advice for using the machine

- The machine has been designed to cut metal building materials, with different shapes and profiles, used in workshops, turner's shops and general mechanical structural work.
- Only one operator is needed to use the machine, that must stand as shown in the picture.



- Before starting each cutting operation, ensure that the part is firmly gripped in the vice and that the end is suitably supported. These figures show examples of suitable clamping of different section bars, bearing in mind the cutting capacities of the machine in order to achieve a good efficiency and blade durability.



- Do not use blades of a different size from those stated in the machine specifications.
- If the blade does not cut through the material, immediately strike the emergency push-button and switch off the machine. Open the vice with the handwheel, remove part to be cut and check that the blade teeth are not broken, If they are, replace tool.
- Check saw frame return spring to ensure proper balancing.
- Before carrying out any repairs on the machine, consult the dealer or apply to THOMAS.



## 3 TECHNICAL CHARACTERISTICS

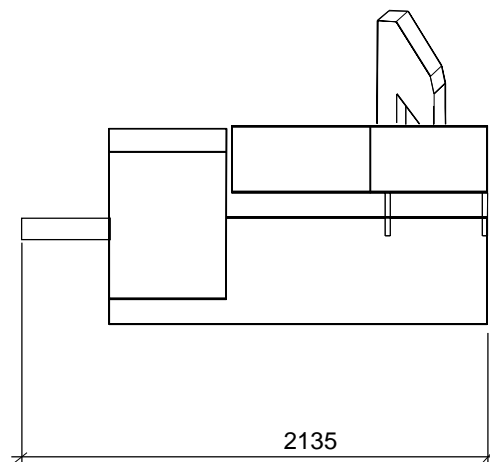
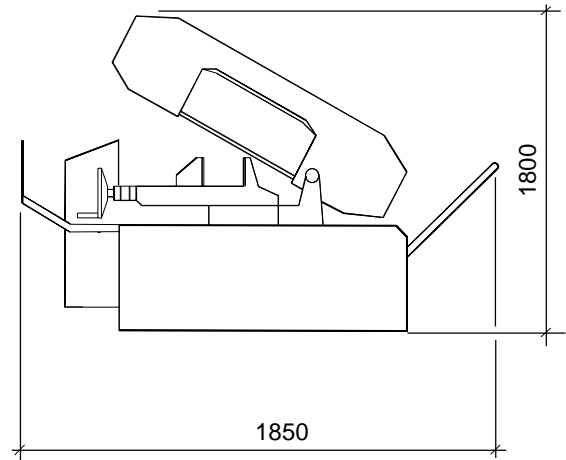
### 3.1 - Table of cutting capacity and technical details

0°	255	240	280 x 200

TECHNICAL DATA		
ELECTRIC MOTOR - 3-PHASE - 2 SPEEDS	Kw	1,3 - 1,9
COOLANT PUMP MOTOR	Kw	0,15
HYDRAULIC PUMP MOTOR	Kw	1,1
REDUCTION RATIO	I	40/1
SERVICE PRESSURE	Bar	30
BLADE DIMENSIONS	mm	2750 x 27 x 0,9
FLYWHEEL Ø	mm	300
BLADE SPEED	mt/min	33 - 66
VICE OPENING	mm	290
SAWFRAME INCLINATION	°	30
WORKING TABLE HEIGHT	mm	740
MACHINE DIMENSIONS	mm	2000x2030x1850
MACHINE WEIGHT	Kg	900
FEEDING SYSTEM		
CARRIAGE MECHANICAL STROKE	mm	500
FEEDING VICE OPENING	mm	290
MATERIAL BUTT	mm	255
WITH INVERTER (OPTION)		
ELECTRIC MOTOR - 3-PHASE	Kw	1,5
BLADE SPEED	mt/min	20 + 105

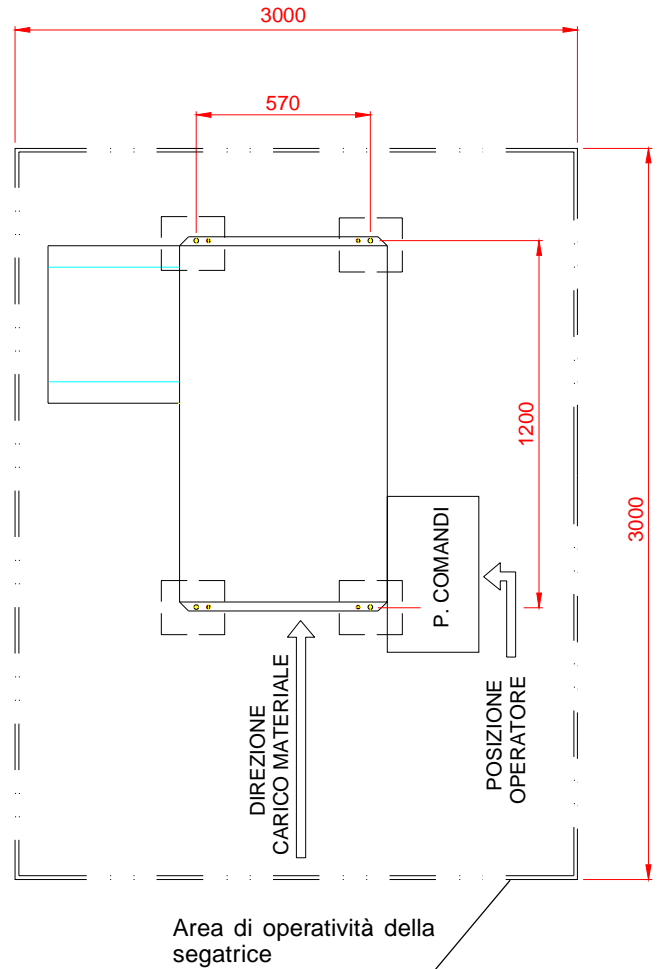
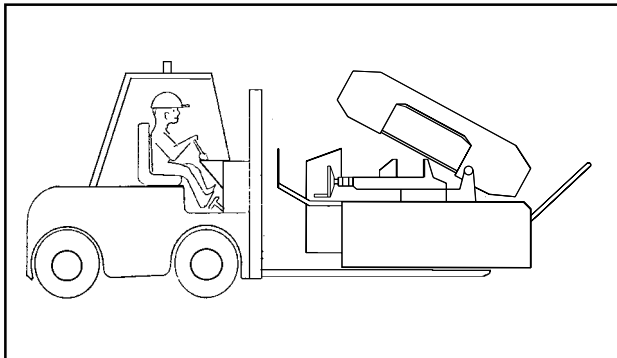
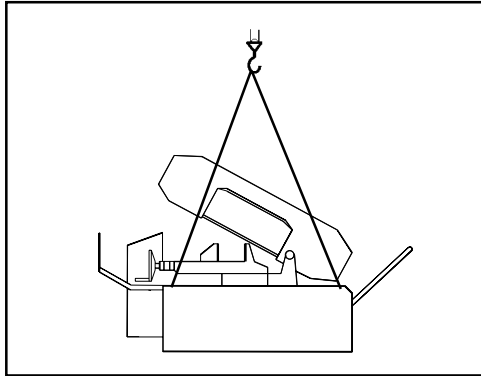
## 4 MACHINE DIMENSIONS TRANSPORT INSTALLATION DISMANTLING

### 4.1 - Machine dimensions



## 4.2 - Transport and handling of the machine

If the machine has to be shifted in its own packing, use a fork-lift truck or sling it with straps through the special attachments as indicated by the arrow.



## 4.3 - Minimum requirements for the premises housing the machine

- Mains voltage and frequency complying with the machine motor characteristics.
- Environment temperature from -10 °C to +50 °C.
- Relative humidity not over 90%.

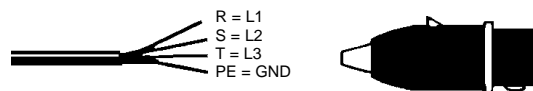
## 4.4 - Anchoring the machine

- Position the machine on a firm cement floor, maintaining, at the rear, a minimum distance of 1000 mm from the wall; anchor it to the ground as shown in the diagram, using screws and expansion plugs or tie rods sunk in cement, ensuring that it is sitting level.

## 4.5 - Instructions for electrical connection

- The machine is not provided with an electric plug, so the customer must fit a suitable one for his own working conditions:

### 1 - WIRING DIAGRAM FOR 4-WIRE SYSTEM FOR THREE-PHASE MACHINE - SOCKET FOR A 20A PLUG



### 4.6 - Instructions for assembly of the loose parts and accessories

---

Fit the components supplied as indicated in the photo:

- Mount the guard protecting the bar feed cylinder.

### 4.7 - Disactivating the machine

---

- If the sawing machine is to be out of use for a long period, it is advisable to proceed as follows:

- 1) detach the plug from the electric supply panel
- 2) loosen blade
- 3) release the arch return spring
- 4) empty the coolant tank
- 5) carefully clean and grease the machine
- 6) if necessary, cover the machine.

### 4.8 - Dismantling

(because of deterioration and/or obsolescence)

#### General rules

If the machine is to be permanently demolished and/or scrapped, divide the material to be disposed of according to type and composition, as follows:

- 1) cast iron or ferrous materials, composed of metal alone, are **secondary raw materials**, so they may be taken to an iron foundry for remelting after having removed the contents (classified in point 3);
- 2) electrical components, including the cable and electronic material (magnetic cards, etc.), fall within the category of material classified as being **assimilable to urban waste** according to the laws of the European community, so they may be set aside for collection by the public waste disposal service;
- 3) old mineral and synthetic and/or mixed oils, emulsified oils and greases are **special refuse**, so they must be collected, transported and subsequently disposed of by the old oil disposal service.

NOTE: since standards and legislation concerning refuse in general is in a state of continuous evolution and therefore subject to changes and variations, the user must keep informed of the regulations in force at the time of disposing of the machine tool, as these may differ from those described above, which are to be considered as a general guide line.

## 5 MACHINE FUNCTIONAL PARTS

### 5.1 - Operating head or saw frame

---

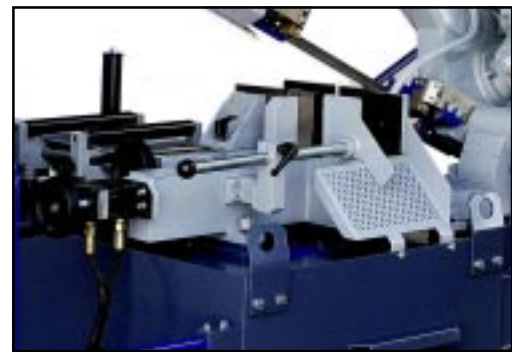
- Part of the machine consisting of drive members (gearmotor or variable speed motor, flywheels), tightening and guide (blade tightening slide, blade guide head) of tool.



### 5.2 - Vice

---

- Material clamping system during the cutting operation by means of an approach handwheel and hydraulic clamping.

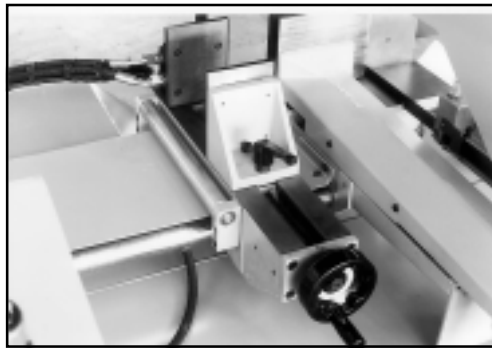


### 5.3 - Material advance unit

---

- Oleodynamic device for material advance.





### 5.4 - Bed

- Structure supporting the SAW FRAME OPERATING HEAD , of the STOCK FEED DEVICE, the bedplate houses the cooling liquid TANK, the CONTROL BOARD, ELECTRICAL PART and the DEVICE CONTROLLING THE AUTOMATIC HYDRAULIC LOWERING AND RISE OF THE SAW FRAME.



## 6 DESCRIPTION OF THE OPERATING CYCLE

Before operating, all the main organs of the machine must be set in optimum conditions (see the chapter on "Regulating the machine").

### 6.1 - Starting up and cutting cycle

- Ensure that the machine is not in emergency stop condition; if it is, release the red mushroom button ( 1 ).
- Check that the protection devices (guard protecting the flywheels and guard protecting the stock feed unit) are actuated.
- Rotate blade tightening handwheel ( A pag. 10 ) clockwise until you press the relative microswitch ( B pag. 10 ).
- Rotate the main switch ( 3 ) to position 1, press the push button ( 5 ) and check that the relative green indicator light is lit.
- MAKE SURE that the hydraulic regulator ( 2 ) is completely closed to the position 0 ( zero ).
- For starting up the machine refer to the separate instruction manual on Programming the control unit ( para. 1.1 - page 4);

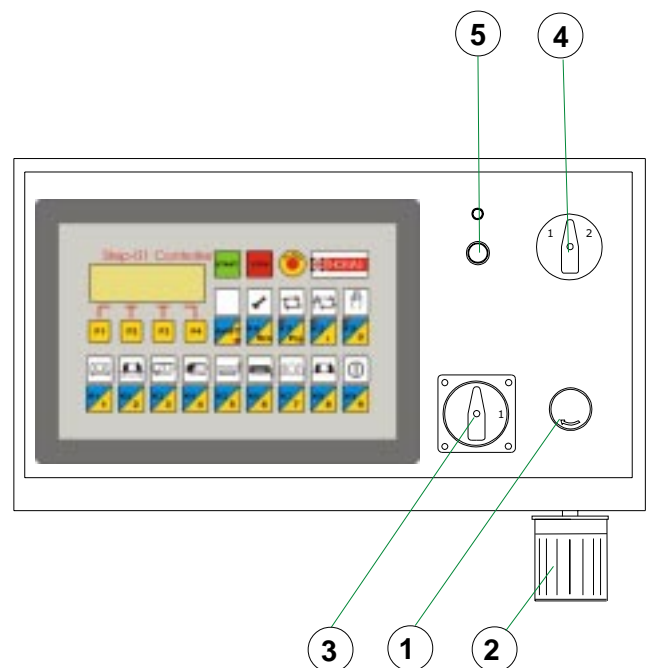
- Check that the pressure gauge, located on the hydraulic unit reads **28 BAR**, if it doesn't attempt to swap one of the electric power supply wires (only during installation).
- Adjust the starting position of the saw frame according to the dimensions of the part to be cut: the blade must be positioned at about 10 mm from the piece (see chapter 7 paragraph 7.5).

- On the standard model, select the cutting speed on commutator ( 4 ):

Position 1 = 33 m/min.  
Position 2 = 66 m/min.

- If the machine is equipped with an electronic speed variator ( inverter ), select the most suitable speed according to the specifications of the workpiece.  
N.B.: After switching on the machine through the main switch and starting the hydraulic pump motor, wait 10 seconds before starting the cutting cycle.

- see **PROGRAMM MANUAL FOR " NC " AUTOMATIC BANDSAWING MACHINES** giving detailed instructions on the cutting cycle programming.



**Keep away at safety distance from the cutting area as the machine is running.**

### CUTTING SPEED VARIATOR ( OPTION )

- To adjust the blade speed rotation at the requested rate (meters per minute), turn the handwheel located on the control panel. Each position corresponds to the speed indicated on the table below:

POSIZIONE VOLANTINO	VELOCITA' m/ 1'
0	18
1	23
2	32
3	40
4	50
5	58
6	67
7	77
8	86
9	97
10	100

The band saw is now ready to start work, bearing in mind that the CUTTING SPEED and the TYPE of BLADE - combined with a suitable lowering of saw frame - are of decisive importance for cutting quality and for machine performance (for further details on this topic, see below in the chapter on "Material classification and blade selection").

- When starting to cut with a new blade, in order to safeguard its life and efficiency, the first two or three cuts must be made while exerting a slight pressure on the part, so that the time taken to cut is about double the normal time (see below in the chapter on "Material classification and blade selection" in the section on *Blade running-in*).
- Press the red emergency button ( 1 ) when there are conditions of danger or malfunctions in general, so as to stop machine operation immediately.
- To reset the machine operation disengage and then engage the main switch ( 3 ).

## 7 REGULATING THE MACHINE

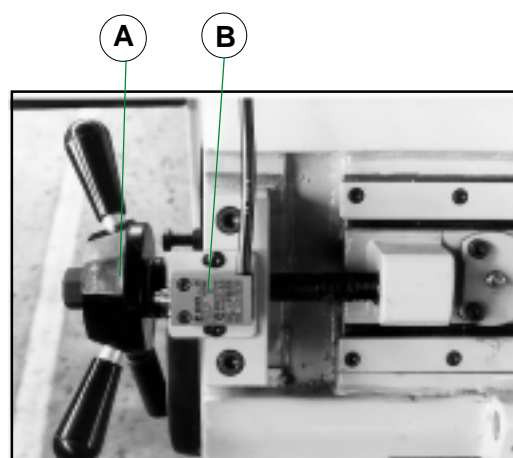
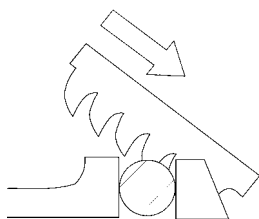
### 7.1 - Blade tension assembly

The ideal tightening of the blade is achieved by rotating the blade tightening handwheel ( A ) clockwise until you press the microswitch ( B ).

Note: In case the saw is not used for a period of time, loosen blade.

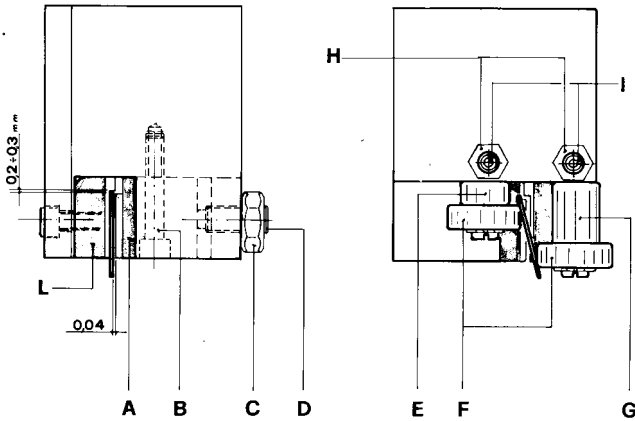
Always use blades having the dimensions specified in this manual.

### CUTTING DIRECTION



### 7.2 - Blade guide blocks

The blade is guided by means of adjustable pads set in place during inspection as per the thickness of the blade with minimum play as shown in the figure.

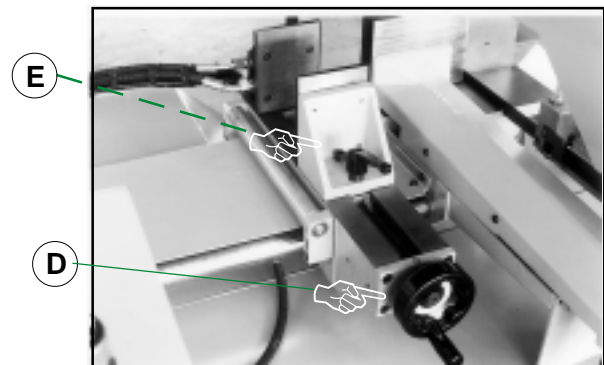


In case the blade needs to be replaced, make sure to always install 0,9 mm thick blades for which the blade guide pads have been adjusted. In the case of toothed blades with different thicknesses adjustment should be carried out as follows:

- Loosen nut ( C ), screw ( B ) and loosen dowel ( D ) widening the passage between the pads.
- Loosen the nuts ( H ) and the dowels ( I ) and rotate the pins ( E - G ) to widen the passage between the bearings ( F ).
- Mount the new blade, place the pad ( A ) on the blade and, loosening the dowel, allow a play of 0,04 mm for the sliding of the toothed blade; lock the relative nut and screw ( B ):
- Rotate the pins ( E - G ) until the bearings rest against the blade as indicated in the figure and then secure the dowels ( I ) and nut ( H ).
- Make sure that between the blade and the upper teeth of the block ( L ) this is at least 0,2 - 0,3 mm of play; if necessary, loosen the screws that fasten the blocks and adjust accordingly.

- This device does not require any special maintenance; keep vice adjustment screw well greased and perfectly clean.
- To adjust proceed as follows:
- Place the part to be cut in cutting position but avoid sudden contacts with the supporting rollers and adjust the opening of the fixed vice at 3-4 mm from the part.
- Place the part to be cut in the vice and clamp the part into place by striking the relative function key ( on the keyboard ).
- Make sure that the bar is resting on the vertical alignment roller.
- Rotate the handwheel of the carriage vice ( D ) in order to move the jaw at abt 0.5 - 0.7 mm from the material to be cut.
- Lock the handgrip ( E ).

Note: Maximum performance of the sawing machine is achieved with material featuring good linearity.

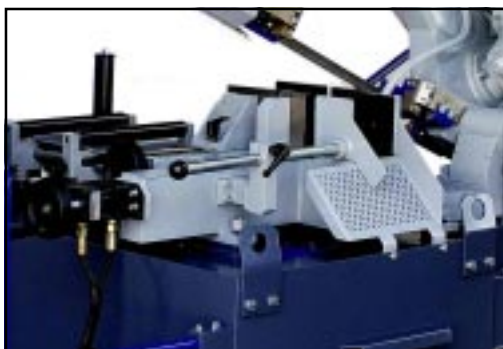


### 7.3 - Bench vice

- Approach the vice jaw up to 3 - 4 mm from the material to cut.
- Adjust the outfeed conveyor according to the dimensions of the material being cut (allow 1-2 mm gap).

NOTE: keep clean the vice guide as well as the relevant vice screw.

### 7.4 - Feed vice unit



### 7.5 - Sawframe return

This system reduces the passive phases of the operating cycle, in other words to eliminate the idle stroke that takes place when the size of the material to be cut is much smaller than the maximum cutting capacity. Practically, you can adjust the starting position of the blade in proximity of the material to cut.

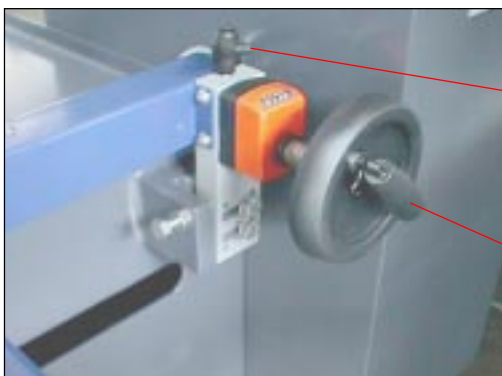
- Set the machine in the MANUAL mode;
- Slightly open the regulator controlling the sawframe downfeed.
- Release the handle ( A ).
- Set the cutting speed switch to position '0' (zero).
- By means of the UP and DOWN keys ( K5 - K6 ), approach the blade up to 10 mm from the material to cut.
- Lock the handle ( A ).



A

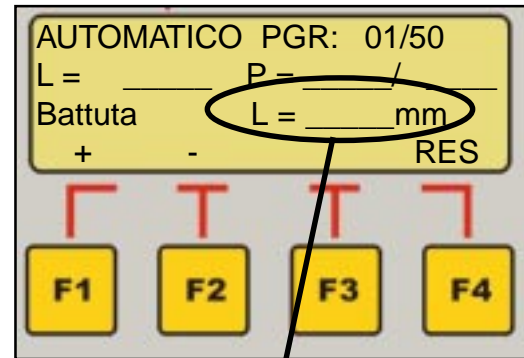
### 7.6 - Cutting length

This is a mechanical system to set the cutting length. The display indicates the value where the system must be adjusted to. This value includes the blade thickness. Move the feeding system to the extreme right against the bench vice. Release the handle ( B ) and turn the handwheel ( C ) to set the cutting length. The counter allows 0,1 mm precision. Eventually, lock the handle ( B ). If the cutting length is beyond the mechanical stroke of the feeding system (500mm), the controller will calculate the length to be set automatically. In fact, the display will show the value where the system must be adjusted to and repeat the material feeding automatically to reach the programmed cutting length.



B

C



**LENGTH TO SET**

**BEFORE PERFORMING THE FOLLOWING OPERATIONS, THE ELECTRIC POWER SUPPLY AND THE POWER CABLE MUST BE COMPLETELY DISCONNECTED.**

### 7.7 - Changing the blade

- Lift the saw frame in utmost position.
- Loosen the blade with the handwheel, open the guard protecting the flywheels and remove the movable guard, withdraw the old worn out blade from the flywheels and from the blade guide heads.
- Assemble the new blade by placing it first between the bearings and then on the races of the flywheels, paying particular attention to the cutting direction of the teeth (*blade rotation diagram* page 10).
- Tighten blade and make sure that it perfectly suits inside the flywheel races and that it actuates the relative microswitch.
- Reinstall the mobile guard, close the guard protecting the flywheels and fasten with the relative clips; check that the safety microswitch is energized or else when the electric system is restored the machine will not start.

**WARNING:** always assemble blades having dimensions specified in this manual and for which the blade guide heads have been set: otherwise, see chapter on "Regulating the machine" in the section on *Blade guide heads*.

### 7.8 - Replacing saw frame return spring

- When performing this operation it is necessary to keep saw frame up using the lifting device.
- Replace the spring by loosening the upper coupling rod and releasing it from the lower tie-rod.



---

**RELY ON SKILLED AND QUALIFIED PERSONNEL TO REPLACE OTHER MACHINE MEMBERS SUCH AS REDUCTION UNIT OR VARIATOR, PUMP MOTOR AND ELECTRICAL COMPONENTS.**

---

## 8 ROUTINE AND SPECIAL MAINTENANCE

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THE MAINTENANCE JOBS ARE LISTED BELOW, DIVIDED INTO DAILY, WEEKLY, MONTHLY AND SIX-MONTHLY INTERVALS. IF THE FOLLOWING OPERATIONS ARE NEGLECTED, THE RESULT WILL BE PREMATURE WEAR OF THE MACHINE AND POOR PERFORMANCE.

---

### 8.1 - Daily maintenance

---

- General cleaning of the machine to remove accumulated shavings.
- Clean the lubricating coolant drain hole to avoid excess fluid.
- Top up the level of lubricating coolant.
- Check blade for wear.
- Rise of saw frame to top position and partial slackening of the blade to avoid useless yield stress.
- Check functionality of the shields and emergency stops.

### 8.2 - Weekly maintenance

---

- More accurate general cleaning of the machine to remove shavings, especially from the lubricant fluid tank.
- Removal of pump from its housing, cleaning of the suction filter and suction zone.
- Cleaning and greasing of the screws and of the slide guides of the fixed vice and of the carriage.
- Cleaning with compressed air the blade guide bearings (drain hole of the lubricating cooling).
- Cleaning flywheel housings and blade sliding surfaces on flywheels.
- Cleaning and greasing of the stock feed carriage guide rods.

### 8.3 - Monthly maintenance

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- Check the tightening of the motor flywheel screws.
- Check the tightening of the transmission flywheel ring nut.

- Check that the blade guide bearings on the heads are perfect running condition.
- Check the tightening of the screws of the gearmotor, pump and accident protection guarding.
- Check shields.

### 8.4 - Six-monthly maintenance (every 2000 hours)

---

#### REDUCTION UNIT

- The worm drive gear box mounted on the machine is maintenance-free guaranteed by its manufacture.
- SPEED REDUCER (optional) as per manufacturer's instructions.
- Replace grease with IP ATINA 0 long life fluid for gears or ESSO FIBER - GREASE 370, or again TOTAL CALIDRIS 0 or similar. Moreover, grease bearings with DIN 51825 K-P-F2K "extreme pressure grease" through the plug.
- Replace oil in the hydraulic unit with SHELL HYDRAULIC OIL 32 or MOBIL DTE 13 or again AGIP OSO 32 or similar.
- Check continuity of the equipotential protection circuit.

### 8.5 - Oils for lubricating coolant

---

Considering the vast range of products on the market, the user can choose the one most suited to his own requirements, using as reference the type SHELL LUTEM OIL ECO. THE MINIMUM PERCENTAGE OF OIL DILUTED IN WATER IS 8 - 10 %.

### 8.6 - Oil disposal

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The disposal of these products is controlled by strict regulations. Please see the Chapter on "**Machine dimensions - Transport - Installation**" in the section on *Dismantling*.

### 8.7 - Special maintenance

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Special maintenance operations must be carried out by skilled personnel. However, we advise contacting THOMAS or their dealer and/or importer. Also the reset of protective and safety equipment and devices, of the reducer, the motor, the motor pump and electric components is to be considered extraordinary maintenance.

## MATERIAL 9 CLASSIFICATION AND CHOICE OF TOOL

Since the aim is to obtain excellent cutting quality, the various parameters such as **hardness of the material, shape and thickness, transverse cutting section** of the part to be cut, **selection of the type of cutting blade, cutting speed** and **control of saw frame lowering**. These specifications must therefore be harmoniously combined in a single operating condition according to practical considerations and common sense, so as to achieve an optimum condition that does not require countless operations to prepare the machine when there are many variations in the job to be performed. The various problems that crop up from time to time will be solved more easily if the operator has a good knowledge of these specifications.

WE THEREFORE RECOMMEND YOU TO ALWAYS USE GENUINE SPARE BLADES THAT GUARANTEE SUPERIOR QUALITY AND PERFORMANCE.

### 9.1 - Definition of materials

The table at the foot of the page lists the characteristics of the materials to be cut, so as to choose the right tool to use.

### 9.2 - Selecting blade

First of all the pitch of the teeth must be chosen, in the other

words, the number of teeth per inch (25,4 mm) suitable for the material to be cut, according to these criteria:

- parts with a thin and/or variable section such as profiles, pipes and plate, need close toothing, so that the number of teeth used simultaneously in cutting is from 3 to 6;
- parts with large transverse sections and solid sections need widely spaced toothing to allow for the greater volume of the shavings and better tooth penetration;
- parts made of soft material or plastic (light alloys, mild bronze, teflon, wood, etc.) also require widely spaced toothing;
- pieces cut in bundles require combo tooth design.

### 9.3 - Teeth pitch

As already stated, this depends on the following factors:

- **hardness of the material**
- **dimensions of the section**
- **thickness of the wall**

THICKNESS MM	Z CONTINUOUS TOOTH DESIGN	Z COMBO TOOTH DESIGN
TILL 1.5	14	10/14
FROM 1 TO 2	8	8/12
FROM 2 TO 3	6	6/10
FROM 3 TO 5	6	5/8
FROM 4 TO 6	6	4/6
MORE THAN 6	4	4/6

S = THICKNESS

TYPES OF STEEL						CHARACTERISTICS		
USE	I UNI	D DIN	F AF NOR	GB SB	USA AISI-SAE	Hardness BRINELL HB	Hardness ROCKWELL HRB	R=N/mm <sup>2</sup>
Construction steels	Fe360	St37	E24	----	----	116	67	360÷480
	Fe430	St44	E28	43	----	148	80	430÷560
	Fe510	St52	E36	50	----	180	88	510÷660
Carbon steels	C20	CK20	XC20	060 A 20	1020	198	93	540÷690
	C40	CK40	XC42H1	060 A 40	1040	198	93	700÷840
	C50	CK50	----	----	1050	202	94	760÷900
	C60	CK60	XC55	060 A 62	1060	202	94	830÷980
Spring steels	50CrV4	50CrV4	50CV4	735 A 50	6150	207	95	1140÷1330
	60SiCr8	60SiCr7	----	----	9262	224	98	1220÷1400
Alloyed steels for hardening and tempering and for nitriding	35CrMo4	34CrMo4	35CD4	708 A 37	4135	220	98	780÷930
	39NiCrMo4	36CrNiMo4	39NCD4	----	9840	228	99	880÷1080
	41CrAlMo7	41CrAlMo7	40CADG12	905 M 39	----	232	100	930÷1130
Alloyed casehardening steels	18NiCrMo7	----	20NCD7	En 325	4320	232	100	760÷1030
	20NiCrMo2	21NiCrMo2	20NCD2	805 H 20	4315	224	98	690÷980
Alloyed for bearings	100Cr6	100Cr6	100C6	534 A 99	52100	207	95	690÷980
Tool steel	52NiCrMoKU	56NiCrMoV7C100K	----	----	----	244	102	800÷1030
	C100KU	C100W1	----	BS 1	S-1	212	96	710÷980
	X210Cr13KU	X210Cr12	Z200C12	BD2-BD3	D6-D3	252	103	820÷1060
	58SiMo8KU	----	Y60SC7	----	S5	244	102	800÷1030
Stainless steels	X12Cr13	4001	----	----	410	202	94	670÷885
	X5CrNi1810	4301	Z5CN18.09	304 C 12	304	202	94	590÷685
	X8CrNi1910	----	----	----	----	202	94	540÷685
	X8CrNiMo1713	4401	Z6CDN17.12	316 S 16	316	202	94	490÷685
Copper alloys Special brass Bronze	Aluminium copper alloy G-CuAl11Fe4Ni4 UNI 5275					220	98	620÷685
	Special manganese/silicon brass G-CuZn36Si1Pb1 UNI5038					140	77	375÷440
	Manganese bronze SAE43 - SAE430					120	69	320÷410
	Phosphor bronze G-CuSn12 UNI 7013/2a					100	56,5	265÷314
Cast iron	Gray pig iron		G25			212	96	245
	Spheroidal graphite cast iron		GS600			232	100	600
	Malleable cast iron		W40-05			222	98	420

SOLID Ø OR L MM	Z CONTINUOUS TOOTH DESIGN	Z COMBO TOOTH DESIGN
TILL 30	8	5/8
FROM 30 TO 60	6	4/6
FROM 40 TO 80	4	4/6
MORE THAN 90	3	3/4

Ø = DIAMETER    L = WIDTH

### 9.4 - Cutting and advance speed

The cutting speed (m/min) and the advance speed (cm<sup>2</sup>/min = area travelled by the blade during removal of chip) are limited by the development of heat close to the tips of the teeth.

- The cutting speed is subordinate to the resistance of the material ( $R = N/mm^2$ ), to its hardness (HRC) and to the dimensions of the widest section.
- Too high an advance speed (= lowering of the saw frame) tends to cause the blade to deviate from the ideal cutting path, producing non rectilinear cuts on both the vertical and the horizontal plane.

The best combination of these two parameters can be seen directly examining the chips.

Long spiral-shaped chips indicate ideal cutting.



Very fine or pulverized chips indicate lack of feed and/or cutting pressure.



Thick and/or blue chips indicate overload of the blade.



### 9.5 - Blade running-in

When cutting for the first time, it is good practice to run in the tool making a series of cuts at a low advance speed (= 30-35 cm<sup>2</sup>/min on material of average dimensions with respect to the cutting capacity and solid section of normal steel with  $R = 410-510 N/mm^2$ ), **generously spraying the cutting area with lubricating coolant.**

### 9.6 - Blade structure

Bi-metal blades are the most commonly used. They consist in a silicon-steel blade backing with electron beam or laser welded high speed steel (HHS) cutting edge. The type of stocks are classified in M2, M42, M51 and differ from each other because of their major hardness due to the increasing percentage of Cobalt (Co) and molybdenum (Mo) contained in the metal alloy.

### 9.7 - Blade type

They differ essentially in their constructive characteristics, such as:

- **shape** and **cutting angle** of tooth
- **pitch**
- **set**

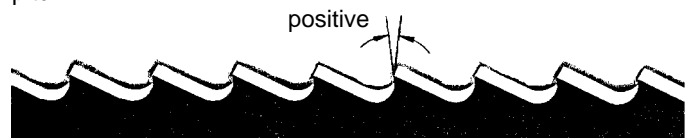
#### Shape and angle of tooth

**REGULAR TOOTH:** 0° rake and constant pitch.



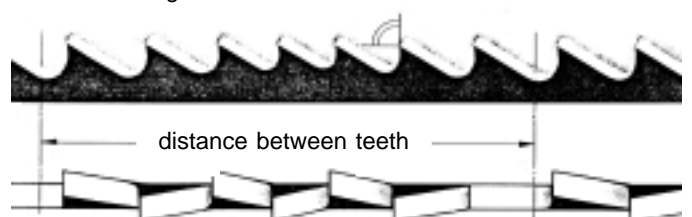
Most common form for transversal or inclined cutting of solid small and average cross-sections or pipes, in laminated mild steel and grey iron or general metal.

**POSITIVE RAKE TOOTH:** 9° - 10° positive rake and constant pitch.



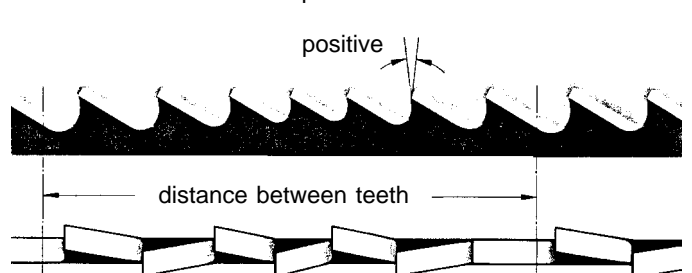
Particular use for crosswise or inclined cuts in solid sections or large pipes, but above all harder materials (highly alloyed and stainless steels, special bronze and forge pig).

**COMBO TOOTH:** pitch varies between teeth and consequently varying teeth size and varying gullet depths. Pitch varies between teeth which ensures a smoother, quieter cut and longer blade life owing to the lack of vibration.



Another advantage offered in the use of this type of blade in the fact that with an only blade it is possible to cut a wide range of different materials in size and type.

**COMBO TOOTH:** 9° - 10° positive rake.

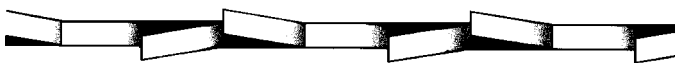


This type of blade is the most suitable for the cutting of section bars and large and thick pipes as well as for the cutting of solid bars at maximum machine capacity. Available pitches: 3-4/4-6.

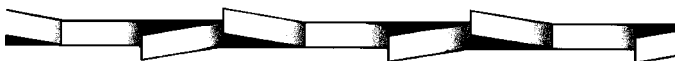


### Set

Saw teeth bent out of the plane of the saw body, resulting in a wide cut in the workpiece.



**REGULAR OR RAKER SET:** Cutting teeth right and left, alternated by a straight tooth.



Of general use for materials with dimensions superior to 5 mm. Used for the cutting of steel, castings and hard nonferrous materials.

**WAVY SET:** Set in smooth waves.



This set is associated with very fine teeth and it is mainly used for the cutting of pipes and thin section bars (from 1 to 3 mm).

**ALTERNATE SET (IN GROUPS):** Groups of cutting teeth right and left, alternated by a straight tooth.



This set is associated with very fine teeth and it is used for extremely thin materials (less than 1 mm).

**ALTERNATE SET (INDIVIDUAL TEETH):** Cutting teeth right and left.



This set is used for the cutting of nonferrous soft materials, plastics and wood.

### 9.7.1 - RECOMMENDED CUTTING PARAMETERS

STEEL	CUTTING SPEED	LUBRICATION	REMOVAL cm <sup>2</sup> /min
CONSTRUCTION	60/80	EMULSIFIABLE OIL	40/60
CEMENTATION	40/50	EMULSIFIABLE OIL	20/40
CARBON STEEL	40/60	EMULSIFIABLE OIL	40/60
HARDENING AND TEMPERING	40/50	EMULSIFIABLE OIL	30/50
BEARINGS	40/60	EMULSIFIABLE OIL	15/30
SPRINGS	40/60	EMULSIFIABLE OIL	10/30
FOR TOOLS	30/40	EMULSIFIABLE OIL	6/20
FOR VALVES	35/50	EMULSIFIABLE OIL	20/30
STAINLESS STEEL	30/40	EMULSIFIABLE OIL	6/20
SPHEROIDAL GRAPHITE	20/40	EMULSIFIABLE OIL	6/30
CAST IRON	40/60	EMULSIFIABLE OIL	30/60
ALUMINIUM	80/600	KEROSENE	60/450
BRONZE	70/120	EMULSIFIABLE OIL	40/70
HARD BRONZE	30/60	EMULSIFIABLE OIL	6/20
BRASS	70/350	EMULSIFIABLE OIL	25/80
COPPER	50/720	EMULSIFIABLE OIL	-----





## 10 MACHINE COMPONENTS

### 10.1 - List of spare parts

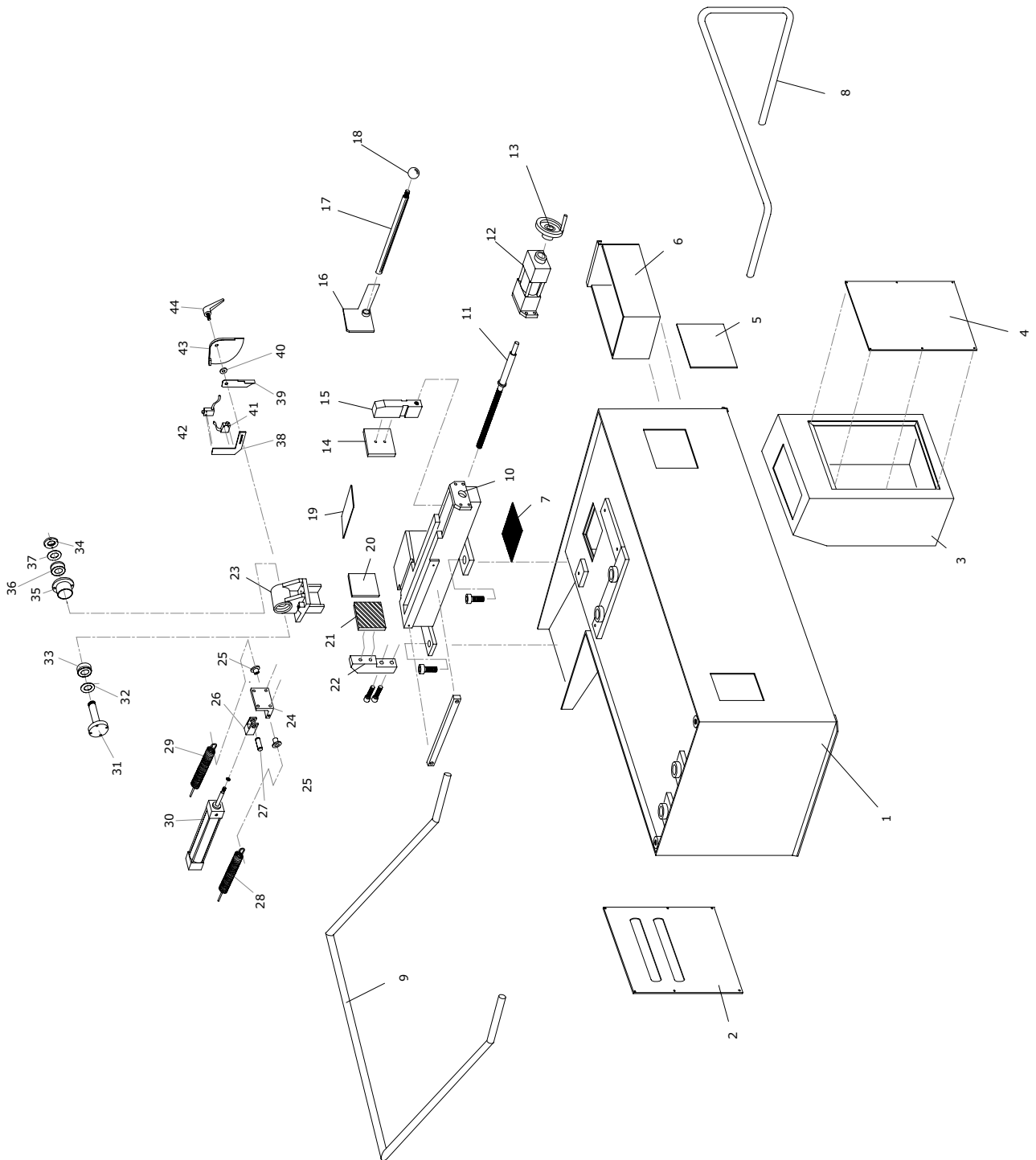
REFERENCE N°	DESCRIPTION	REFERENCE N°	DESCRIPTION
<b>BEDPLATE UNIT</b>			
1	Bed	80	
2	Rear cover	81	
3	Electric box	82	Ring nilos 32006 XAV
4	Electric box cover	83	Spacer ring
5	Cover	84	Bearing 32006 X
6	chip collect box	85	Transmission flywheel
7	Crugible	86	Ring nut M 30
8	Front protection	87	Screw TE M 12
9	Rear protection	88	Washer
10	Vice support	89	Motor flywheel
11	Vice screw	90	Bearing 6208 2RS
12	Vice cylinder	91	Key
13	Vice handwheel	92	Key
14	Vice jaw	93	Motor flywheel shaft
15	Vice	94	Reduction unit
16	Conveyor jaw	95	Electric motor
17	Conveyor rod	96	Bracket
18	Handwheel	97	Screw TE M 12
19	Vice screw cover	98	Bush
20	Antiburr Jaw	99	Sping couple blade
21	Countervice jaw	100	Cooling distributor
22	Countervice	101	Coupling
23	Hinge pin support	102	Cooling liquid cock
24	Bracket	103	Coupling
25	Spring bush	104	Microswitch
26	Cylinder fork	105	Knob
27	Pin	106	Saw frame cover
28	Saw frame spring	107	Knob
29	Saw frame spring	108	Bracket
30	Saw frame cylinder	109	Coupling
31	Hinge pin	110	Blade guide adjustable rod
32	NILOS ring	111	Short eccentric pin
33	Bearing 32007 X	112	Long eccentric pin
34	Ring nut M 35	113	Bearing 608 2RS
35	Eccentric bush	114	Blade guide adjustable cover
36	Bearing 32007 X	115	Fixed blade guide pad
37	Ring NILOS	116	Movable blade guide pad
		117	Movable blade guide block
		118	Additional protection
		119	Fixed blade guide block
		120	Fixed blade guide block
		121	Cleaning brush
		122	Support
		123	Bearing 626 2RS
		124	Bush
<b>SAW FRAME UNIT</b>			
70	Rear saw frame		
71	Front saw frame		
72	Blade tension slide		
73	Pin		
74	Microswitch		
75	Plate		
76	Blade tension guide block		
77	Blade tension pin		
78	Spring		
79	Blade tension handwheel		



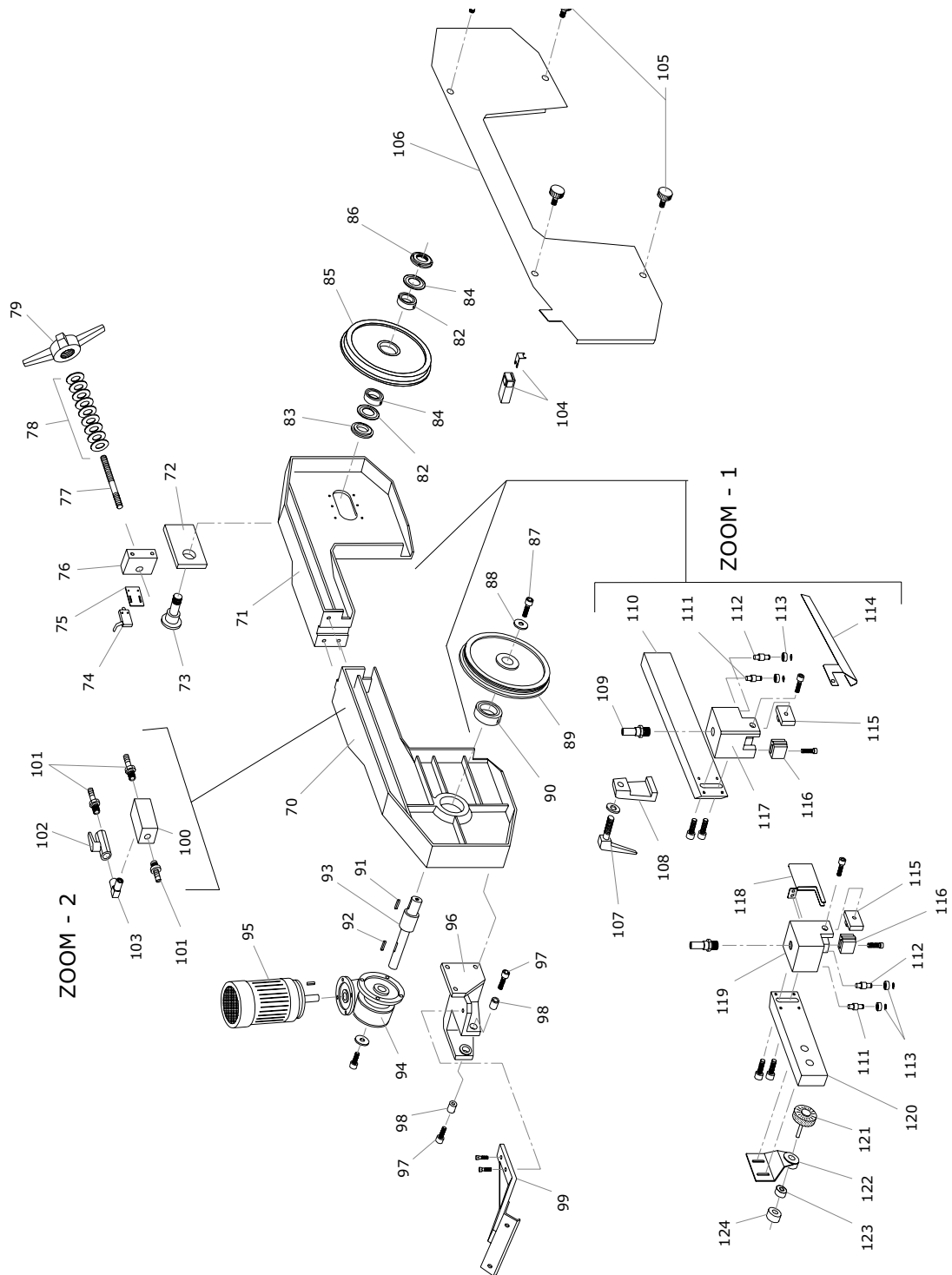
REFERENCE N°	DESCRIPTION
<b>FEEDING SYSTEM</b>	
201 .....	Support
202 .....	Screw
203 .....	Carriage guide rod
204 .....	Support
205 .....	Bush
206 .....	Roller
207 .....	
208 .....	Supprt plate
209 .....	Block
210 .....	Carriage countervice cylinder
211 .....	Carriage countervice jaw
212 .....	Microswitch cam
213 .....	Microswitch
214 .....	
215 .....	Support
216 .....	Pin
217 .....	Bearing 6200 2RS
218 .....	Roller
219 .....	Scraper ring 40/50/4
220 .....	Bush GLISSA 40/50/40
221 .....	Carriage
222 .....	Adjustable screw
223 .....	Guide nut
224 .....	Measuring system body
225 .....	Bearing 30203 X
226 .....	Support
227 .....	Bearing 30203 X
228 .....	Pulley
229 .....	Ring nut M 17x1
230 .....	Cogged belt 270 L
231 .....	Belt cover
232 .....	Ring nut M 17x1
233 .....	Pulley
234 .....	Ring
235 .....	Support
236 .....	Handwheel
237 .....	Measuring system SIKO
238 .....	Bearing 6003 2RS
239 .....	Adjustable shaft
240 .....	Handwheel
241 .....	Carriage vice jaw
242 .....	Carriage vice guid nut
243 .....	
244 .....	Screw support plate
245 .....	Adjustable screw
246 .....	Handwheel
247 .....	Carriage vice
248 .....	Handwheel
249 .....	Adjustable screw
250 .....	Support
251 .....	Support
252 .....	Avance Cylinder
253 .....	Cylinder protection

REFERENCE N°	DESCRIPTION
254 .....	Washer
255 .....	Bearing 6002 2RS
256 .....	Vertical roller
257 .....	Roller protection
258 .....	Nut
259 .....	Washer
260 .....	Bearing 6002 2RS
261 .....	Pin
262 .....	Rod protection
263 .....	
264 .....	Microswitch
265 .....	Microswitch

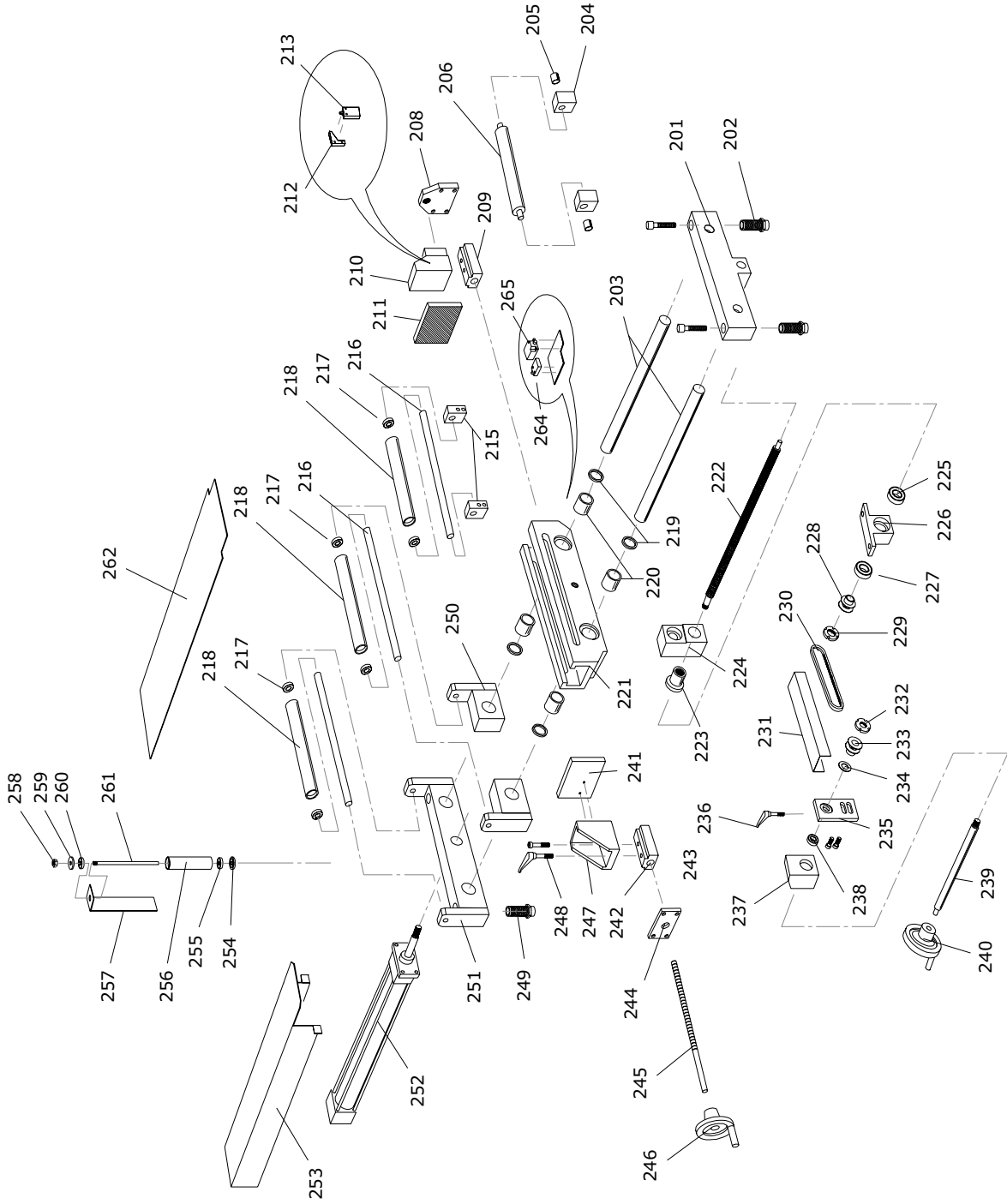
### BEDPLATE UNIT



### SAW FRAME UNIT

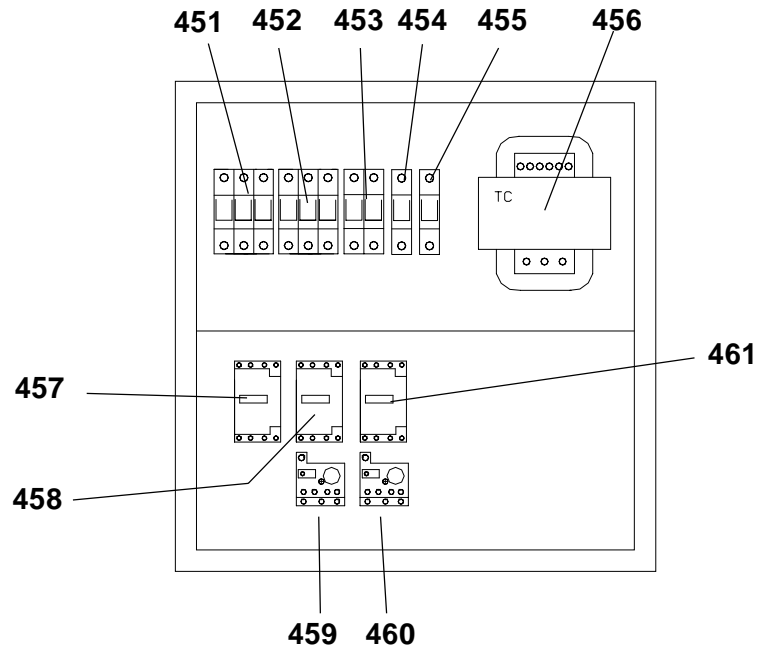


### AVANCE UNIT



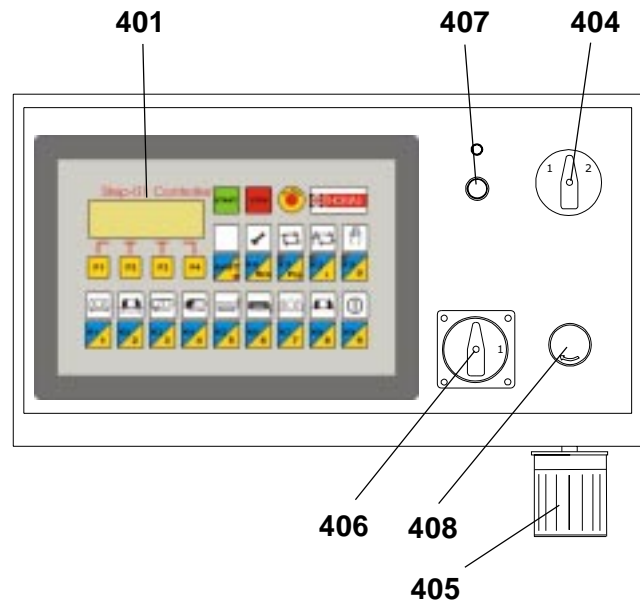
### ELECTRIC WIRING

- 451 Fuse holder cartridge
- 452 Fuse holder cartridge
- 453 Fuse holder cartridge
- 454 Fuse holder cartridge
- 455 Fuse holder cartridge
- 456 Transformer TC1
- 457 Remote switch KM
- 458 Remote switch KM
- 459 Thermal relay FR1
- 460 Thermal relay FR2
- 461 Remote switch KM



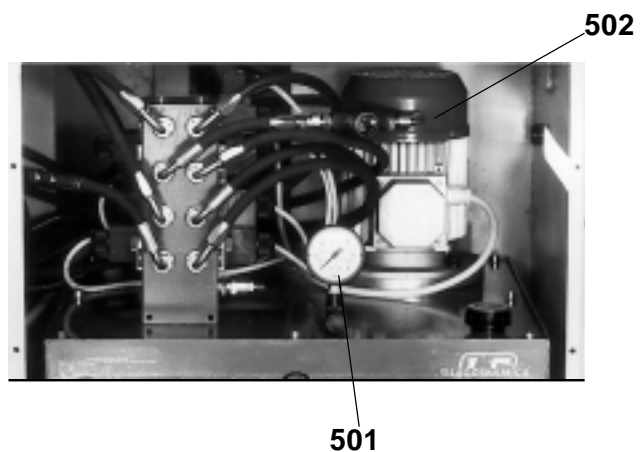
### CONTROL PANEL

- 401 Electronic instrument (controller)
- 404 Sped switch
- 405 Saw frame lowering regulator
- 406 Main switch
- 407 Line push button
- 408 Emergency push-button



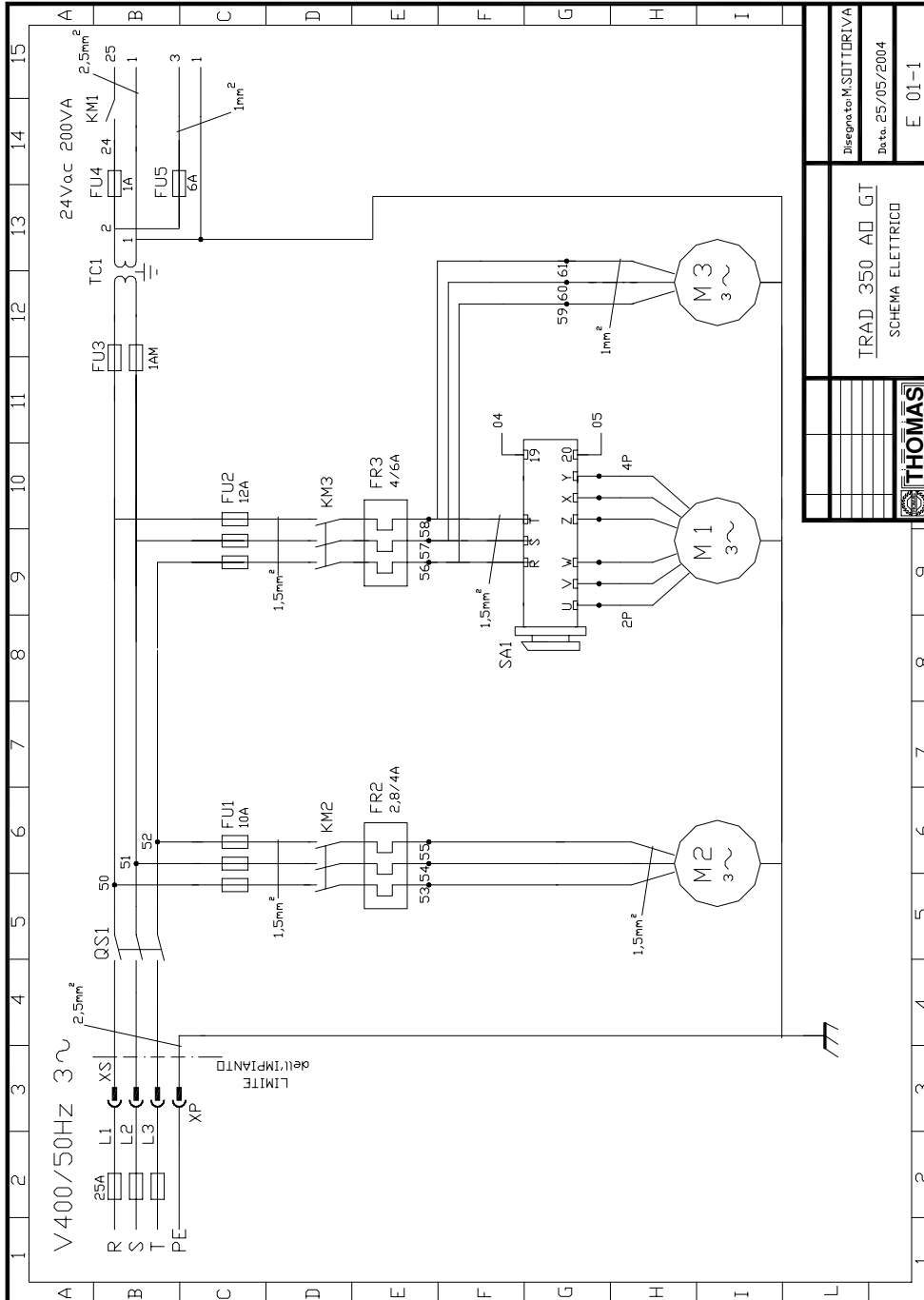
### HYDRAULIC UNIT

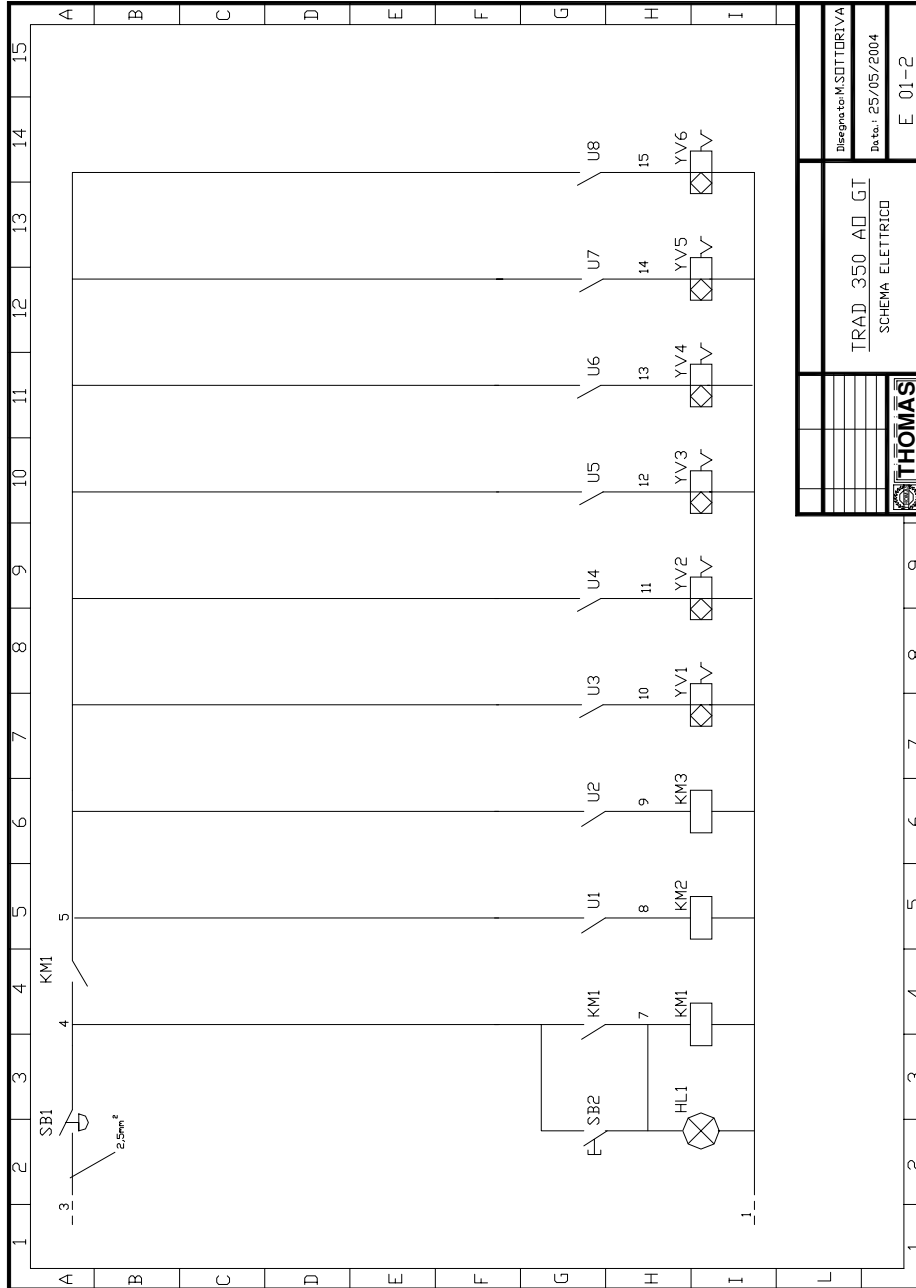
- 501 Main manometer
- 502 Electric motor



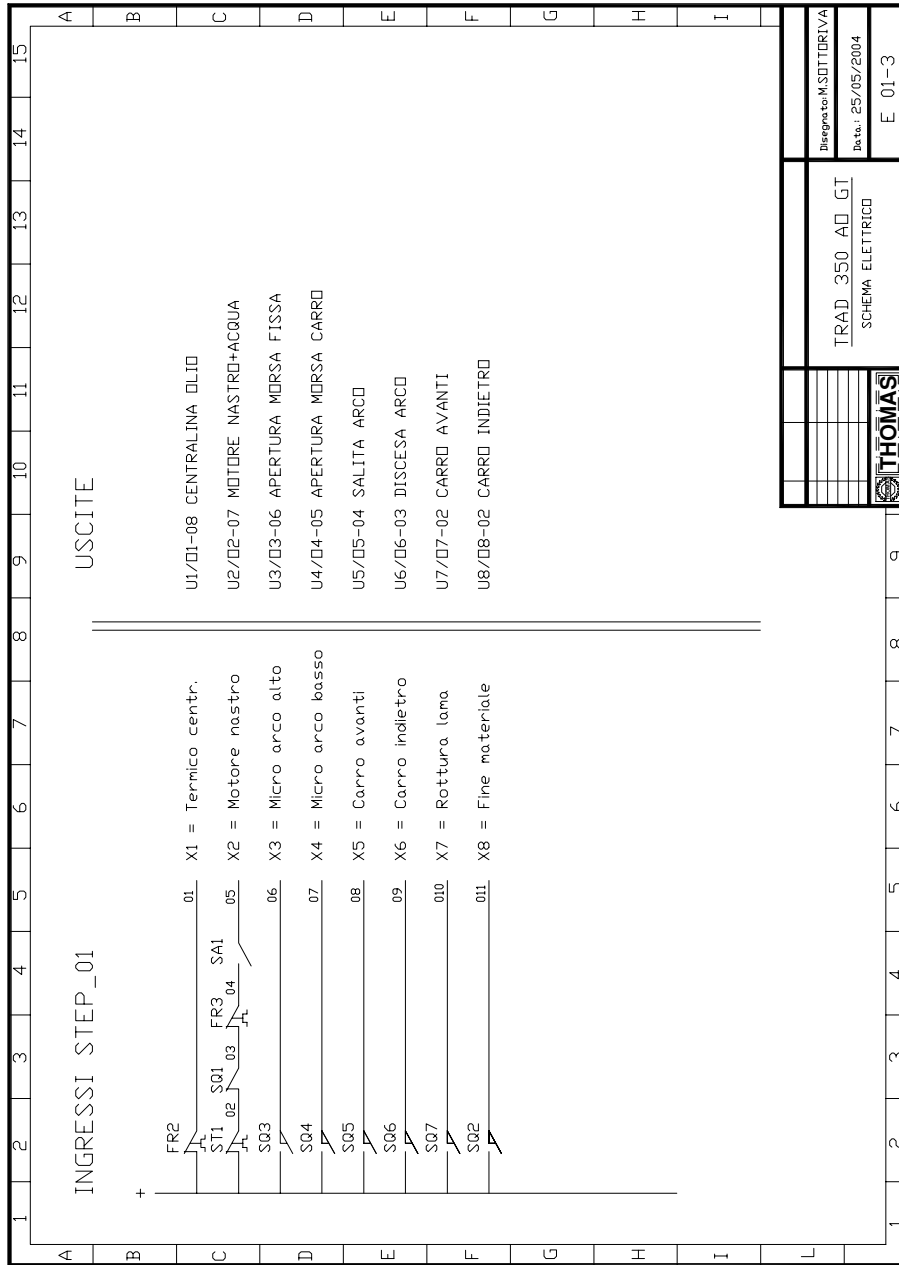
## 11 WIRING DIAGRAMS

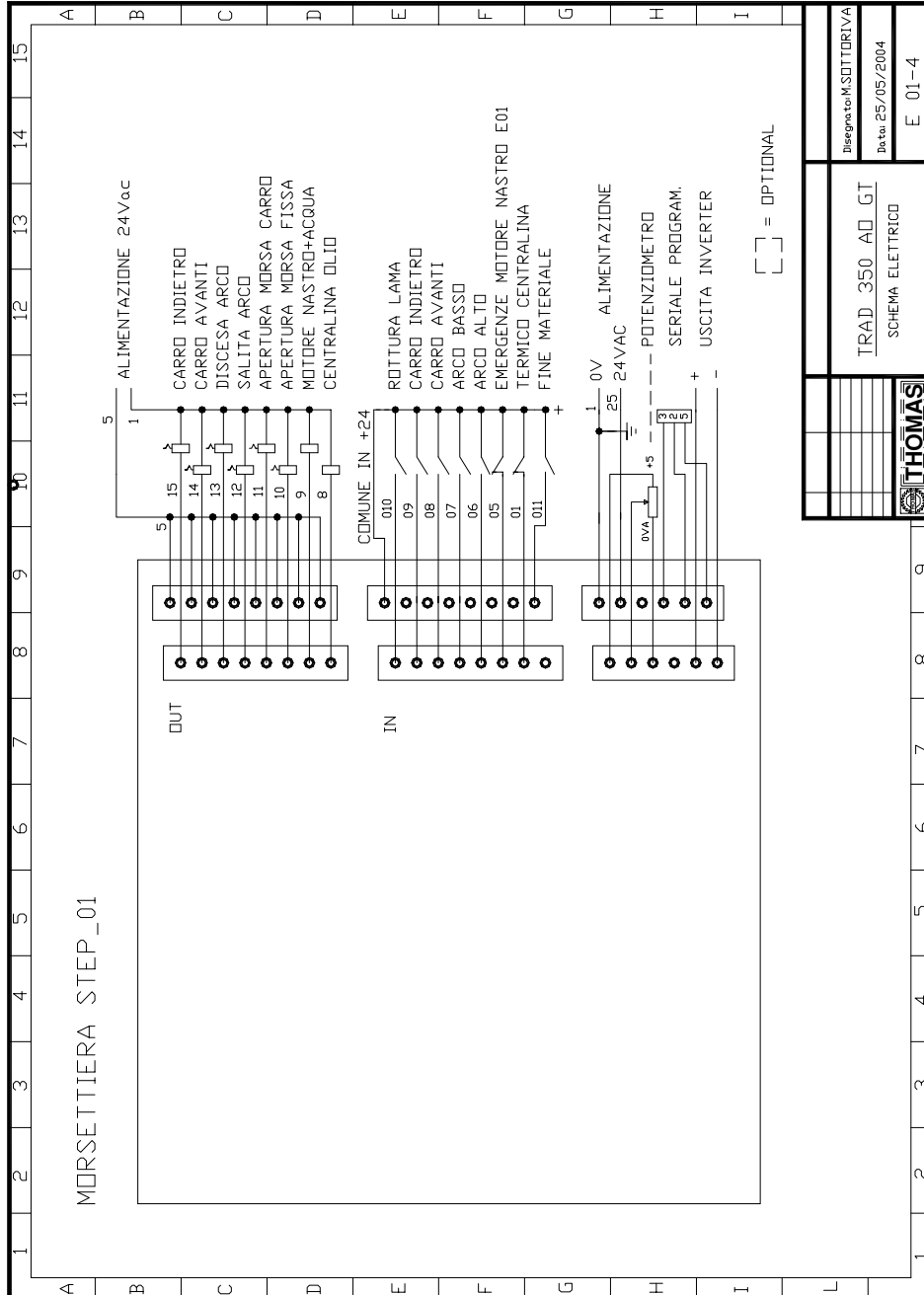
### 11.1 - Three-phase electric diagram







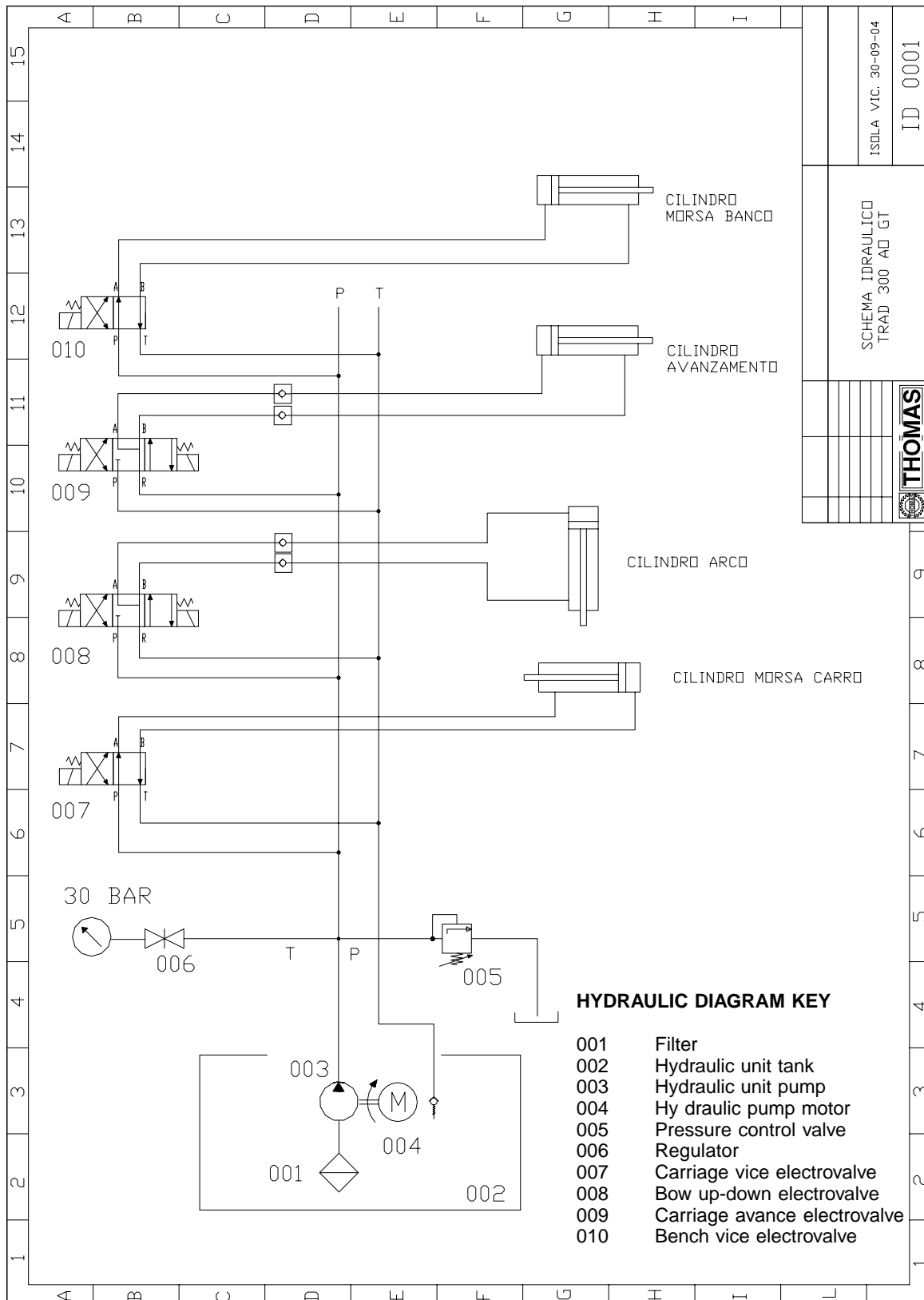




Disegnata da: M. SODDIBRIVA Data: 25/05/2004 E 01-4	TRAD_350_AO_GT SCHEMA ELETTRICO

MOD.: .TRAD 300 AO GT		OPTIONAL: STANDARD			TRIFASE		
RIF.	DESCRIZIONE	CARATTERISTICHE	QUANTITA'	FORNITORE	ART.		
M1	MOTORE CENT. IDRAULICA	KW 1,1 1400 GIRI	1	TESSARO			
M2	MOTORE NASTRO	KW 1--1,4 1400-2800 GIRI	1	TESSARO			
M3	MOTORE POMPA A CQUA	KW 0,15 2800 GIRI H 120	1	SACEMI			
D1	STRUMENTO CONTROLLO	8 INGRESSI 8 USCITE RELE	1	SERTECH	STEP 1		
SB1	PULSANTE EMERGENZA	CONT NC 10 A. 250 V	1	BRETER	RT065 R+ V40		
SB2	PULSANTE LINEA	CONT NO 10 A. 250 V		BRETER	RM 010 + P22804 V		
HL 1	LAMPADA SPIA LINEA	24 V NEONVERDE	1	SLIM	TBF 010 SC1		
YV 12345-78	BOBINA ELETTROVALVOLE	21 V CC. 30 VA. CON RAC	8	L.C.	CENTRALE IDRAULICA L.C.		
YV9 *	BOBINA VALV. NEBULIZZATORE	24 V. 50 HZ 5 VA	1	I.L.C.			
ST1	SONDA TERMICA MOTORE	130 GRADI 0,5 A. N.C.	1	INT.MOTORE			
SQ6	MICRO CARRO INDIETRO	3 A 400 VOLT IP 67	1	PIZZATO	FA 4101 5 METRI		
SQ2	MICRO FINE MATERIALE	U 500 V IP 67	1	CROUZET	83871,0 3 METRI		
SQ3	MICRO ARCO ALTO	3 A 400 VOLT IP 67	1	PIZZATO	FA 4101 2 METRI		
SQ4	MICRO ARCO BASSO	3 A 400 VOLT IP 67	1	PIZZATO	FA 4101 2 METRI		
SQ5	MICRO CARRO AVANTI	6 A. 250 V IP 66	1	ERSCE	E300 OO AM		
SQ7	MICRO ROTTURA LAMA	3 A 400 VOLT IP 67	1	PIZZATO	FA 4101 3 METRI		
SQ 1	MICRO RIPARO NASTRO	6 A 250 V A CHIAVE	1	LOVATO	RS2 10 11 D		
X1	MORSETTI COLLEGAMENTO	2,5 MM 800V 4 MM 690 V	22+40	SIEMENS	8WA1 011 1DF11-+2DG11		
RC ?	SCATOLA DERIVAZIONE	PLASTICA	1	GEWIS	G.W.44206		
	FILTRI ANTIDISTURBO TEL.	24-48 VOLT	3	G.E	BSLR2G		
*	PARTICOLARI A RICHIESTA						

### 11.2 - Hydraulic electric diagram

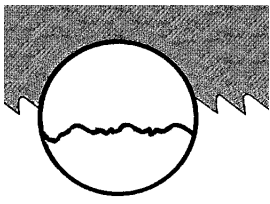
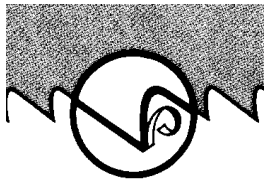


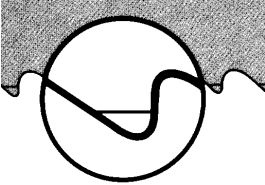
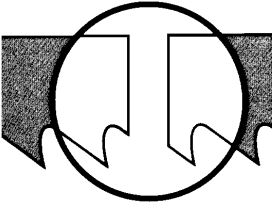
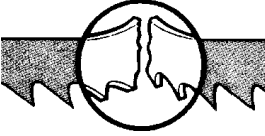
# 12 TROUBLESHOOTING

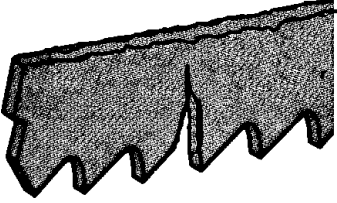
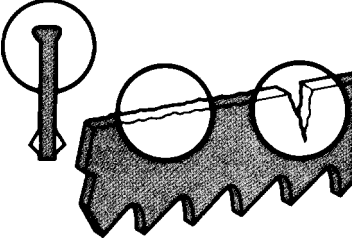
This chapter lists the probable faults and malfunctions that could occur while the machine is being used and suggests possible remedies for solving them.

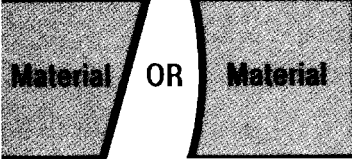
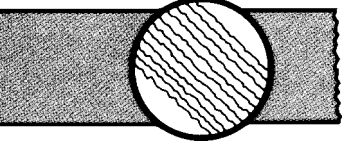
The first paragraph provides diagnosis for TOOLS and CUTS, the second for ELECTRICAL COMPONENTS.

### 12.1 - Blade and cut diagnosis

FAULT	PROBABLE CAUSE	REMEDY
<p><b>TOOTH BREAKAGE</b></p>  	<p>Too fast advance</p> <p>Wrong cutting speed</p> <p>Wrong tooth pitch</p> <p>Chips sticking onto teeth and in the gullets or material that gums</p> <p>Defects on the material or material too hard</p> <p>Ineffective gripping of the part in the vice</p> <p>The blade gets stuck in the material</p> <p>Starting cut on sharp or irregular section bars</p> <p>Poor quality blade</p> <p>Previously broken tooth left in the cut</p> <p>Cutting resumed on a groove made previously</p> <p>Vibrations</p> <p>Wrong tooth pitch or shape</p> <p>Insufficient lubricating refrigerant or wrong emulsion</p> <p>Teeth positioned in the direction opposite the cutting direction</p>	<p>Decrease advance, exerting less cutting pressure.</p> <p>Change blade speed and/or type. See Chapter “<b>Material classification and blade selection</b>” in the <i>Blade selection table according to cutting and feed speed</i>.</p> <p>Choose a suitable blade. See Chapter “<b>Material classification and blade selection</b>”.</p> <p>Check for clogging of cooling liquid drain holes on the blade-guide heads and that flow is plentiful in order to facilitate the removal of chips from the blade.</p> <p>Material surfaces can be oxidised or covered with impurities making them, at the beginning of the cut, harder than the blade itself, or have hardened areas or inclusions inside the section due to productive agents used such as casting sand, welding wastes, etc. Avoid cutting these materials or in any case perform cutting with extreme care, cleaning and removing such impurities as quickly as possible.</p> <p>Check the gripping of the part.</p> <p>Reduce feed and exert less cutting pressure.</p> <p>Pay more attention when you start cutting.</p> <p>Use a superior quality blade.</p> <p>Accurately remove all the parts left in.</p> <p>Make the cut elsewhere, turning the part.</p> <p>Check gripping of the part.</p> <p>Replace blade with a more suitable one. See Chapter “<b>Material classification and blade selection</b>” in the <i>Blade Types</i> section.</p> <p>Check level of liquid in the tank. Increase the flow of lubricating refrigerant, checking that the hole and the liquid outlet pipe are not blocked.</p> <p>Check the emulsion percentage.</p> <p>Turn teeth in correct direction.</p>

FAULT	PROBABLE CAUSE	REMEDY
<p><b>PREMATURE BLADE WEAR</b></p> 	<p>Faulty running-in of blade</p> <p>Teeth positioned in the direction opposite the cutting direction</p> <p>Poor quality blade</p> <p>Too fast advance</p> <p>Wrong cutting speed</p> <p>Defects on the material or material too hard</p> <p>Insufficient lubricating refrigerant or wrong emulsion</p>	<p>See Chapter “<b>Material classification and blade selection</b>” in the <i>Blade running-in</i> section.</p> <p>Turn teeth in correct direction.</p> <p>Use a superior quality blade.</p> <p>Decrease advance, exerting less cutting pressure.</p> <p>Change blade speed and/or type. See Chapter “<b>Material classification and blade selection</b>” in the <i>Blade selection table according to cutting and feed speed</i>.</p> <p>Material surfaces can be oxidised or covered with impurities making them, at the beginning of the cut, harder than the blade itself, or have hardened areas or inclusions inside the section due to productive agents used such as casting sand, welding wastes, etc. Avoid cutting these materials or in any case perform cutting with extreme care, cleaning and removing such impurities as quickly as possible.</p> <p>Check level of liquid in the tank. Increase the flow of lubricating refrigerant, checking that the hole and the liquid outlet pipe are not blocked.</p> <p>Check the emulsion percentage.</p>
<p><b>BLADE BREAKAGE</b></p>  	<p>Faulty welding of blade</p> <p>Too fast advance</p> <p>Wrong cutting speed</p> <p>Wrong tooth pitch</p> <p>Ineffective gripping of the part in the vice</p> <p>Blade touching material at beginning of cut</p>	<p>The welding of the blade is of utmost importance. The meeting surfaces must perfectly match and once they are welded they must have no inclusions or bubbles; the welded part must be perfectly smooth and even. They must be evenly thick and have no bulges that can cause dents or instant breakage when sliding between the blade guides bearings.</p> <p>Decrease advance, exerting less cutting pressure.</p> <p>Change blade speed and/or type. See Chapter “<b>Material classification and blade selection</b>” in the <i>Blade selection table according to cutting and feed speed</i>.</p> <p>Choose a suitable blade. See Chapter “<b>Material classification and blade selection</b>”.</p> <p>Check the gripping of the part.</p> <p>At the beginning of the cutting process, never lower the saw frame before starting the blade motor.</p>

FAULT	PROBABLE CAUSE	REMEDY
 	<p>Blade guide pads not regulated or dirty because of lack of maintenance</p> <p>Blade too slack</p> <p>Blade guide block too far from material to be cut</p> <p>Improper position of blade on flywheels</p> <p>Insufficient lubricating refrigerant or wrong emulsion</p>	<p>Check distance between pads (see Chapter “<b>Machine adjustments</b>” in the <i>Blade guide blocks</i> section): extremely accurate guiding may cause cracks and breakage of the tooth. Clean carefully.</p> <p>Check that the blade tightening hand-wheel is positioned in such a way as to actuate the relative microswitch.</p> <p>Approach head as near as possible to material to be cut so that only the blade section employed in the cut is free, this will prevent deflections that would excessively stress the blade.</p> <p>The back of blade rubs against the support due to deformed or poorly welded bands (tapered), causing cracks and swelling of the back contour.</p> <p>Check level of liquid in the tank. Increase the flow of lubricating refrigerant, checking that the hole and the liquid outlet pipe are not blocked.</p>
<p><b>STREAKED OR ETCHED BANDS</b></p>	<p>Damaged or chipped blade guide pads</p> <p>Tight or slackened blade guide pads</p>	<p>Replace them.</p> <p>Adjust them (see Chapter “<b>Machine adjustments</b>” in <i>Blade guide heads</i> section).</p>
<p><b>CUTS OFF THE STRAIGHT</b></p>	<p>Blade not parallel as to the counter-vice</p> <p>Blade not perpendicular due to the excessive play between the blade guide pads and maladjustment of the blocks</p> <p>Too fast advance</p> <p>Blade guide block too far from material to be cut</p> <p>Blade too slack</p> <p>Worn out blade</p> <p>Wrong tooth pitch</p> <p>Broken teeth</p>	<p>Check fastenings of the blade guide heads as to the counter-vice so that they are not too loose; bring into line the position of the degrees and if necessary adjust the stop screws of the degree cuts.</p> <p>Check and vertically re-adjust the blade guide heads; reset proper side guide play (see Chapter “<b>Machine adjustments</b>” in <i>Blade guide heads</i> section).</p> <p>Decrease advance, exerting less cutting pressure.</p> <p>Approach head as near as possible to material to be cut so that only the blade section employed in the cut is free, this will prevent deflections that would excessively stress the blade.</p> <p>Check that the blade tightening hand-wheel is positioned in such a way as to actuate the relative microswitch.</p> <p>Replace it.</p> <p>Blade with major density of teeth is being used, try using one with less teeth (see Chapter “<b>Material classification and blade selection</b>” in the <i>Blade Types</i> section).</p> <p>Irregular work of the blade due to the lack of teeth can cause deflection in the cut; check blade and if necessary replace it.</p>

FAULT	PROBABLE CAUSE	REMEDY
	Insufficient lubricating refrigerant or wrong emulsion	Check level of liquid in the tank. Increase the flow of lubricating refrigerant, checking that the hole and the liquid outlet pipe are not blocked. Check the emulsion percentage.
<p><b>FAULTY CUT</b></p> 	<p>Worn out flywheels</p> <p>Flywheel housing full of chips</p> <p>Blade too slack</p>	<p>The support and guide flange of the band are so worn out that they cannot ensure the alignment of the blade, causing faulty cutting; blade rolling and drawing tracks can have become tapered. Replace them.</p> <p>Clean with compressed air.</p> <p>Check that the blade tightening hand-wheel is positioned in such a way as to actuate the relative microswitch.</p>
<p><b>STREAKED CUTTING SURFACE</b></p> 	<p>Too fast advance</p> <p>Poor quality blade</p> <p>Worn out blade or with chipped and/or broken teeth</p> <p>Wrong tooth pitch</p> <p>Blade guide block too far from material to be cut</p> <p>Blade too slack</p> <p>Insufficient lubricating refrigerant or wrong emulsion</p>	<p>Decrease advance, exerting less cutting pressure.</p> <p>Use a superior quality blade.</p> <p>Replace it.</p> <p>Blade with not enough teeth is being used, try using one with major density (see Chapter “<b>Material classification and blade selection</b>” in the <i>Blade Types</i> section).</p> <p>Approach head as near as possible to material to be cut so that only the blade section employed in the cut is free, this will prevent deflections that would excessively stress the blade.</p> <p>Check that the blade tightening hand-wheel is positioned in such a way as to actuate the relative microswitch.</p> <p>Check level of liquid in the tank. Increase the flow of lubricating refrigerant, checking that the hole and the liquid outlet pipe are not blocked.</p> <p>Check the emulsion percentage.</p>
<p><b>NOISE ON THE BLADE GUIDE HEADS</b></p>	<p>Chipped blade guide pads</p>	<p>Dirt and/or chips between blade and guide pads. Replace them.</p>





## 12.2 - Electrical components diagnosis

FAULT	PROBABLE CAUSE	REMEDY
<b>THE GREEN LIGHT DOES NOT LIGHT UP</b>	Light burnt No power supply " TC " transformer Main disconnect switch	Replace light. Check the plug, the wiring cable between machine and mains and then the fuses. Check that the supply voltage is the same as the line voltage and that it gives a value of 24V at output on terminals 1 and 2. It must be in position 1 and allow the passage of the three phases.
<b>THE INSTRUMENT DOES NOT TURN ON</b>	fuse Emergency push-button Trasformer Instrument	Make sure that cartridges are not damaged and replace them if necessary. Check that it is disengaged and check for efficiency. Check that the power supply voltage corresponds to the one of the line and that it is 24V at exit. Check that voltage reaches terminals, replace instrument if necessary.
<b>THE MOTOR OF THE HYDRAULIC UNIT DOES NOT WORK</b>	Hydraulic unit temperature relay fuse Instrument Remote control switch	The temperature relays have stepped in. Remove the protections of the box containing the electric parts and mechanically detach the protections. Make sure that cartridges are not damaged and if they are blown, check for shorts in the transformer and in the control parts (push-buttons - coils). Check if the relative functional key enables the Y3 output. Check that phases are present in both input and output; that it isn't jammed, that it doesn't close when energized, that it isn't the cause of short circuits; otherwise replace it.
<b>THE MAIN VICE DOES NOT OPEN</b>	Instrument Burnt solenoid valve coil Electrical disconnections Hydraulic unit pressure Electrically speaking everything is fine but the valve doesn't work	Check if the relative functional key enables the Y2 output. Check that voltage reaches coil terminals and that there is a certain resistance between the coil terminals; replace if necessary. Check for possible electrical disconnections of the coil. Check that on the relative pressure gauge in the hydraulic unit there is a pressure of abt 28 BAR. Check mechanical functioning of the valve, replace if necessary.



FAULT	PROBABLE CAUSE	REMEDY
<b>CARRIAGE VICE DOES NOT OPEN</b>	Instrument Burnt solenoid valve coil Electrical disconnections Hydraulic unit pressure	Check if the relative functional key enables the Y1 output. Check that voltage reaches coil terminals and that there is a certain resistance between the coil terminals; replace if necessary. Check for possible electrical disconnections of the coil. Check that on the relative pressure gauge in the hydraulic unit there is a pressure of abt 28 BAR.
<b>THE BAND ROTATION MOTOR DOES NOT WORK</b>	Mechanical hindrance Motor power supply fuses Speed switch Thermal relay of band motor Thermal relay pump Flywheel guard microswitch Instrument remote control switch Motor	Check for mechanical hindrances. Check if motor is energized. Make sure that the cartridges are not damaged, replace them if necessary. It must be engaged in position 1 or 2. Check that thermal relay protecting band motor is correctly connected. The pump protection has stepped in. Remove the protections of the box containing the electric parts and mechanically detach the protections. Check to have properly closed the flywheel guard so as to actuate the relative microswitch. Check if the relative functional key enables the Y10 output. Check that phases are present in both input and output; that it isn't blocked, that it doesn't close when power energized, that it isn't the cause of short circuits; otherwise replace it. Check that motor is not burnt and that it is free to rotate. It can be rewound or replaced.
<b>THE PUMP DOES NOT WORK</b>	Electrical connections Mechanical hindrance Motor power supply fuses Speed switch	The pump operates parallel as to the band motor. Check electrical connections of wires up to the terminal board of the pump; if necessary replace faulty parts. Check for mechanical hindrances. Check if motor is energized. Make sure that the cartridges are not damaged, replace them if necessary. It must be engaged in position 1 or 2.



FAULT	PROBABLE CAUSE	REMEDY
	Pump temperature probe	The pump protection has stepped in. Remove the protections of the box containing the electric parts and mechanically detach the protections.
	Flywheel guard microswitch	Check to have properly closed the flywheel guard so as to actuate the relative microswitch.
	Instrument	Check if the relative functional key enables the Y10 output.
	remote control switch	Check that phases are present in both input and output; that it isn't blocked, that it doesn't close when power energized, that it isn't the cause of short circuits; otherwise replace it.
	Pump motor	Check that motor is not burnt and that it is free to rotate. It can be rewound or replaced.
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<b>SAW FRAME DOES NOT MOVE DOWN</b>	Instrument	Check if output Y6 is energized.
	Solenoid valve	Check that voltage reaches coil terminals; replace if necessary.
	Electrical disconnections	Check for possible electrical disconnections of the coil.
	Electrically speaking everything is fine but the valve doesn't work	Check mechanical functioning of the valve, replace if necessary.
	Saw frame lowering adjustment	Make sure that the saw frame lowering adjustment is open.
	Saw frame down microswitch	Check that it is not blocked nor damaged.
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<b>SAW FRAME DOES NOT MOVE UP</b>	Instrument	Check if output Y9 is energized.
	Solenoid valve	Check that voltage reaches coil terminals; replace if necessary.
	Electrical disconnections	Check for possible electrical disconnections of the coil.
	Electrically speaking everything is fine but the valve doesn't work	Check mechanical functioning of the valve, replace if necessary.
	Saw frame up microswitch	Check that it is not blocked nor damaged.



FAULT	PROBABLE CAUSE	REMEDY
<b>THE SAWING MACHINE DOES NOT OPERATE IN AUTOMATIC</b>	<p>Saw frame limit switch microswitch up</p> <p>End of material</p> <p>Carriage back limit switch microswitch</p> <p>Speed switch</p> <p>Protections closing microswitch</p> <p>Data not entered properly</p>	<p>Check that it is pressed and check efficiency.</p> <p>Upon clamping of the carriage vice it must not be released completely; if necessary adjust or replace the microswitch.</p> <p>Check efficiency and check that it is not jammed.</p> <p>It must be engaged in position 1 or 2.</p> <p>Check to have properly closed the feed carriage protection and the flywheel protection guard and to have actuated the relative microswitches.</p> <p>Check to have entered all the cutting parameters in the proper manner; refer to the relative chapter.</p>

## 13 NOISE TESTS

In accordance with point 1.7.4.f of the Machines Directive EEC 98/37

INTEGRATING PHONOMETER " DELTA OHM " mod. HD9019k1 serial n. 110996B295.

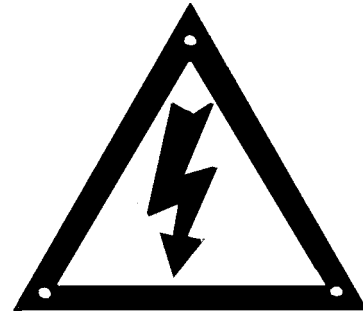
MICROPHONE mod. HD 9019S1.

SOUND GAUGER mod. HD 9101 at 94dB/110dB a 1.000 Hz in class 1 according to IEC regulation n.942 1988 and ANSI S1.40 1984. 3 measurements with the machine operating unloaded.

- The microphone was been located close to the operator's head, at medium height.
- The weighted equivalent continuous acoustic pressure level was 71,5 dB (A).
- The maximum level of the WEIGHTED instantaneous acoustic pressure C was always less than 130 dB.

NOTE: with the machine operating, the noise level will vary according to the different materials being processed. The user must therefore assess the intensity and if necessary provide the operators with the necessary personal protection, as required by Law 277/1991.

### PLATES AND LABELS



REMARKS: \_\_\_\_\_

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