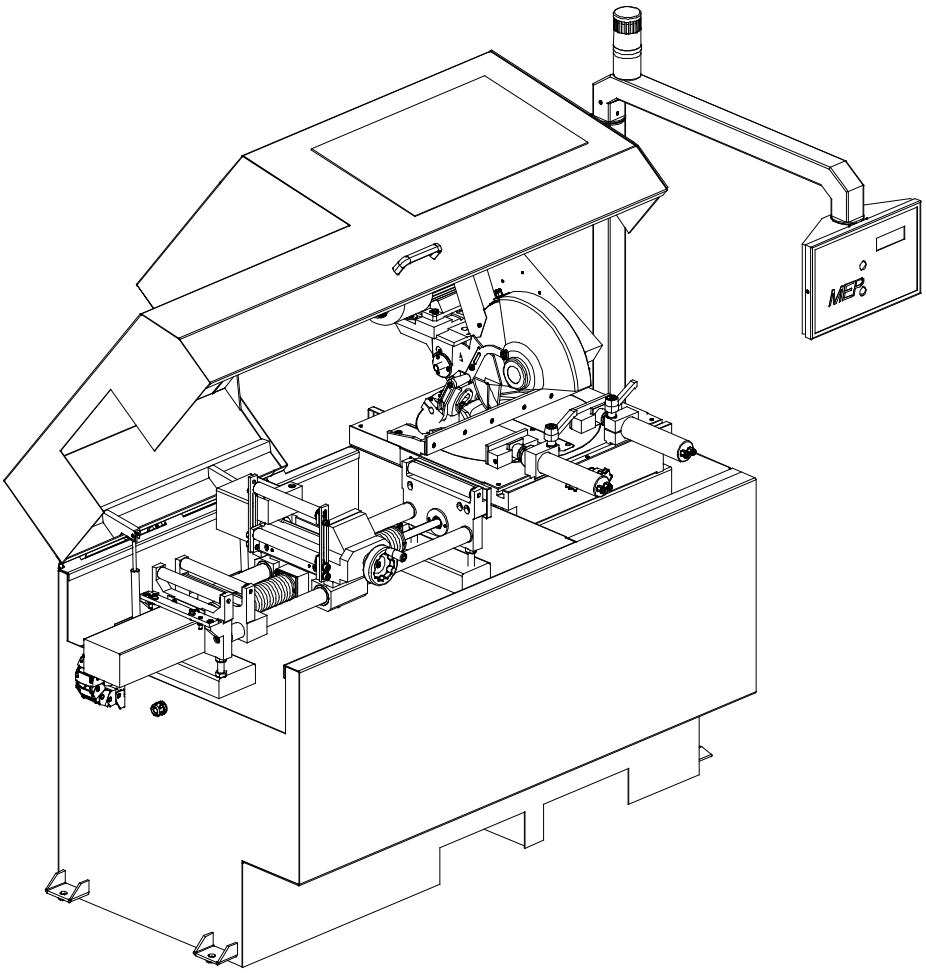

USE AND MAINTENANCE MANUAL

EN PNF 350-2 CNC

YEAR OF MANUFACTURE: _____

”CE” CONFORMITY DECLARATION
(according to EEC MACHINES DIRECTIVE 2006/42/CE annex II A)

The manufacturer:

MEP S.p.A.
Via Enzo Magnani, 1
61045 Pergola (PU) ITALIA
Tel. 072173721- Fax 0721734533

Hereby declares that the circular sawing machine:

Machine Type:	**SAWING MACHINE**
Machine model:	**PNF 350- 2 CNC**
Serial number:	
Year of manufacture:	

is in specification with the following directives:

- **EEC MACHINES DIRECTIVE 2006/42/CE (D.Lgs. 17/2010)**
  - **EN 13898:2003 + A1:2009**
  - **EN 12100:2010**
- **DIRECTIVE 2014/30/UE ”EMC” (D.Lgs. 80/2016)**
  - **EN 50370- 1:2005 Emission**
  - **EN 50370- 2:2003 Immunity**
- **DIRECTIVE 2014/35/UE ”LVD” (D.Lgs. 86/2016)**

Responsible of a Technical File
(Walter Di Giovanni)

c/o MEP SPA
Via Enzo Magnani, 1
61045 - Pergola - PU - ITALY

Managing Director
(William Giacometti)

Pergola, lì _____

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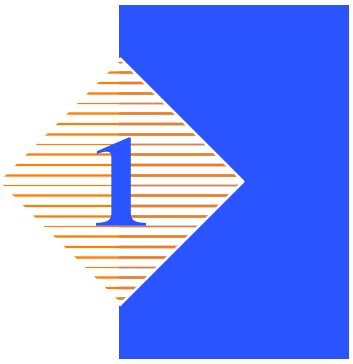
Introduction and technical specifications



Foreword

We have decades of experience in the construction of the best metal- cutting machines. Our experience, our knowledge of our customers and constant technological development of design and production equipment allow us to offer a specific solution for every type of cutting need.

This work tool has been designed as a simple and reliable answer to the wide range of cutting needs of the modern workshop.

PNF 350- 2 CNC is a disk sawing machine and can perform mitre cuts of 45° on the left and 45° on the right.

These features, together with its good cutting capabilities, make the Tiger 350 a very versatile machine.

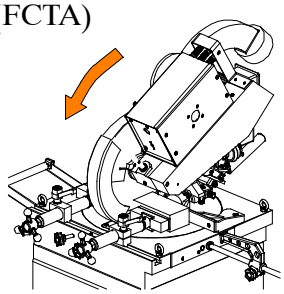
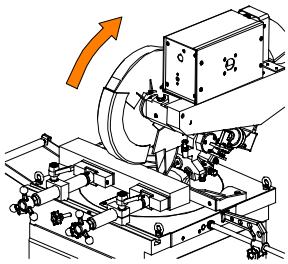
Congratulations for having chosen this product which, by following the instructions contained in this user and maintenance handbook, will guarantee you years of dependable service.

Warning

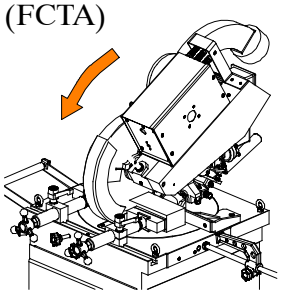
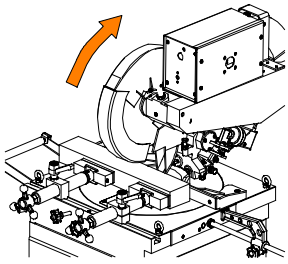
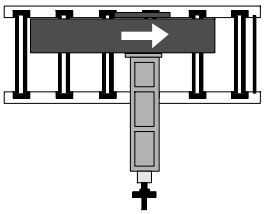
This band saw has been exclusively designed to cut metals.

Machine presentation

It can operate in SEMIAUTOMATIC or AUTOMATIC mode. In Semiautomatic mode, after setting the cutting head stroke and the head downstroke speed on the control panel, position the vice 2÷3 mm from the material being processed and press the start button on the control panel to activate the disk (or foot pedal if supplied);

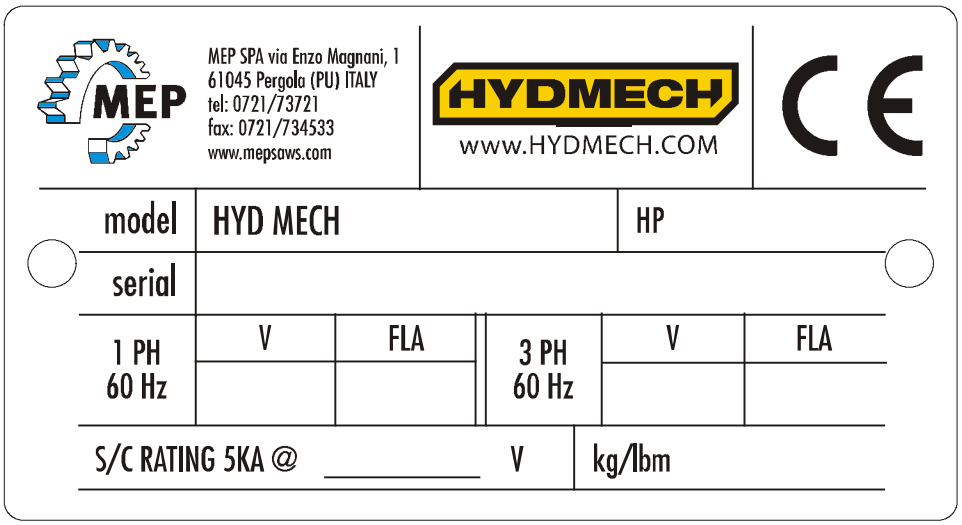
1. The cutter vice closes	2. The head lowers until the cut is made (FCTA) 	3. The head returns to start position (FCTI) 	4. The cutter vice opens

In Automatic mode, after setting the cutting head stroke and the head downstroke speed on the control panel, position the vice 2÷3 mm from the material being processed and press the start button on the control panel to activate the disk (or foot pedal if supplied):

1. The cutter vice closes	2. The head lowers until the cut is made (FCTA) 	3. The head returns to start position (FCTI) 	4. The feed vice closes
5. The cutter vice opens	6. The cutting material is fed 	7. The cutting vice closes	8. The feed vice opens and the cutting cycle starts up

Machine specification

The anodised aluminium name plate is riveted on the side of the machine; the same data are reproduced on the declaration of conformity included with this use and maintenance
manual.



N.B. When communicating with the Technical Service department, the model, serial number and year of manufacture of the machine must be quoted.

CUTTING SPEEDS		
Three- phase machine 2 speeds	rpm	1700/3400

BLADE		
External disc diameter	mm	350
Internal hole diameter	mm	32
Blade thickness	mm	3,4

RATED ELECTRICAL POWER		
Three- phase head spindle motor 2 speeds	KW	2,6 / 3,5
Max installed power	KW	3,5

WORKING PRESSURE		
Max. working pressure for opening/closing vice	Bar	6
Air consumption for a complete cycle	Nl/min	7,35

N.B. The ”air consumption for vice” value refers to standard conditions (temperature 0° and pressure 1.013 bar, i.e. density 1.3 x 10- 3 Kg/l) where 1 Kg/min. = 772 Nl/min.

LUBRICANT/COOLANT FLUID AND OIL		
Lubricant/coolant fluid (oil concentration 10 %)	capacità Lt.	1
Lubricant/coolant fluid MA (oil concentration 10 %)	capacità Lt.	10

VICE		
Vice max. opening	mm	180

THREE- PHASE MOTOR FEATURES 2 speed				
No.of poles	**Current (Volts)**	**Absorption (Amps)**	**Power (Kw)**	**rpm**
2	400 λ	7,7	3,5	2.840
4	400 Δ	5,95	2,6	1.410
Stator wound with enamelled copper wire, class H 200° C.				
Class F insulation (limit temperature TL 155° C).				
IP 54 protection rating (total against contact with live parts, water sprayed from all directions, with shaft oil seal).				
Conforming to CEI norms, publication: IEC 34 of 01/07/1985.				

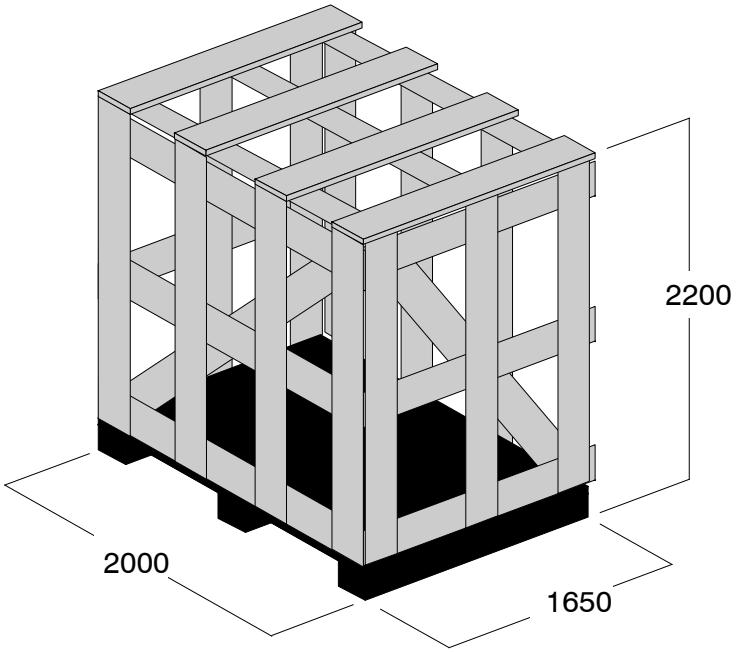
N.B. Example of class F insulation: in air- cooled machines at an ambient temperature of 40° C (according to CEI 2- 3 and IEC 85), the allowable overtemperature is 100° C (where 100° C represents the allowable ΔT).

EXTRACTOR MOTOR (Optional)			
Voltage (Volts)	**Absorption (Amps)**	**Power (Kw)**	**rpm**
230	5	2,25	2.800
400	8,7	2,25	2.800
Protection rating IP 55.			
Conforming to CEI norms, publication: IEC 34 of 01/07/1985.			

CUTTING CAPACITY				
Section				
0°	120	105	180 x 70	80
45° ⬗	120	100	135 x 60	55
45° ⬖	110	95	135 x 60	55

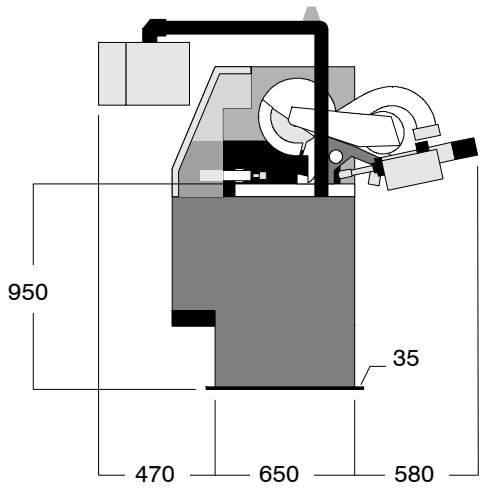
CUTTING CAPACITY With head placed on the left			
Section			
45° ⬗	50	50	160 x 35

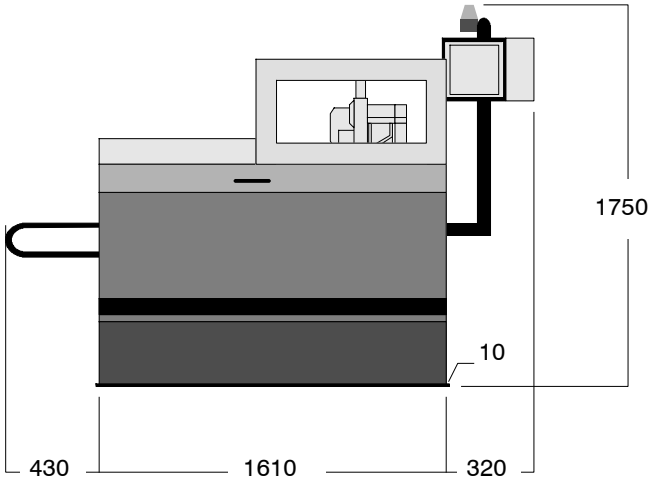
PACKED WEIGHT		
Wooden cage and pallet	kg	70
Wooden pallet	kg	20

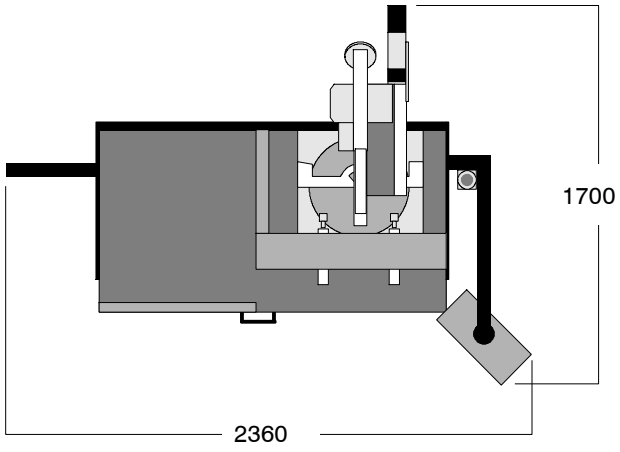


Dimensions

MACHINE INSTALLED		
Work table height	mm	940
Weight	kg	600





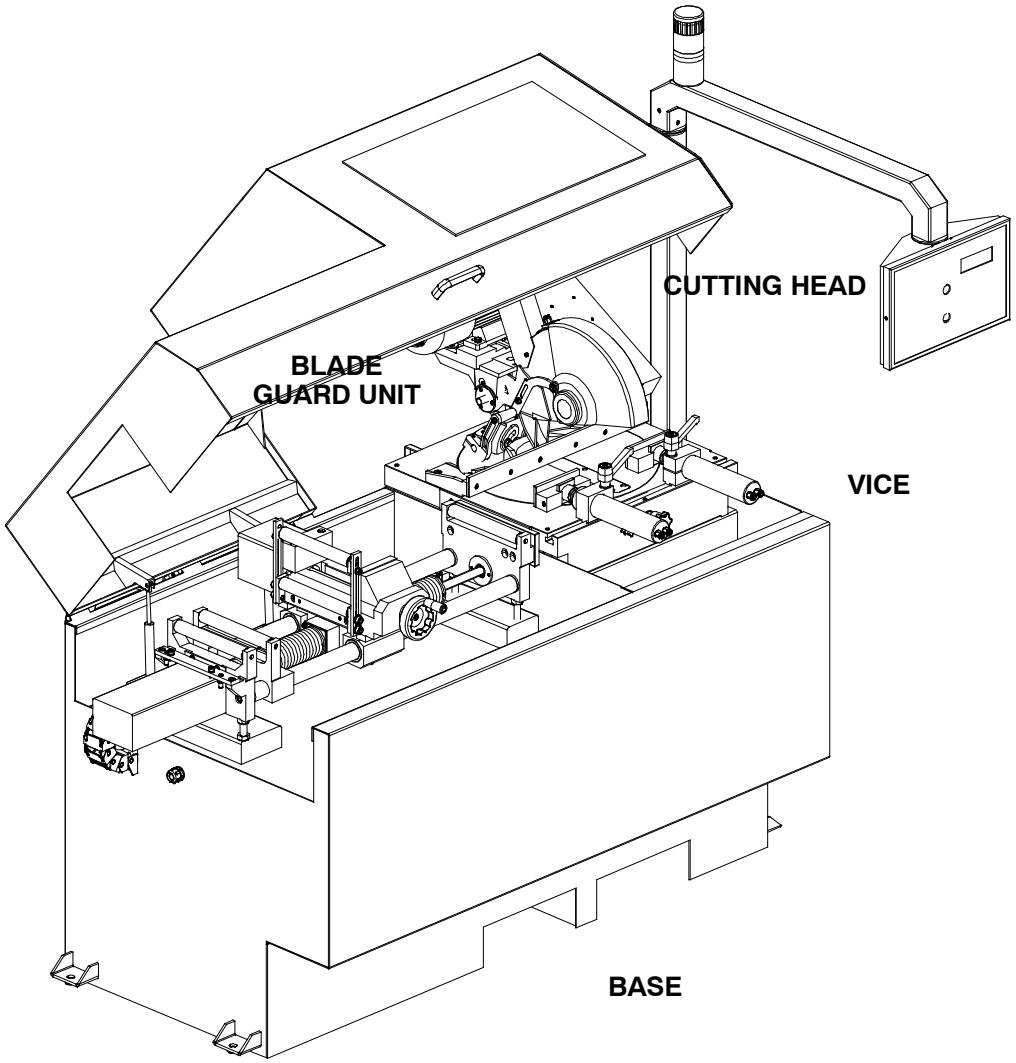


Functional parts

2

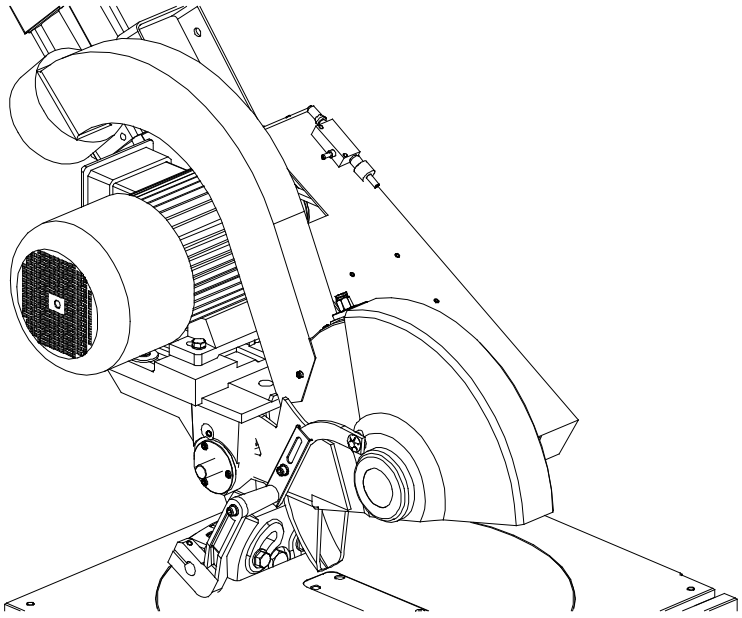
PNF 350-2 CNC model

In order for the user to move towards a full understanding of how the machine works, which is described in detail in the chapter 5, this chapter deals with the main units and their locations.



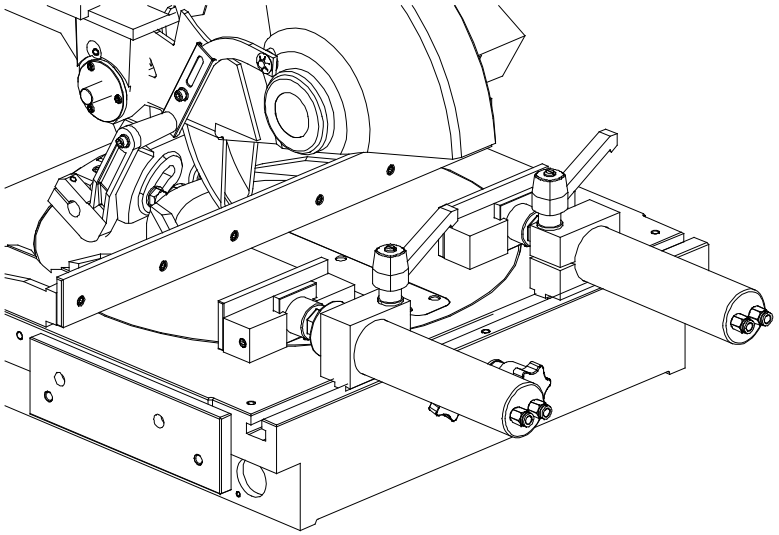
Cutting head

The cutting head is the unit that cuts the material. It consists of a cast iron head on which the following are mounted: the band saw, the blade guide components, the blade tensioner components, the transmission box and the spindle motor.



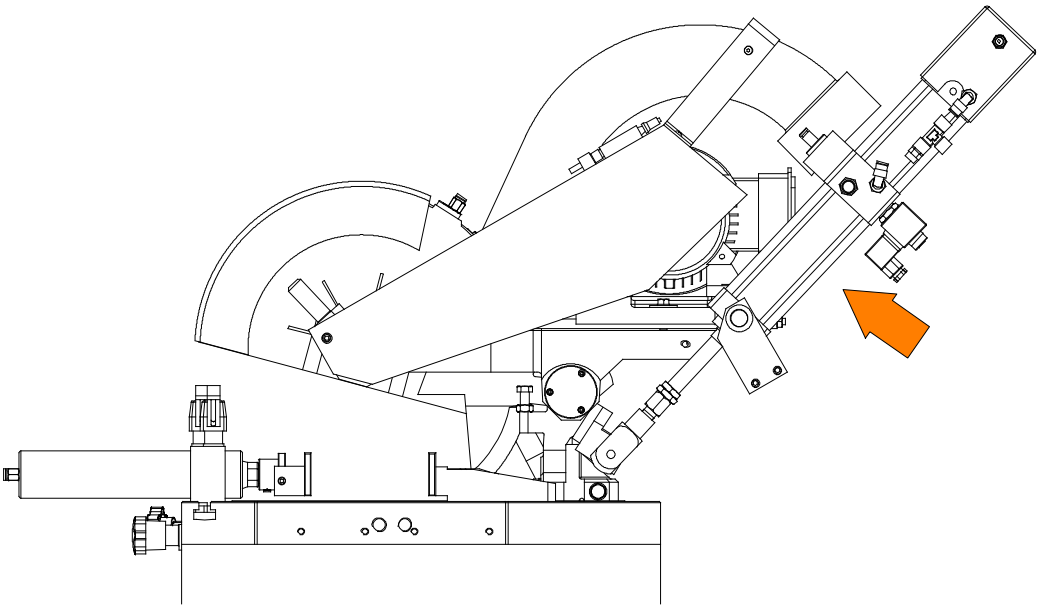
Shearing vices

Shearing vices are the components locking the material during the cut; they are made of fixed jaws, integral with the rotating platform and the sliding blocks with the movable jaws that can move on the dovetail guide. The vices are controlled by the vice opening and closing button on the control panel. The vice approaching movement is manual and the closing is operated by a pneumatic cylinder.



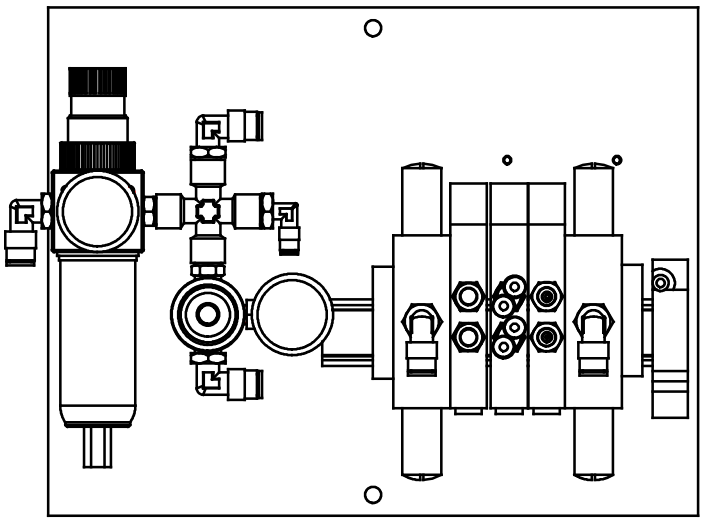
Oil pneumatic unit

This unit drives and regulates the upward and downward movement of the cutting head and consists of a hydro- pneumatic cylinder and recovery electro- valves. The head descent regulator on the control panel can be used to regulate the quantity of oil that flows into the cylinder and naturally the downward movement speed of the cutting head.



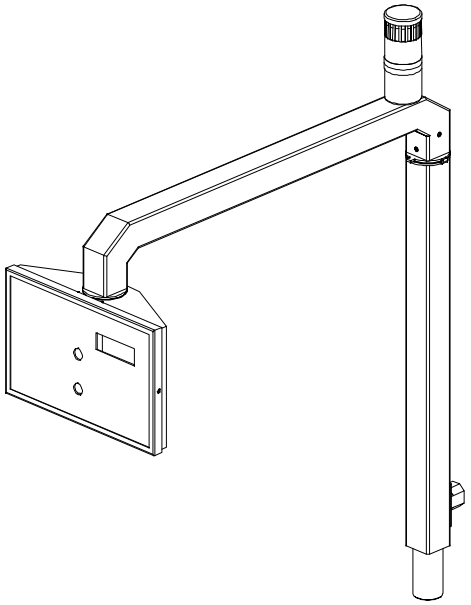
Electro- pneumatic unit

The panel shown in the diagram below is the electro- pneumatic unit. It consists of an air treatment unit and an electro- valve; the unit serves to filter the air entering the circuit. The box above the air treatment unit is for the coolant and its electric pump.



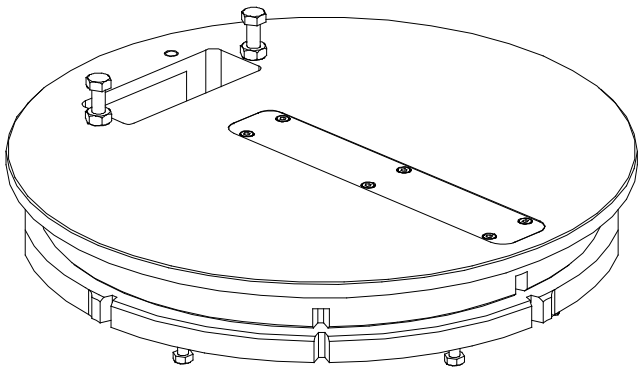
Control Panel

The control panel has a protection rating of IP 54 and contains the electronic equipment. Access to the control panel is protected by a safety panel mounted on hinges and fastened with screws, specially designed to prevent tampering. The control panel swivels on two articulated joints so that it can be positioned by the operator for greater ease- of- use and safety.



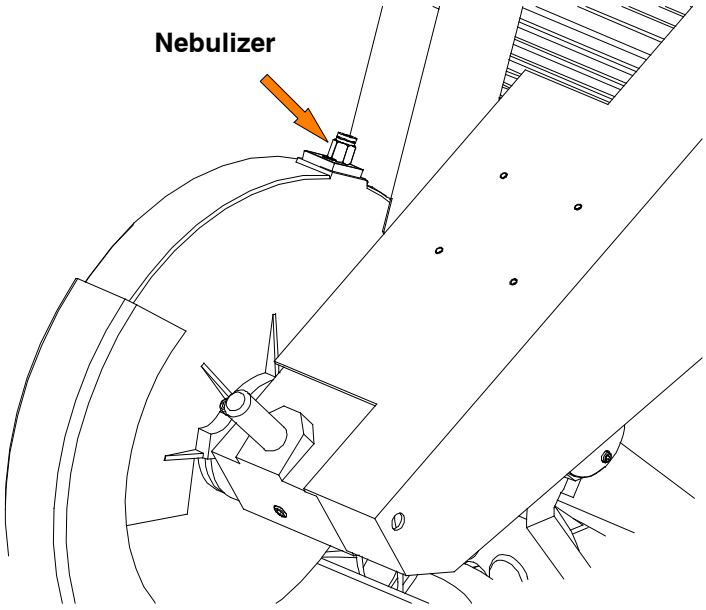
Turntable

Made in cast iron, it is the supporting plane for the material being processed and can rotate on the central pin together with the cutting head indicating the cutting angle by the etched grading. The cutting slot is made of two replaceable aluminum plates.



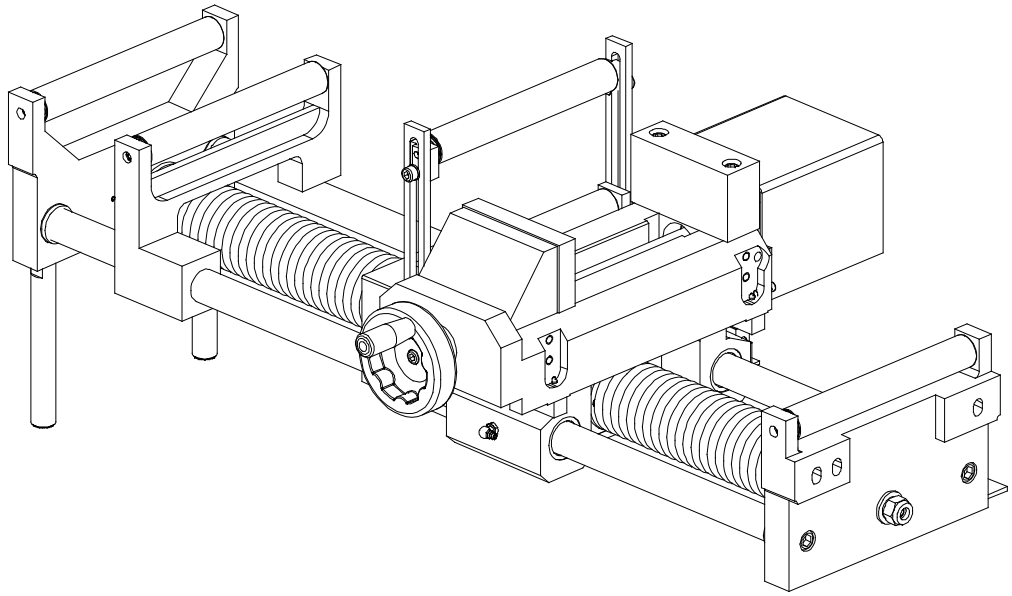
Lubrication system

The lubrication system is entirely automatic. When the band starts rotating, a pneumatic vacuum system is started to aid the liquid flow inside the band cover from the containing tank in the machine base. The liquid flow is adjusted by the nebulizer cock on the band cover back.

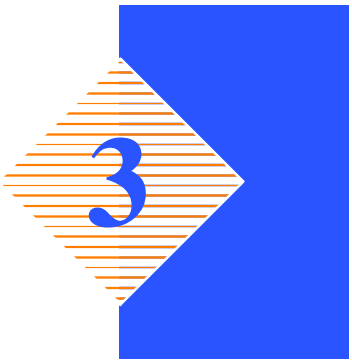


Feeder

The material, locked by means of the pneumatic vice, is delivered by a carriage which conveys it along ground guides. The numeric check controls, with great precision, the step motor of the infeed carriage, enabling the operator to set, on the same bar, 32 batches of pieces to be cut, each with different amounts and lengths.The material, locked by means of the pneumatic vice, is delivered by a carriage which conveys it along ground guides. The numeric check controls, with great precision, the step motor of the infeed carriage, enabling the operator to set, on the same bar, 32 batches of pieces to be cut, each with different amounts and lengths.



Safety and accident prevention



The **PNF 350- 2 CNC** has been designed and produced in accordance with European standards. For the correct use of the machine we recommend that the instructions contained in this chapter are carefully followed.

Use of the machine

The disk vertical sawing machine **PNF 350- 2 CNC** can be used only and exclusively for cutting profiles and solid parts in aluminum and light alloys. Other types of material and machining are not compatible with the specific characteristics of the saw.
The employer is responsible for instructing the personnel who, in turn, are obliged to inform the operator of any accident risks, safety devices, noise emission and accident prevention regulations provided for by international standards and national laws regarding the use of the machine. The operator must be perfectly aware of the position and function of all the machine's controls.The instructions, warnings and accident prevention standards in this manual must be respected without question by all those concerned.The following definitions are those provided for by **EEC MACHINES DIRECTIVE 2006/42/CE** :

- "Danger zone": any zone in and/or around a machine in which the presence of a person constitutes a risk for the safety and health of that person.
- "Person exposed": any person finding himself either completely or partly in a danger zone.
- "Operator": the person or persons given the responsibility of installing, operating, adjusting, maintaining, cleaning, repairing or transporting the machine.

Attention

The manufacturer declines any responsibility whatsoever, either civil or criminal, should there be unauthorised interference or replacement of one or more parts or assemblies on the machine, or if accessories, tools and consumable materials are used that are different from those recommended by the manufacturer itself or if the machine is employed in a plant system and its proper function is thereby altered.

General recommendations

LIGHTING

Insufficient lighting for the types of operation envisaged could constitute a safety hazard for the persons concerned. For this reason, the machine user must provide lighting in the working area sufficient to eliminate all shadowy areas while also avoiding any blinding light concentrations. (Reference standard ISO 8995- 89 ”Lighting in work environments”).

CONNECTIONS

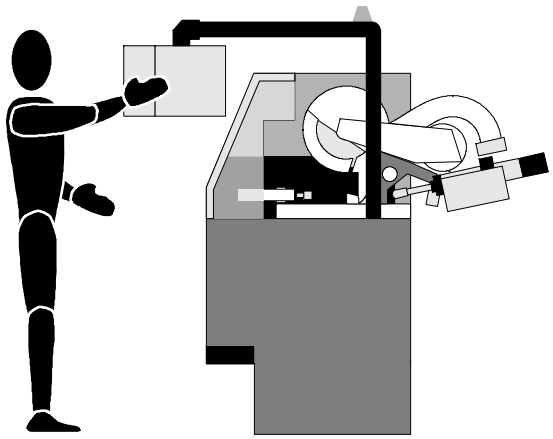
Check that the power supply cables and pneumatic feed systems comply with the maximum machine absorption values listed in the ”Machine Specification” tables; replace if necessary.

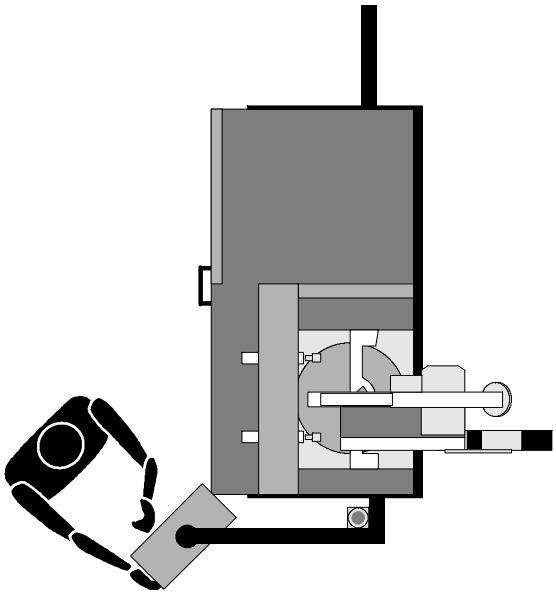
EARTHING

The installation of the earthing system must comply with the requirements set out in IEC STANDARD 204.

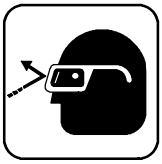
OPERATOR POSITION

The position of the operator controlling machine operations must be as shown in the diagram below.





Recommendations to the operator



Always wear proper goggles or protective glasses.

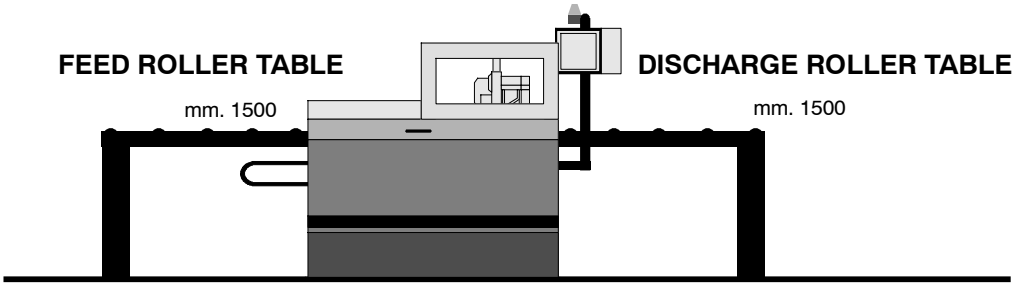
Do not use the machine without the guards in position. Replace the polycarbonate windows , if subject to corrosion.

Do not allow hands or arms to encroach on the cutting zone while the machine is in operation.

Do not wear oversize clothing with long sleeves, oversize gloves, bracelets, necklaces or any other object that may become entangled in the machine during working; long hair must be tied back and bunched.

Always disconnect the power supply to the machine before carrying out any maintenance work whatsoever, including in the case of abnormal operation of the machine.

Before starting cutting operations, support the material at both ends of the machine using the support arm - standard, or OPTIONAL accessories such as the feed and discharge roller tables shown in the diagram below. Before removing the devices supporting and moving the material, fasten the latter in place using the machine's clamping devices or other suitable equipment.



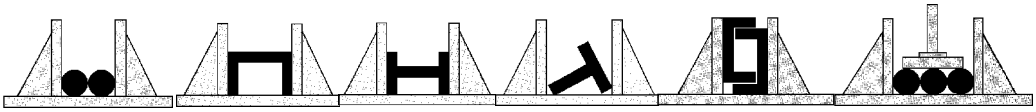
Any maintenance work on the hydraulic or pneumatic systems must be carried out only after the pressure in the system has been released.

The operator MUST NOT perform any risky operations or those not required for the machining in course (e.g. remove swarf or metal shavings form the machine while cutting).

Remove equipment, tools or any other objects from the cutting zone; always keep the working area as clean as possible.

Do not use the machine for cutting pieces which exceed the cutting capacity described in the technical specifications or are less than 5 mm

Before starting any cutting operations, ensure that the workpiece is securely held in the vice and the machine has been set correctly. A number of examples of how to clamp the different profiles correctly in our machines are shown below.



Never move the machine while it is cutting.

Do not use blades of different sizes to those recommended in the machine's specifications.

When cutting very short pieces, make sure that they are not dragged behind the support shoulder, where they could jam in the blade.

When using the pneumatic vice (version MA) check that the jaws actually move right up to and effectively block the piece, as the maximum travel in only 8 mm, and check that the clamping pressure is correct.

When working on the bandsaw, only wear gloves when handling materials and tool change or adjustment operations. Only carry out one operation at a time and do not hold more than one item or operate more than one device simultaneously. Keep hands as clean as possible.

Warning: if the blade jams in the cut, press the emergency stop pushbutton immediately. If this does not free the blade, slowly release the vice, remove the piece and check that the blade or its teeth for damage, if need be replace the blade.

Before carrying out any repair works on the machine, consult the Hyd-Mech Technical Service; this can also be done through an agency in the country in which the machine is being used.

Machine safety devices

This use and maintenance manual is not intended as purely a guide for the use of the machine in a strictly productive environment, it is instead an instrument providing information on how to use the machine correctly and safely. The following standards are those specified by the EEC Committee in the directives regarding safety of machinery, health and safety at work, personal protection and safeguarding of the environment. These standards have been applied to the **PNF 350- 2 CNC** band saw.

Reference standards

MACHINE SAFETY

- EEC MACHINES DIRECTIVE 2006/42/CE ;
- EEC directive no. 2014/30/EU “EMC - Electromagnetic Compatibility”;
- EEC Directive No. 2014/35/EU known as “Low voltage directive”.
- EN 13898:2003+A1:2009 Machine tools - Safety - Sawing machines for cold metal
- EN 12100:2010 ”Safety of machinery - General principles for design - Risk assessment and risk reduction”.

HEALTH AND SAFETY AT WORK

- EEC Directive No. 80/1107; 83/477;86/188;88/188; 88/642 for the protection of workers against risks caused by exposure to physical, chemical and biological agents during working.
- EEC Directive No. 89/391 and Special EEC Directives No. 89/654 and No. 89/655 for improvements in health and safety at work.
- EEC Directive No. 90/394 for the protection of workers against risks deriving from exposure at work to carcinogenic substances.
- EEC Directive No. 77/576 and No. 79/640 on safety signs at work.

PERSONAL PROTECTION

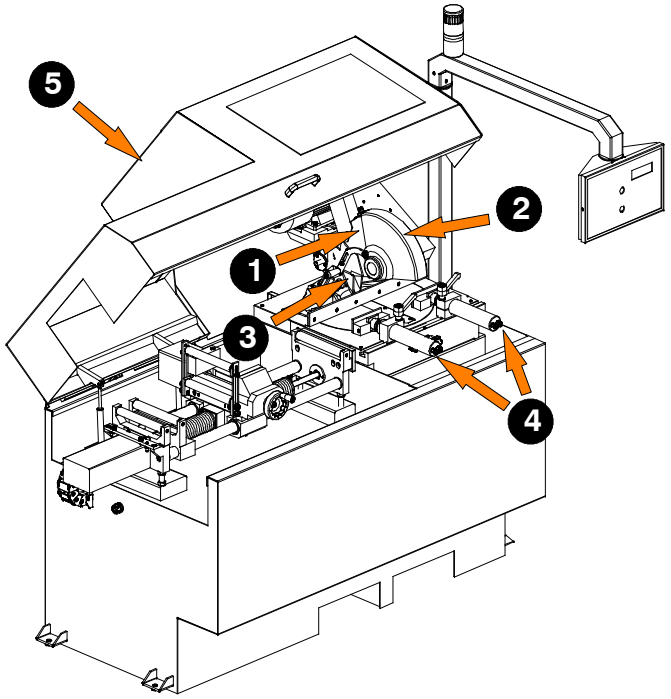
- EEC Directive No. 89/656 and No. 89/686 on the use of personal protection devices.

ENVIRONMENTAL PROTECTION

- EEC Directive No. 75/442 on waste disposal.
- EEC Directive No. 75/439 on the disposal of used oil.

Protection against accidental contact with the blade

1. metal blade guard fixed firmly to the cutting head;
2. mobile protective blade cover fixed axially to the blade guard (operator side), forming an integral part of the working table so as to ensure that the only part of the blade exposed is that used for the actual cutting in accordance with DPR 547/55 art.108;
3. fixed lower blade protecting cover;
4. the cutting vices are pneumatically operated and controlled by a limit switch tightening them as soon as the head lowers, with a max. stroke of 8 mm; the jaws locking the piece must be approached to the part being machined at a distance of 2÷3 mm.
5. the cutting area is enclosed by a sheet metal cover that can be opened with a plexiglass inspection window to check the cutting operations. An electric limit switch ensures that the sawing machine functions are stopped and inhibited when the cover is opened.



Electrical equipment

In accordance with Italian standard CEI 60204- 1, April 1998, derived from European Standard EN 60204- 1 publication IEC 204- 1, 1997:

- access to electrical board limited by screws and automatic electro- thermal main switch with Minimum Voltage Coil;
- 24 Vac Control voltage for actuators, in accordance with chapter 6 of European Standard ”Control and indication circuits” paragraph 2 ”Control Circuits” sub- section 1 ”Preferential voltage values for control circuits”.
- Plant protected against short circuits by quick blowing fuses and earthing of all work and accidental contact parts.
- Protection from accidental start- up by a minimum voltage relay in the case of power failure.

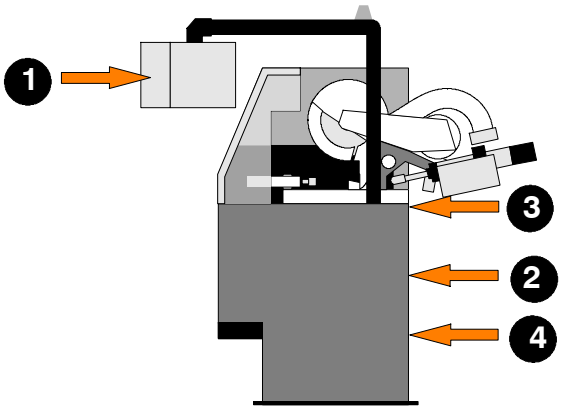
Emergency devices

In accordance with Standard CEI 204- 1:

- **Chapter 5 Section 6 Sub-section 1 "Emergency stop device"**: «the emergency stop device immediately stops all the dangerous and other functions of the machine».

...Emergency devices applicable to the PNF 350- 2 CNC:

1. **Emergency stop**: a non- return mushroom- head pushbutton, colour red on yellow background, is located on the control panel of the machine. To release the pushbutton, the actuator must be rotated 45° . After the emergency situation has been resolved, the machine must be reset.
2. **Thermal- magnetic circuit breaker**: this device incorporates two power failure protection systems. In fact, in the event of a power failure, it disconnects all the electrical components, causing the machine to shut down immediately and prevents it from automatically starting up again when power is restored. The device also resets the thermal relay fitted to protect against current overloads.
3. **Feeder casing safety switch**: to access the cutting material feeder, it is necessary to open the casing, with a safety limit switch that stops all machine operations that must be reset to continue processing.
4. **Pressure contact (pressure switch):** this device inhibits all functions of the machine immediately, when pressure in the compressed air system drops below 3 Bar.



Noise level of the machine

Noise can cause hearing damage and represents one the problems faced by many countries who adopt their own standards. In accordance with the **EEC MACHINES DIRECTIVE 2006/42/CE** , we are listing the standards that specify noise levels for machine tools.
The following paragraph explains the modes and the detected sound power and pressure values released by the sawing machine.
These values comply with norm EN 13898:2003 + A1:2009, EN ISO 12100:2010 and EN ISO 4871:2009,concerning the rules for drawing and presenting a procedure for noise tests and the declaration and check of sound emission values by machines and equipment.

Noise level measurement

Noise levels are measured using an instrument known as an Integrator noise- meter which registers the equivalent continuous acoustic pressure level at the work station.The damage caused by noise depends on three parameters: level, frequency and duration. The equivalent level concept Leq combines the three parameters and supplies just one indication. The Leq is based on the principle of equal energy, and represents the continuous stationary level containing the same amount of energy, expressed in dBA, as that actually fluctuating over the same period of time.This calculation is made automatically by the integrator noise- meter. The measurements are taken every 60 seconds, in order to obtain a stabilised value. The reading stays on the display for a sufficient time to enable a reading to be taken by the operator.Measurements are taken by holding the instrument at approximately 1 metre from the machine at a height of 1.60 metres above the platform at the operator's work station.
Two measurements are taken: the first while the machine operates without cutting anything, the second while cutting in manual mode.

Noise level values

Identification	
Machine type	Band saw for metal applications
Model	**PNF 350- 2 CNC**
Reference standard	ISO 3746

Results		
Test 1st	**Description**	60 x 40 mm pipe in aluminium Disc blade HSS HM 350x32 Z 84
	Results	**Mean sound level (Leq) 96,36 dB (A)** Environmental correction (K) 5,73 dB(A) Peak sound power (Lw) 99,23 dB(A)
Test 2nd	**Descriprion**	Ø 80 mm pipe in aluminium Disc blade HSS HM 350x32 Z 84
	Results	**Mean sound level (Leq) 98,54 dB(A)** Environmental correction (K) 5,73 dB(A) Peak sound power (Lw) 101,24 dB(A)
Test 3rd	**Description**	50 x 40 mm solid tube in aluminium Disc blade HSS HM 350x32 Z 84
	Results	**Mean sound level (Leq) 88,37 dB(A)** Environmental correction (K) 5,73 dB(A) Peak sound power (Lw) 98,33 dB(A)

Electromagnetic compatibility

As from 1 January 1996 all electrical and electronic appliances bearing the CE marking that are sold on the European market must conform to Directive 2014/30/UE e 2014/35/UE and **EEC MACHINES DIRECTIVE 2006/42/CE** . The prescriptions regard two specific aspects in particular:

1. "EMISSIONS: during its operation, the appliance or system must not emit spurious electromagnetic signals of such magnitude as to contaminate the surrounding electromagnetic environment beyond clearly prescribed limits";
2. "IMMUNITY: the appliance or system must be able to operate correctly even when it is placed in an electromagnetic environment that is contaminated by disturbances of defined magnitude".

The following text contains a list of the applied standards and the results of the electromagnetic compatibility testing of machine model **PNF 350- 2 CNC**; Test report no. 120101.

Emissions

- CEI EN 61000-6-4 (2002) Electromagnetic Compatibility (EMC) - Generic standard regarding emissions. Part 6-4: Industrial Environment.
- EN 55011 (1999) Industrial, scientific, and medical radio frequency appliances (ISM). Characteristics of radio frequency disturbance - Limits and methods of measurement.
- EN 50370-1:2005 Electromagnetic compatibility (EMC) - Product family standard for machine tools - Part 1: Emission

CONDUCTED EMISSIONS				
Gate A	**Freq. (MHz)**	**Q- peak limit (dBuV)**	**Mean value limit (dBuV)**	**Result**
A.C. power supply input	0.15 - 0.5	79 - 73 (linear reduction with log of frequency)	66 - 60 (linear reduction with log of frequency)	Complies
	0.5 - 5	73	60	
	5 - 30	73	60	

CONDUCTED EMISSIONS - ANALYSIS OF INTERMITTENT DISTURBANCES	
Gate	**Result**
A.C. power supply input	Not applicable

IRRADIATED EMISSIONS			
Gate	**Freq. (MHz)**	**Q- peak limit (10 m) (dBuV/m)**	**Result**
Enclosure	30 - 230	40	Complies
	230 - 1000	47	

Immunity

- CEI EN 61000-6-2 (2000) Electromagnetic Compatibility (EMC) - Generic standard on immunity. Part 6-2: Industrial Environment.
- EN 61000-4-2 + A1 (1996-1999) Electromagnetic Compatibility (EMC) - Part 4: Test and measurement techniques - Section 2: Electrostatic discharge immunity tests - Basic publication.
- EN 61000-4-3 Electromagnetic Compatibility (EMC) - Part 4: Test and measurement techniques - Section 3: Radiated radio-frequency electromagnetic field immunity tests.
- EN 61000-4-4 (1996) Electromagnetic Compatibility (EMC) - Part 4: Test and measurement techniques - Section 4: Fast transients/bursts immunity tests - Basic publication.

- EN 61000-4-5 (1997) Electromagnetic Compatibility (EMC) - Part 4: Test and measurement techniques - Section 5: Pulse magnetic field immunity tests.
- EN 61000-4-6 (1995) Electromagnetic Compatibility (EMC) - Part 4: Test and measurement techniques - Section 6: Immunity to conducted interference, induced by radio frequency fields.
- EN 61000-4-11 (1977) Electromagnetic Compatibility (EMC) - Part 4: Test and measurement techniques - Section 11: Voltage dips, short interruptions and voltage variations immunity tests.
- EN 50370-2:2003 Electromagnetic compatibility (EMC) - Product family standard for machine tools - Part 2: Immunity

IMMUNITY TO ELECTROSTATIC DISCHARGES			
Gate	**Test levels**	**Evaluation criterion**	**Result**
Enclosure	contact 4 kV steel plate 4 kV in air 8 kV	B	Complies

IMMUNITY TO VOLTAGE (BURSTS)			
Gate	**Test levels**	**Evaluation criterion**	**Result**
A.C. power supply input	2 kV	B	Complies

IMMUNITY TO CONDUCTED ELECTROMAGNETIC FIELDS			
Gate	**Test levels**	**Evaluation criterion**	**Result**
A.C. power supply input	10V	A	Complies

IMMUNITY TO IRRADIATED ELECTROMAGNETIC FIELDS			
Gate	**Test levels**	**Evaluation criterion**	**Result**
Enclosure	10 V/m	A	Complies

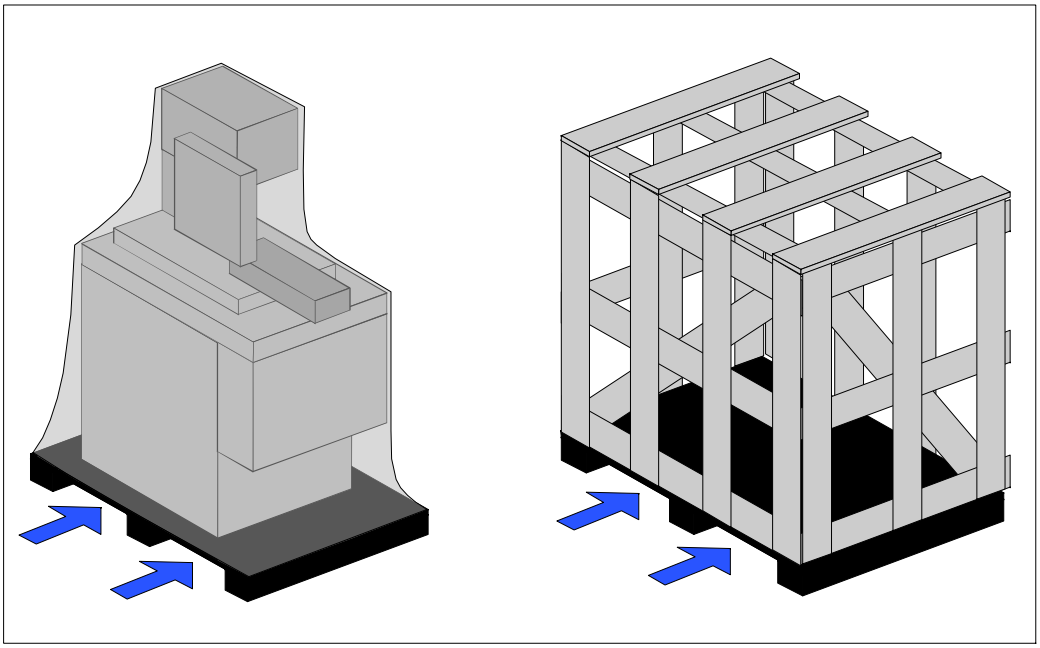
Machine installation

4

Packaging and storage

Hyd- Mech use packing materials that guarantee the integrity and protection of the machine during its transport to the customer.

The type of packing differs according to the size, weight and destination. Therefore the customer will receive the machine in one of two following ways:



1. on a pallet with straps and heat- shrink plastic;
2. on a pallet with straps, heat- shrink plastic and a wooden crate.

Warning

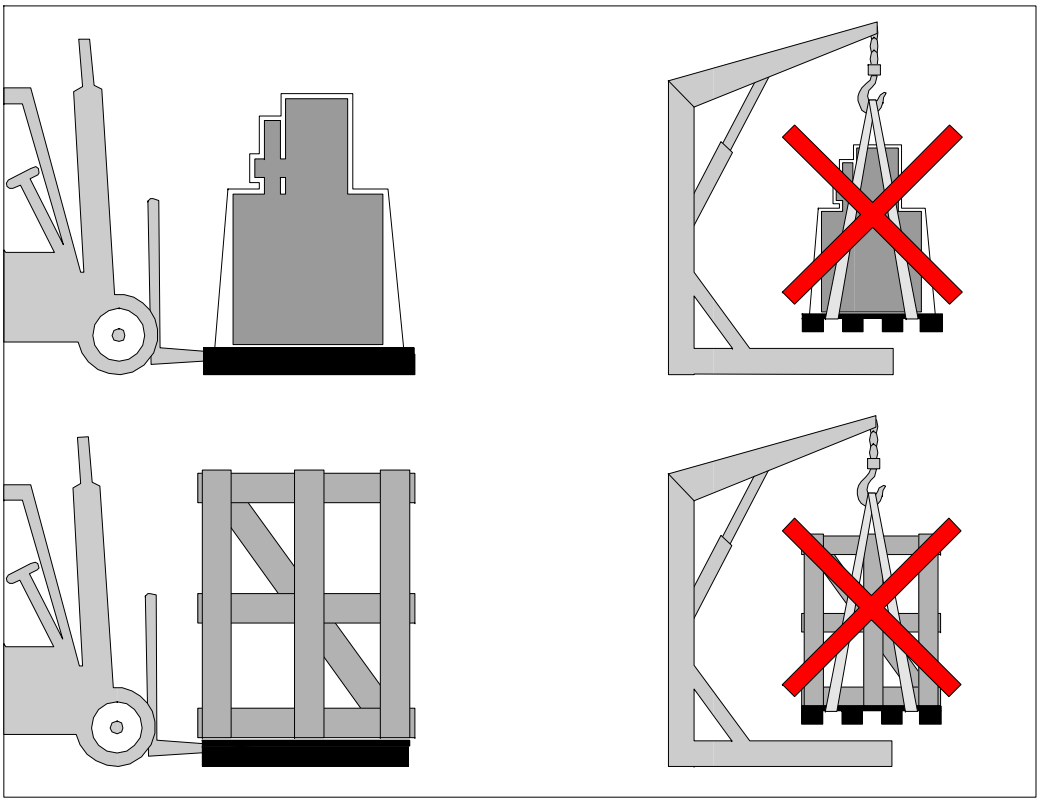
In both cases, for correct balancing the machine must be handled using a fork- lift truck, inserting the tines at the points indicated by the arrows, using the reference marks on the crate itself.

Attention

Before carrying out lifting operations, make sure that the weight of the machine, as indicated on the crating or other packaging, is within the forklift truck load limit.

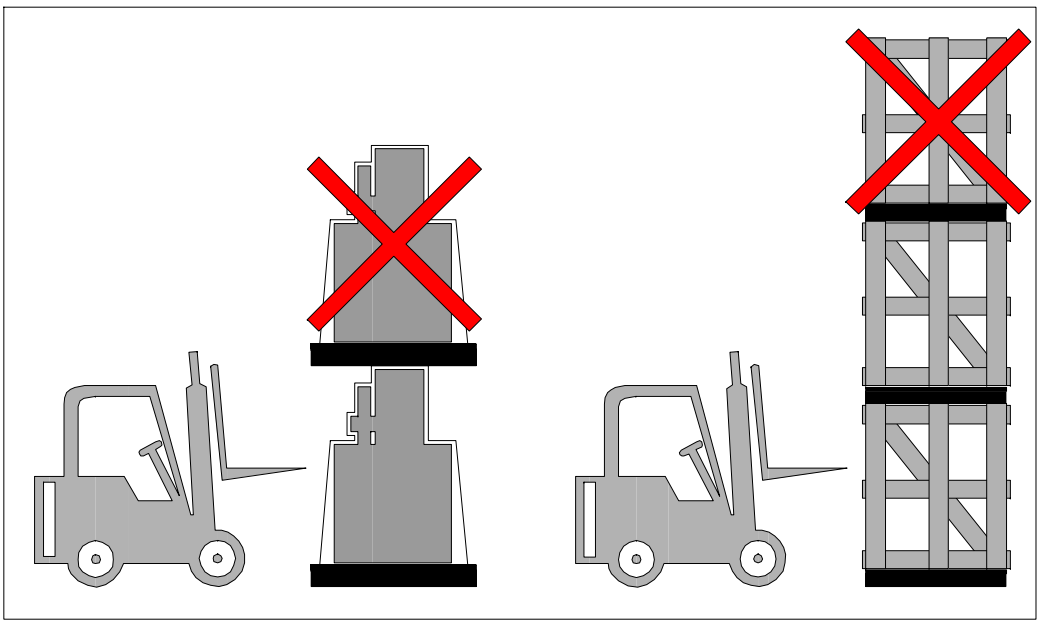
Attention

Do not handle the packed machine using slings.



Attention

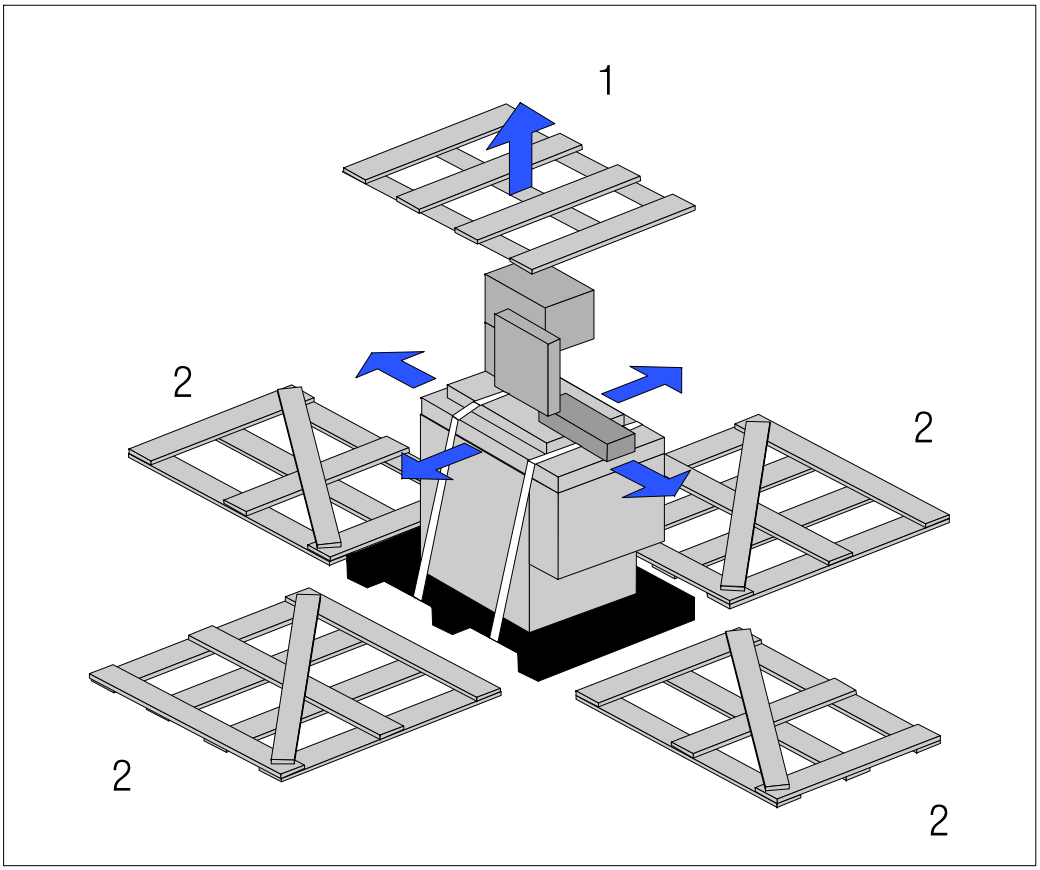
When storing, machines palletized and shrink- wrapped must not be stacked two high, and machines pallettized and crated must not be stacked three high.



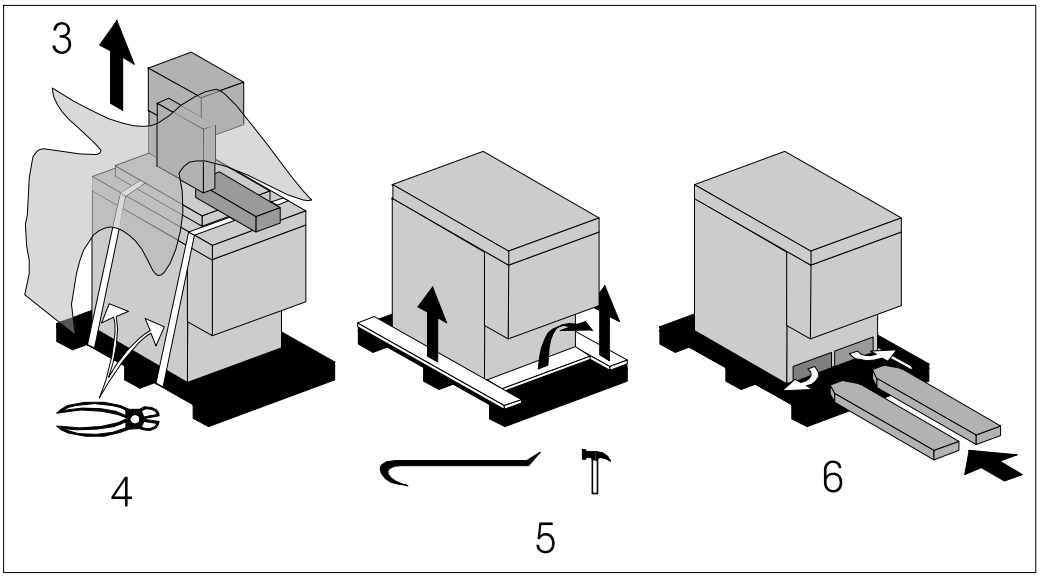
To install the machine, first remove the packing, paying particular attention not to cut any electric wires or hydraulic hoses; if necessary use pliers, a hammer and a cutter.
Open crate in the illustrated order:

1. remove nails and lift the top of the cage;

2. remove nails and lower walls;



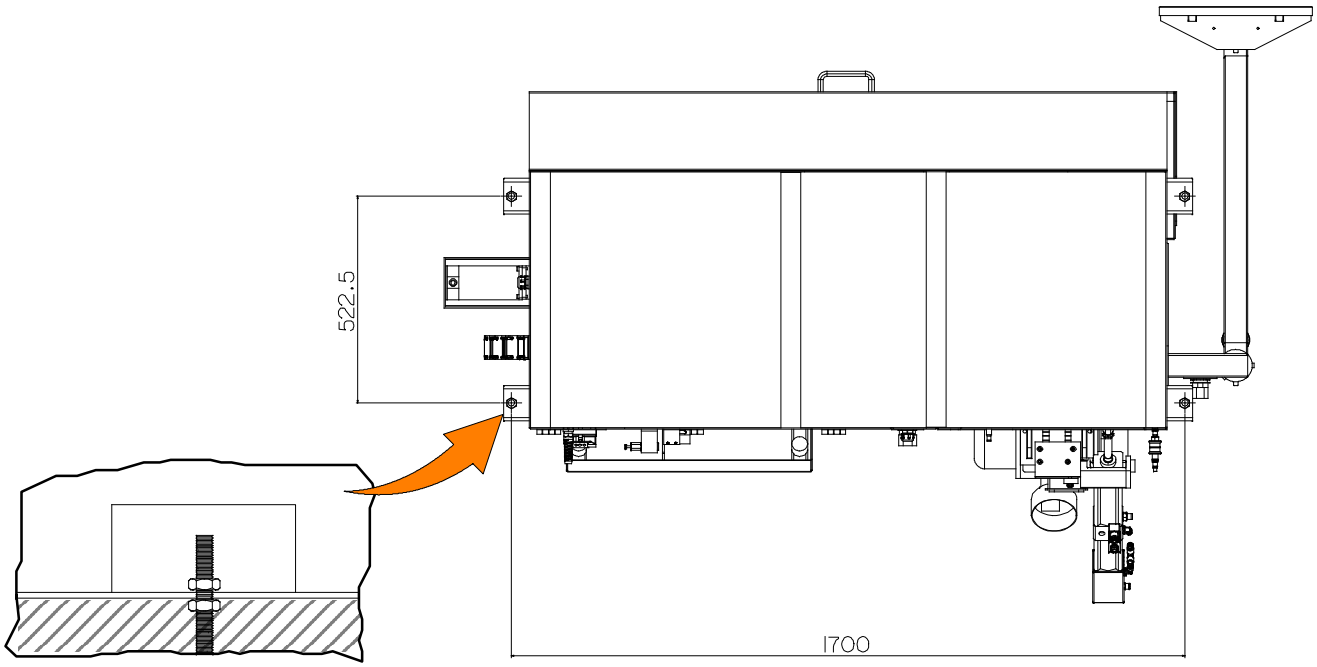
3. remove heat- shrink covering;
4. remove the straps;
5. remove nails from pallet securing planks and remove planks;
6. remove the front panel and insert fork tines.



To locate the machine in the workplace, **the machine dimensions** and necessary operator working space, including **the spaces laid** down in safety standards, **must be taken into account.**

Anchoring the machine

The base of the machine is anchored to the floor by two permanent studs located on the sides of the base. The studs are screwed into nuts previously sunk into the concrete, and tightened from above with lock nuts. The schematic specifications set out in Chapter 1 should be taken into account when positioning the machine.



Minimum requirements

For the machine to function correctly, the room in which it is to be installed must satisfy the following requirements:

- power supply voltage/frequency: refer to the values on the rating plate;
- Working pressure (MA version) not less than 6 Bar and not greater than 8 Bar;
- temperature of machine location: from - 10 to + 50 C;
- relative humidity: not more than 90%
- lighting: not less than 500 Lux.

Warning

The machine is already protected against voltage variations, but will only run trouble- free if the variations do not exceed ± 10%.

Check list

Before starting installation, check that all the accessories, whether standard or optional, supplied with the machine are present. The **PNF 350- 2 CNC** sawing machine in the single- phase, three- phase with 1 or 2 speeds, with or without automatic vice, is supplied complete with:

CHARACTERISTICS	STANDARD	OPTIONAL
Multi- microprocessor with two controlled axes that permits programming 1000 batches of workpieces with different lengths and quantities on the same bar	✓	
7” touch screen display and mechanical buttons for the operating functions of the sawing machine	✓	
Positioning of the feeder shuttle and of the cutting head by means of joystick	✓	
Displaying and recording of alarms and errors with possibility of displaying the event log	✓	
The head stroke is set directly from the control panel according to the dimensions of the bars to be cut	✓	
Automatic band lubricating device	✓	
Aluminum movable jaws with vertical positioning adjustment	✓	
Possibility of cutting from 0° to 45° on the right and 45° on the left, tilting on the vertical for mitre head cuts from 0° to 45° on the left	✓	
Cabinet for electric and electronic equipment with fully identifiable wiring, door- locking switch with padlockable device, emergency device, motor overload cut- out, minimum voltage coil and protection against a missing phase	✓	
Activation and control systems protected by input and output electric and electronic devices	✓	
Low tension control panel: softkey polyester keypad with thermo- moulded touch sensitive buttons and acoustic signal when the machine is started	✓	
Acoustic and flashing light signal in case of machine stop	✓	
Feeder with stepper motor, 600 mm, with screw system/nut with recirculating ball screws	✓	
HM toothed circular blade ø 350 x 32 x 3.4 mm, positive rake, balanced and silenced		✓
HM toothed circular blade ø 350 x 32 x 3.4 mm, negative rake		✓
Vertical pneumatic vice	✓	
Rotating platform installed on bearings for a precise and easy rotation	✓	
Machine preset for lifting	✓	
Adjustable mechanical strokes for the head fast positioning at 0° and 45° on the right and on the left	✓	
Screw locking system for positioning the head at any angle	✓	
Chip conveyor preset for suction system	✓	
Tightening system made of two front vices, that can be positioned along the piece longitudinal axis as wished	✓	
Double suction kit		✓
Series of comb jaws max 75 x 75 mm*		✓
K40 roller table module for feed side, 1500 mm		✓
Feed side roller table support		✓
Discharge side roller table adapter		✓
K40 roller table for discharge side, 1500 mm		✓
K40 roller table for discharge side, 3000 mm		✓

CHARACTERISTICS	STANDARD	OPTIONAL
K40 roller table for discharge side, 4500 mm		✓
K40 roller table for discharge side, 6000 mm		✓
5 l can of emulsible oil		✓
Bar- supporting arm complete with roller, preset for the loading plane application	✓	
Supplementary pedal control*		✓
Aspirator electric connection*		✓
Suction system		✓
Device for customized cuts with steel millimeter rod		✓
Spray mist system		✓

***ACCESSORIES AVAILABLE ON REQUEST**

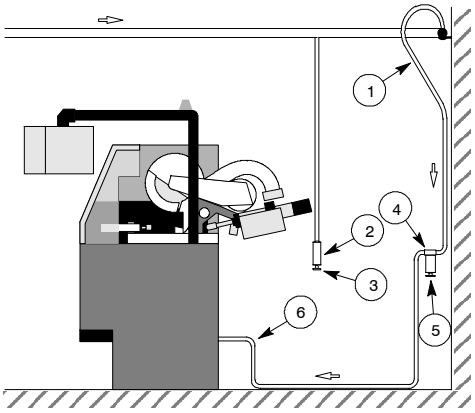
The bag of accessories is enclosed in the machine before being packed and contains:

- 4, 5, 6, 8 mm Allen keys;
- 17, 36 mm double open-ended and box wrenches;
- 20 mm Ø rod for cuts to measure with an 8 mm Ø ratchet fork and lever + VCE M8x35 Allen grub screw;
- arm with roller on which the bars to be cut rest and for fitting the feed side roller tables;
- jaws for piece supporting shoulder, height mm 60;
- this Use and Maintenance Manual.

Connection to the compressed air supply

To ensure perfect operation and a long service life, it is recommended that the machine is connected to a compressed air system having the characteristics reported in the diagram below.

KEY
1 - DOWN PIPE
2 - CONDENSATE COLLECTOR
3 - DRAIN COCK
4 - AIR FILTER
5 - DRAIN COCK
6 - CONNECTING HOSE



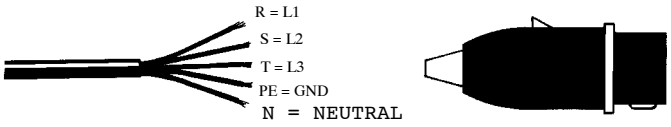
Connection to the power supply

Before connecting the machine to the power supply, check that the socket is not connected in series with other machines. This requirement is fundamental for the good operation of the machine.

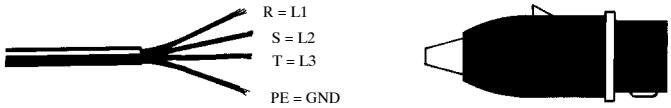
To connect the machine to the power supply, proceed as follows:

▶ connect the power supply cable of the machine to a plug which matches the socket to be used. (EN 60204- 1; par. 5.3.2)

CONNECTION FOR **"5-CORE"** WIRE SYSTEMS WITH NEUTRAL



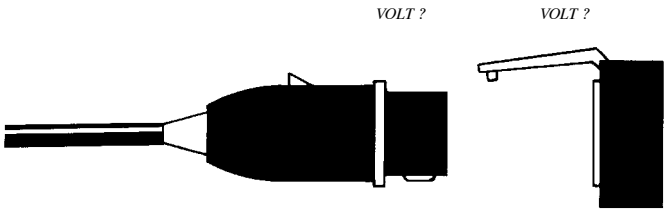
CONNECTION FOR **"4-CORE"** WIRE SYSTEMS WITH NEUTRAL



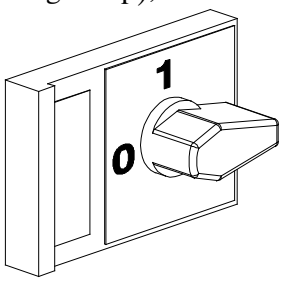
Attention

When using systems with a neutral wire, special care must be taken when connecting the **blue** neutral wire, in that if it is connected to a phase wire it will discharge the **phase voltage** to the equipment connected for **voltage: phase- neutral.**

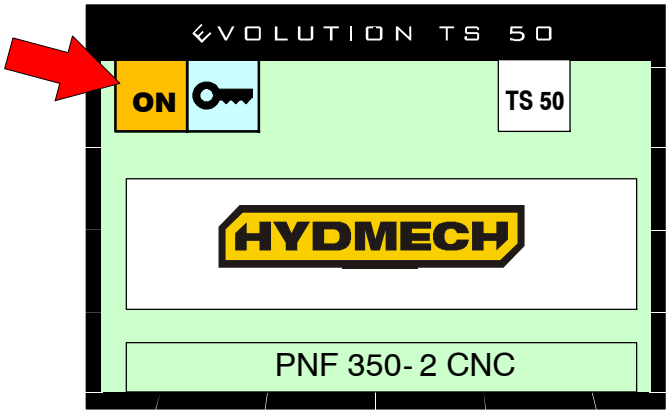
▶ Insert the plug in the socket, ensuring that the mains voltage is the same as that for which the machine has been setup.



▶ Power the machine, rotating the main switch in the rear part of the basement left side (the control console lights up);



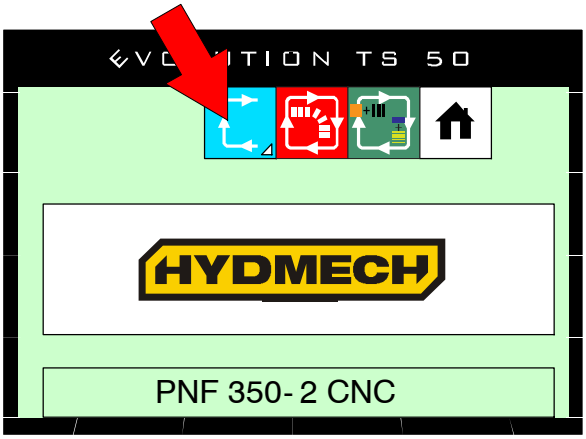
▶ press the ON button on the control console;



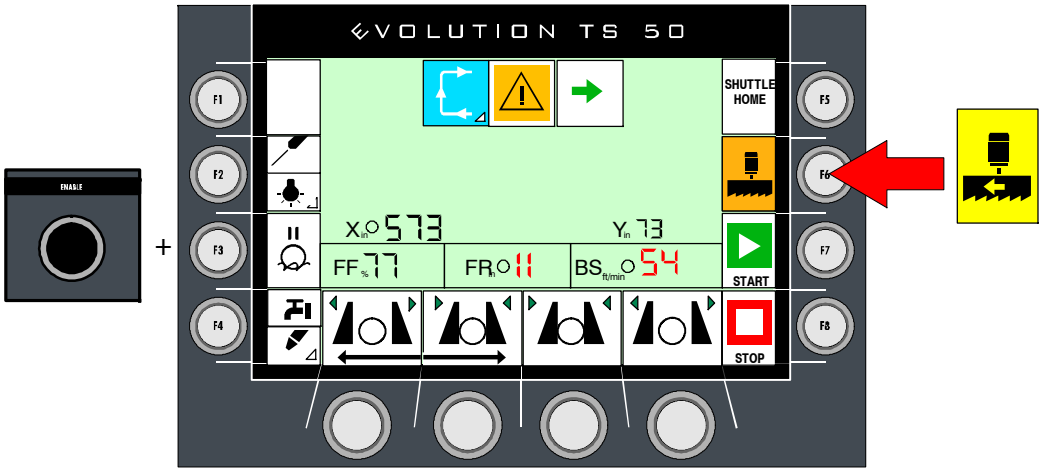
▶ press RESET.

The above sequence (ON and RESET buttons) must be performed each time the machine is switched on and before tensioning the saw band during a normal production cycle.
Ensure that the hydraulic power pack rotation is correct. To do this, proceed as follows:

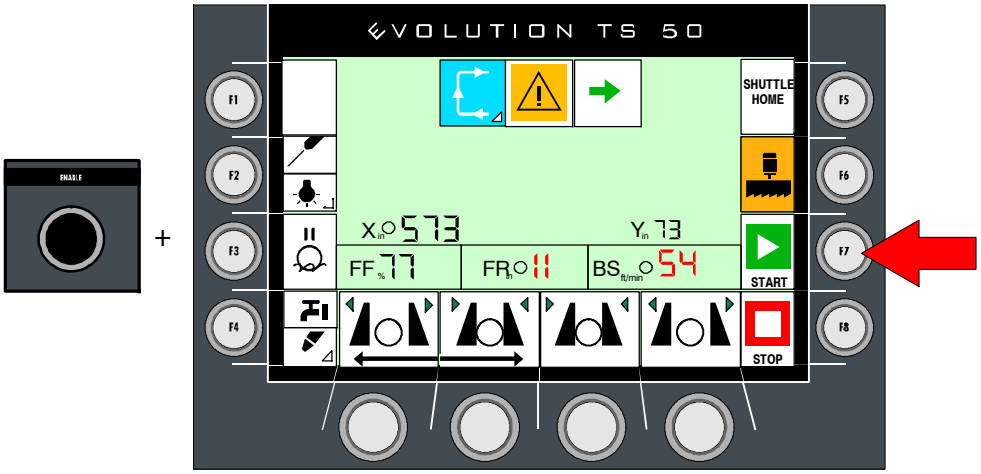
- ▶ make sure the machine is not in emergency status (red mushroom head button released); otherwise, release the emergency stop button and press RESET.
- ▶ Select the semiautomatic machining mode, pressing the box shown in the figure on the touch screen.



- ▶ Enable the blade rotation by holding the control enabling key and the key shown in the figure (F6) pressed; the box lights on to indicate it has been selected.

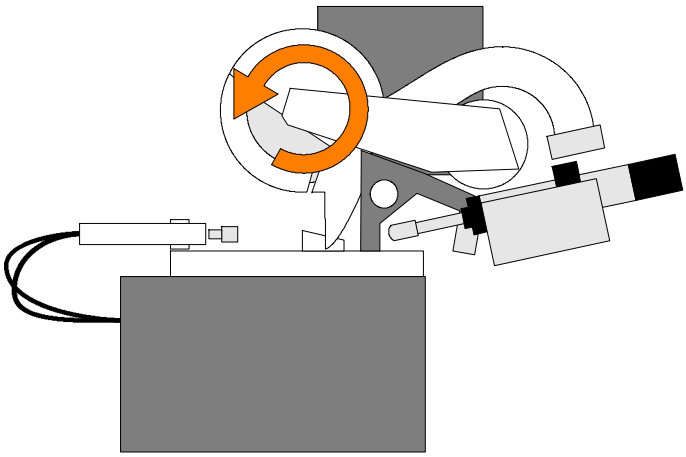


▶ Start the cutting cycle holding the control enabling key and the key shown in the figure (F7) pressed; the disc starts turning and the machine cuts. At the cut end the head goes up again, ready to make a new working cycle.



Attention

Ensure that the blade moves in the correct direction as shown in the above figure. If it does not, simply reverse two of the phase wires on the machine's power supply input.



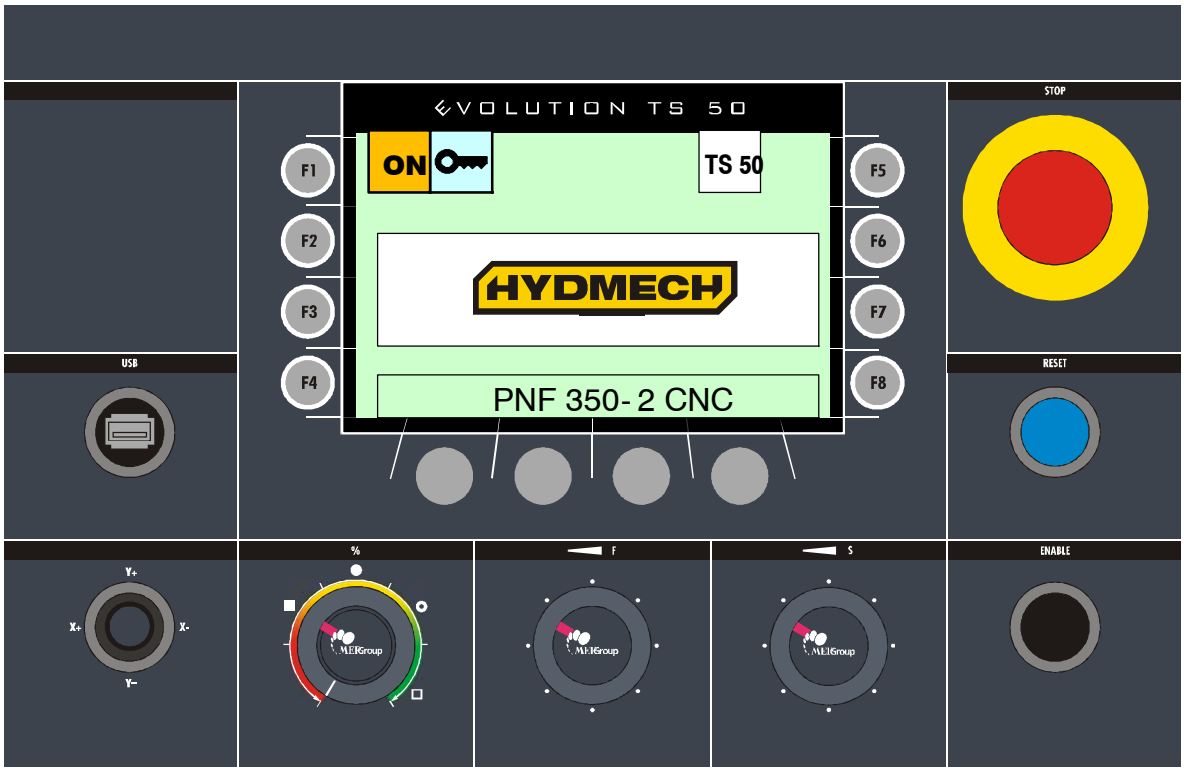
The sawing machine is now ready to start the work for which it was designed. Chapter 5 provides a detailed description of the various functions of the machine and its operating cycles.

Description of machine operation

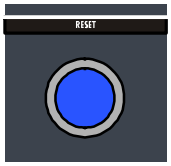
This chapter analyses all the machine functions. We begin with a description of the pushbuttons and other components on the control panel.

Description of the control panel

The control console is housed inside the control panel in an IP 54 rated housing which is tamperproof and resistant to dust and moisture. The control panel swivels on two articulated joints so that it can be positioned by the operator for greater ease of use and safety. The control console for the **PNF 350- 2 CNC** is illustrated below.

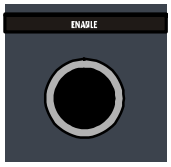


Key for control console keyboard

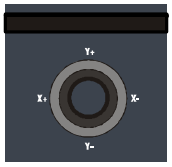


RESET:
Press to reactivate machine functions after an alarm.

EMERGENCY STOP:
This button will stop both the hydraulic and blade motors. The head motion will cease. The vises remain as they are, but if closed, they will lose gripping force. For this reason all long stock should be supported so that it will not fall.
To reset the button, simply rotate through 45°.



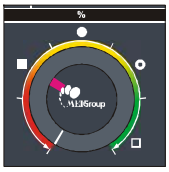
ENABLE COMMANDS:
Hold pressed to enable machine commands.



JOYSTICK:
This moves the head upwards- downwards and the forward and backward movement the feeder while the enable commands button is pressed.

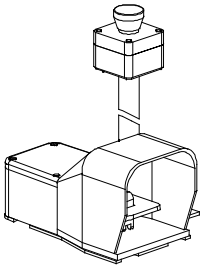
Not used

KNOB F:
This adjusts the head descent speed.



KNOB A%:
Adjusts the current absorption depending on the machine cutting force

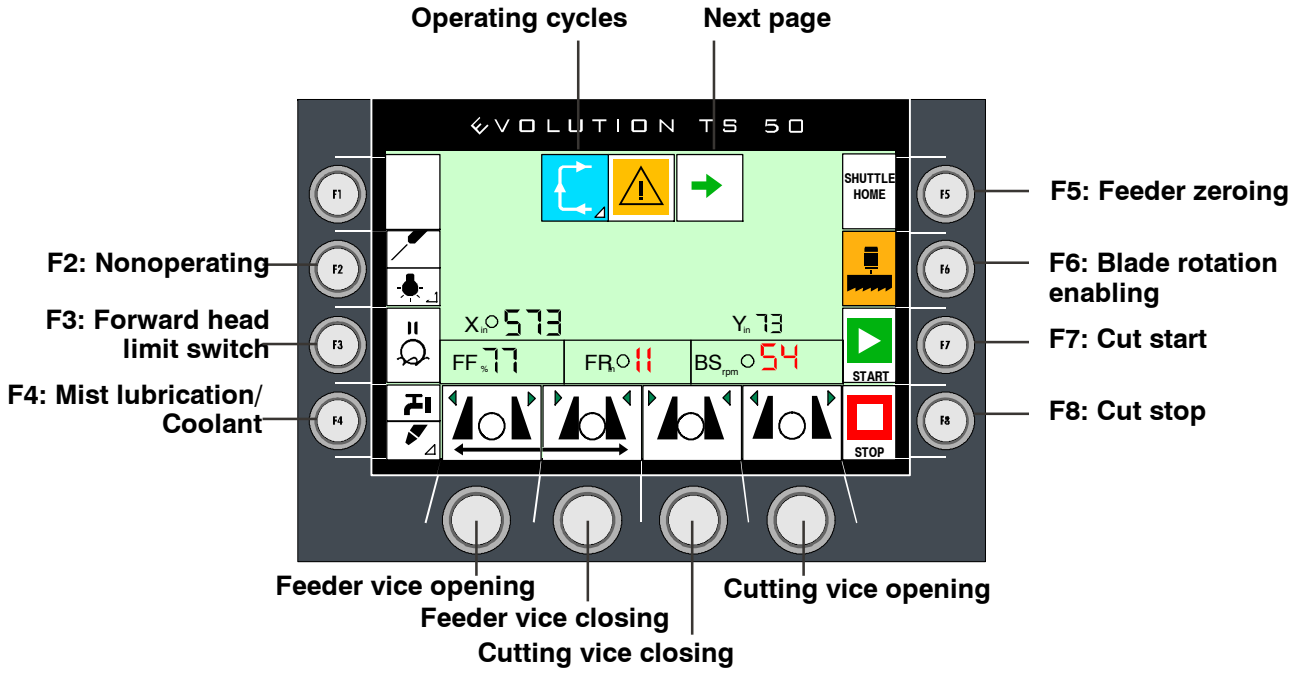
USB PORT:
Communication port for the software update and the machine diagnostics



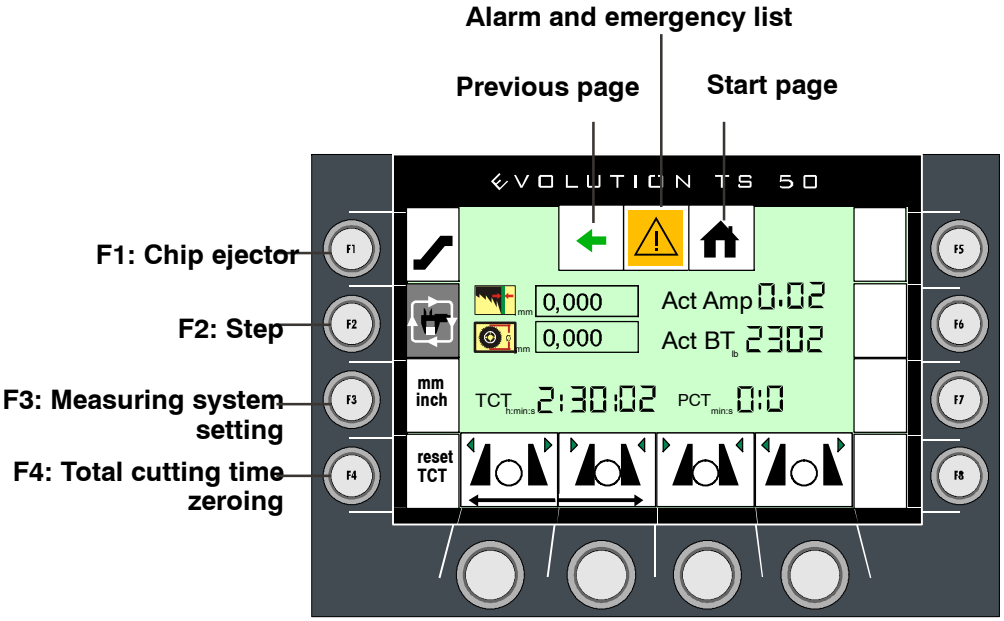
MOBILE START - EMERGENCY DEVICE. The machine is equipped with a remote control device which controls start- up of the semi- automatic cycle by the foot pedal and emergency shut- down by the red mushroom head button.

Symbol key

The key for the symbols used on the display follows.



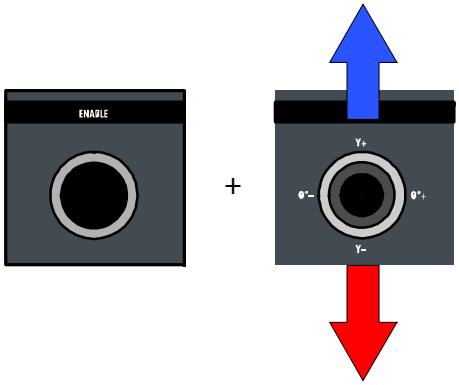
Pressing the “Next page” key, you can display the second machining screen:



Basic instructions for carrying out a cutting operation cycle

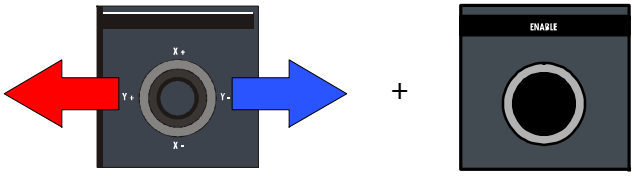
Moving the cutting head up and down

The cutting head can be moved up and down by pressing the enable commands button and using the joystick at the same time. Refer to the control console keyboard description in this chapter.



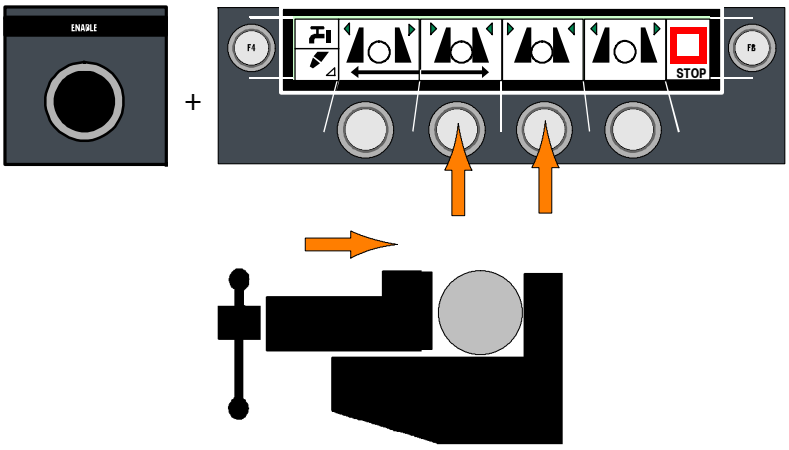
Manoeuvring the feeder

The feeder can be moved using the joystick, holding the control enabling key pressed at the same time. Due to safety reasons, the movement is enabled only if the head is completely up.



Clamping the work piece in the vice

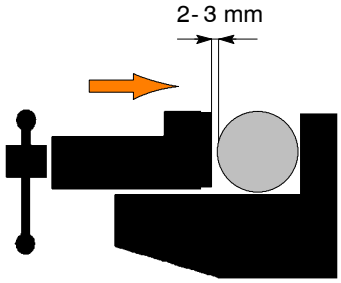
Vice opening and closure, for the cutting vice and the feeder vice, are controlled by the corresponding buttons on the control console.



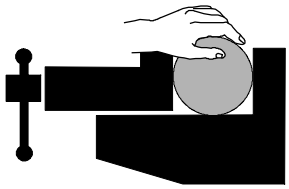
However, to ensure that the workpiece is securely clamped in the vice, proceed as follows:

- ▶ make sure the workpiece dimensions do not exceed the machine's cutting capacity;
- ▶ make sure the piece is correctly supported on both sides of the machine;

- move the vice to within 2÷3 mm of the workpiece using the handwheel.



- Close the cutting vice by holding the control enabling button and the vice closing button pressed at the same time.
- make sure that the material is well blocked by trying to move it manually, as the vice cylinder has a stroke of 8 mm only.



Preliminary check list for cutting operation

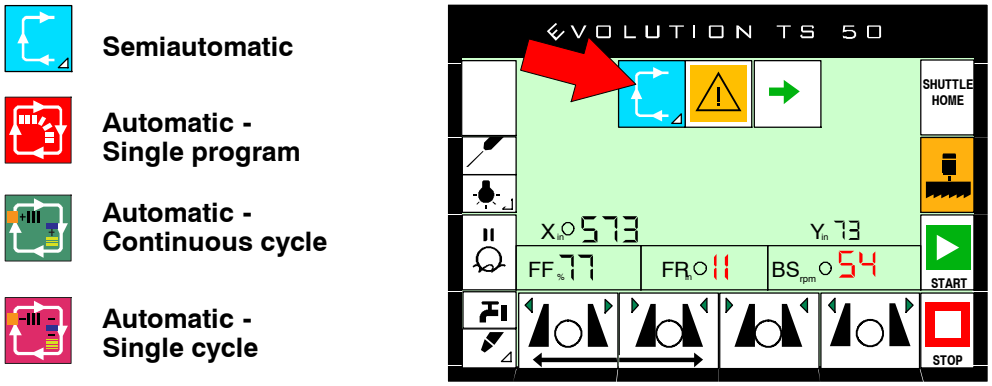
To guarantee complete safety during cutting cycles, the operator should work through a check list of the entire apparatus, checking:

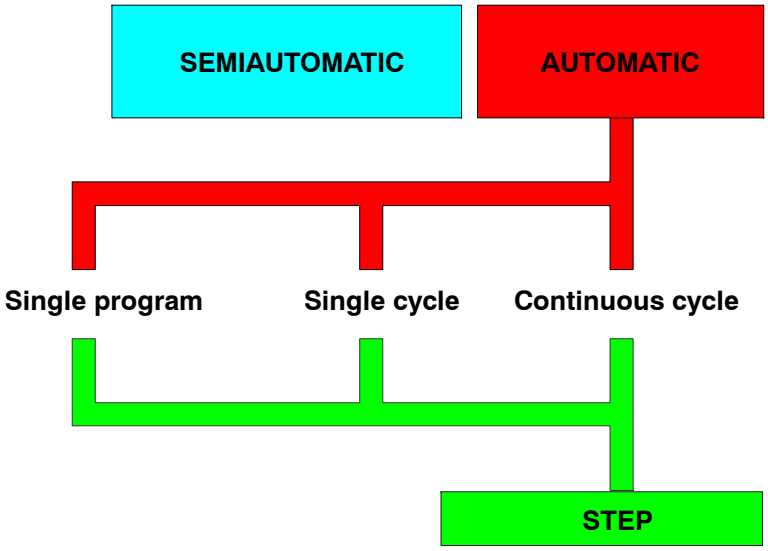
- ensure that the disk guard completely surrounds the tool when it is not in use;
- that the work piece is properly clamped in place;
- ensure that the blade teeth are appropriate for the material being cut;
- that the speed selected is right for the kind of piece to be cut;
- that all protections are in place and correctly locked;
- lubricant/coolant level and activation of the electropump;
- the blade downstroke speed must be correct.

Cutting cycles

This sawing machine can cut in Manual, Dynamic Semiautomatic, Semiautomatic and Automatic cycles. In automatic mode, it can carry out single or series cuts stored in max. 10 programs that can run individually or in sequence.

▶ after initializing the sawing machine, the display shows ”main menu”





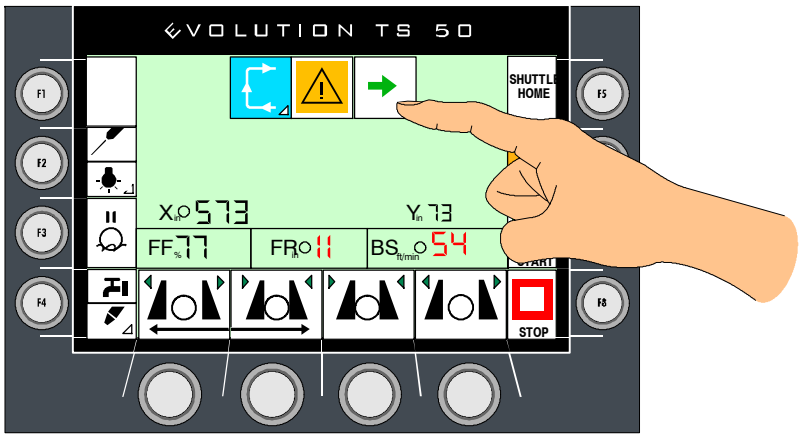
AUTOMATIC CYCLE

- Single program: it carries out exclusively the programmed cycle directly on the working video page. After setting the length and the number of necessary pieces, it runs the program stopping the cycle and giving a light and sound alarm.
- Single cycle: it carries out the stored programs one at a time and stops waiting for the consent before the next program.
- Continuous cycle: it carries out the stored programs like in the single cycle but at the end of each program it AUTOMATICALLY goes to the next program.

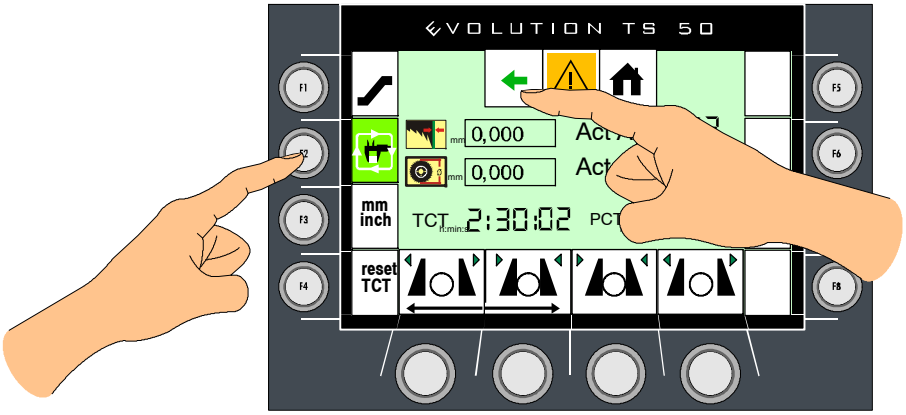
UTILITY STEP

- STEP: accessible from any cycle. In the automatic cycle it makes the bar facing cut, the first piece cut and then stops so that the piece can be measured.

▶ Press the box shown in the figure to access the second video page;



▶ Press the “Step” box to activate this function and return to the working page by pressing the previous page box: the activated Step signal will be displayed on the upper left.

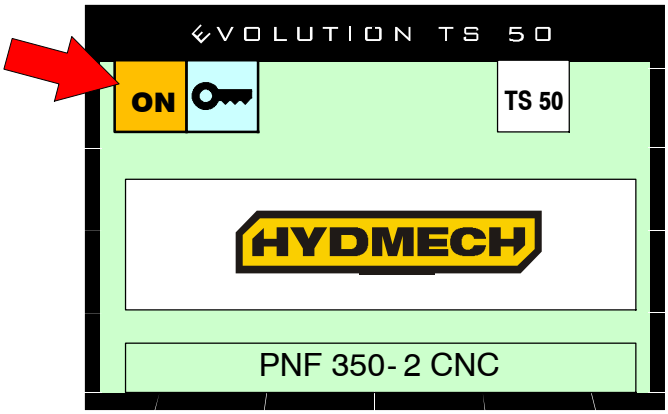


▶ Proceed like a standard automatic working cycle, restarting it at every cut made by the machine, pressing simultaneously the Control enabling button and the key F7 (Start).

Starting up the machine

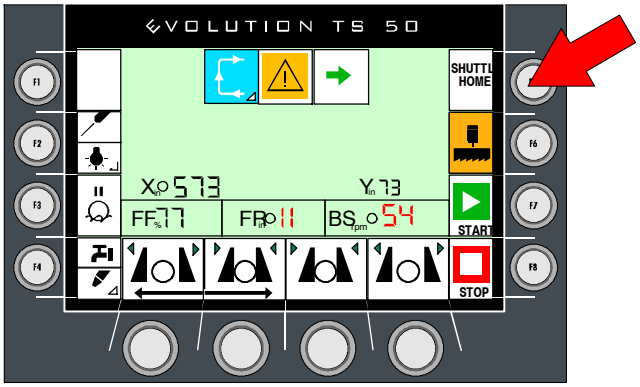
The presentation and start- up display appears when the machine is switched on.

▶ Tap on the box with the on symbol on the touchscreen.



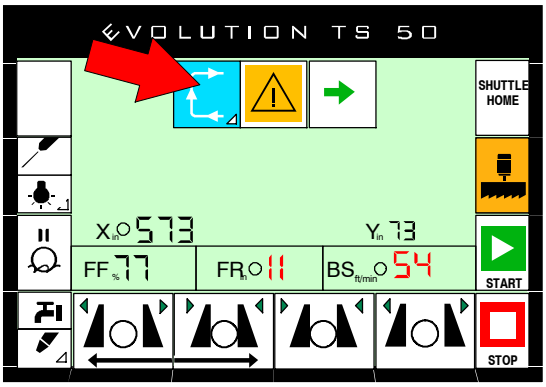
▶ press reset and release the emergency mushroom button if pressed, the head rises completely.

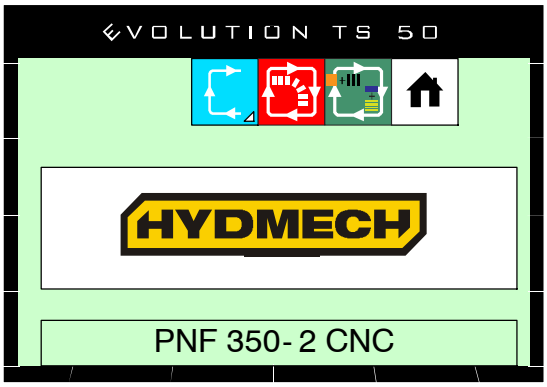
▶ Zero the feeder by pressing holding down the key enabling command and the key shown in figure (F5).



This sawing machine can carry out single or series cuts stored in max. 10 programs, that can even be repeated, to be ordered in a preset sequence.

▶ After the initialization of the sawing machine the display shows the following screen. Press the box shown in the figure until the symbol of the wished cycle is displayed.

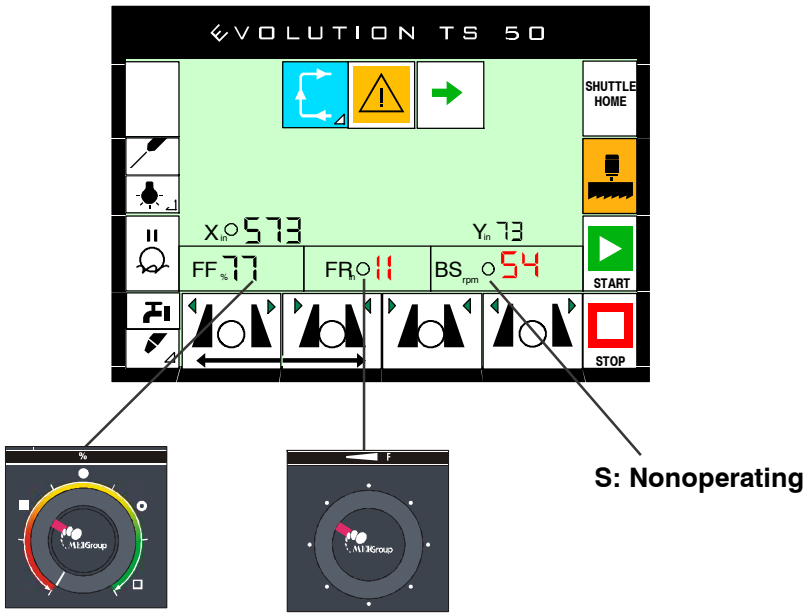




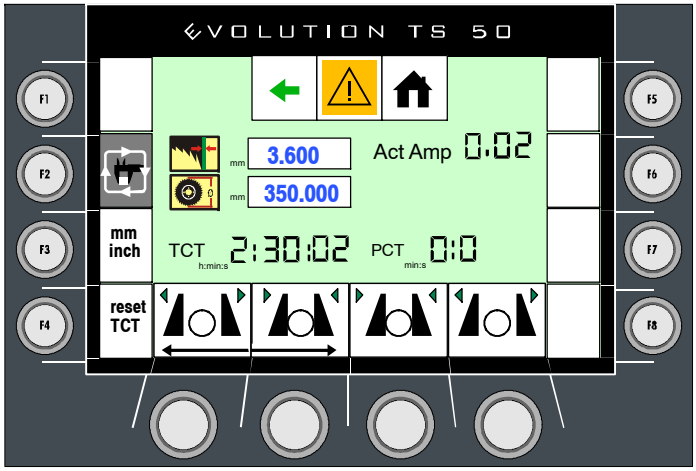
The available machining cycles are: manual, automatic with single program and automatic with continuous program.
In the manual cycle the cutting only involves the setting of the rear head limit

switches (RHLS) and forward head limit switches (FHLS); then, after having positioned the material at the wished cutting length, start by the Cut start key (F7).
As for the automatic cycle, it can operate with single or automatic program.

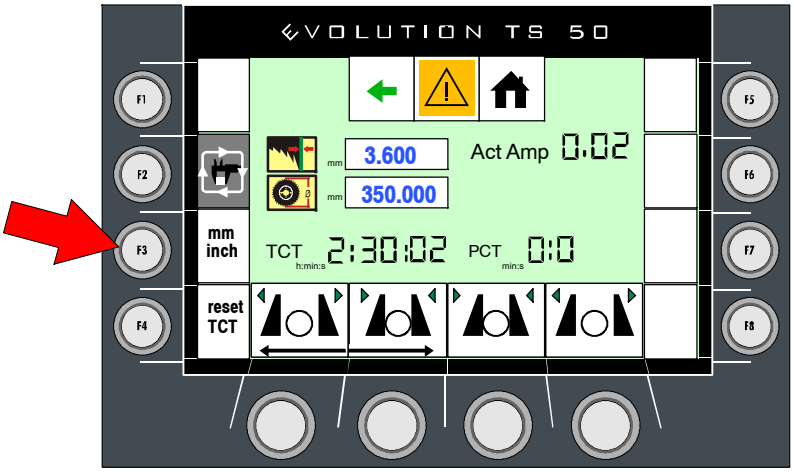
During the machining cycle, by pressing the box in the figure, it is possible to check the machine operating parameters:
FF = Feed Force, value of the cutting force that can be set through the potentiometer from the control board.
FR = Feed Rate, value of the cutting head lowering speed that can be set through the potentiometer from the control board.



Pressing the arrow key shown in the figure the second page of the operating parameters can be displayed:
Kerf = blade thickness
Blade Dimension = Diameter of disc
Act AMP = Actual Ampere, current value of motor absorption;
PCT = Partial Cutting Time;
TCT = Total Cutting Time.



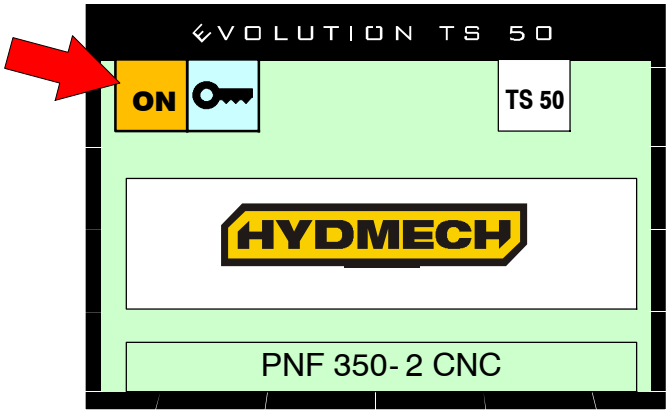
N.B. Pressing the key shown in the figure the decimal metric measuring system or the Imperial measuring system can be set.



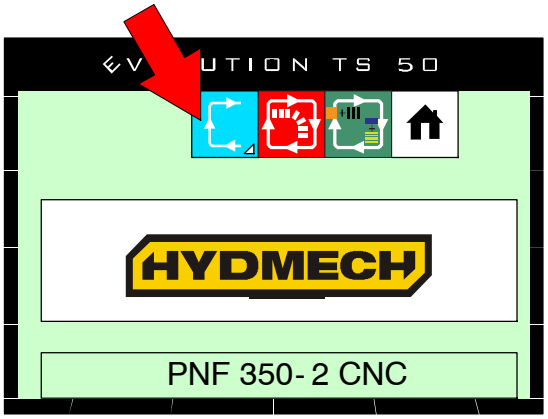
Semi- automatic operating cycle

The operation sequence for running a semiautomatic cutting cycle:

- power up the machine by turning the main switch;
- Tap on the box with the on symbol on the touchscreen.



- Select the semiautomatic machining mode, pressing the box shown in the figure on the touch screen.

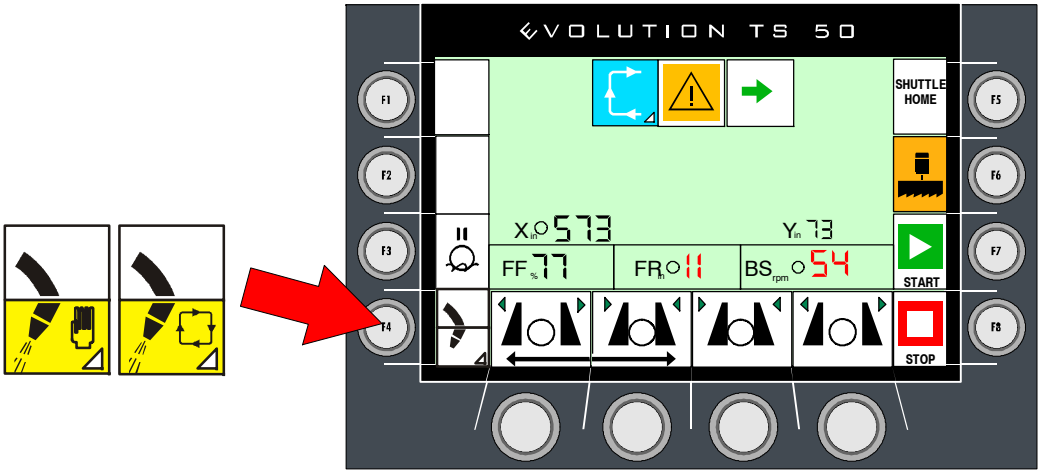


- Set the cutting parameters, previously shown, using the following adjusters.

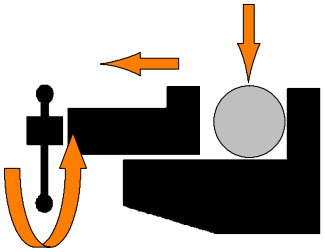
Warning

In this step it is recommended to set the head lower adjuster at the min. Value (F), to prevent the head from lowering too fast breaking the blade.

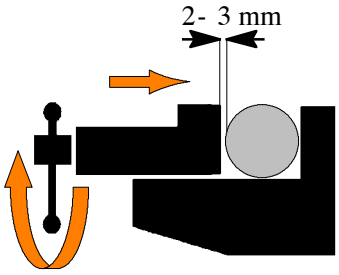
▶ Set the fluid jet by pressing the button shown in the figure (F4). The box will light up to indicate that it is selected. Adjust the amount using the valves on the blade guide head. Press the button repeatedly to select the dispensing mode (automatic or manual).



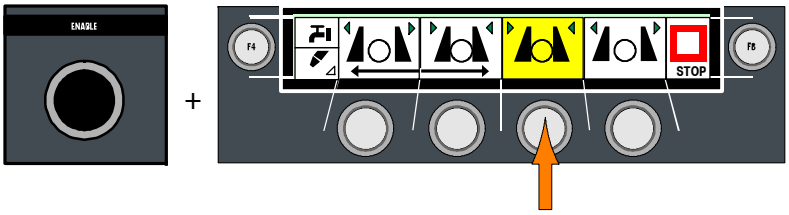
▶ Open the vice by rotating the handwheel anti- clockwise and position the workpiece between the jaws.



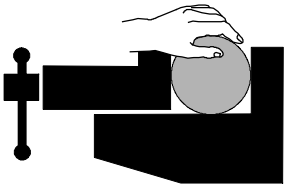
▶ Bring the moveable jaw to within 2÷3 mm of the workpiece by rotating the handwheel clockwise.



▶ Close the cutting vice by holding the control enabling button and the vice closing button pressed at the same time.



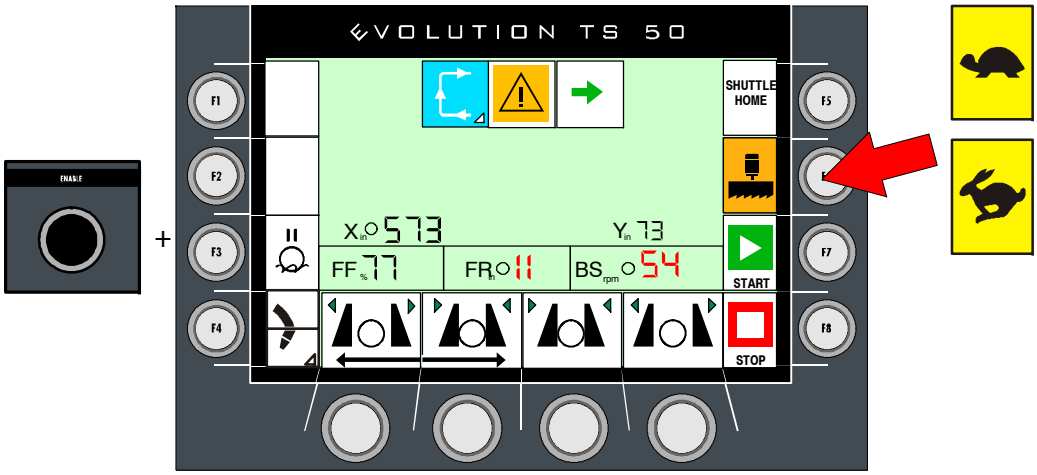
▶ Check that the workpiece is effectively locked in positon!



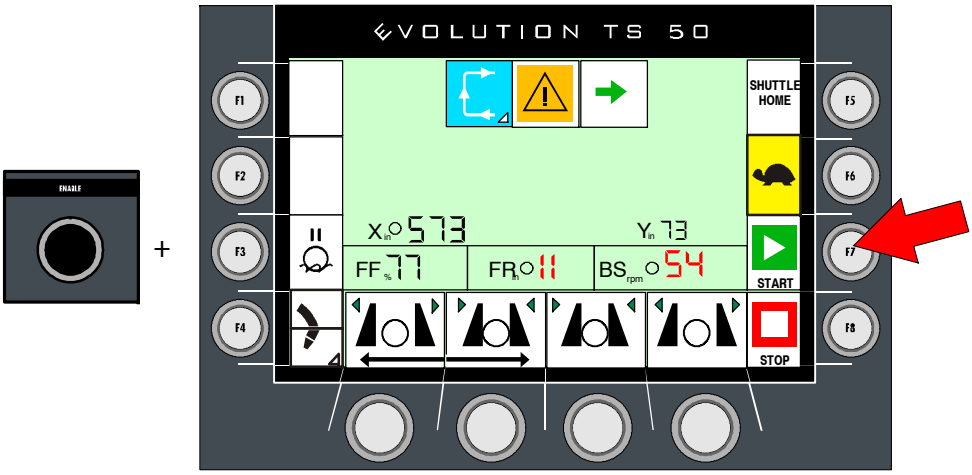
N.B. If the vice was already closed by the pneumatic piston, it may not block the piece. In this case it is necessary to repeat the operation, i.e.: open the vice by pressing the specific button, bring the moving jaw near to the piece and block it again with the closing button, bearing in mind that the stroke of the pneumatic piston is approx. 6 mm.

▶ Position the head at approximately 10 mm from the workpiece.

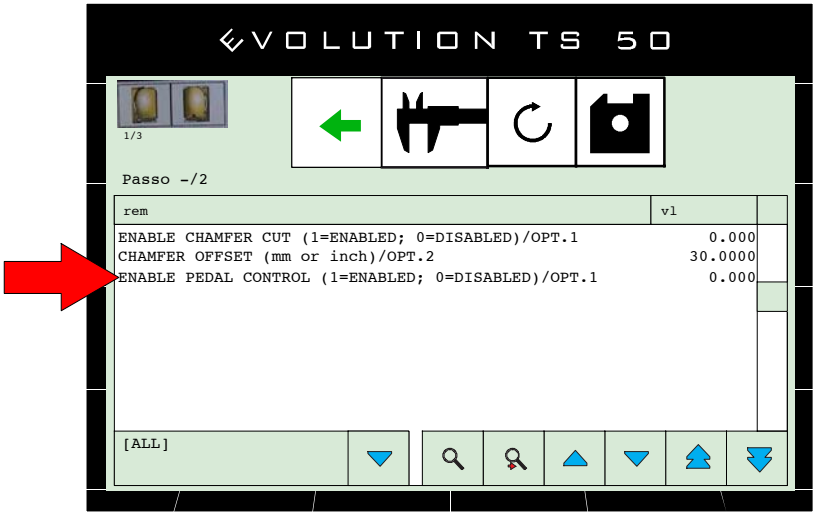
▶ Choose the rotation speed of the disk ”hare” (high) or ”turtle” (low) Hold the control enabling key and the blade rotation enabling key (F6) pressed at the same time.



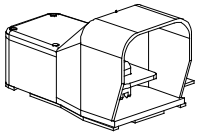
▶ Hold the control enabling key and the cycle start key (F7) pressed at the same time to start the disk rotation and the head lowering at the set speeds. The RHLS point is automatically stored in this way.



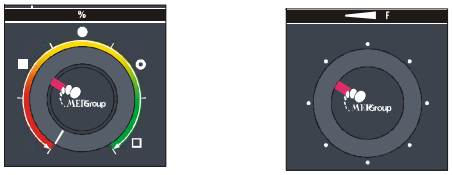
N.B. If the sawing machine is equipped with optional pedal control the cycle start control can be made from remote station. In this case it is necessary to enable the operation of the pedals, by selecting the appropriate entry in the list of options.



▶ Press the pedal control to start the working cycle.

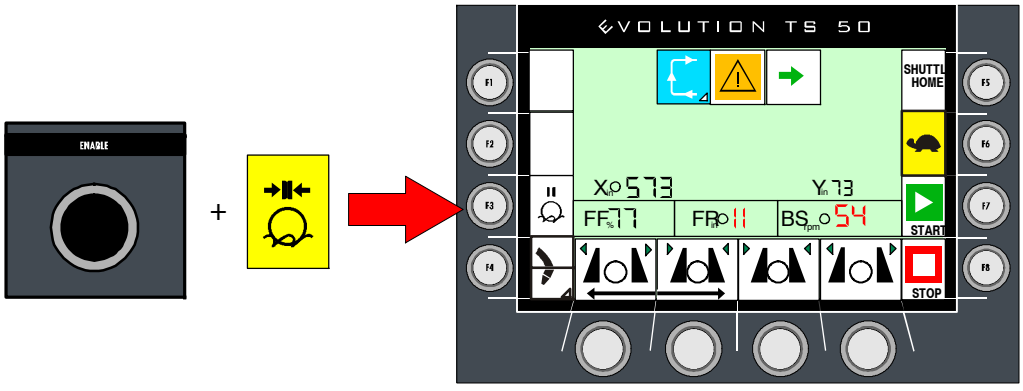


▶ Set the cutting parameters, previously shown, using the following adjusters.

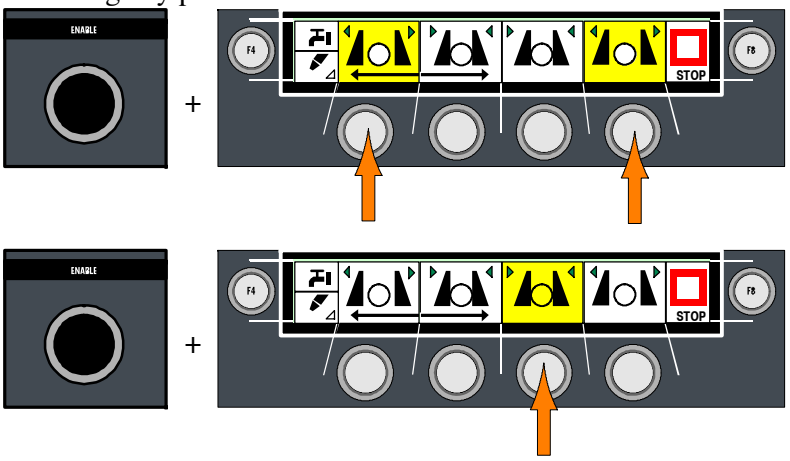


Now the blade starts, the cutting cylinder is under pressure and the lubricant/ coolant supply starts.

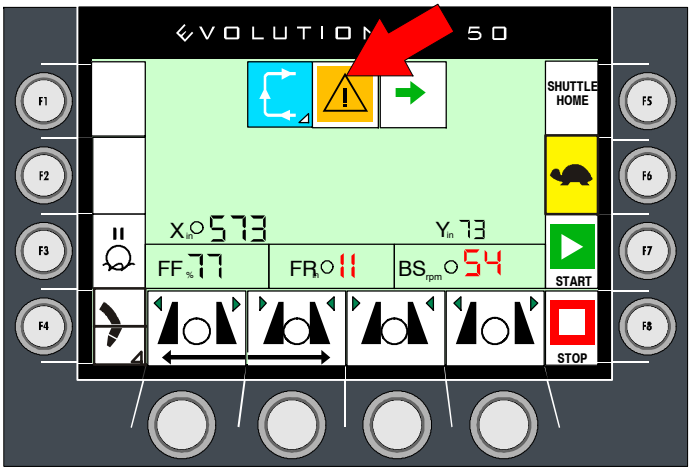
N.B. At this point, hold the enable commands button pressed and move the head down using the joystick to delete the existing FHLS point: the FHLS setup box will start blinking to indicate that the FHLS point was deleted. When the head reaches the required end of cutting point, press the FHLS setup button shown in the figure together with the enable commands button. The corresponding box will light up to indicate that it was selected.



- When the head reaches the FHLS point the band stops and the head returns to the set RHLS point, ready to make a new cutting cycle.
- Open both vices holding the control enabling key and the vice opening key pressed at the same time. Feed the material to be machined, as explained above, and then close the cutting vice by holding the control enabling key and the vice closing key pressed.



N.B. Tap on the touchscreen box shown in the figure to see problems during operation. The box will turn blue to indicate caution and red to indicate a machine alarm. See chapter 10 for a complete list of alarms.



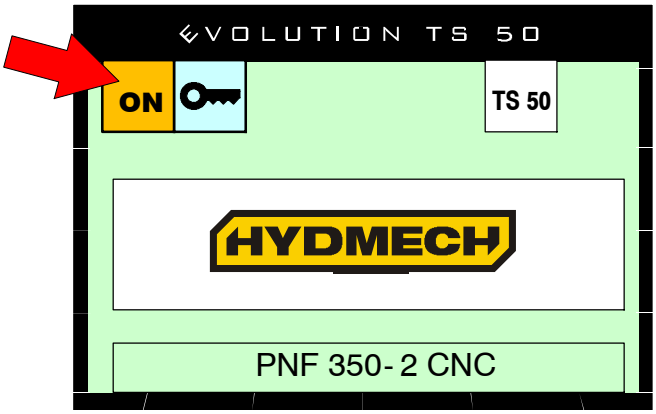
Automatic mode single job

- Single program: it carries out exclusively the programmed cycle directly on the working video page. After setting the length and the number of necessary pieces, it runs the program stopping the cycle and giving a light and sound alarm.

The operation sequence for running in automatic mode and single job:

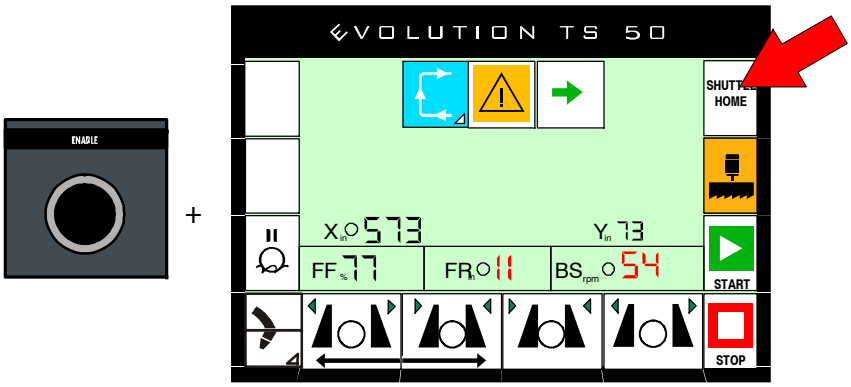
▶ power up the machine by turning the main switch;

▶ tap on the box with the on symbol on the touchscreen;



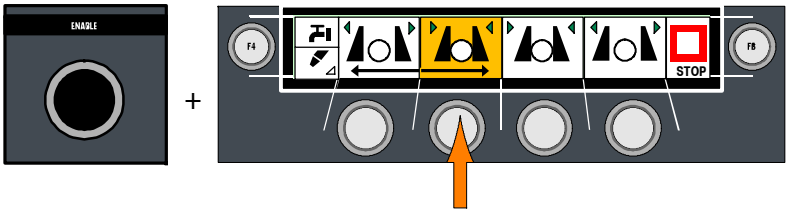
▶ press reset and release the emergency mushroom button if pressed, the head rises completely.

▶ Zero the feeder by holding the control enabling key and the key shown in figure (F5) pressed at the same time. In this operation the sawing machine closes the cutting vice, opens the feeder vice and transfers the shuttle till reaching the zero value.

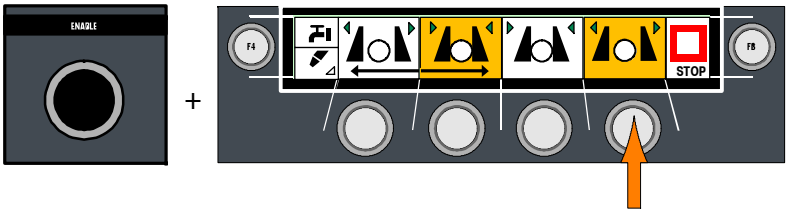


▶ Position the material inside the feeding vice.

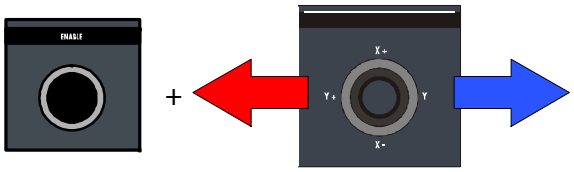
▶ Close the feeding vice by holding the control enabling button and the vice closing button pressed at the same time.



▶ Open the cutting vice by manually adapting the opening with the flywheel and using the button



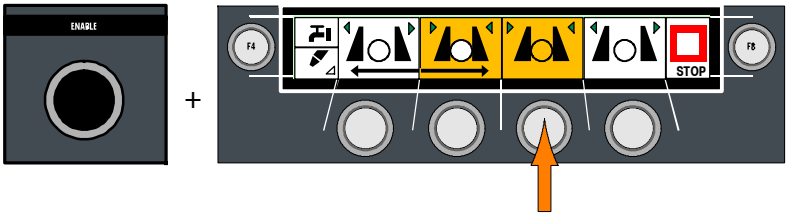
▶ Feed the material to be machined, to align it on the cutting line in the working table, by moving it using the joystick and holding the control enabling key pressed.



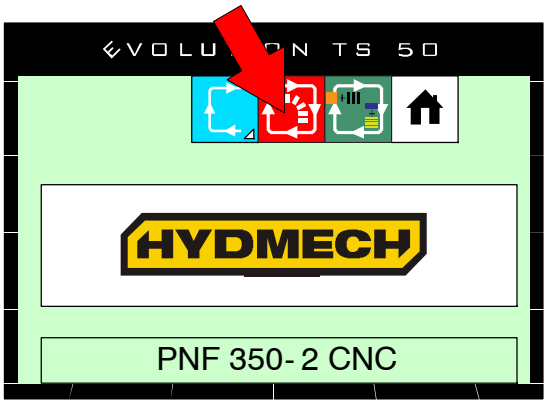
Warning

Before handling the material in the feeder, take the cutting head totally up so that it does not interfere with the tool.

▶ Close the cutting vice by holding the control enabling button and the vice closing button pressed at the same time.

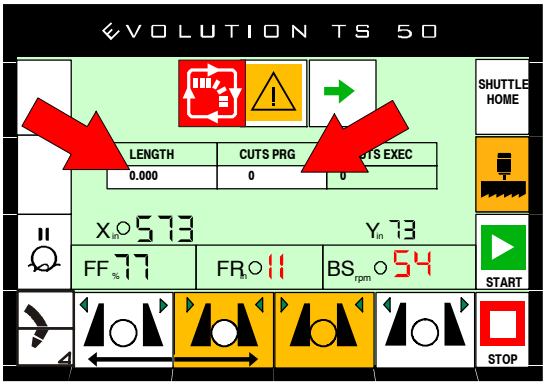


▶ Select the automatic machining mode with single program, pressing repeatedly the box shown in the figure on the touch screen.



▶ Press CLEAR (F5) to set the number of pieces cut in the previous machining to zero.

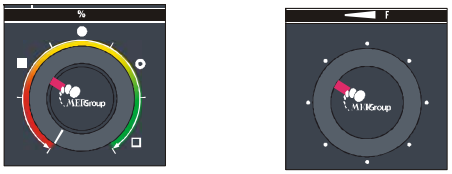
▶ Set the wished length and the wished number of cuts pressing the boxes shown in the figure and entering the values on the keypad that pops up automatically.



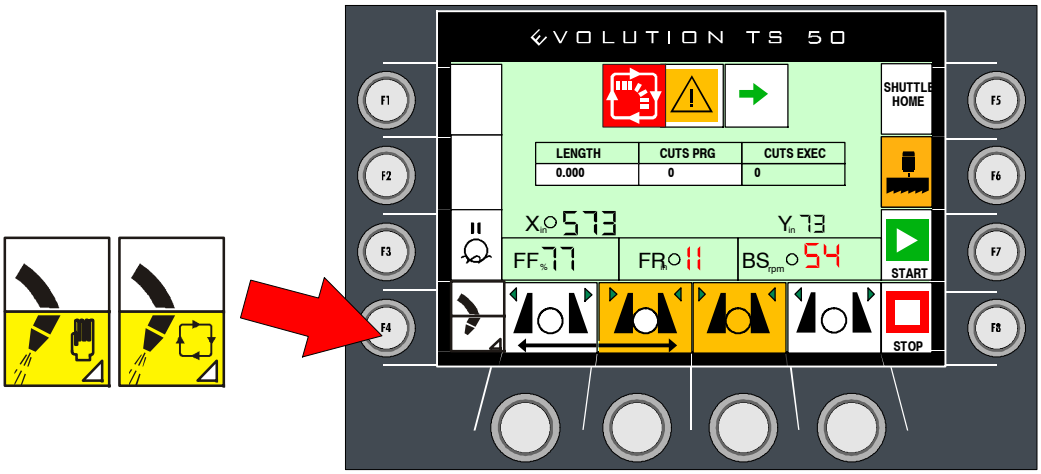
▶ Set the cutting parameters, previously shown, using the following adjusters.

Warning

In this step it is recommended to set the head lower adjuster at the min. value, to prevent the head from lowering too fast breaking the blade.

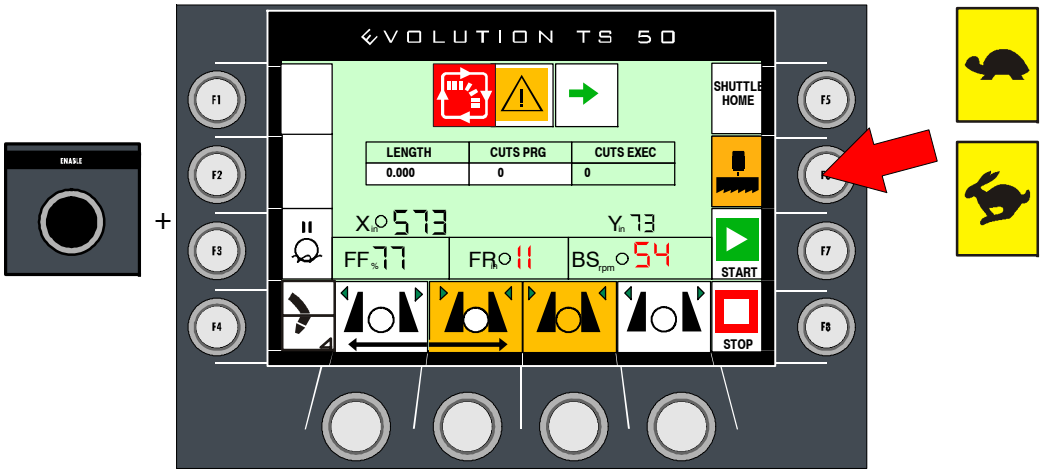


▶ Set the fluid jet by pressing the button shown in the figure (F4). The box will light up to indicate that it is selected. Adjust the amount using the valves on the blade guide head. Press the button repeatedly to select the dispensing mode (automatic or manual).

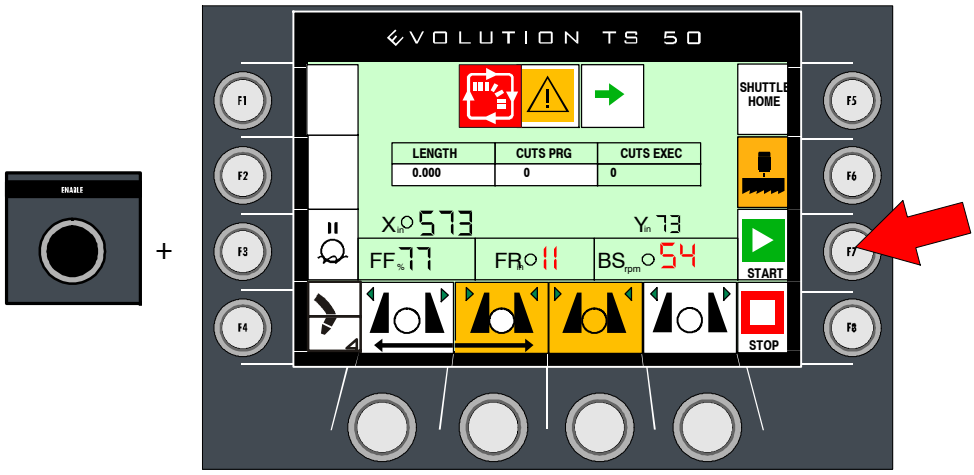


▶ Position the head at approximately 10 mm from the workpiece.

▶ Hold the control enabling key and the disk rotation enabling key (F6) pressed at the same time.

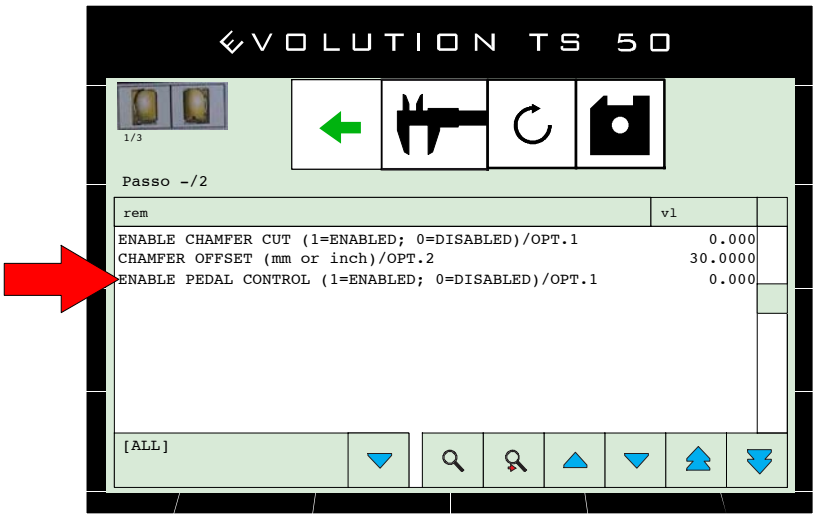


▶ Hold the control enabling key and the cycle start key (F7) pressed at the same time to start the diskrotation and the head lowering at the set speeds. The RHLS point is automatically stored in this way.

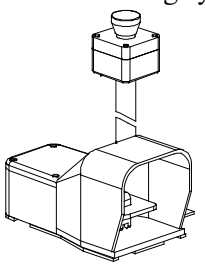


N.B. If the sawing machine is equipped with optional pedal control the cycle start control can be made from remote station. In this case it is necessary to enable

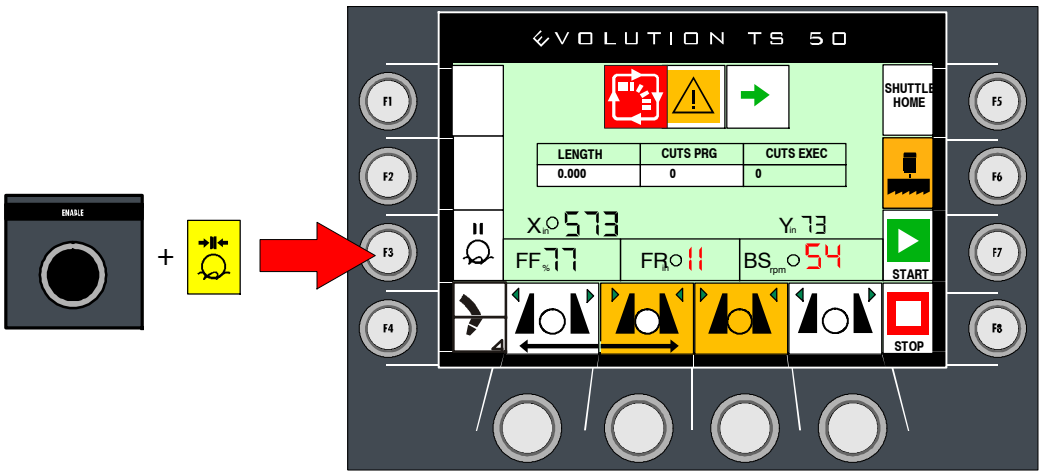
the operation of the pedals, by selecting the appropriate entry in the list of options.



▶ Press the pedal control to start the working cycle.



N.B. Then, if the existing FHLS point is to be deleted, follow the operations previously described in the semiautomatic cycle for deleting and setting again the head stroke limits.



The sawing machine is running before cutting and then trimming the planned cuts. At the end of the top and head disk motor stops. If you intend to repeat the cycle or start a new job, press CLEAR (F5) to clear the cut pieces.

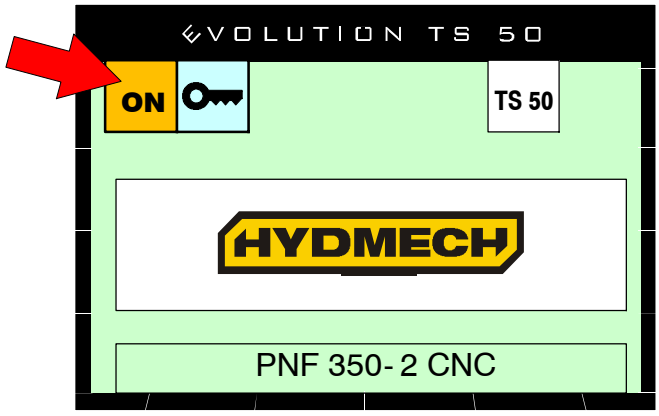
Automatic operating cycle with single cycle

- Single cycle: it carries out the stored programs one at a time and stops waiting for the consent before the next program.

Sequence of the operations for an automatic cutting with single cycle:

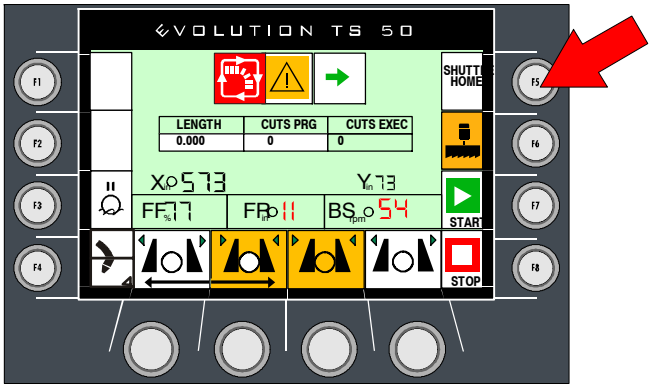
▶ power up the machine by turning the main switch;

▶ tap on the box with the on symbol on the touchscreen;



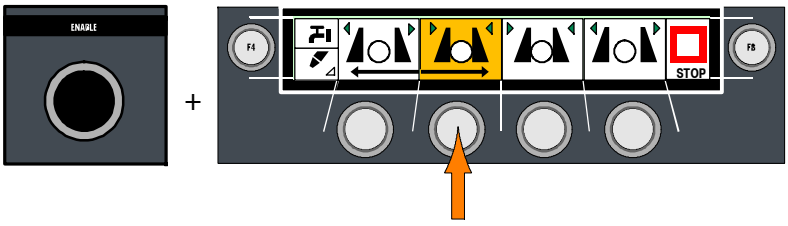
▶ press reset and release the emergency mushroom button if pressed, the head rises completely.

N.B. The sawing machine zeroes the feeder shuttle when the automatic cycles are started. If the feeder must be zeroed before the cycle start, select the semi-automatic working cycle and zero by pressing the control enabling key and the F5 key shown in the figure at the same time.

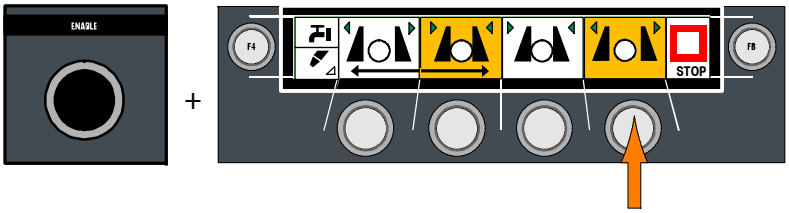


▶ Position the material inside the feeding vice.

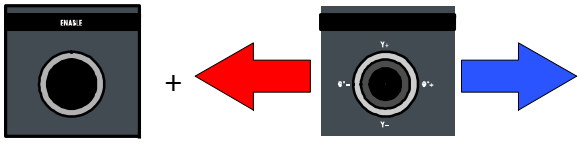
▶ Close the feeding vice by holding the control enabling button and the vice closing button pressed at the same time.



▶ Open the cutting vice by manually adapting the opening with the flywheel and using the button.



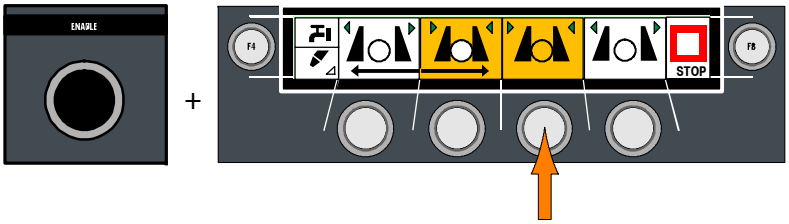
▶ Feed the material to be machined, to align it on the cutting line in the working table, by moving it using the joystick and holding the control enabling key pressed.



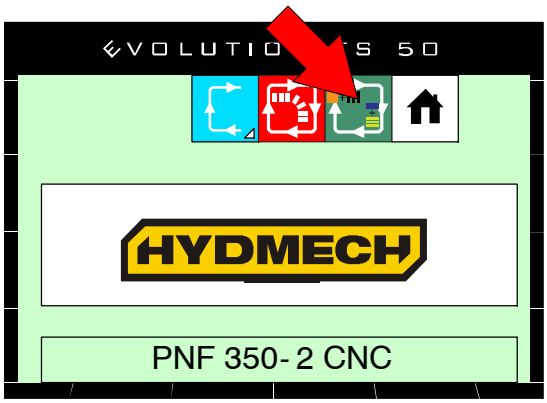
Warning

Before handling the material in the feeder, take the cutting head totally up so that it does not interfere with the tool.

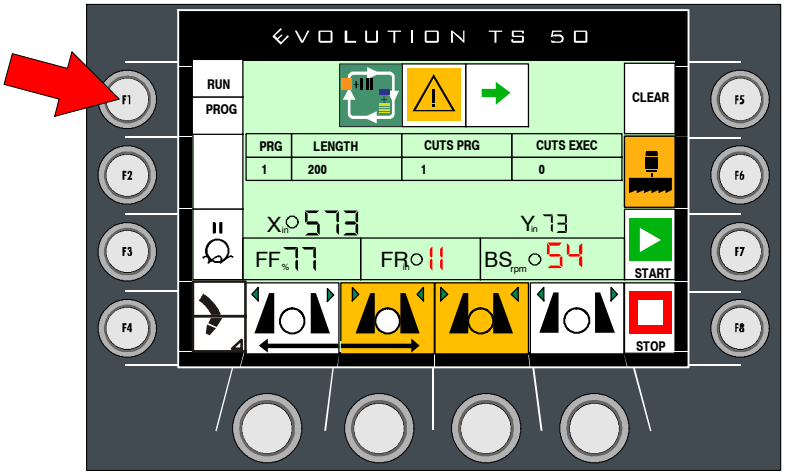
▶ Close the cutting vice by holding the control enabling button and the vice closing button pressed at the same time.



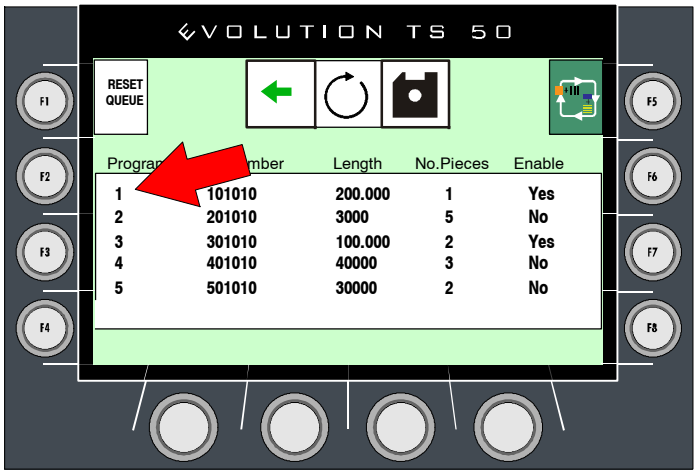
▶ Select the automatic machining mode with continuous cycle, pressing the box shown in the figure on the touch screen.



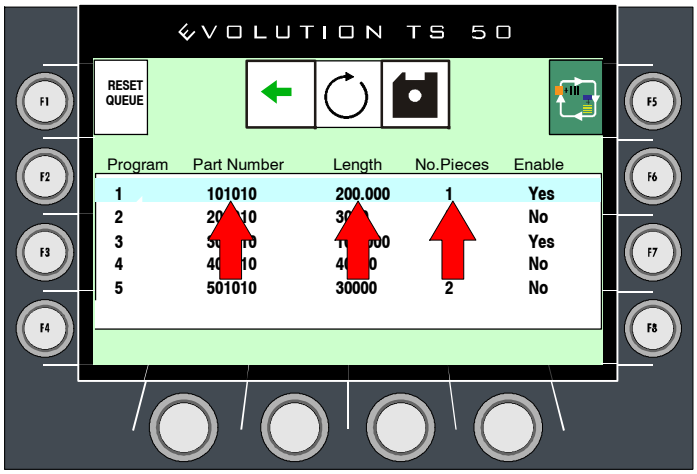
▶ Press the RUN/PROG key to access the programming page for the automatic operation with single cycle.



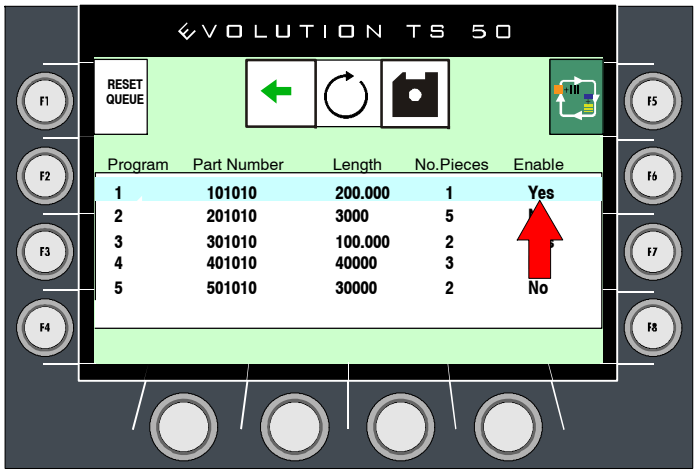
▶ The display shows the following screen listing all programs (max. 10). Press the program number to select the one to be set.



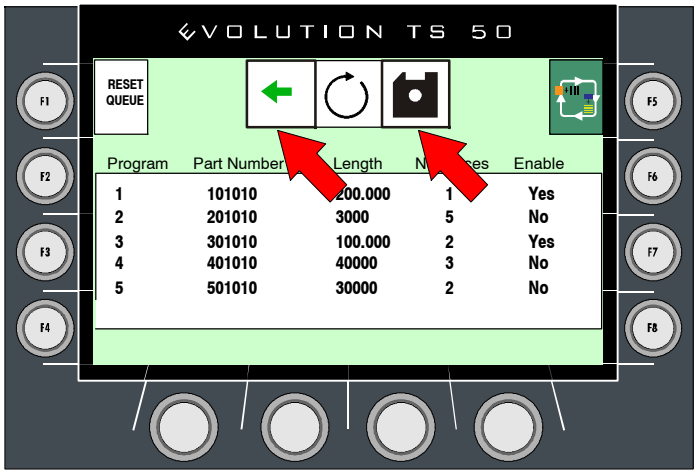
▶ Press to edit all values of “Part Number” (company identification code), “Length” (piece length), and “Nr. Piece” (number of pieces) using the key-pad.



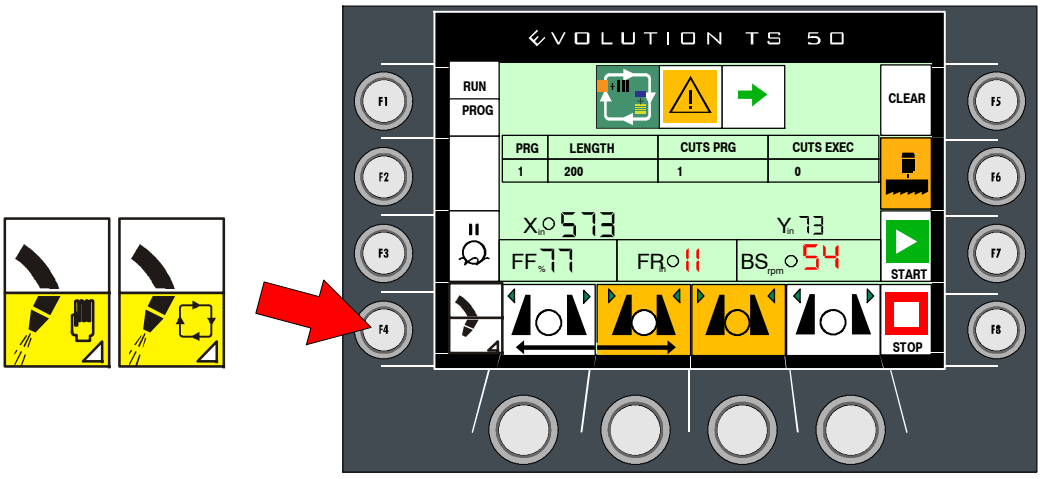
▶ In the end choose to activate or deactivate the selected by “Enable” (Yes / No).



N.B. Press the F1 key to zero the program queue.
Press the F5 key to zero the piece number.
Before returning to the machining screen, press the data saving key and then the green arrow shown in the figure.



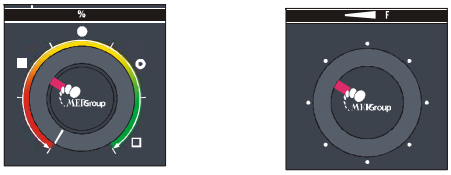
▶ Set the fluid jet by pressing the button shown in the figure. The box will light up to indicate that it is selected. Adjust the amount using the valves on the blade guide head. Press the button repeatedly to select the dispensing mode (automatic or manual).



▶ Set the cutting parameters, previously shown, using the following adjusters.

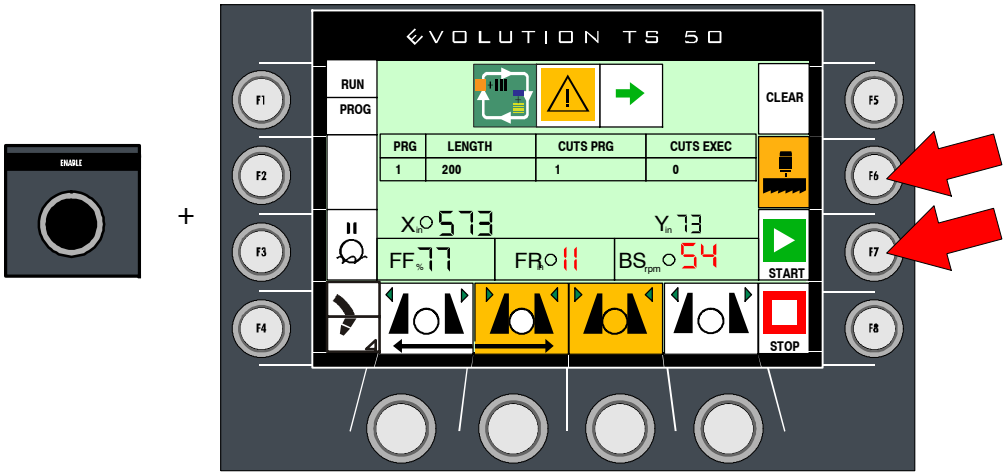
Warning

In this step it is recommended to set the head lower adjuster at the min. Value F, to prevent the head from lowering too fast breaking the blade.



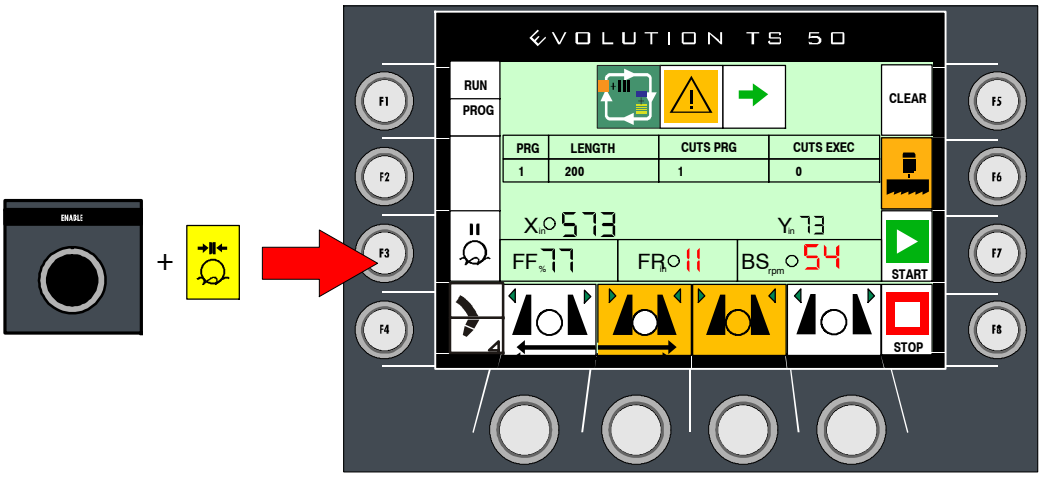
▶ Position the head at approximately 10 mm from the workpiece.

▶ Press the disk rotation enabling key (F6).



▶ Press the F7 cycle start key to start the disk rotation and the head lowering. The RHLS point is automatically stored in this way, as explained before. At the end, the disk stops and the head rises again.

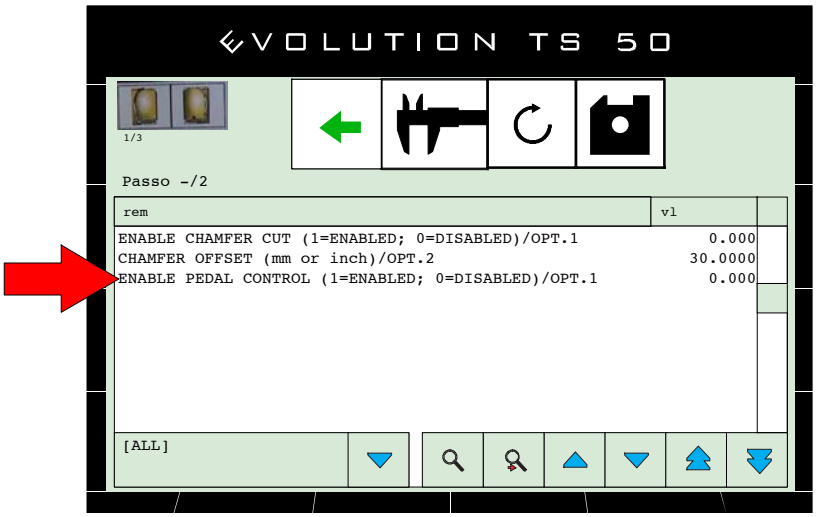
N.B. If the existing FHLS point is to be deleted now, follow the operations described above.



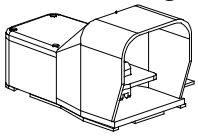
The sawing machine then feeds new material performing all the program cuts and continues with the set sequence. If the machining cycle must be stopped, press F8 Cycle Stop. To start it again, press an uold down the enabling command key and F7 Cycle Start key.

▶ If the sawing machine is equipped with optional pedal control the cycle start control can be made from remote station. In this case it is necessary to enable

the operation of the pedals, by selecting the appropriate entry in the list of options.



▶ Press the pedal control to start the working cycle.



N.B. If the existing FHLS point is to be deleted now, follow the operations described above.

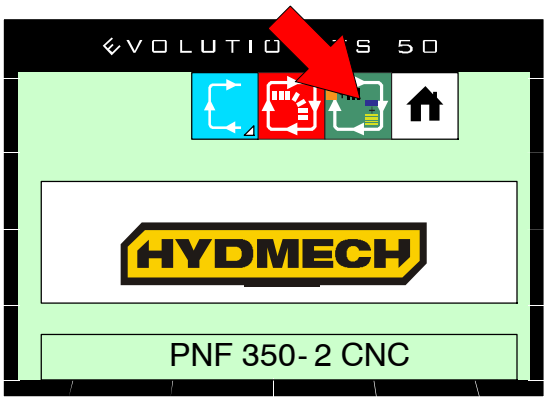
The sawing machine first makes the facing cut and then the previously stored programs, stopping at the end of each performed program, waiting for the start by the operator before going to the next program. At the end, the head rises again and the disk motor stops. To repeat the cycle or to start a new machining press CLEAR (F5) to set the cut pieces to zero.

Automatic operating cycle with continuous cycle

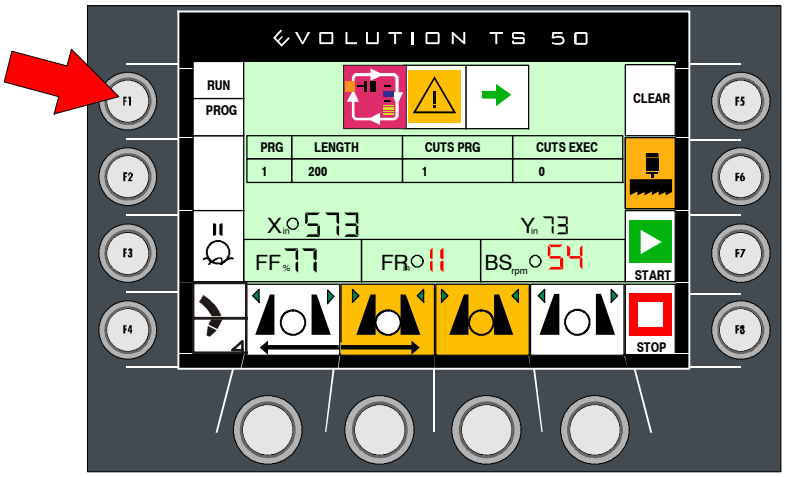
- Continuous cycle: it carries out the stored programs like in the single cycle but at the end of each program it AUTOMATICALLY goes to the next program.

The machine programming to carry out this type of automatic operation is the same as the one for the single cycle explained in the previous paragraph:

▶ After having initialized the machine, prepared the material to be machined and set the functional parameters, select the automatic machining mode with continuous cycle, pressing the box shown in the figure on the touch screen.



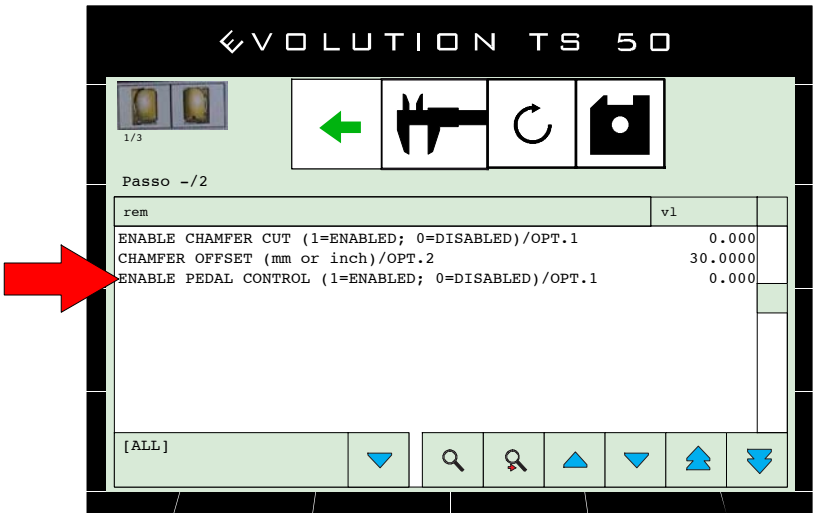
▶ Press the RUN/PROG key to program the cuts and lengths to be made as explained in the previous paragraph.



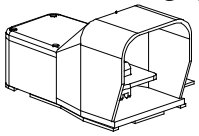
The sawing machine then feeds new material performing all the program cuts and continues automatically with the next ones according to the set sequence. If the machining cycle must be stopped, press F8 Cycle Stop. To restart it, hold the control enabling key and the Cycle Start key F7 pressed.

▶ If the sawing machine is equipped with optional pedal control the cycle start control can be made from remote station. In this case it is necessary to enable

the operation of the pedals, by selecting the appropriate entry in the list of options.



▶ Press the pedal control to start the working cycle.



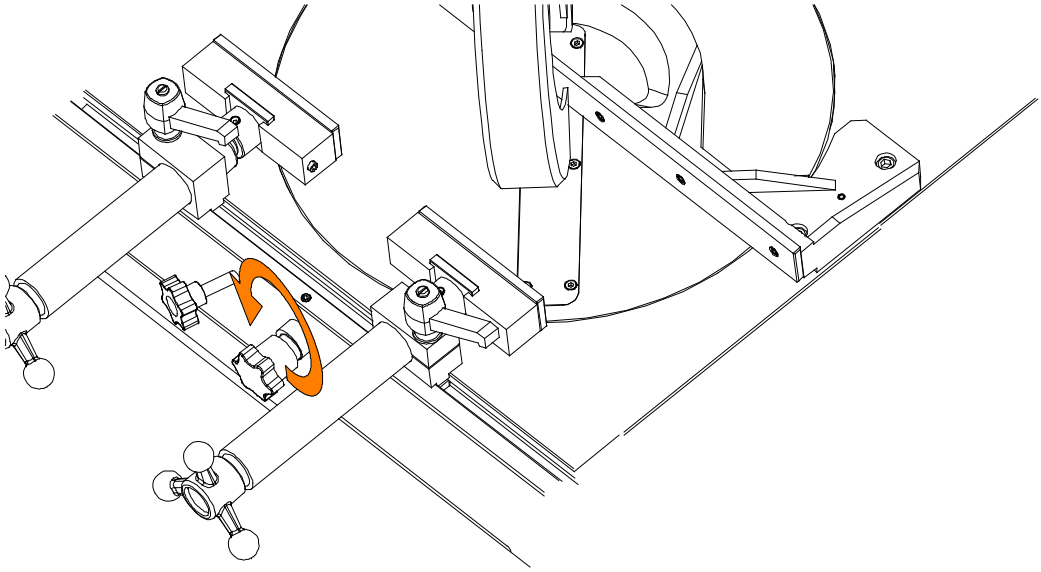
Angled cuts

The machine can make angled cuts from 45° left to 45° right. Reference stops are mounted on the sides of the turntable to facilitate rapid 0°, 45° cuts to the left and 45° cuts to the right.

Angled cuts 45° to the left

- ▶ Loosen the fastening knob on the fixed platform;
- ▶ pull the knob of the fixed point outwards and rotate it by 45 degrees, rotate the head till reaching the wished grading and lock again the tightening knob;

N.B. To use the preset strokes at 0° and 45° on the left and on the right, restore the initial position of the fixed point pin.



Angled cuts 45° to the right

- ▶ Pull the pin of the fixed point outwards and rotate it by 45 degrees, rotate the head till reaching the wished grading and lock again the tightening knob;
- ▶ adjust the vice position.

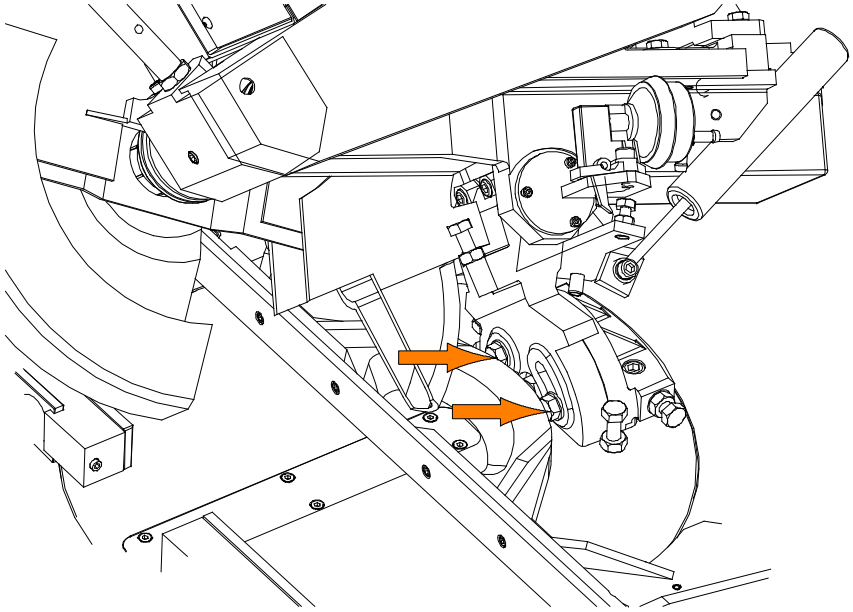
N.B. To use the preset strokes at 0° and 45° on the left and on the right, restore the initial position of the fixed point pin.

Mitre head cut

It is a special machining as it can make mitre cuts to the orthogonal line of the working plane.

Attention When making the first mitre head cut, also the left jaws of the piece- supporting shoulder must be inevitably cut.

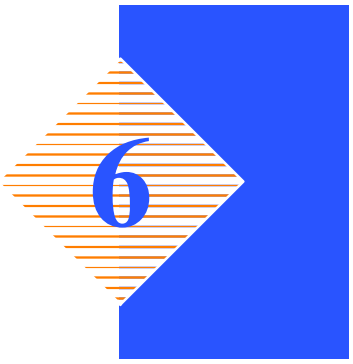
▶ Loosen the HH screws on the head rocker arm;



▶ bend the head leftwards will reaching the indicated sloping on the rocker arm support;

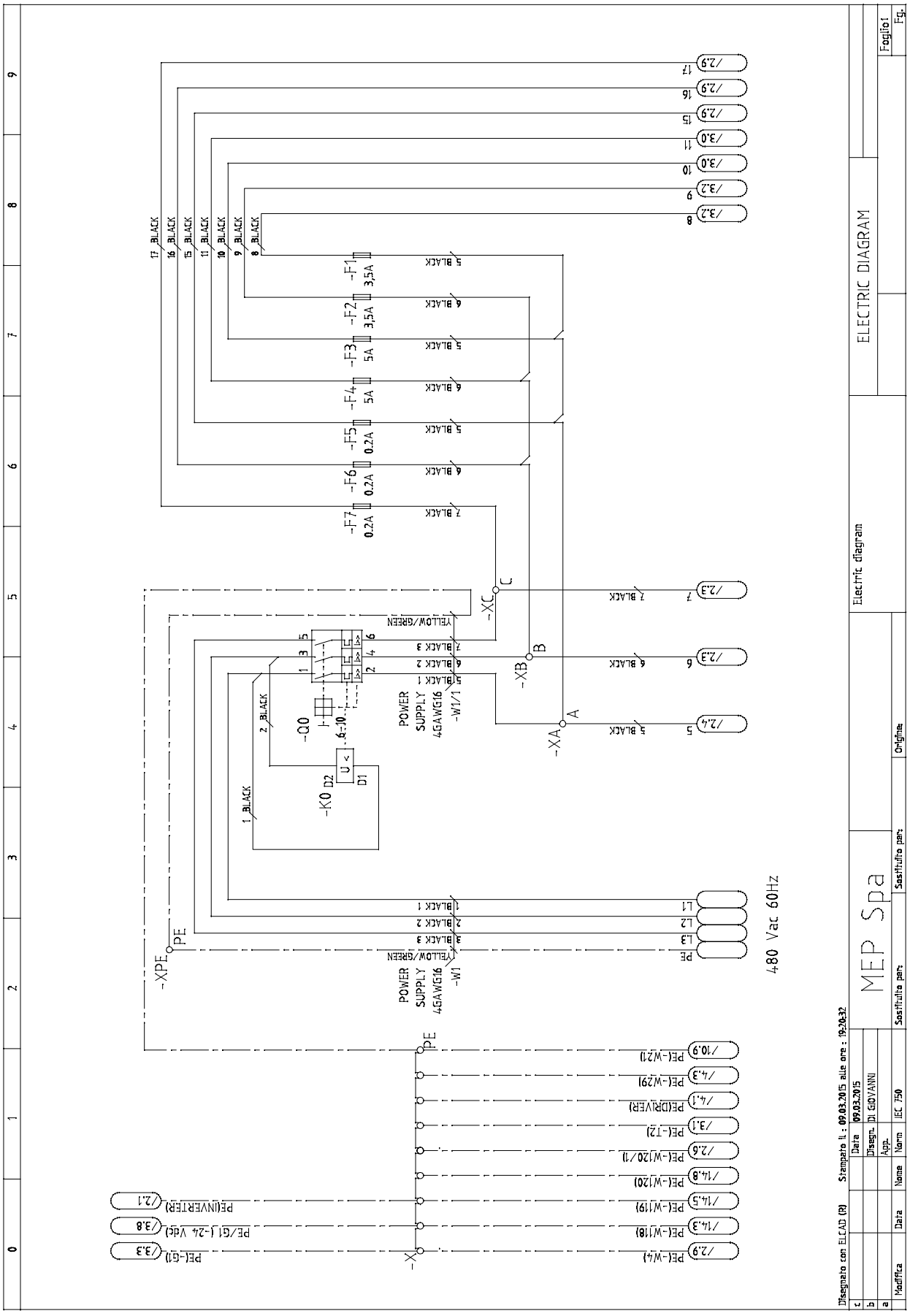
▶ tighten the HH screws and cut.

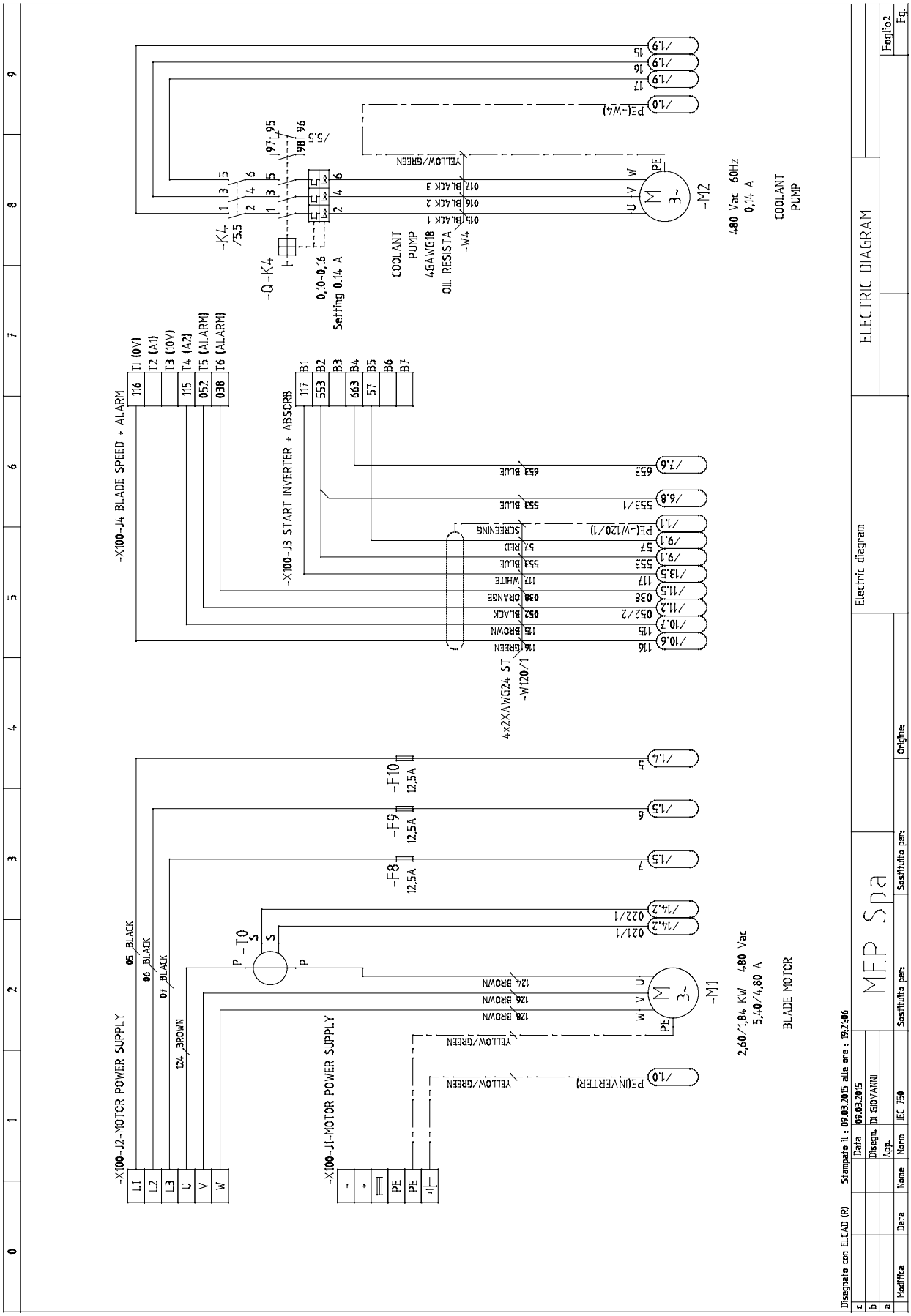
Diagrams, exploded views and replacement parts

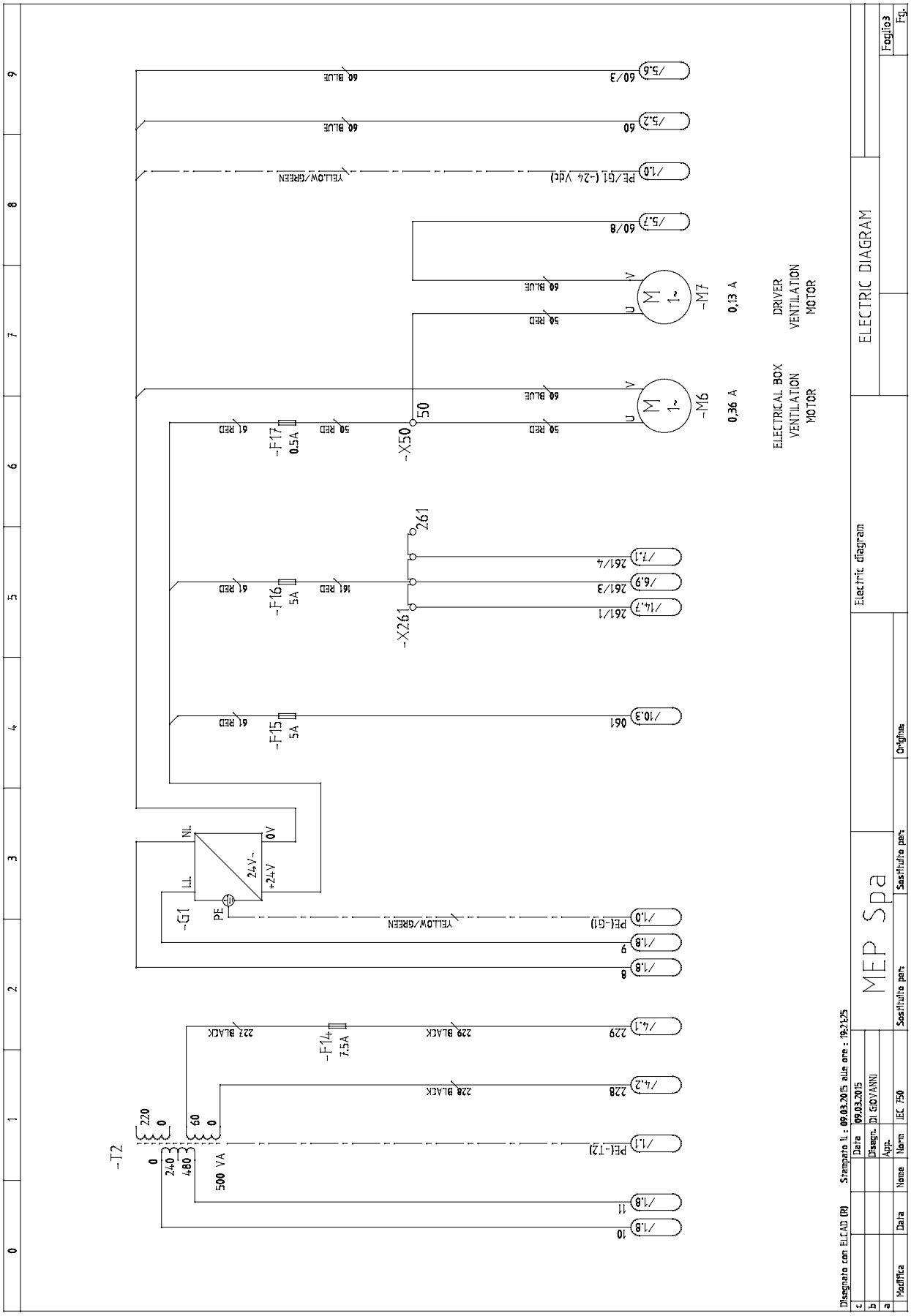


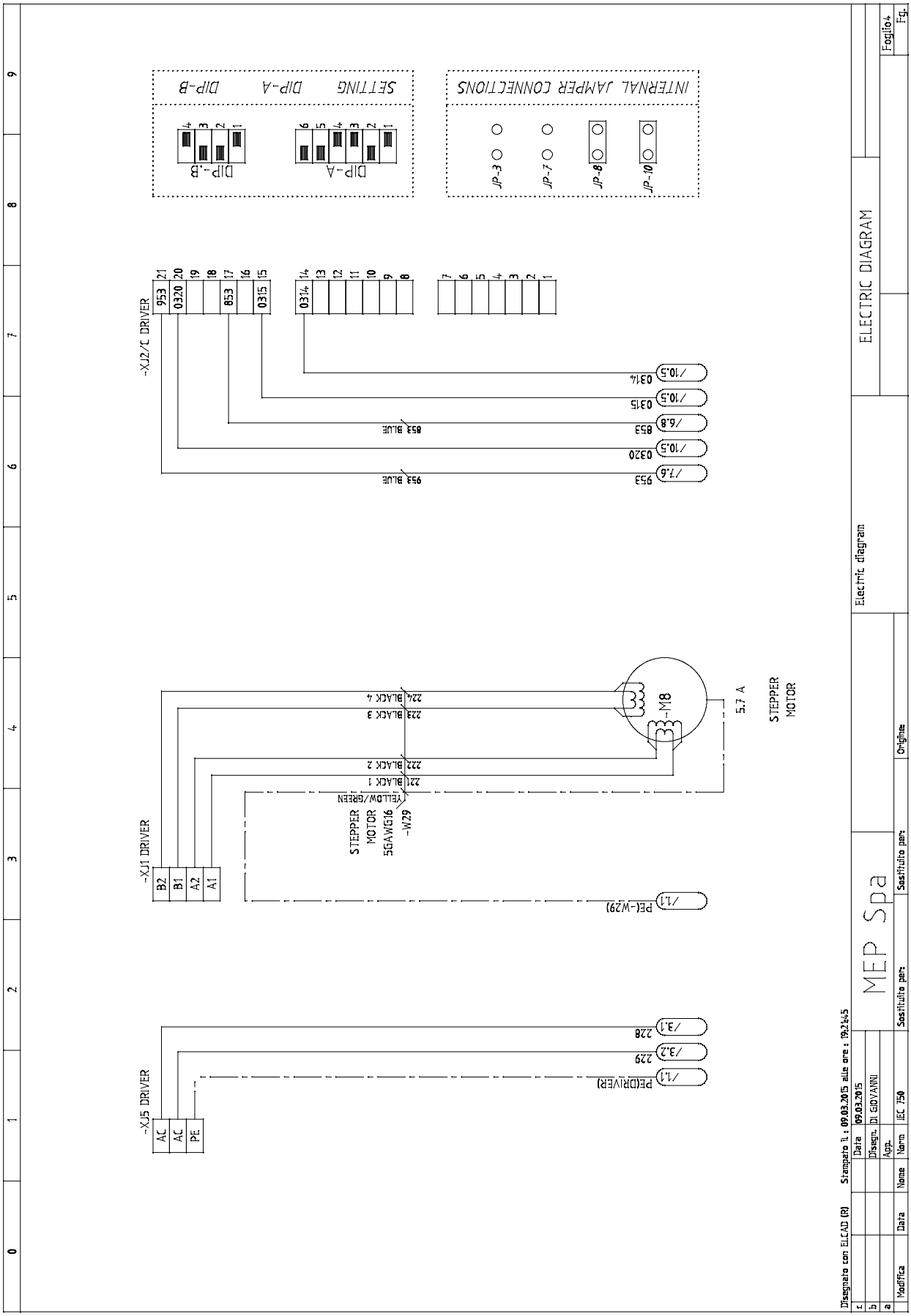
This chapter contains functional diagrams and exploded views of the **PNF 350- 2 CNC**. This document is intended to help in identifying the location of the various components making up the machine, giving information useful in carrying out repair and maintenance operations; This chapter will also enable the user to order replacement parts with no risk of misunderstanding, as all parts are given codes.

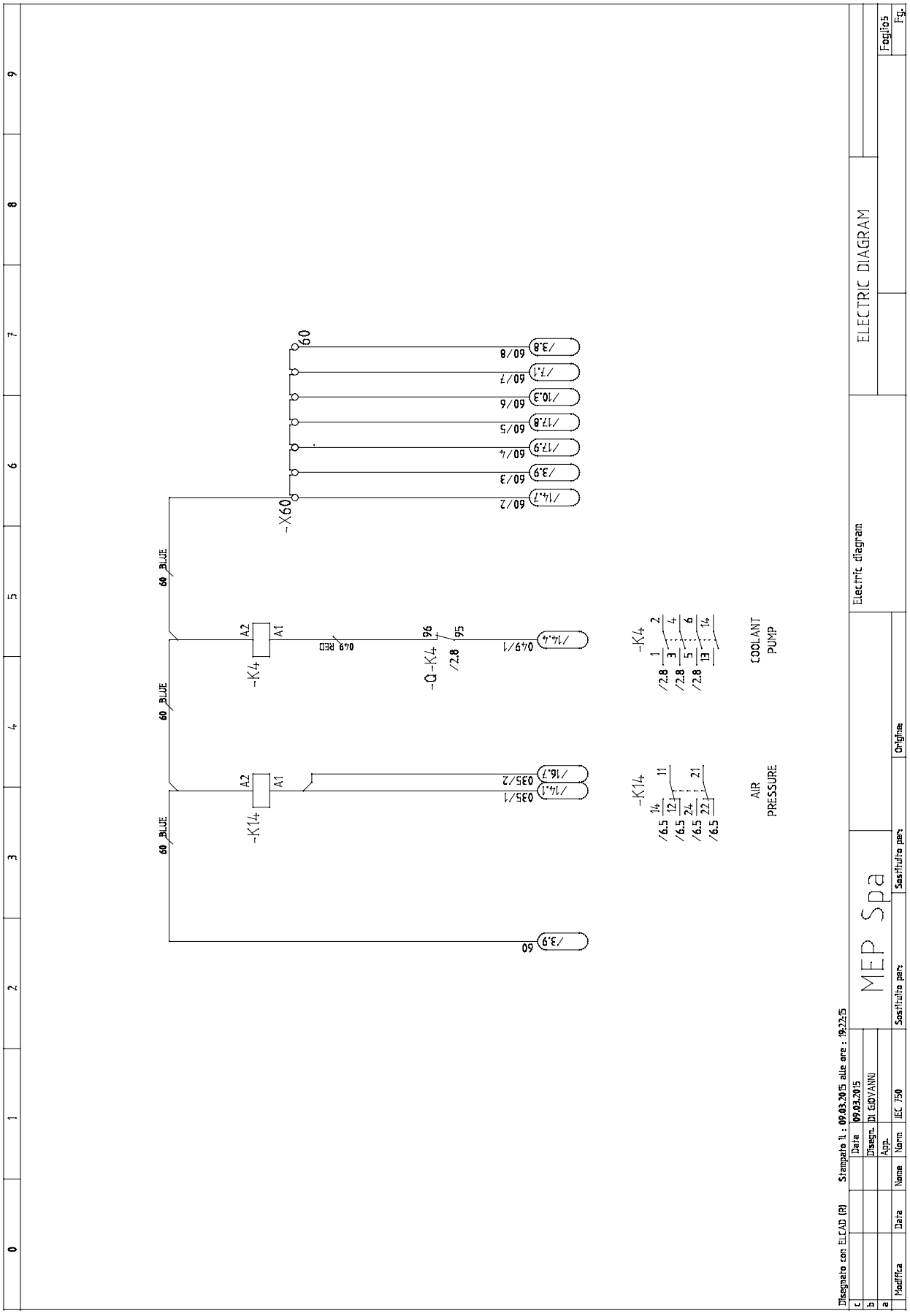
Standardised Wiring Diagrams (CENELEC Standard)

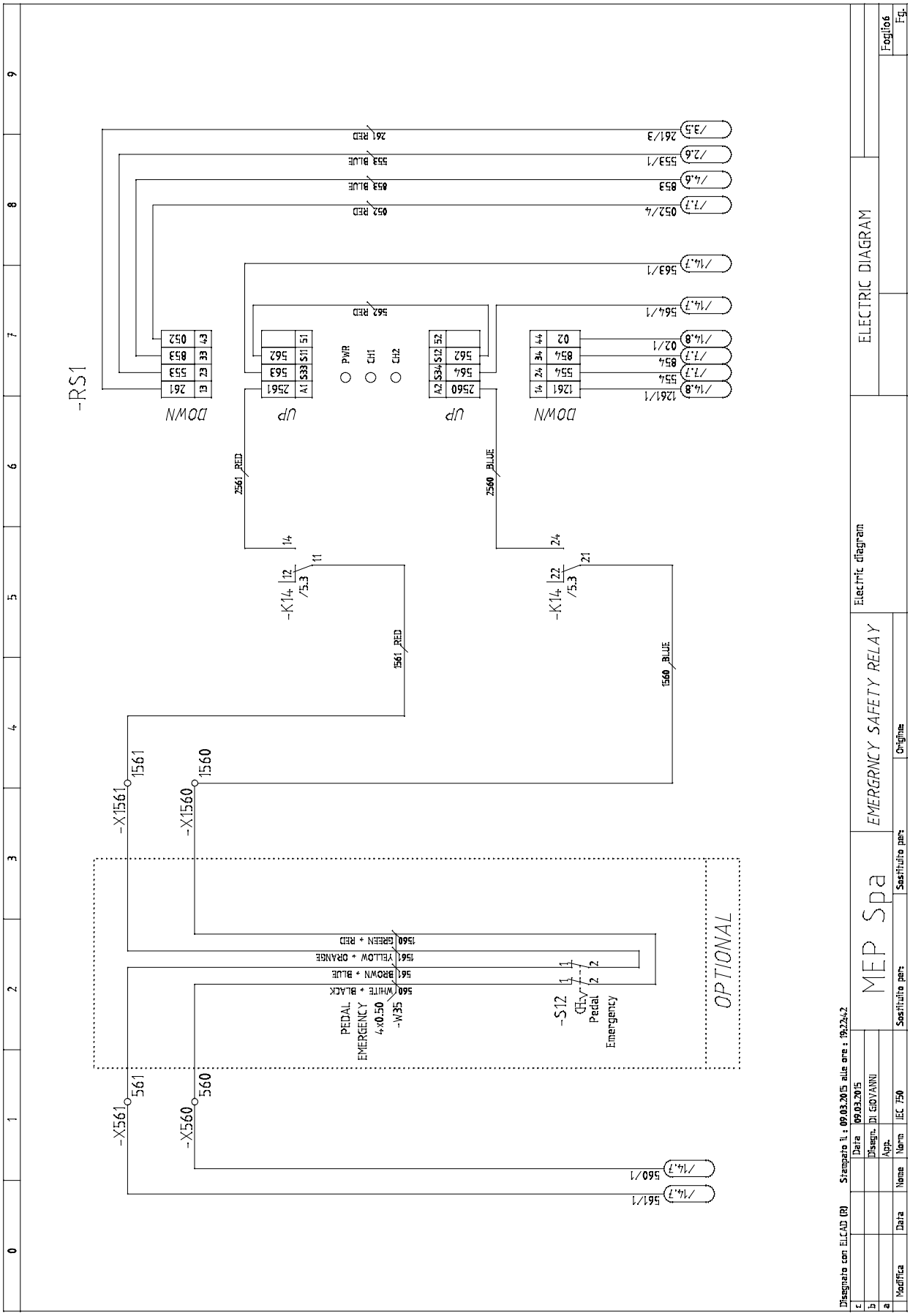


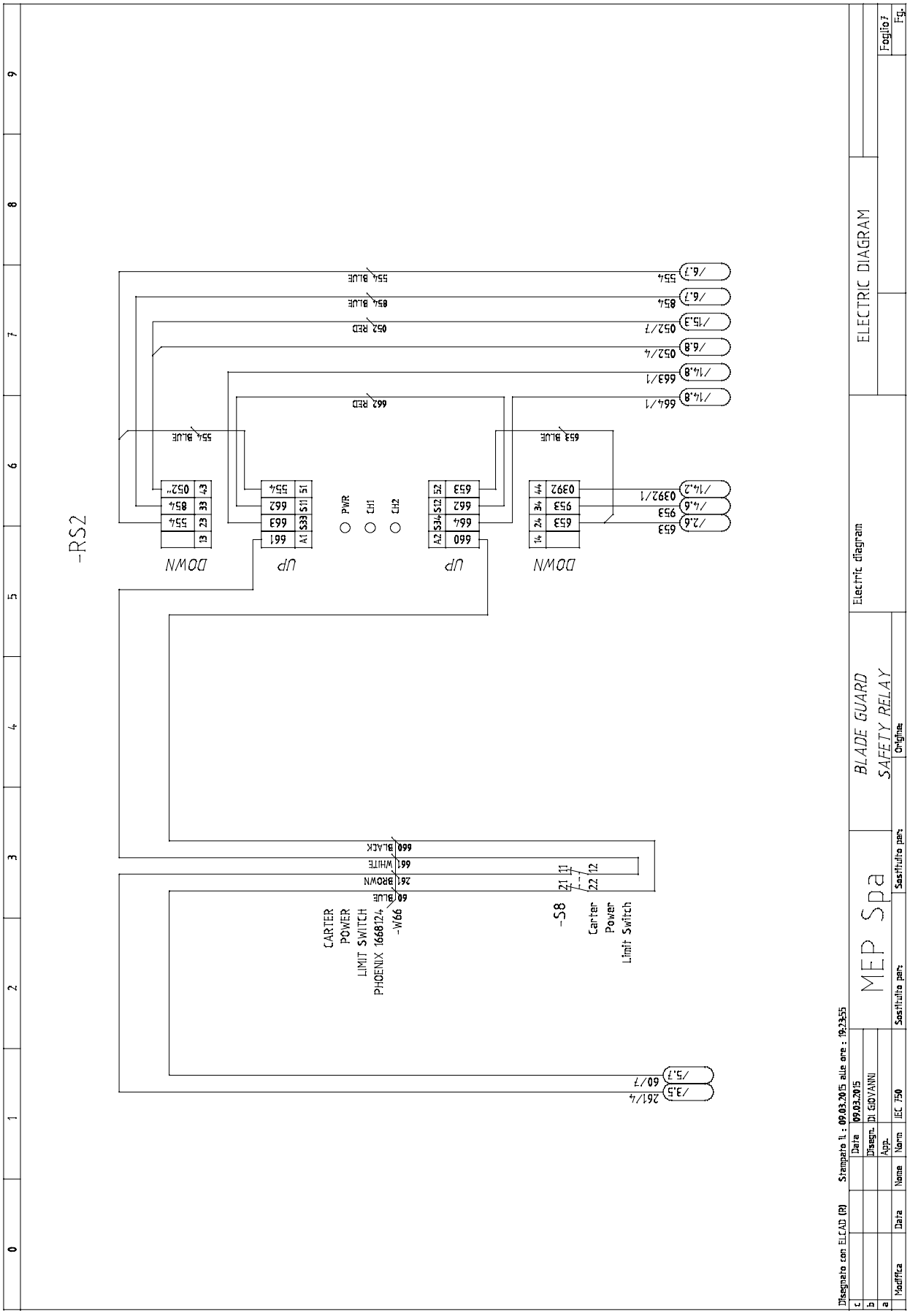

ELECTRIC DIAGRAM
Electric diagram
MEP Spa
BLADE MOTOR
COOLANT PUMP
OIL RESISTA
-X100-J4 BLADE SPEED + ALARM
-X100-J3 START INVERTER + ABSORB
-X100-J2-MOTOR POWER SUPPLY
-X100-J1-MOTOR POWER SUPPLY
-M1
-M2
-K4
-Q.-K4
-F8
-F9
-F10
-W120/1
-W4
4x2XAWG24 ST
4GAWG18
2,60/1,84 KW 4,80 Vac
5,40/4,80 A
4,80 Vac 60Hz
0,14 A
Setting 0,14 A
0,10-0,16

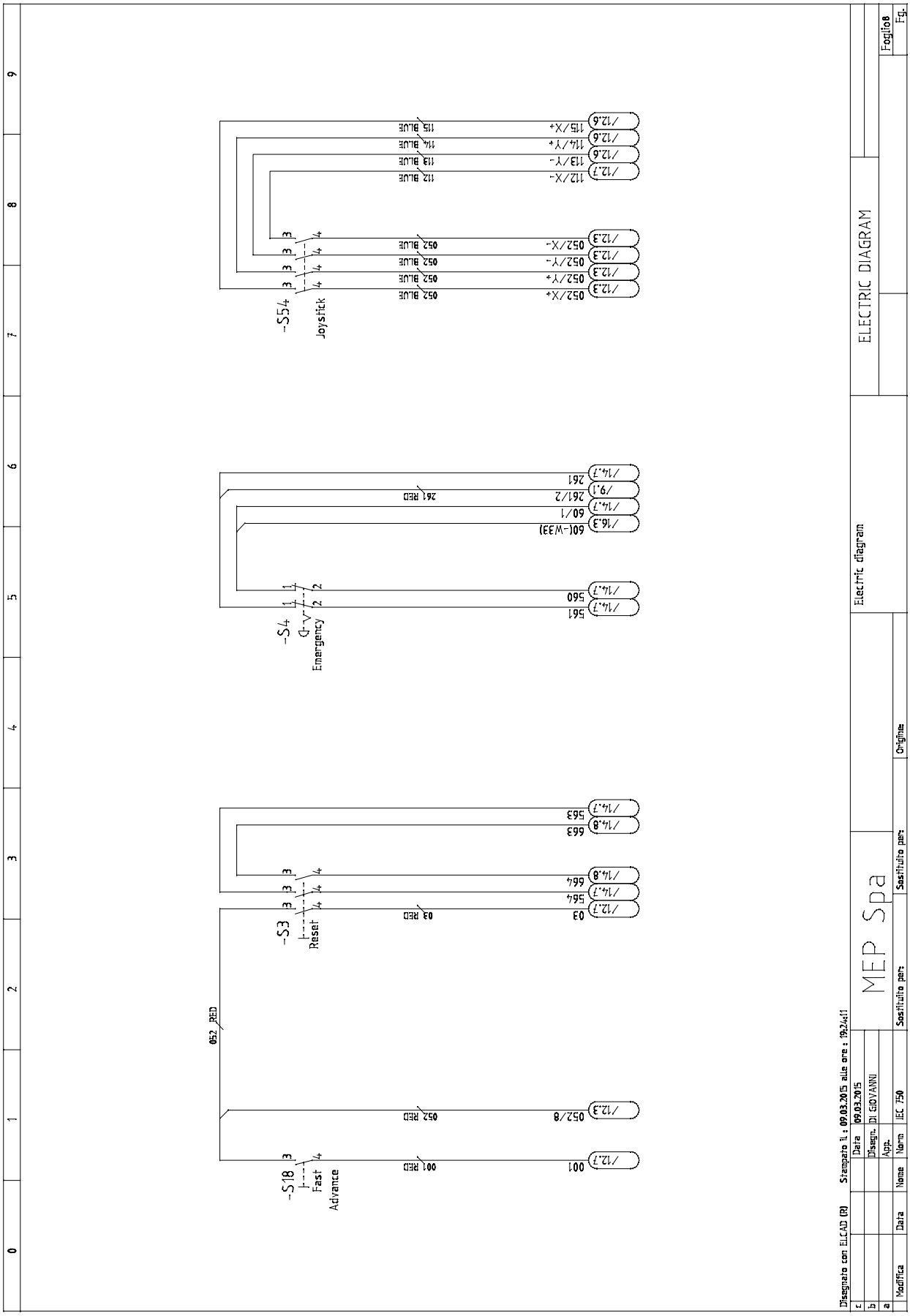

ELECTRIC DIAGRAM
Electric diagram
MEP SpA
-T2
-G1
-F14
-F15
-F16
-F17
-X50
-X261
-M6
-M7
ELECTRICAL BOX VENTILATION MOTOR
DRIVER VENTILATION MOTOR
0,36 A
0,13 A
500 VA
PE(-T2)
PE(-G1)
PE/G1 (-24 Vdc)
YELLOW/GREEN
BLUE
BLACK
RED
261
50
60
61
8
9
10
11
Foglio 3

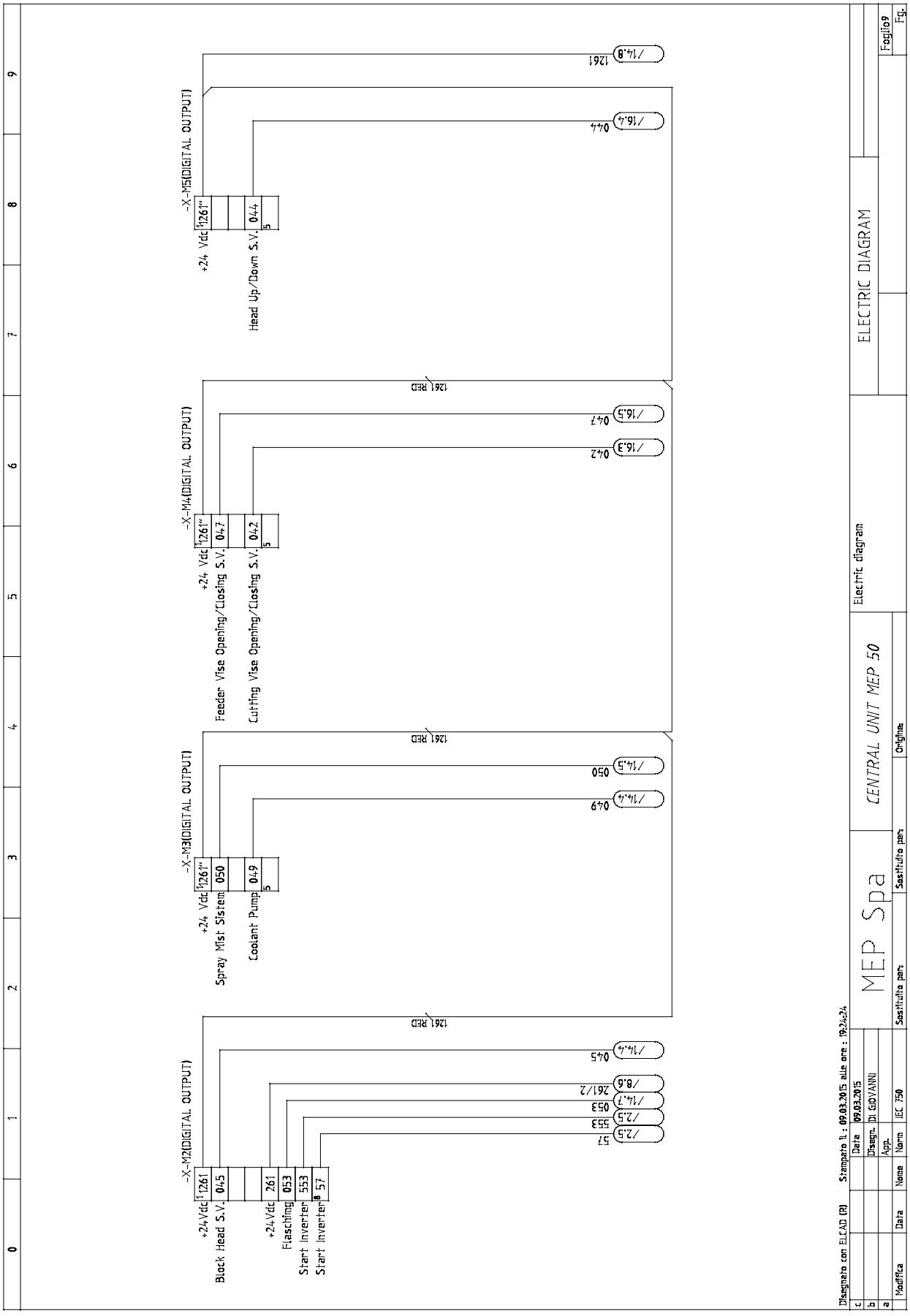

ELECTRIC DIAGRAM
Electric diagram
MEP Spa
STEPPER MOTOR
5.7 A
M8
-XJ2/C DRIVER
-XJ1 DRIVER
-XJ5 DRIVER
INTERNAL JAMPER CONNECTIONS
SETTING
DIP-A
DIP-B

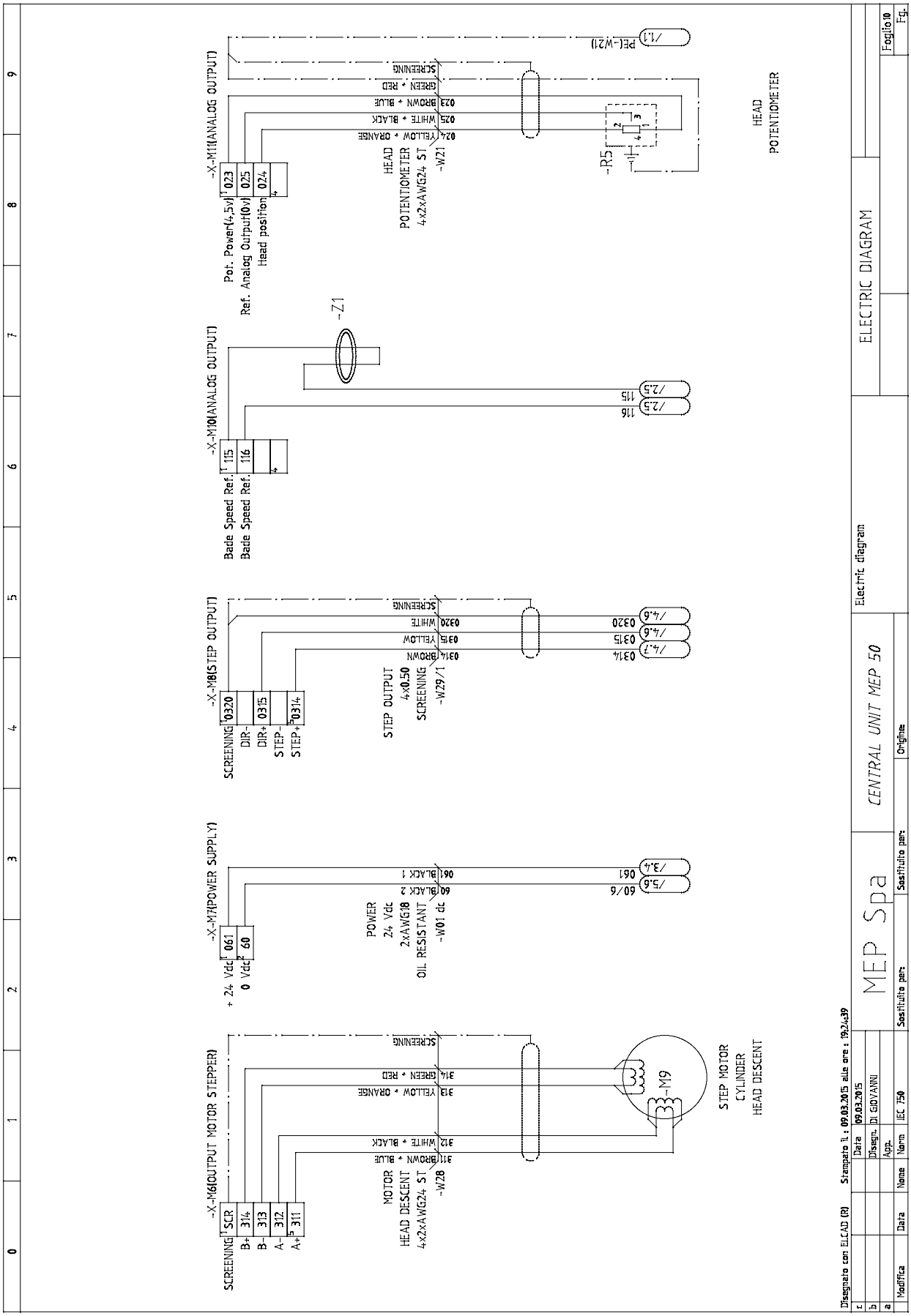

ELECTRIC DIAGRAM
Electric diagram
MEP SpA
-X60
-K4
-K14
-Q-K4
COOLANT PUMP
AIR PRESSURE
60 BLUE
0,9 RED

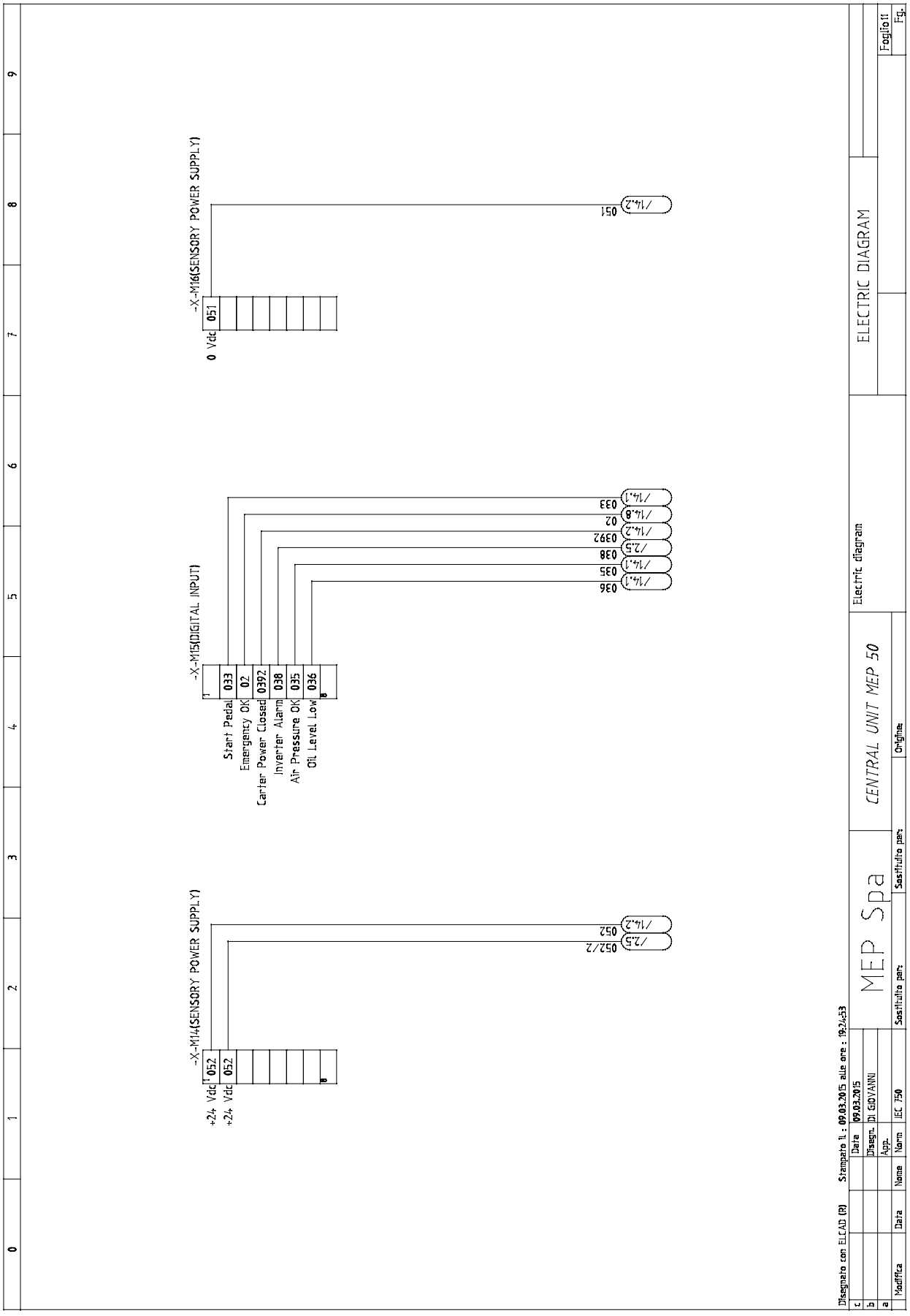

-RS1
DOWN
UP
UP
DOWN
PWR
CH1
CH2
-K14
-K14
-X1561
-X1560
-X561
-X560
-S12
PEDAL EMERGENCY
4x0.50
-W35
OPTIONAL
MEP Spa
EMERGENCY SAFETY RELAY
ELECTRIC DIAGRAM
Electric diagram

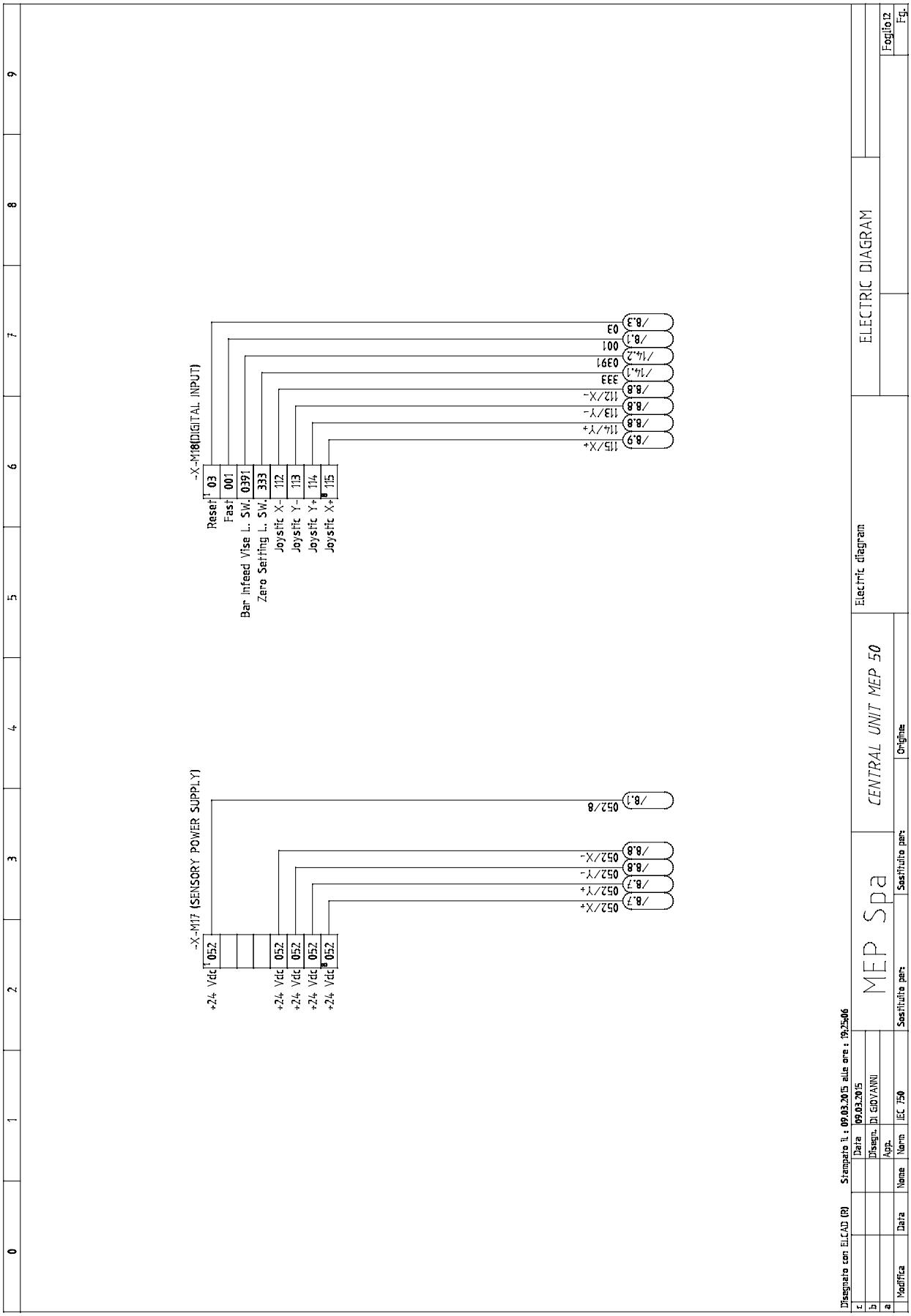

-RS2
DOWN
UP
UP
DOWN
PWR
CH1
CH2
CARTER
POWER
LIMIT SWITCH
PHOENIX 1668124
-W66
-S8
Carter
Power
Limit Switch
MEP SpA
BLADE GUARD
SAFETY RELAY
ELECTRIC DIAGRAM
Electric diagram

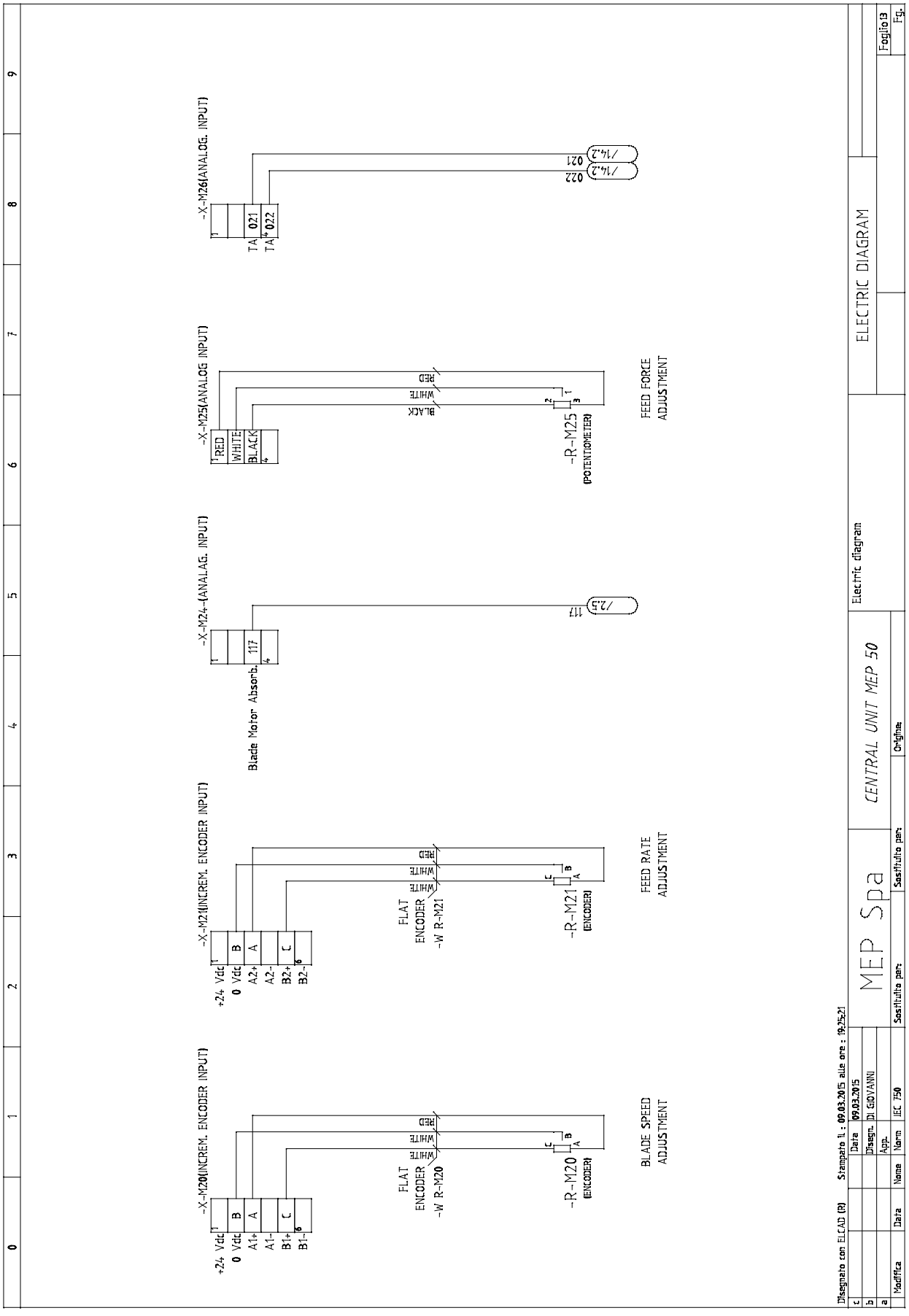

ELECTRIC DIAGRAM
Electric diagram
MEP Spa
-S54
Joystick
-S4
Emergency
-S3
Reset
-S18
Fast
Advance
052 RED
052 BLUE
112 BLUE
113 BLUE
114 BLUE
115 BLUE
112/X-
113/Y-
114/Y+
115/X+
052/X+
052/Y+
052/Y-
052/X-
052/8
001
001 RED
052 RED
03
03 RED
564
563
663
664
560
561
60(-W33)
60/1
261
261 RED
261/2
Disegnato con ELCAD (R)
Stampato il : 09.03.2015 alle ore : 19.24.11
Data
Disegn.
App.
Name
Norm
IEC 750
Sostituito per
Origine
Foglio 8
Fg.
Modifica
Data
Name

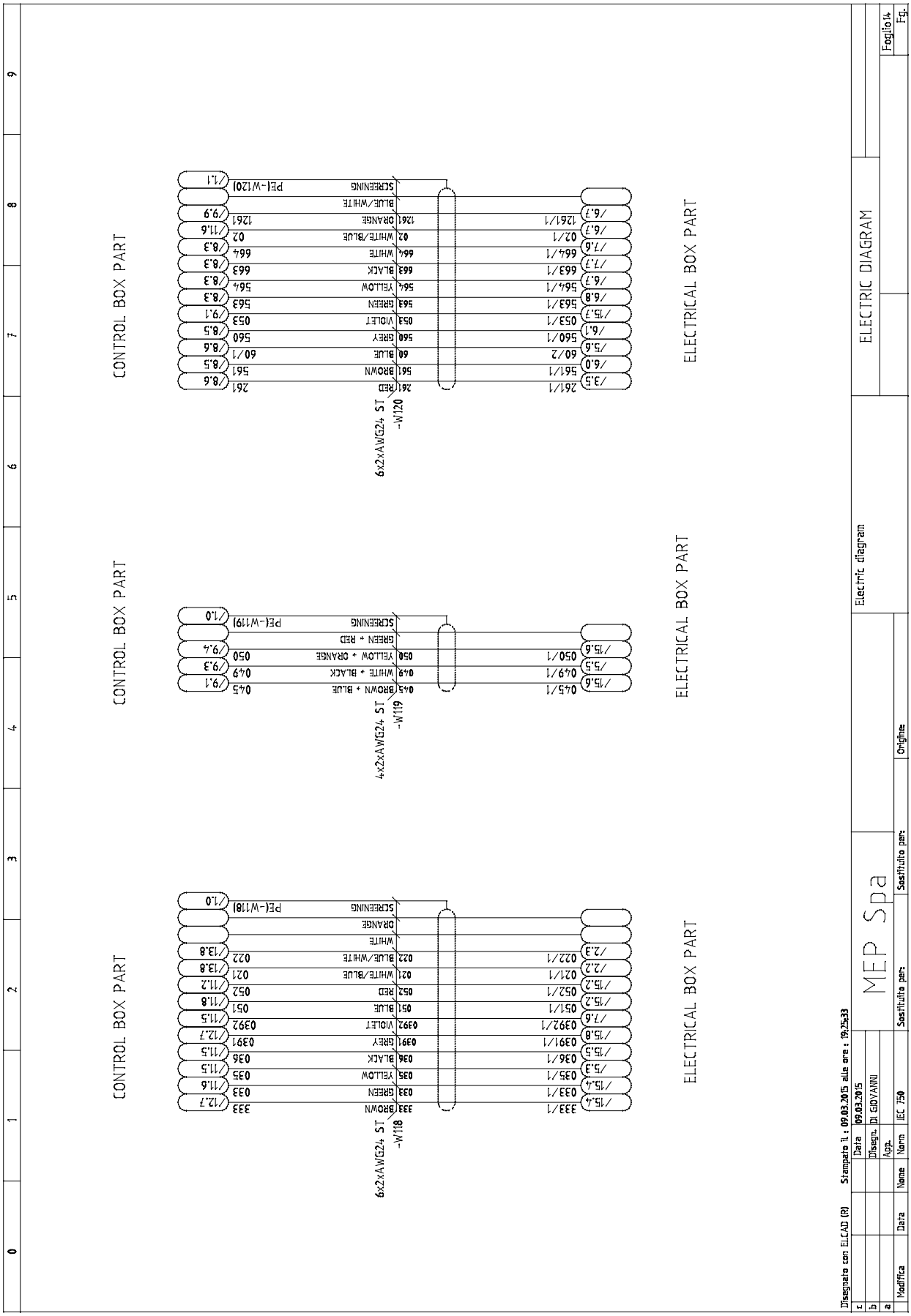

-X-M2(DIGITAL OUTPUT)
+24 Vdc 1261
Block Head S.V. 045
+24 Vdc 261
Flaschning 053
Start Inverter 553
Start Inverter 57
/14.4 045
/8.6 261/2
/14.7 053
/2.5 553
/2.5 57
-X-M3(DIGITAL OUTPUT)
+24 Vdc 1261
Spray Mist Sistem 050
Coolant Pump 049
/14.5 050
/14.4 049
-X-M4(DIGITAL OUTPUT)
+24 Vdc 1261
Feeder Vise Opening/Closing S.V. 047
Cutting Vise Opening/Closing S.V. 042
/16.5 047
/16.3 042
-X-M5(DIGITAL OUTPUT)
+24 Vdc 1261
Head Up/Down S.V. 044
/16.4 044
/14.8 1261
1261 RED
1261 RED
1261 RED
MEP SpA
CENTRAL UNIT MEP 50
Electric diagram
ELECTRIC DIAGRAM
Foglio 9

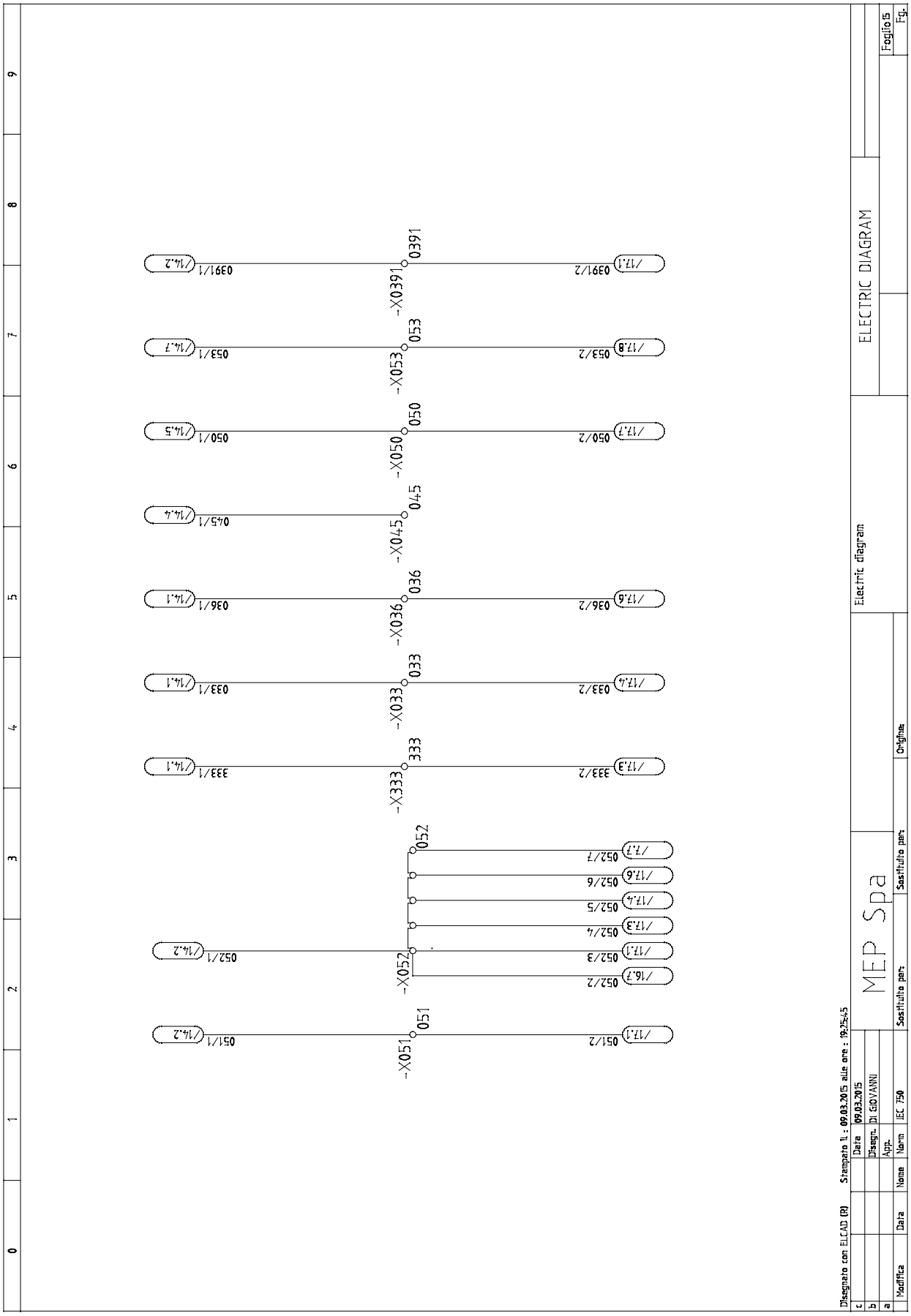

-X-M11(ANALOG OUTPUT)
Pot. Power(4,5v)
Ref. Analog Output(0v)
Head position
023
025
024
SCREENING
GREEN + RED
BROWN + BLUE
WHITE + BLACK
YELLOW + ORANGE
HEAD POTENTIOMETER 4x2x AWG24 ST -W21
-R5
HEAD POTENTIOMETER
-X-M10(ANALOG OUTPUT)
Bade Speed Ref.
Bade Speed Ref.
115
116
-Z1
-X-M8(STEP OUTPUT)
SCREENING
DIR-
DIR+
STEP-
STEP+
0320
0315
0314
STEP OUTPUT 4x0.50 SCREENING -W29/1
-X-M7(POWER SUPPLY)
+ 24 Vdc
0 Vdc
061
60
POWER 24 Vdc 2xAWG18 OIL RESISTANT -W01 dc
BLACK 1
BLACK 2
-X-M6(OUTPUT MOTOR STEPPER)
SCR
B+
B-
A-
A+
311
312
313
314
MOTOR HEAD DESCENT 4x2x AWG24 ST -W28
WHITE + BLACK
BROWN + BLUE
-M9
STEP MOTOR CYLINDER HEAD DESCENT
Disegnato con ELCAD (R)
Stampato il : 09.03.2015 alle ore : 19.24.39
MEP Spa
CENTRAL UNIT MEP 50
Electric diagram
ELECTRIC DIAGRAM
Foglio 10
Fg.
Modifica
Data
Name
Norm
IEC 750
Sostituito pers.
Origine

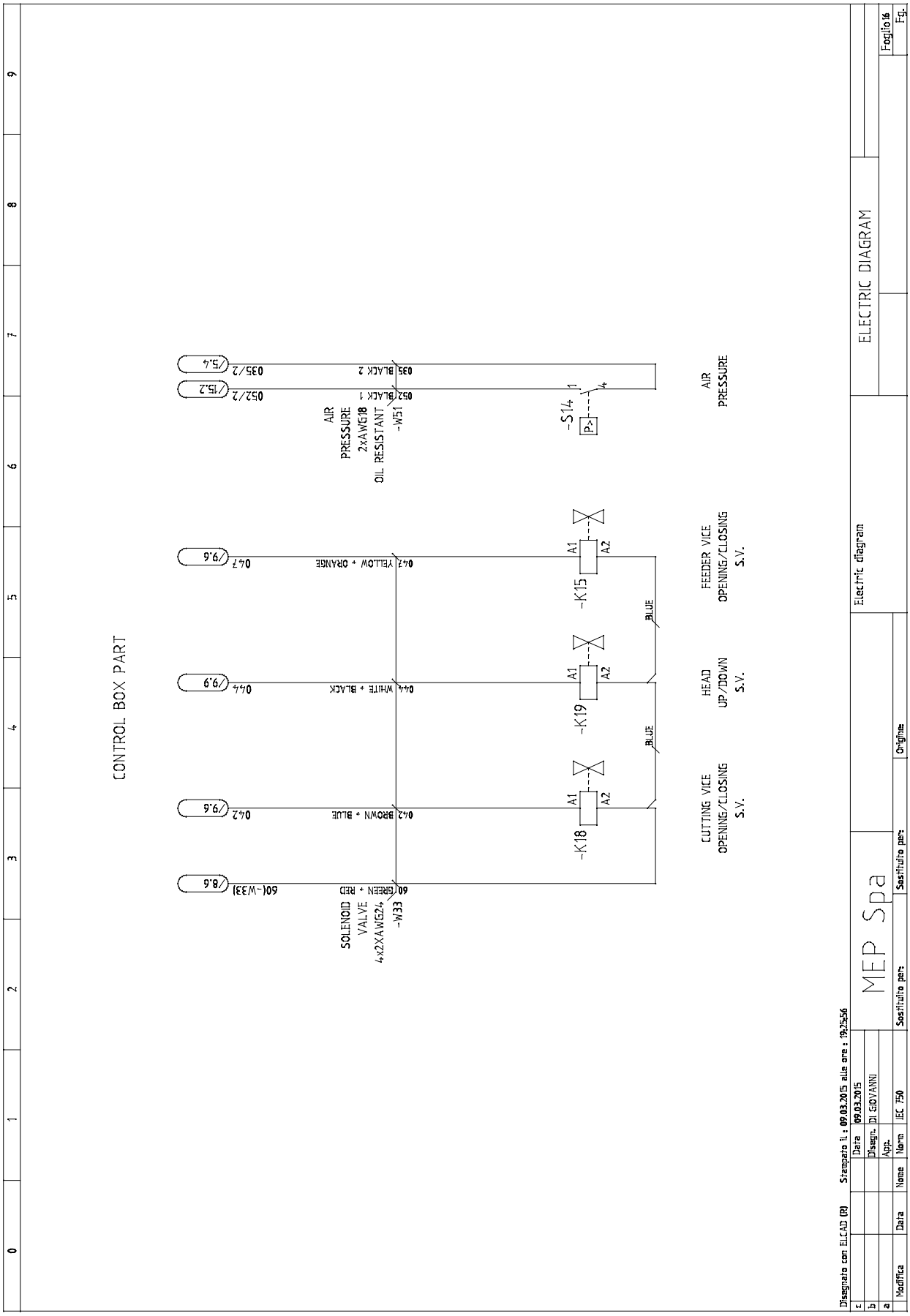

-X-M16(SENSORY POWER SUPPLY)
0 Vdc 051
/14.2 051
-X-M15(DIGITAL INPUT)
Start Pedal 033
Emergency OK 02
Carter Power Closed 0392
Inverter Alarm 038
Air Pressure OK 035
Oil Level Low 036
/14.1 033
/14.8 02
/14.2 0392
/2.5 038
/14.1 035
/14.1 036
-X-M14(SENSORY POWER SUPPLY)
+24 Vdc 052
+24 Vdc 052
/2.5 052/2
/14.2 052
MEP SPA
CENTRAL UNIT MEP 50
Electric diagram
ELECTRIC DIAGRAM
Disegnato con ELCAD (R) Stampato il : 09.03.2015 alle ore : 19.24.53
Data 09.03.2015
Disegn. DI GIOVANNI
Appr.
Norm IEC 750
Sostituito per:
Origine:
Modifica
Foglio 11
Fg.

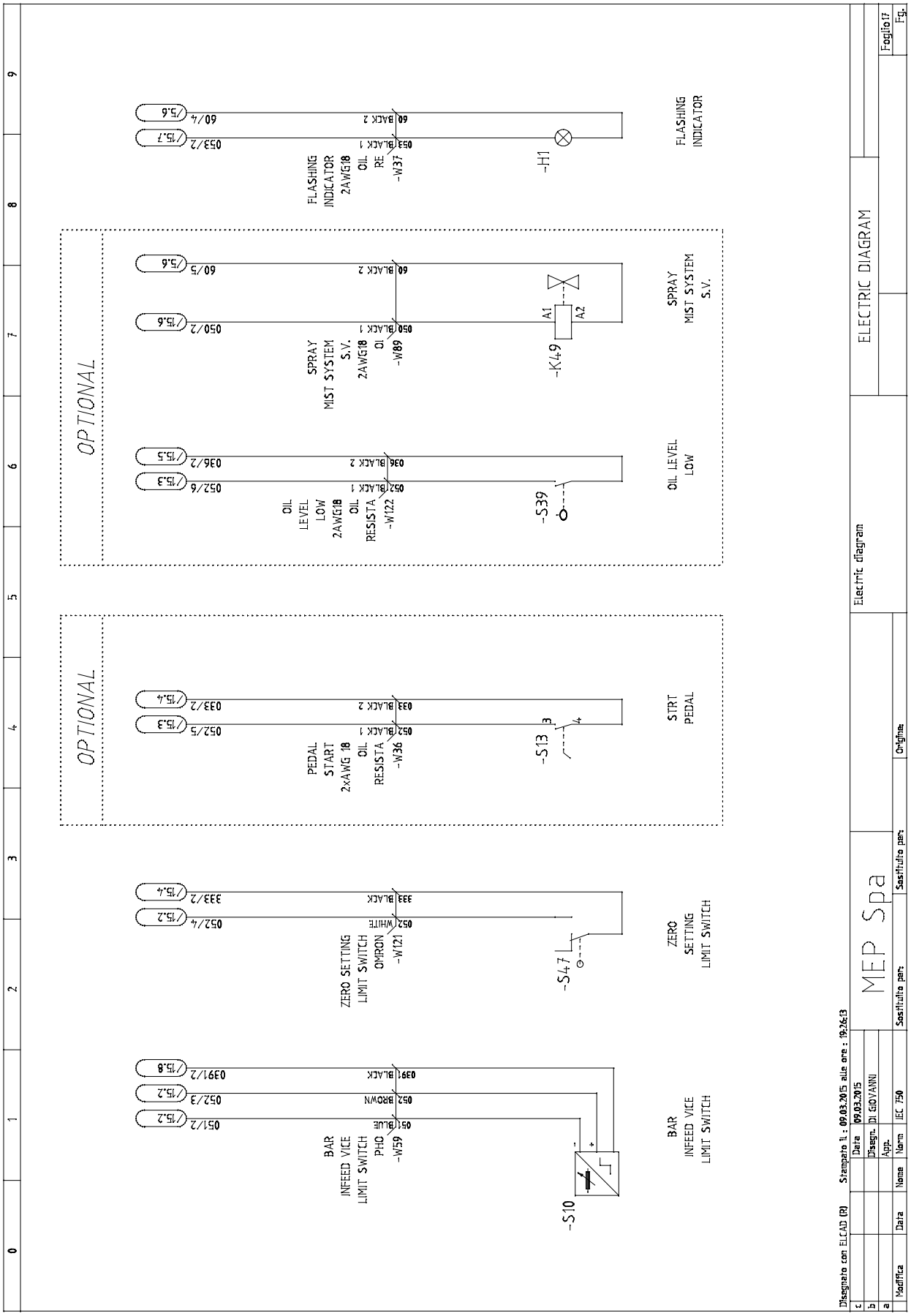

-X-M18(DIGITAL INPUT)
Reset 03
Fast 001
Bar infeed Vise L. SW. 0391
Zero Setting L. SW. 333
Joysitc X- 112
Joysitc Y- 113
Joysitc Y+ 114
Joysitc X+ 115
/8.9 115/X+
/8.8 114/Y+
/8.8 113/Y-
/8.8 112/X-
/8.8 333
/14.1 0391
/14.2 001
/8.1 03
/8.3
-X-M17 (SENSORY POWER SUPPLY)
+24 Vdc 052
+24 Vdc 052
+24 Vdc 052
+24 Vdc 052
+24 Vdc 052
/8.7 052/X+
/8.7 052/Y+
/8.8 052/Y-
/8.8 052/X-
/8.1 052/8
MEP Spa
CENTRAL UNIT MEP 50
Electric diagram
ELECTRIC DIAGRAM
Foglio 12
Fg.

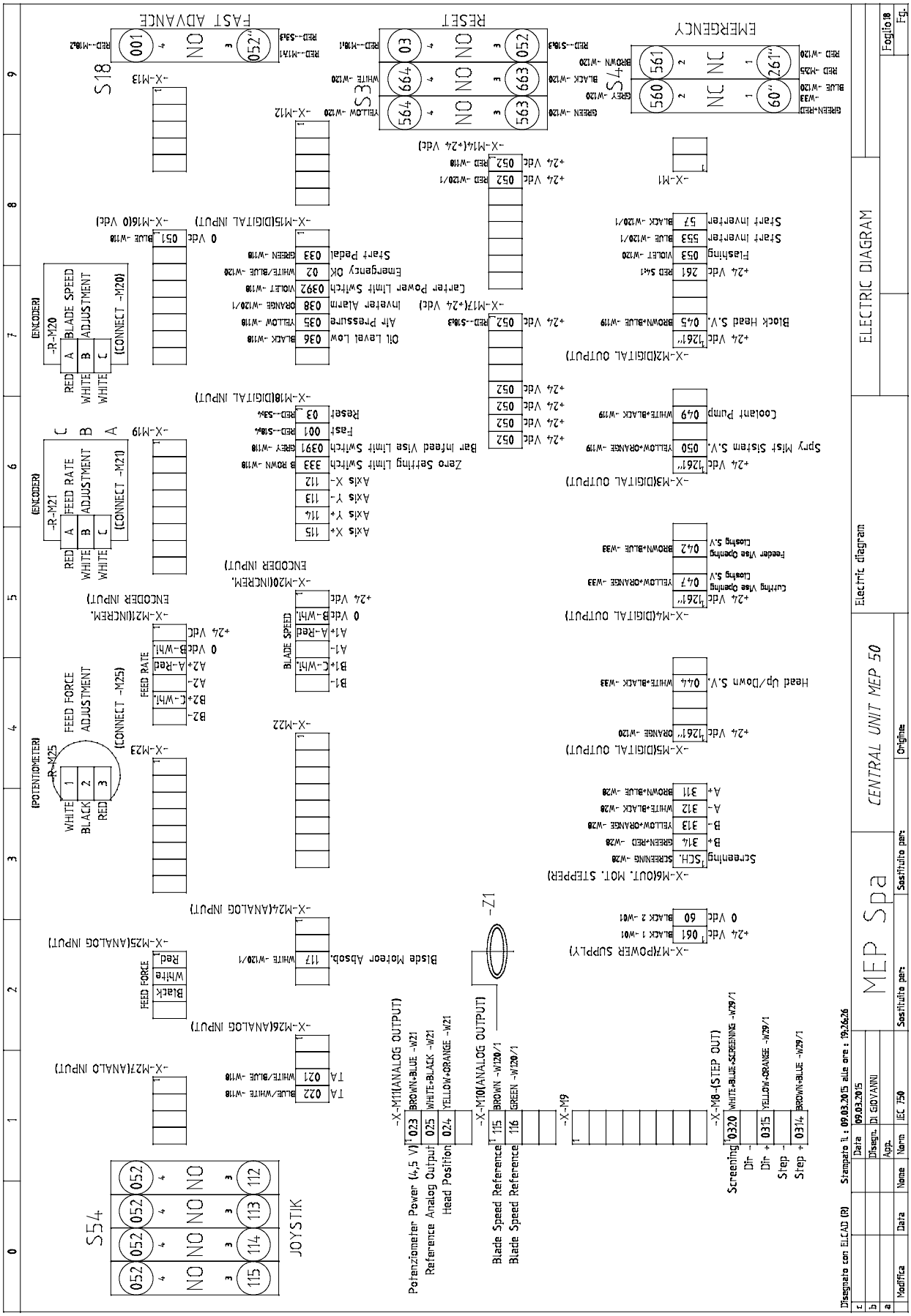

-X-M20(INCREM. ENCODER INPUT)
+24 Vdc
0 Vdc
A1+
A1-
B1+
B1-
FLAT ENCODER -W R-M20
-R-M20 (ENCODER)
BLADE SPEED ADJUSTMENT
-X-M21(INCREM. ENCODER INPUT)
+24 Vdc
0 Vdc
A2+
A2-
B2+
B2-
FLAT ENCODER -W R-M21
-R-M21 (ENCODER)
FEED RATE ADJUSTMENT
-X-M24-(ANALAG. INPUT)
Blade Motor Absorb.
117
-X-M25(ANALOG INPUT)
RED
WHITE
BLACK
-R-M25 (POTENTIOMETER)
FEED FORCE ADJUSTMENT
-X-M26(ANALOG. INPUT)
TA 021
TA 022
MEP SpA
CENTRAL UNIT MEP 50
ELECTRIC DIAGRAM
Electric diagram

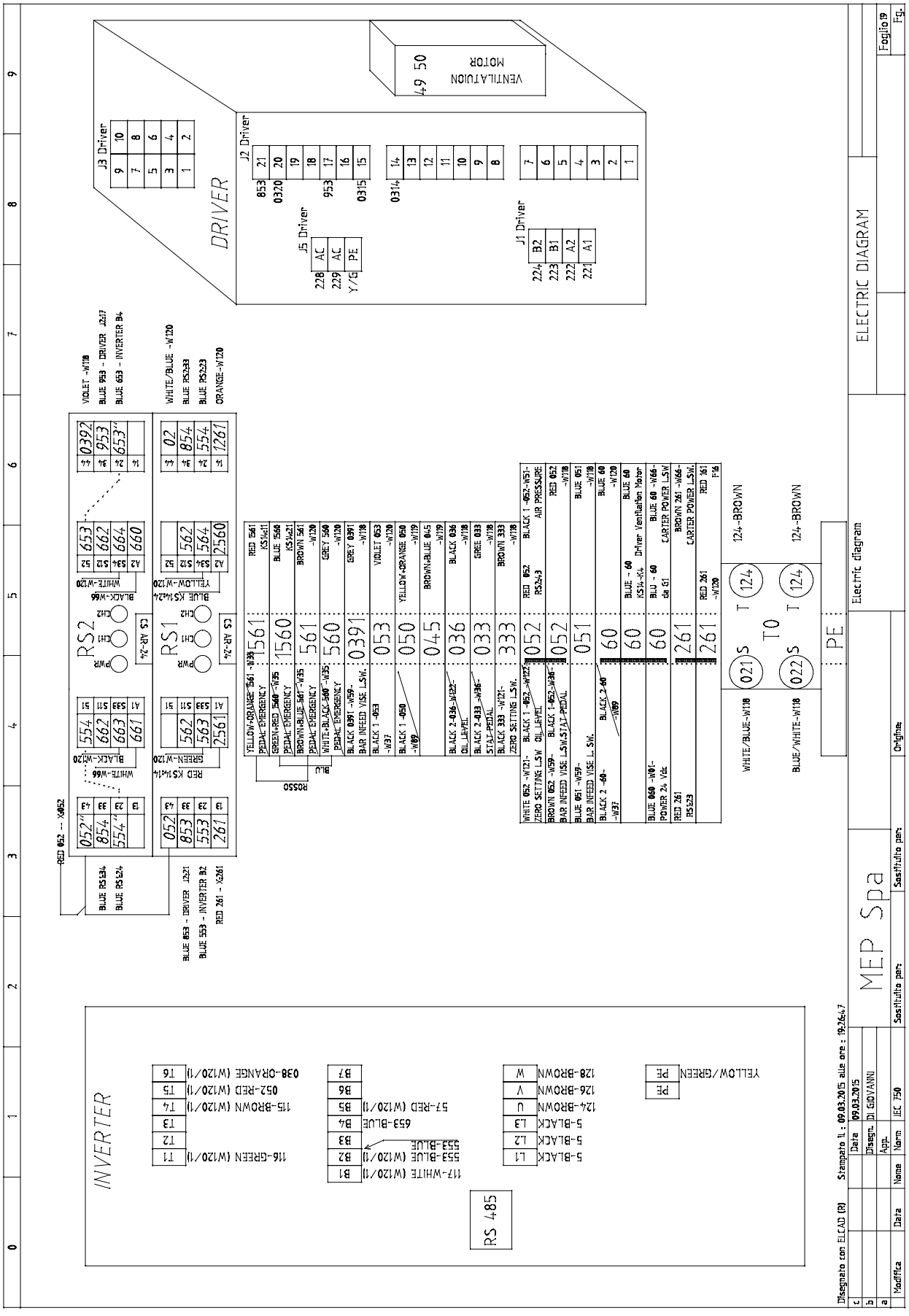

CONTROL BOX PART
CONTROL BOX PART
CONTROL BOX PART
ELECTRICAL BOX PART
ELECTRICAL BOX PART
ELECTRICAL BOX PART
-W118
6x2xAWG24 ST
-W119
4x2xAWG24 ST
-W120
6x2xAWG24 ST
MEP Spa
Electric diagram
ELECTRIC DIAGRAM
Foglio 14
Fg.
Origine
Sostituito da:
Sostituito per:
Disegnato con ELCAD (R)
Stampato il : 09.03.2015 alle ore : 19.25:33
Modifica
Data
Name
Norm
IEC 750
Disegn.
DI GIOVANNI
App.

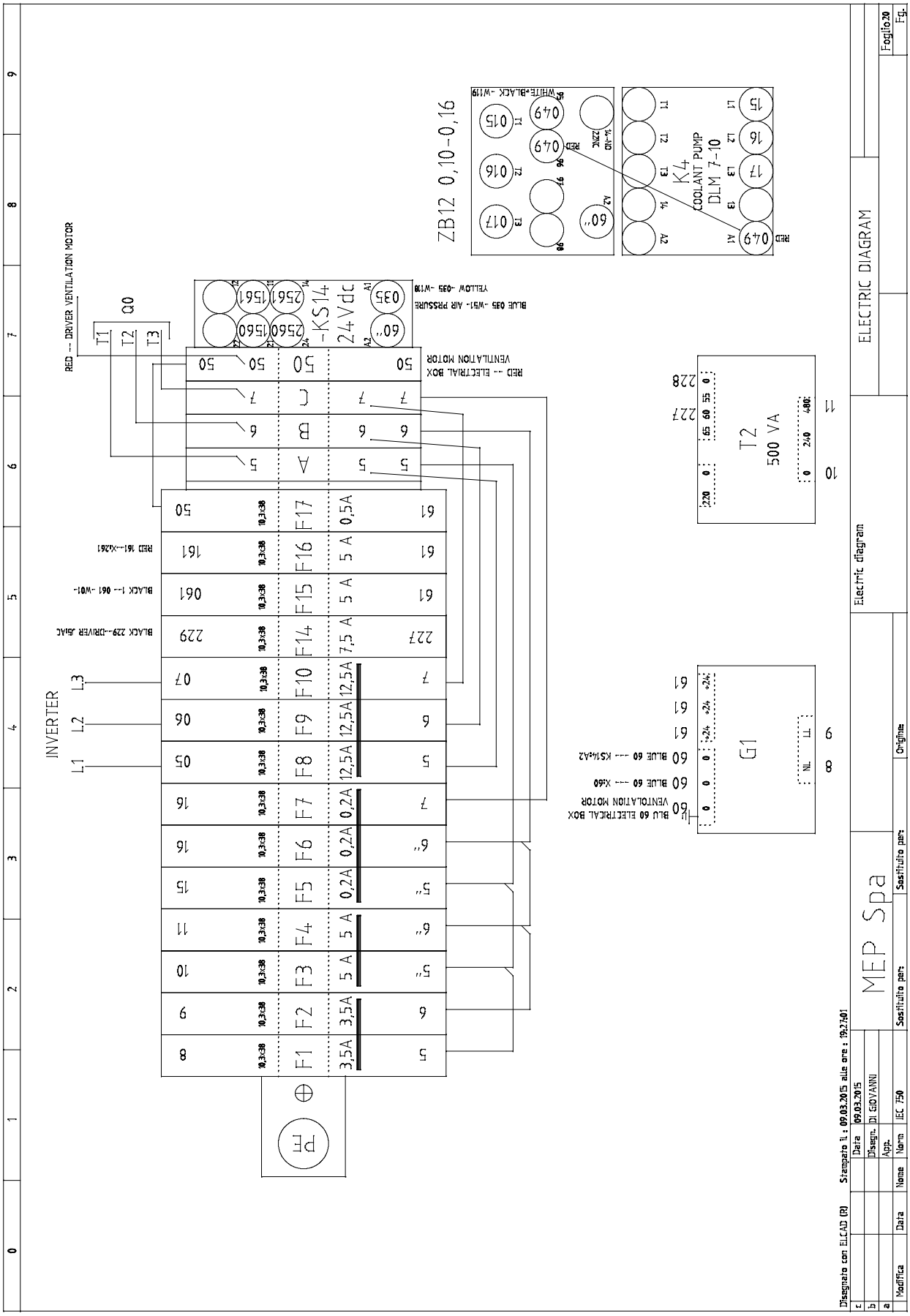

ELECTRIC DIAGRAM
Electric diagram
MEP SpA
Foglio 15
Fg.
Disegnato con ELCAD (R)
Stampato il : 09.03.2015 alle ore : 19.25.45
Data
Disegn.
Di GIOVANNI
Appr.
Modifica
Nome
Norm
IEC 750
Sostituito per:
Sostituito per:
Originale
-X0391
0391
-X053
053
-X050
050
-X045
045
-X036
036
-X033
033
-X333
333
-X052
052
-X051
051
/17.1
0391/2
/14.2
0391/1
/17.8
053/2
/14.7
053/1
/17.7
050/2
/14.5
050/1
/14.4
045/1
/17.6
036/2
/14.1
036/1
/17.4
033/2
/14.1
033/1
/17.3
333/2
/14.1
333/1
/7.7
052/7
/17.6
052/6
/17.4
052/5
/17.3
052/4
/17.1
052/3
/16.7
052/2
/14.2
052/1
/17.1
051/2
/14.2
051/1


CONTROL BOX PART
AIR PRESSURE 2xAWG18 OIL RESISTANT -W51
BLACK 1
BLACK 2
052/2
035/2
-S14
AIR PRESSURE
SOLENOID VALVE 4x2XAWG24 -W33
GREEN + RED
BROWN + BLUE
WHITE + BLACK
YELLOW + ORANGE
-K18
-K19
-K15
CUTTING VICE OPENING/CLOSING S.V.
HEAD UP/DOWN S.V.
FEEDER VICE OPENING/CLOSING S.V.
BLUE
ELECTRIC DIAGRAM
Electric diagram
MEP Spa


OPTIONAL
OPTIONAL
-S10
-S47
-S13
-S39
-K49
-H1
-W59
-W121
-W36
-W122
-W89
-W37
BAR INFEED VICE LIMIT SWITCH
ZERO SETTING LIMIT SWITCH
PEDAL START
OIL LEVEL LOW
SPRAY MIST SYSTEM S.V.
FLASHING INDICATOR
MEP SpA
Electric diagram
ELECTRIC DIAGRAM


ELECTRIC DIAGRAM
CENTRAL UNIT MEP 50
MEP Spa
Electric diagram
EMERGENCY
RESET
FAST ADVANCE
JOYSTIK
S54
S4
S3
S18
-X-M1
-X-M2(DIGITAL OUTPUT)
-X-M3(DIGITAL OUTPUT)
-X-M4(DIGITAL OUTPUT)
-X-M5(DIGITAL OUTPUT)
-X-M6(OUT. MOT. STEPPER)
-X-M7(POWER SUPPLY)
-X-M8-(STEP OUT)
-X-M9
-X-M10(ANALOG OUTPUT)
-X-M11(ANALOG OUTPUT)
-X-M12
-X-M13
-X-M14(+24 Vdc)
-X-M15(DIGITAL INPUT)
-X-M16(0 Vdc)
-X-M17(+24 Vdc)
-X-M18(DIGITAL INPUT)
-X-M19
-X-M20(INCREM. ENCODER INPUT)
-X-M21(INCREM. ENCODER INPUT)
-X-M22
-X-M23
-X-M24(ANALOG INPUT)
-X-M25(ANALOG INPUT)
-X-M26(ANALOG INPUT)
-X-M27(ANALO INPUT)
-Z1
-R-M20 (ENCODER)
-R-M21 (ENCODER)
-R-M25 (POTENTIOMETER)
(CONNECT -M20)
(CONNECT -M21)
(CONNECT -M25)
BLADE SPEED ADJUSTMENT
FEED RATE ADJUSTMENT
FEED FORCE ADJUSTMENT
Block Head S.V.
Spry Mist Sistem S.V.
Coolant Pump
Cutting Vise Opening S.V
Feeder Vise Opening S.V
Head Up/Down S.V.
Screening
Potenziometer Power (4,5 V)
Reference Analog Output
Head Position
Blade Speed Reference
Blade Speed Reference
Blade Motor Absob.
Oil Level Low
Air Pressure
Inverter Alarm
Carter Power Limit Switch
Emergency OK
Start Pedal
Bar Infeed Vise Limit Switch
Zero Setting Limit Switch
Fast
Reset
Axis X+
Axis X-
Axis Y+
Axis Y-
Flashing
Start Inverter
Start Inverter
Disegnato con ELCAD (R)
Stampato il : 09.03.2015 alle ore : 19.26.26
Data 09.03.2015
Disegn. DI GIOVANNI
Modifica
Foglio 18
Fg.


DRIVER
INVERTER
ELECTRIC DIAGRAM
MEP SpA
Electric diagram
VENTILATION MOTOR
RS 485
PE
T0
J1 Driver
J2 Driver
J3 Driver
J5 Driver
RS1
RS2
WHITE/BLUE-W118
BLUE/WHITE-W118
124-BROWN
YELLOW/GREEN


ELECTRIC DIAGRAM
Electric diagram
MEP Spa
INVERTER
L1 L2 L3
RED -- DRIVER VENTILATION MOTOR
T1 T2 T3 Q0
RED -- ELECTRICAL BOX VENTILATION MOTOR
BLUE 035 -W51- AIR PRESSURE
YELLOW -035 -W18
-KS14 24Vdc
ZB12 0,10-0,16
WHITE+BLACK -W119
K4 COOLANT PUMP DLM 7-10
T2 500 VA
G1
F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 F14 F15 F16 F17
3,5A 3,5A 5 A 5 A 0,2A 0,2A 0,2A 12,5A 12,5A 12,5A 7,5 A 5 A 5 A 0,5A
BLACK 229--DRIVER 3PHAC
BLACK 1-- 061 -W01-
RED 161--X261
BLU 60 ELECTRICAL BOX VENTOLATION MOTOR
60 BLUE 60 --- X60
60 BLUE 60 --- KS14:A2
Disegnato con ELCAD (R) Stampato il : 09.03.2015 alle ore : 19:27:01
Data 09.03.2015
Disegn. DI GIOVANNI
Appr.
Norm IEC 750
Sostituito pers
Origine
Foglio 20
Fg.

APS/P drive for step motors

FOREWORD

This drive allows you to control a step motor, using the RS485.
When the ENABLE input is connected to +12 Vdc/+24 Vdc the drive is disabled (current on motor = 0) resulting in the rotation of the motor being interrupted. When it is disconnected, or connected to 0 V, the drive will be re- enabled and the motor will be energised after at least 1 step is started.
The rate of acceleration/deceleration, the current, and the step division, can be adjusted using the dip- switches and trimmers on the card (see tables).
The two outputs allow the machine to display if the drive is protected (READY_OUT) and if positioning in progress has finished (BUSY).

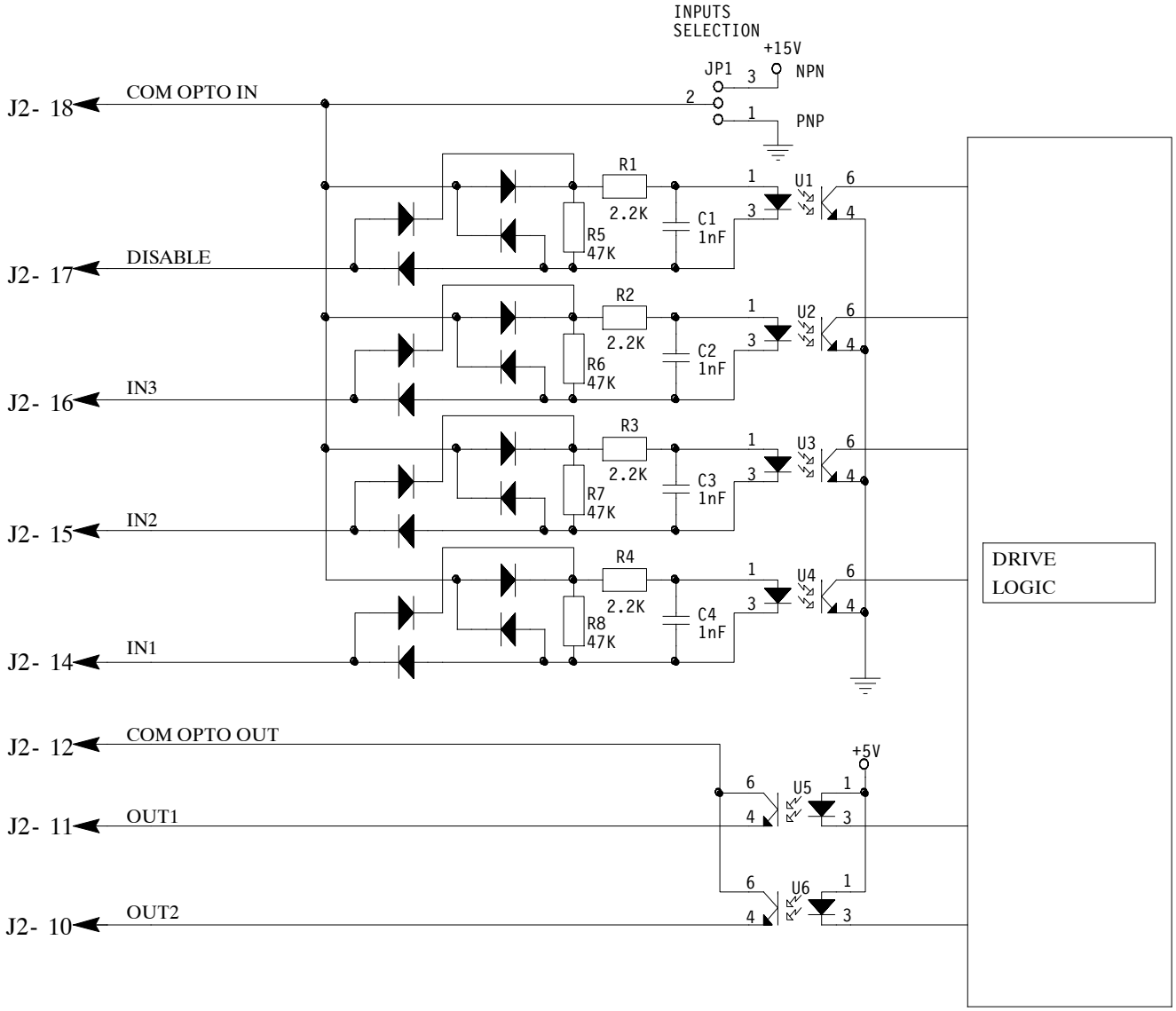
CHARACTERISTICS

CUT	APS3/P
VDC NOM. [V]	40- 80
VDC MAX. [V]	90
VDC MIN. [V]	30
I MAX. [A]	10
I MIN. [A]	1
I PASSO [A]	0.5
Operating temperature [° C]	0- 45

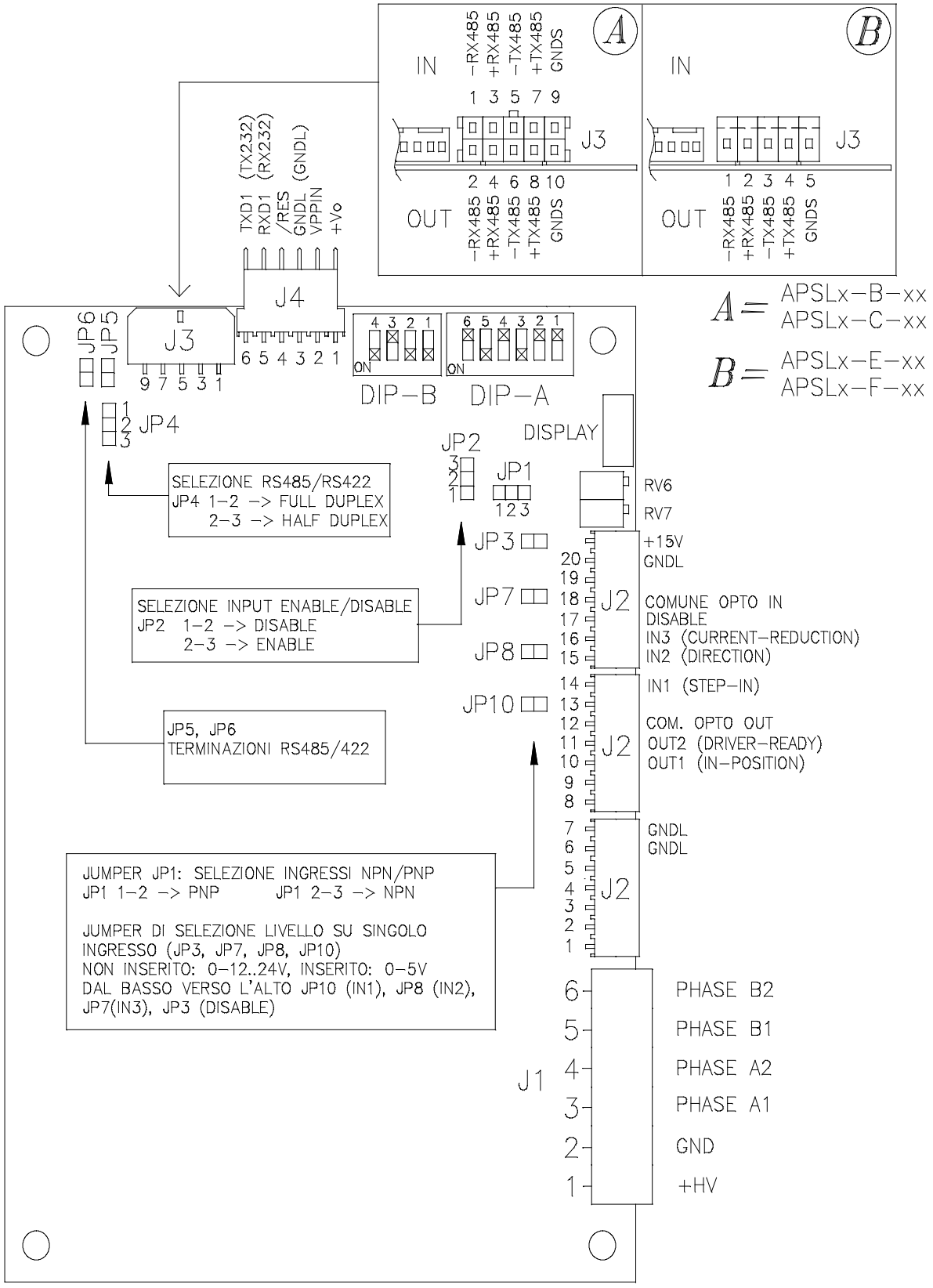
MEANING OF THE PARAMETERS IN THE TABLE

- **Vdc nom:** Nominal voltage at which the drive can be powered.
- **Vdc max:** Maximum voltage at which the drive can operate, where this limit is exceeded the protection intervenes, inhibiting the operation of the drive itself.
- **Vdc min:** Minimum voltage at which the drive can operate. When the voltage drops below this limit, the protection intervenes, inhibiting the operation of the drive itself.
- **I max:** Maximum value for the phase current.
- **I min:** Minimum value for the phase current.
- **I step:** Difference between the settable current values.
- **Operating temperature:** Forced ventilation is necessary for currents exceeding 6A.

SCHEMATIC CONFIGURATION OF INPUTS / OUTPUTS



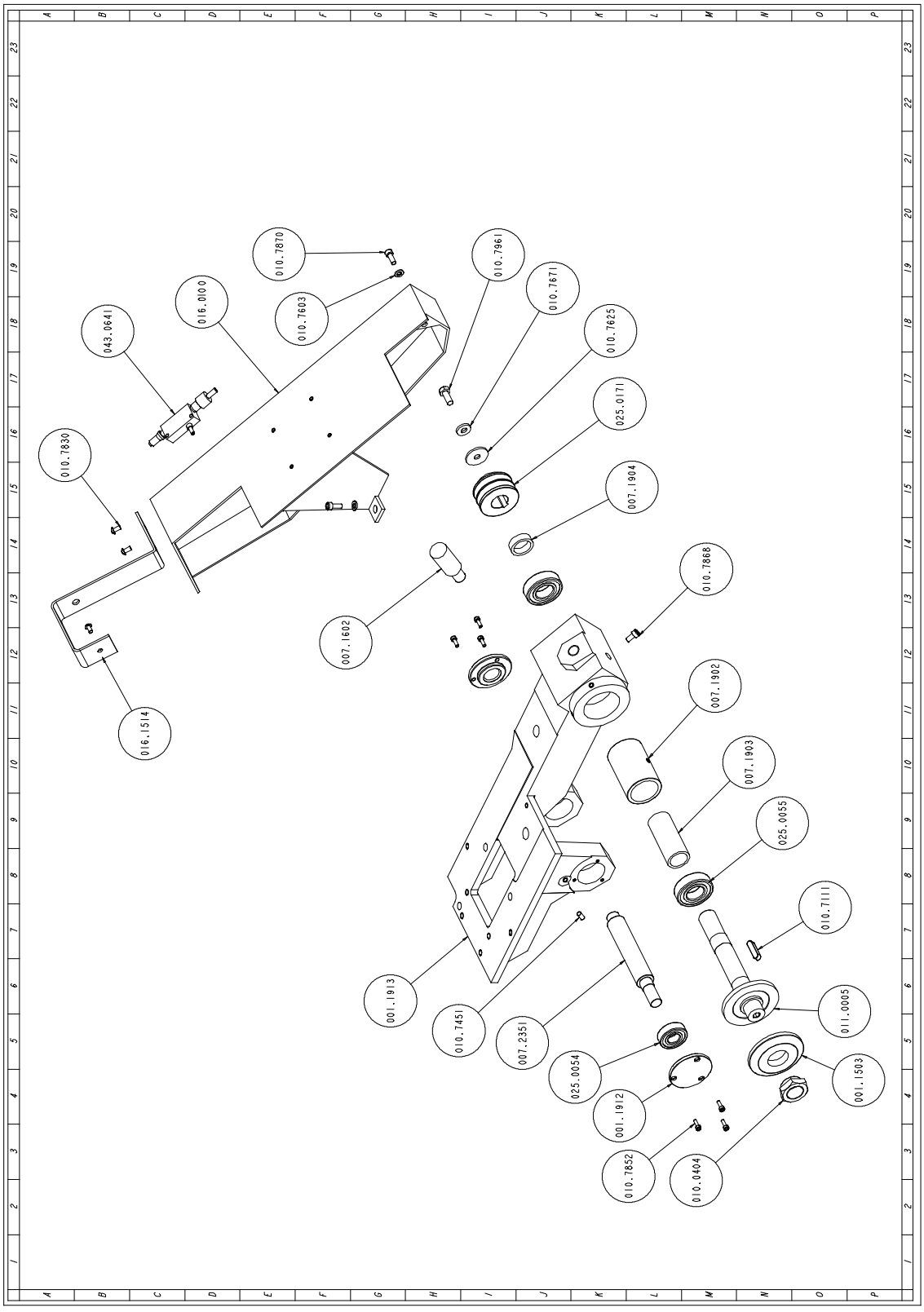
LAYOUT OF APS/P DRIVE COMPONENTS



Exploded views

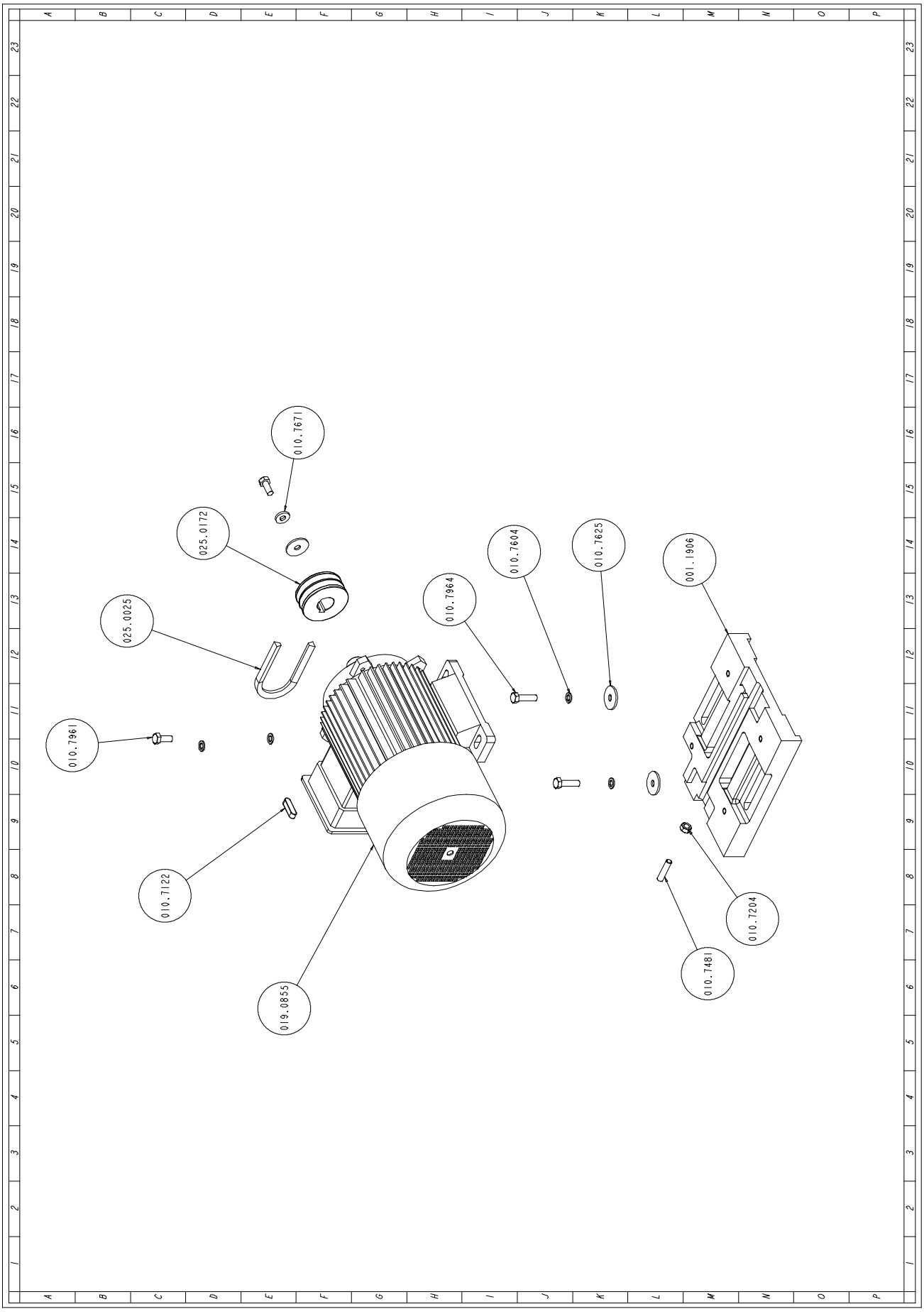
This part of the manual contains detailed exploded views of the machine which can help to gain a deeper knowledge of how it is made.

Head unit



Code	Description	U. of M.	Quantity
001.1503	FLANGIA ESTERNA	NR	1,000
001.1912	COPERCHIO SNODO TESTA	NR	2,000
001.1913	BILANCIERE	NR	1,000
007.1602	ASTA COMANDO MANUALE	NR	1,000
007.1902	DISTANZIALE CUSCINETTO ESTERNO	NR	1,000
007.1903	DISTANZIALE CUSCINETTO INTERNO	NR	1,000
007.1904	DISTANZIALE PULEGGIA	NR	1,000
007.2351	PERNO SUPPORTO SNODO TESTA	NR	1,000
010.0404	DADO ESAGONALE MM.25 P. 2	NR	1,000
010.7111	CHIAVETTA 8 X 7 X 32	NR	1,000
010.7451	GRANO VCE P.CON. 6 X 12	NR	1,000
010.7603	RONDELLA DIAM. 6	NR	2,000
010.7625	RONDELLA DIAM. 8 X 32	NR	1,000
010.7671	RONDELLA SPESSORE DIAM. 8 X 3	NR	1,000
010.7830	VITE BUTON 5 X 10	NR	3,000
010.7852	VITE TCEI 4 X 12	NR	6,000
010.7868	VITE TCEI 6 X 12	NR	1,000
010.7870	VITE TCEI 6 X 16	NR	2,000
010.7961	VITE TE 8 X 20	NR	1,000
011.0005	ALBERO PORTADISCO	NR	1,000
016.0100	CARTER CINGHIA	NR	1,000
016.1514	STAFFA FIX CONVOGLIATORE TRUCI	NR	1,000
025.0054	CUSCINETTO 62.03 2Z	NR	1,000
025.0055	CUSCINETTO 62.05 2Z C3	NR	2,000
025.0171	PULEGGIA 50X2 SPZ FORO 24	NR	1,000
043.0641	NEBULIZZATORE A DEPR. T.724020	NR	1,000

Motor unit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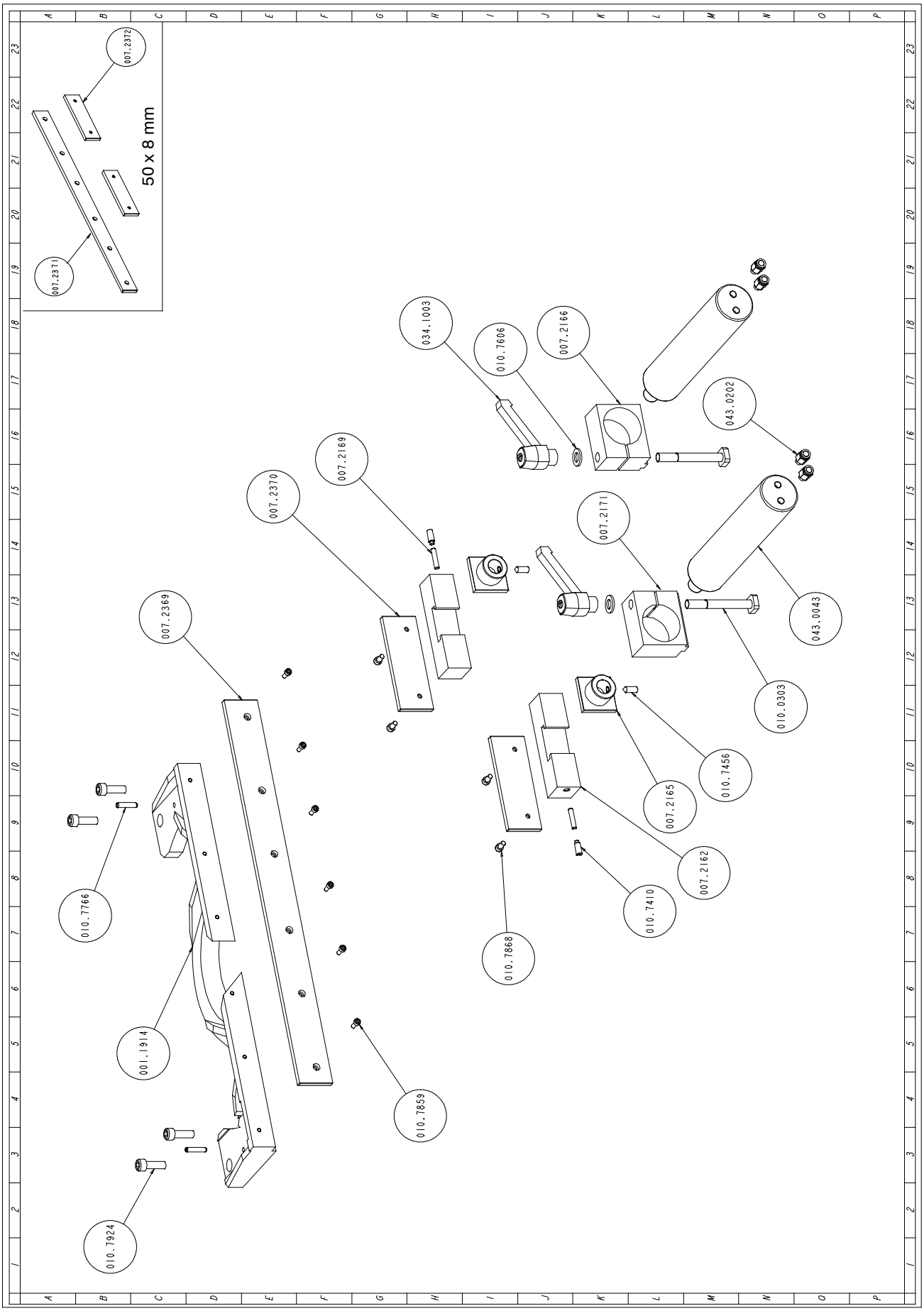
019.0855
010.7204
010.7481

Code	Description	U. of M.	Quantity
001.1906	PIANA MOTORE	NR	1,000
010.7122	CHIAVETTA 8 X 8 X 32	NR	1,000
010.7204	DADO M8	NR	1,000
010.7481	GRANO VCE PUNTA PIANA 8 X 35	NR	1,000
010.7604	RONDELLA DIAM. 8	NR	6,000
010.7625	RONDELLA DIAM. 8 X 32	NR	3,000
010.7671	RONDELLA SPESSORE DIAM. 8 X 3	NR	1,000
010.7961	VITE TE 8 X 20	NR	5,000
010.7964	VITE TE 8 X 30	NR	2,000
019.0855	HP 2/3 2/4P 2V.V.380 C90L	NR	1,000
025.0025	CINGHIA SPZ 900 S.TX	NR	1,000
025.0172	PULEGGIA 60X2 SPZ FORO 24	NR	1,000

Vice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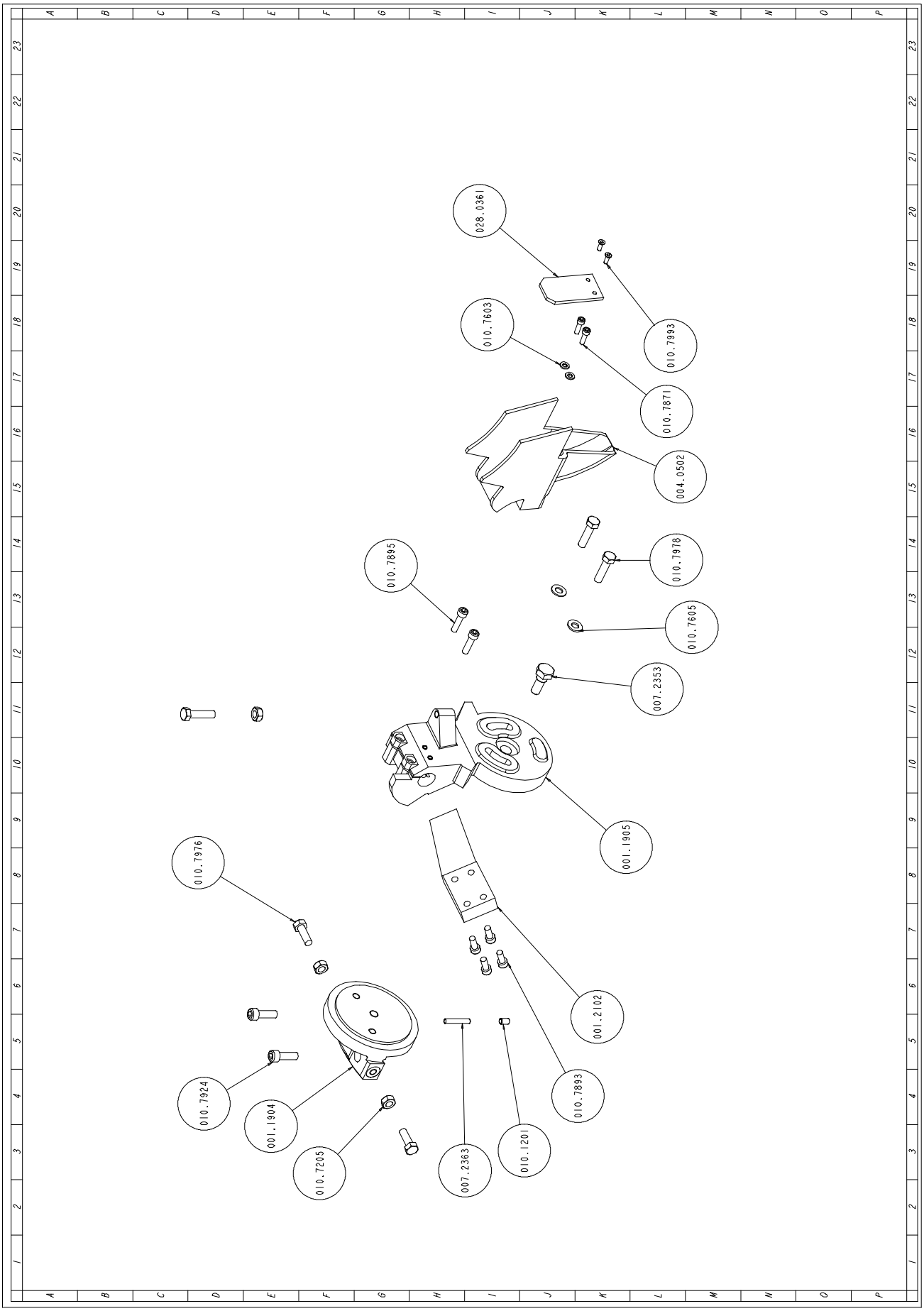
010.7868
010.7766
001.1914
010.7859
010.7924

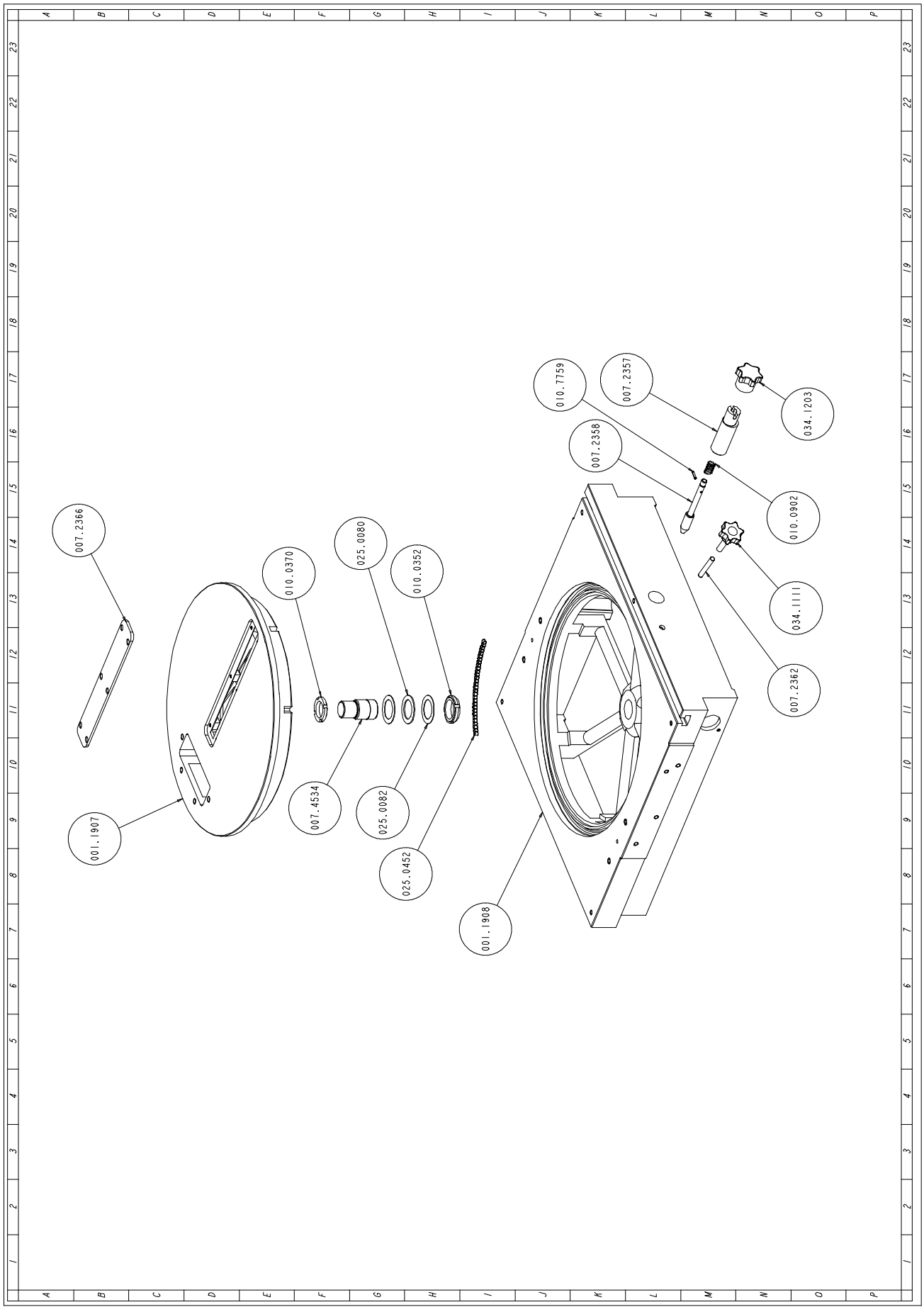
Code	Description	U. of M.	Quantity
001.1914	SQUADRO-MORSA-CB350	NR	1
001.3709	STAFFA-BLOCCAGGIO-CILINDRO	NR	1
007.2162	GANASCIA-MORSA-CB350	NR	2
007.2165	SUP-GANASCIA-MORSA-CB349-350	NR	2
007.2166	SUP-CAN-MORSA-CB350-SX-AX-CNC	NR	1
007.2171	SUPPORTO DX CANNOTTO MORSA CBSX-AX-CNC	NR	1
007.2169	PERNO-BLOCC-GANASCIA-CB350	NR	2
007.2369	GANASCIA FISSA 38X8 CB 350	NR	1
007.2370	GANASCIA MOBILE 38X8 CB350	NR	2
007.2511	SUPPORTO-CIL-SUPPLEMENT-CB352	NR	1
007.3234	BOCC-GAN-CIL-SUPPL	NR	1
010.0303	VITE-TQ-22X22M12X95CB350	NR	2
010.7410	M8X16-VCEI-PR	NR	2
010.7456	M8X16-VCEI-PC	NR	2
010.7460	M8X12-VCEI-PC	NR	1
010.7606	ROSETTA-13X24	NR	3
010.7766	SPINA-ELASTICA-6X30	NR	2
010.7859	M5X12-TCEI	NR	6
010.7868	M6X12-TCEI	NR	4
010.7894	M8X25-TCEI	NR	1
010.7912	M10X35-TCEI	NR	1
010.7924	M10X30-TCEI	NR	2
010.7926	M10X45-TCEI	NR	2
010.7941	M12X35-TCEI	NR	1
034.1003	LEVA-SCATTO-M12	NR	2
043.0041	CILINDRO-MORSE-DOPPIO-EFFETTO	NR	1
043.0043	CILINDRO-MORSE-50-C8-DE	NR	2
043.0199	ATTACCO-A-GOMITO-G-4X1_8CL6511	NR	2
043.0202	ATTACCO-ESAGONO-8X1_8CL6511	NR	4
178.0007	GRUPPO-MORSA-CB352-NC-EVO	NR	1
NOCODE	SUPPORTO-CIL-SUPPL-P1	NR	1
NOCODE	SUPPORTO-CIL-SUPPL-P2	NR	1
NOCODE	SUPPORTO-CIL-SUPPL-P3	NR	1
NOCODE	BOCC-CIL-SUPPL	NR	1
NOCODE	GAN-CIL-SUPPL	NR	1

Head pivot support



Code	Description	U. of M.	Quantity
001.1904	SUPPORTO PIANO GIREVOLE	NR	1,000
001.1905	SUPPORTO SNODO TESTA	NR	1,000
001.2102	STAFFA ATTACCO FORCELLA	NR	1,000
004.0502	PROTEZIONE FISSA	NR	1,000
007.2353	VITE ESAGONO SNODO TESTA	NR	1,000
007.2363	PERNO ANTIROT.TESTA E BLOCC.P.	NR	1,000
010.1201	VITERIA E BULLONERIA	NR	1,000
010.7205	DADO M10	NR	3,000
010.7603	RONDELLA DIAM. 6	NR	2,000
010.7605	RONDELLA DIAM. 10	NR	2,000
010.7871	VITE TCEI 6 X 20	NR	2,000
010.7893	VITE TCEI 8 X 20	NR	4,000
010.7895	VITE TCEI 8 X 30	NR	2,000
010.7924	VITE TCEI 10 X 30	NR	2,000
010.7976	VITE TE 10 X 30	NR	2,000
010.7978	VITE TE 10 X 40	NR	3,000
010.7993	VITE TSPEI 5 X 12	NR	2,000
028.0361	RACCORDO IN GOMMA CARTER	NR	1,000

Tourntable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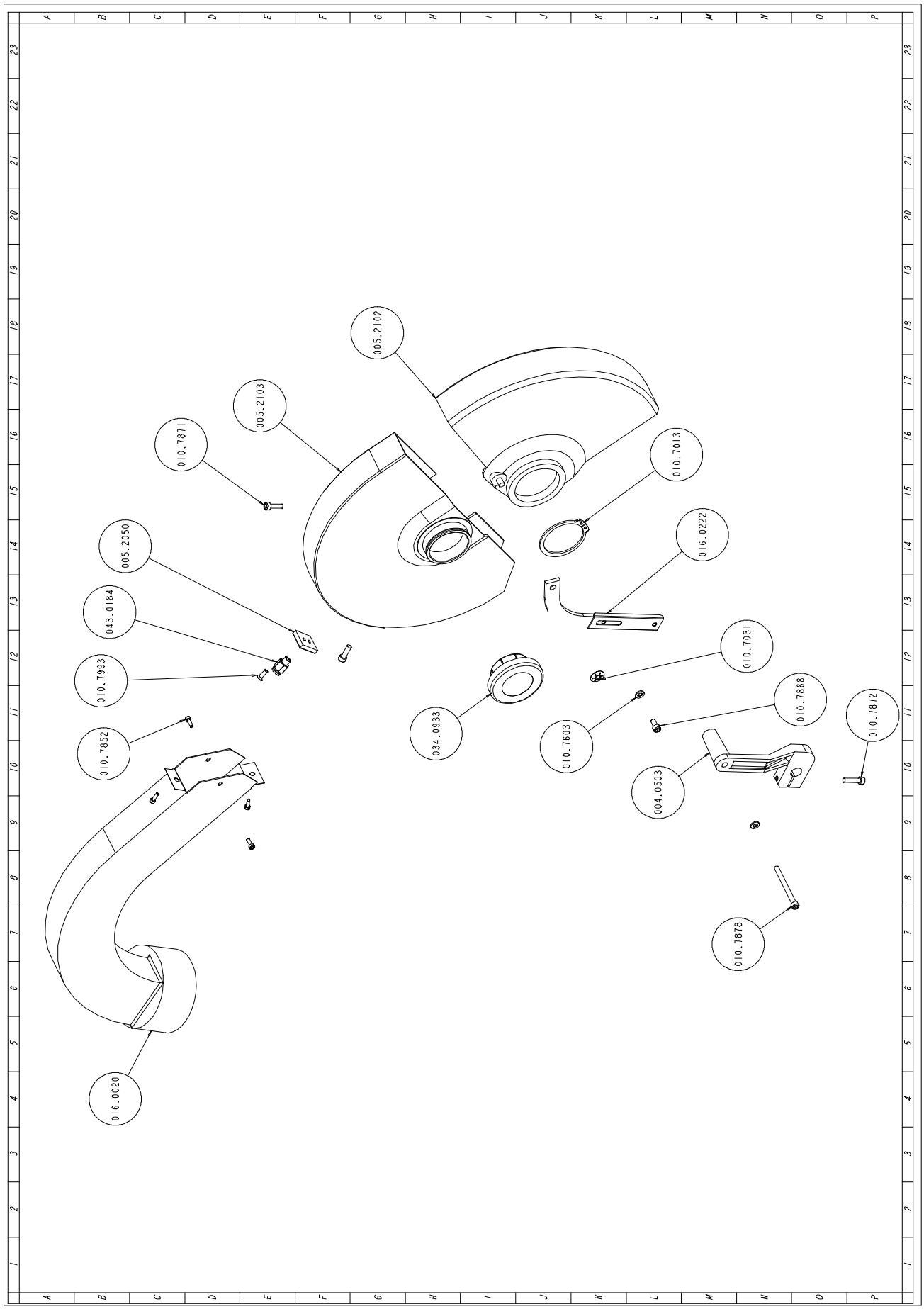
007.2362

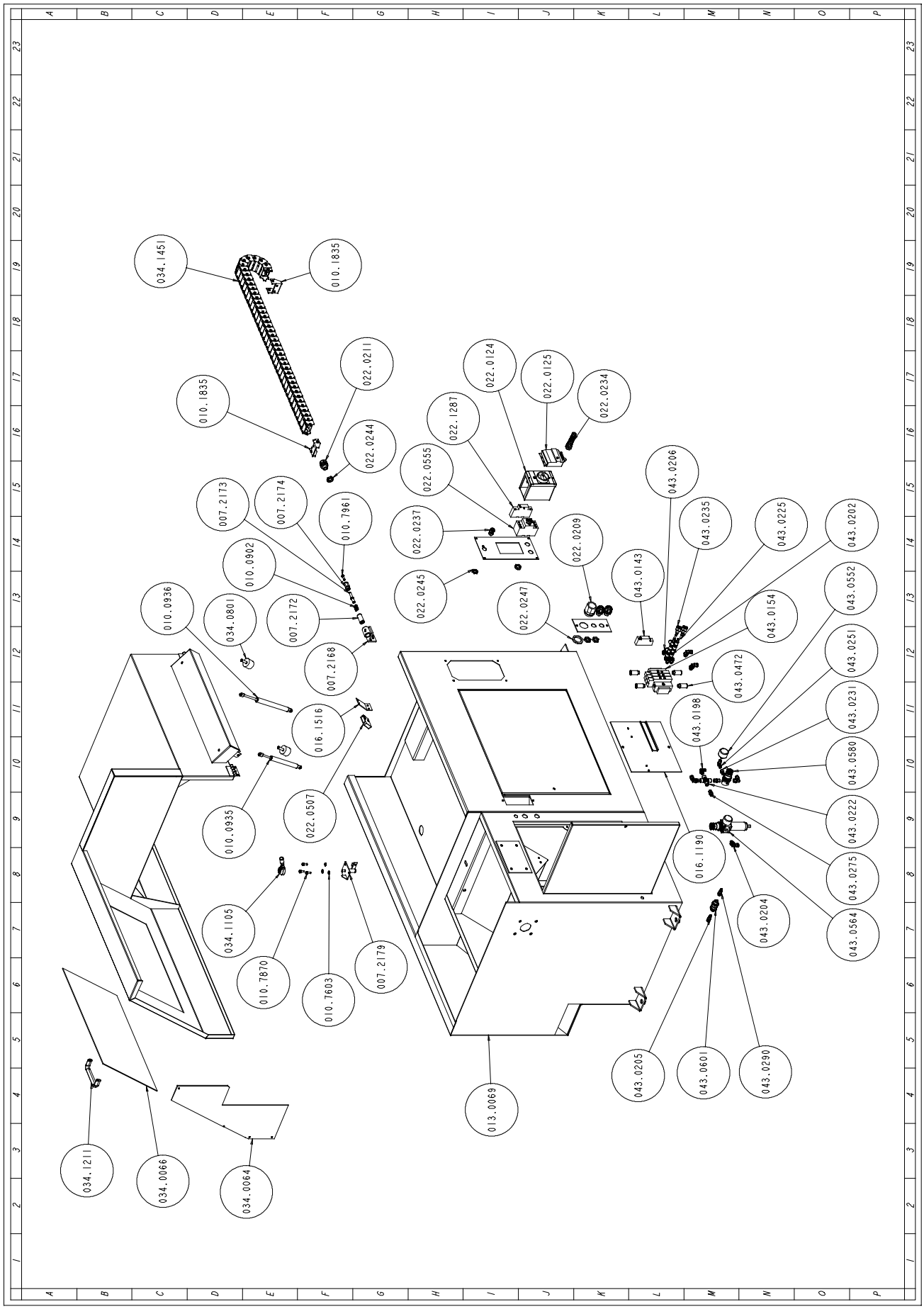
Code	Description	U. of M.	Quantity
001.1907	PIANO GIREVOLE CB 350 N.T.	NR	1,000
001.1908	BASAMENTO CB 350 N.T. MOD	NR	1,000
007.2356	ECCENTRICO PUNTO FISSO	NR	1,000
007.2359	PERNO PUNTO FISSO CB 350 N.T.	NR	1,000
007.2362	PERNO BLOCCAGGIO PIANO GIREVOL	NR	1,000
007.2366	PIASTRA PIANO GIREVOLE CB 350	NR	1,000
007.4534	PERNO DI CENTRO	NR	1,000
010.0352	GHIERA AUTOBLOCCANTE 35X1,5	NR	1,000
010.0370	GHIERA 5S 30X1,5	NR	1,000
010.0902	MOLLE PUNTO FISSO TESTA	NR	1,000
010.7759	SPINA ELASTICA DIAM. 3 X 16	NR	1,000
025.0080	GABBIA ASSIALE A RULLINI AXK 3	NR	1,000
025.0082	RALLA AS 3552	NR	2,000
025.0452	RULLI 6X6 AISI 420	NR	30,000
034.1111	VOLANTINO DIAM.30 M10 X 40	NR	1,000
034.1203	IMPUGNATURA NS. DISEGNO M10	NR	1,000

Blade guard unit



Code	Description	U. of M.	Quantity
004.0503	SUPPORTO ASTA PROTEZIONE	NR	1,000
005.2050	COPERCHIETTO FORO RUBINETTO	NR	1,000
005.2102	PROTEZIONE DISCO	NR	1,000
005.2103	CARTER DISCO	NR	1,000
010.7013	ANELLO SEEGER DIAM. 62	NR	1,000
010.7031	RING SK 8	NR	1,000
010.7603	RONDELLA DIAM. 6	NR	2,000
010.7852	VITE TCEI 4 X 12	NR	4,000
010.7868	VITE TCEI 6 X 12	NR	1,000
010.7871	VITE TCEI 6 X 20	NR	2,000
010.7872	VITE TCEI 6 X 25	NR	1,000
010.7878	VITE TCEI 6 X 70	NR	1,000
010.7993	VITE TSPEI 5 X 12	NR	1,000
016.0020	CONVOGLIATORE TRUCIOLI	NR	1,000
016.0222	ASTA COMANDO PROTEZIONE	NR	1,000
034.0933	TAPPO CARTER DISCO	NR	1,000
043.0184	ATTACCO A ESAGONO 6X1/8 CL 651	NR	1,000

Base vice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Code	Description	U. of M.	Quantity
007.2168	SUPPORTO- BLOC- CART- ALI- CBAX- CNC	NR	1.000
007.2172	BUSSOLA- CB349- 350D	NR	1.000
007.2173	PERNO- BLOCCAGGIO- CB349- 350D	NR	1.000
007.2174	GHIERA- DI- SPALL- CB349- 350D	NR	1.000
007.2179	GRUPPO- SBLOC- TESTA- CB350	NR	1.000
007.2179	GRUPPO- SBLOC- TESTA- CB350PRT2	NR	1.000
010.0902	MOLLA- PUNTO- FISSO- TESTA- MOD95	NR	1.000
010.0935	MOLLA- GAS- PROT- CB350SX	NR	1.000
010.0936	MOL- GAS125MM600N- CBAX- CNC- SH300	NR	1.000
010.1835	SET- ATTACCHI- 117_4_12P- AX- CNC- F	NR	1.000
010.1835	SET- ATTACCHI- 117_4_12P- AX- CNC- M	NR	1.000
010.7221	DADO- M16- BASSO	NR	4.000
010.7603	ROSETTA- 6_4X12_5	NR	3.000
010.7870	M6X16- TCEI	NR	3.000
010.7961	VITE- SBLOC- TESTA- CB350	NR	1.000
013.0069	PIEDISTALLO- CB352- NC	NR	1.000
016.1190	PAN- PNE- TI- CB- NC- SX	NR	1.000
016.1242	PIASTRA- PASSACAVI- NC	NR	1.000
016.1243	PIASTRA- FIX- INT- NC	NR	1.000
016.1516	STAFFA- FIX- FC- COP- CB350AX	NR	1.000
022.0124	INTERRUTTORE- PKZ0- GR	NR	1.000
022.0125	BLOCCO- LUCCHETTO- SVB- PKZ0	NR	1.000
022.0209	PG- 29- KIEPE	NR	1.000
022.0211	PASSACAVO- DIA16- PG13_5	NR	3.000
022.0234	PASSACAVO- PG13_5	NR	1.000
022.0237	PRESSACAVO- PG11- BS01	NR	1.000
022.0244	DADO- PASSACAVO- PG13_5	NR	4.000
022.0245	DADO- PASSACAVO- PG11	NR	1.000
022.0247	DADO- POLIAM- HUMMEL- 262- 2900- 11	NR	1.000
022.0507	FINECORSA- D4C1092- 2M- ALIM- CNCFE	NR	1.000
022.0555	SGANCIATORE- U- PKZ0- V400	NR	1.000
022.0900	BARRA- OMEGA	NR	1.000
022.1287	INTERRUTTORE- PKZM0- TERMICA	NR	1.000
034.0064	PROTEZ- LEXAN- LATERALE- CB350CNC	NR	1.000
034.0066	PROT- ALIMENT- CB350AXCNC	NR	1.000
034.0801	ARRESTO- ELAST- P40_30	NR	2.000
034.1105	VOLANTINO- DI- MANOVRA- CB350	NR	1.000
034.1211	MANIGLIA- GN- 565- 20- 128- SH	NR	1.000
034.1451	CATENA- PORTAC- TI- CB- 352	NR	1.300
043.0143	PRESSOSTATO- PNEUMATICO	NR	1.000
043.0154	BLOCCO- 3- VALV- ALIM- DOPPIA	NR	1.000
043.0198	ATTACCO- A- GOMITO- G- 4X1_4CL6521	NR	1.000
043.0202	ATTACCO- ESAGONO- 8X1_8CL6511	NR	4.000
043.0204	ATTACCO- A- GOMITO- 8X1_4- CL6521	NR	5.000
043.0205	ATTACCO- A- ESAGONO- 88X1_4CL6510	NR	1.000
043.0206	ATTACCO- A- ESAGONO- 4X1_8CL6511	NR	2.000
043.0215	T_E- INTERMEDIO_8- CL6540	NR	4.000
043.0222	043_0222	NR	1.000
043.0225	RIDUZIONE- TUBO- 8- 4MM	NR	4.000
043.0231	RIDUZIONE- MF- 1_8CL2520	NR	1.000
043.0235	BIFORC- Y- TUBO- 4MM	NR	2.000
043.0251	GOMITO- MF1_8CL2020	NR	1.000
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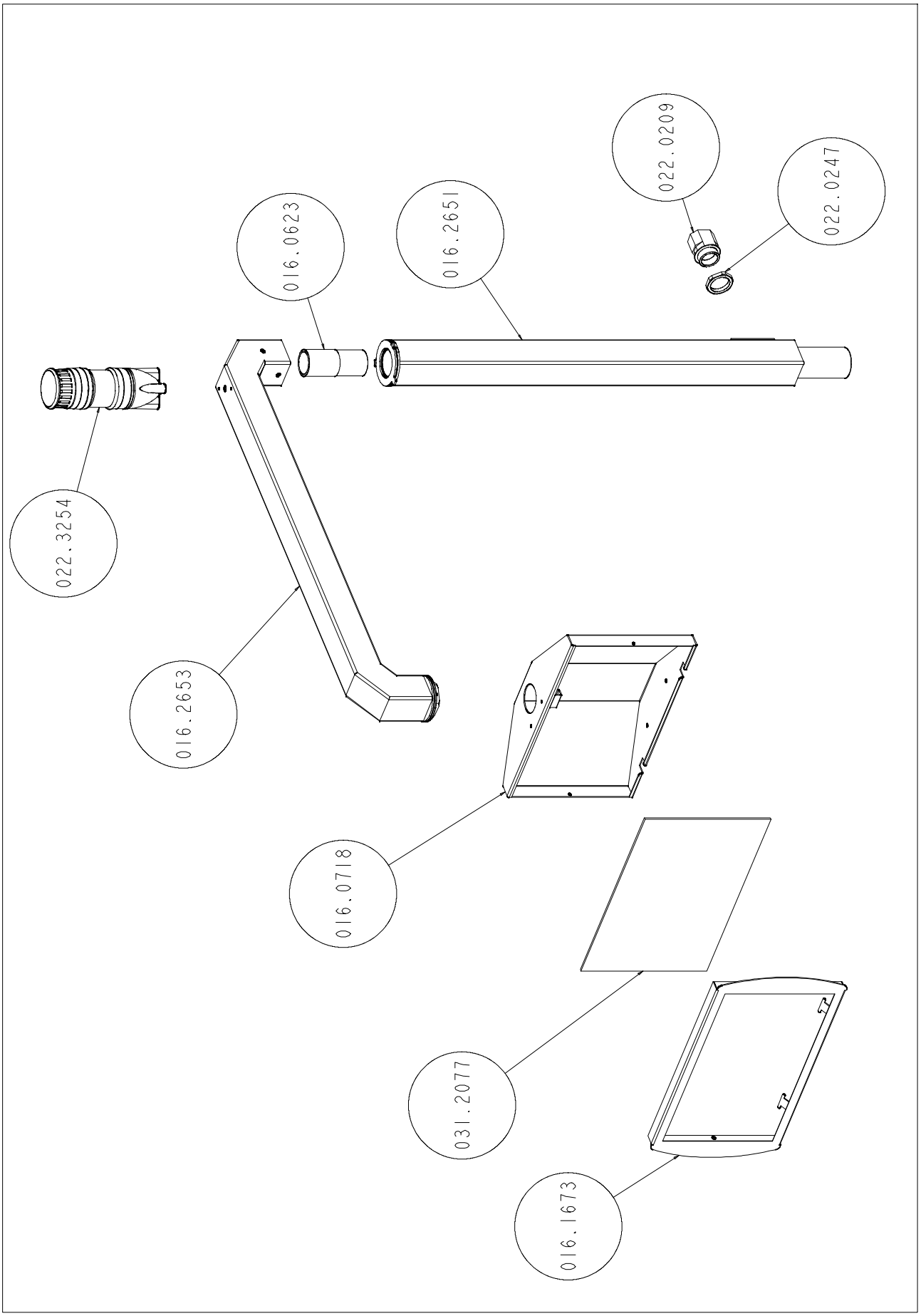
043.0290	INNESTO- RAPIDO- 1- 4GHIOTTO13_A	NR	1.000
043.0301	TUBO- RILSAN- 8X6	NR	4.000
043.0472	SILENZIATORE- 1_4- PLASTICA	NR	4.000
043.0552	MANOMETRO- DIAM- 40	NR	2.000
043.0564	FR1_4- 20- 08	NR	1.000
043.0580	REGOLATORE- PRESSIONE	NR	1.000
043.0601	VALVOLA- VSM- 114- 1_4- 08	NR	1.000
043.0608	VALVOLA- 5VIE- PARKER1_8	NR	3.000

Control panel unit



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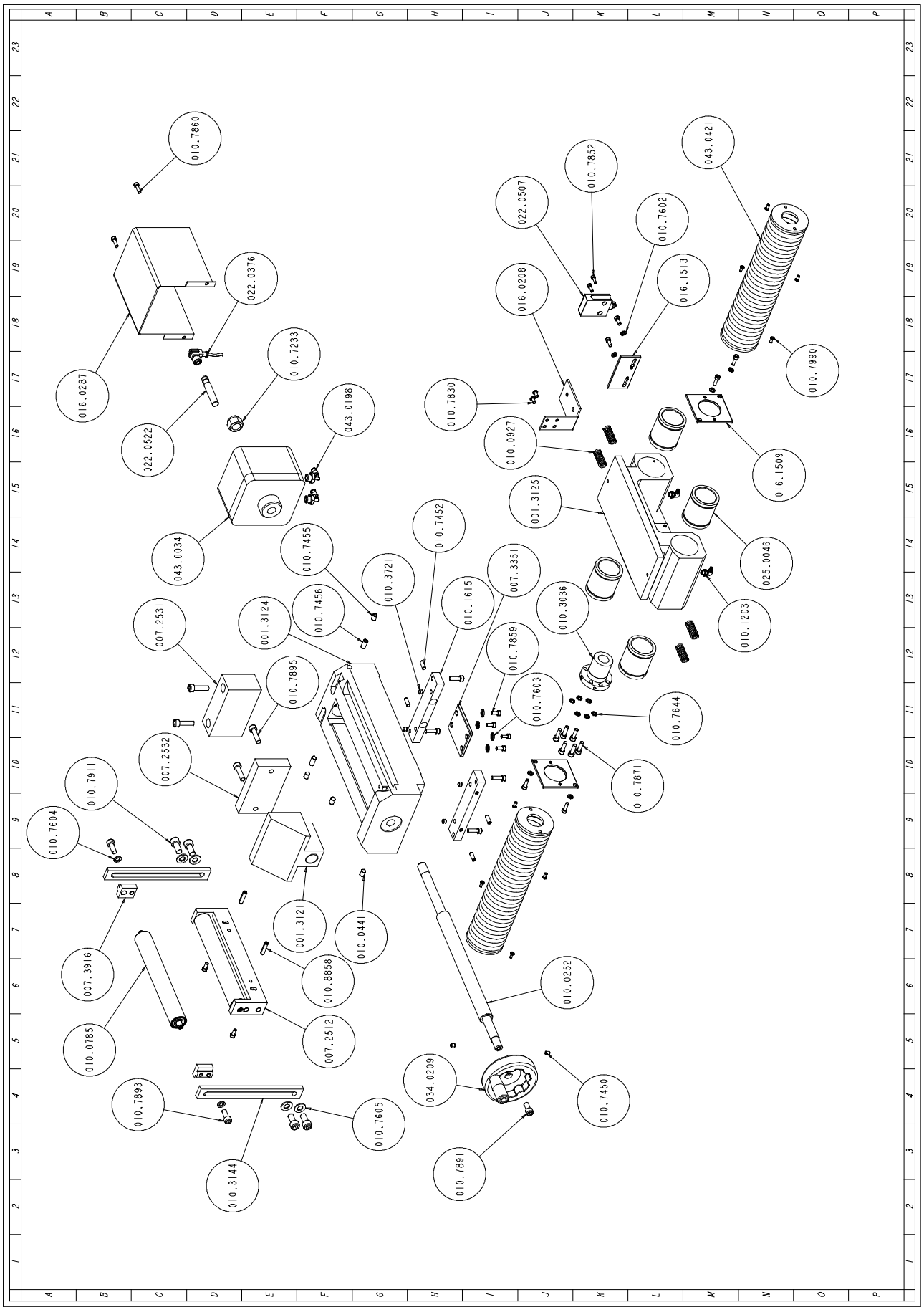
016.1673	CORNICE QUADRO COMANDI X SHARK NC 5.0	NR	1
016.2651	ASTA VERTICALE COMPLETA DI PIASTRA X QUADRO COMANDI TI 352 NC- EVO	NR	1
016.0623	SUPPORTO X SNODO QUADRO COMANDI CB- TI352	NR	1
016.2653	ASTA ORIZZONTALE X QUADRO COMANDI TI- CB	NR	1
016.0718	QUADRO COMANDI SH NC - EVO	NR	1
022.3254	LAMPEGGIANTE LED 24 VAC SL7- CB- IMH +SL7- BL24Y + SL7- AP24	NR	1
022.0209	RACCORDO RAPIDO SEM 29 ART.3800296	NR	1
022.0247	DADO POLIAMIDE HUMMEL 1.262.2900.11	NR	1
031.2077	CONSOLLE DI PROGRAMMAZIONE MEP 50 TOUCH- SCREEN 7 INCH X NC EVO - SH 230 NC HS	NR	1

Feeder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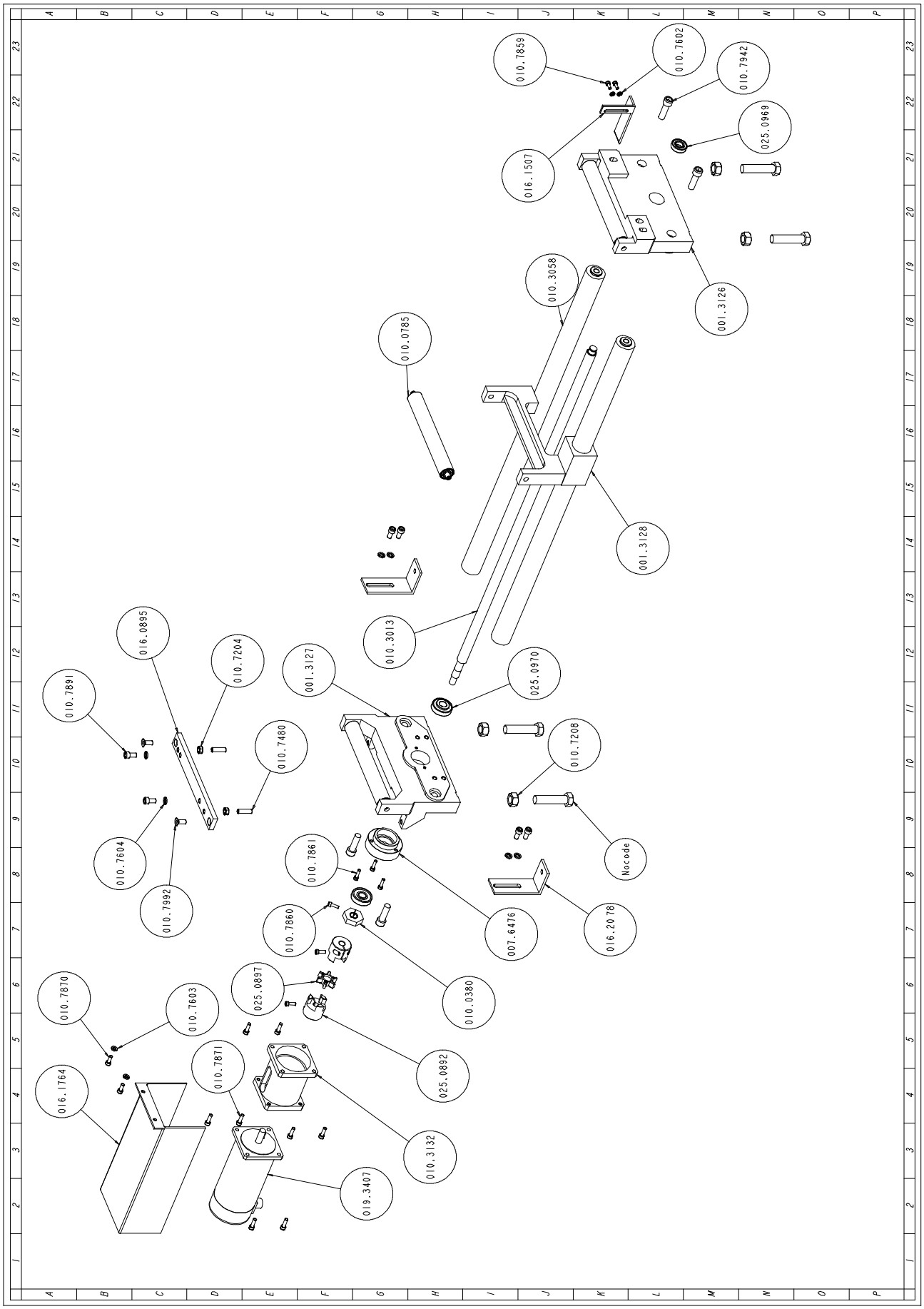
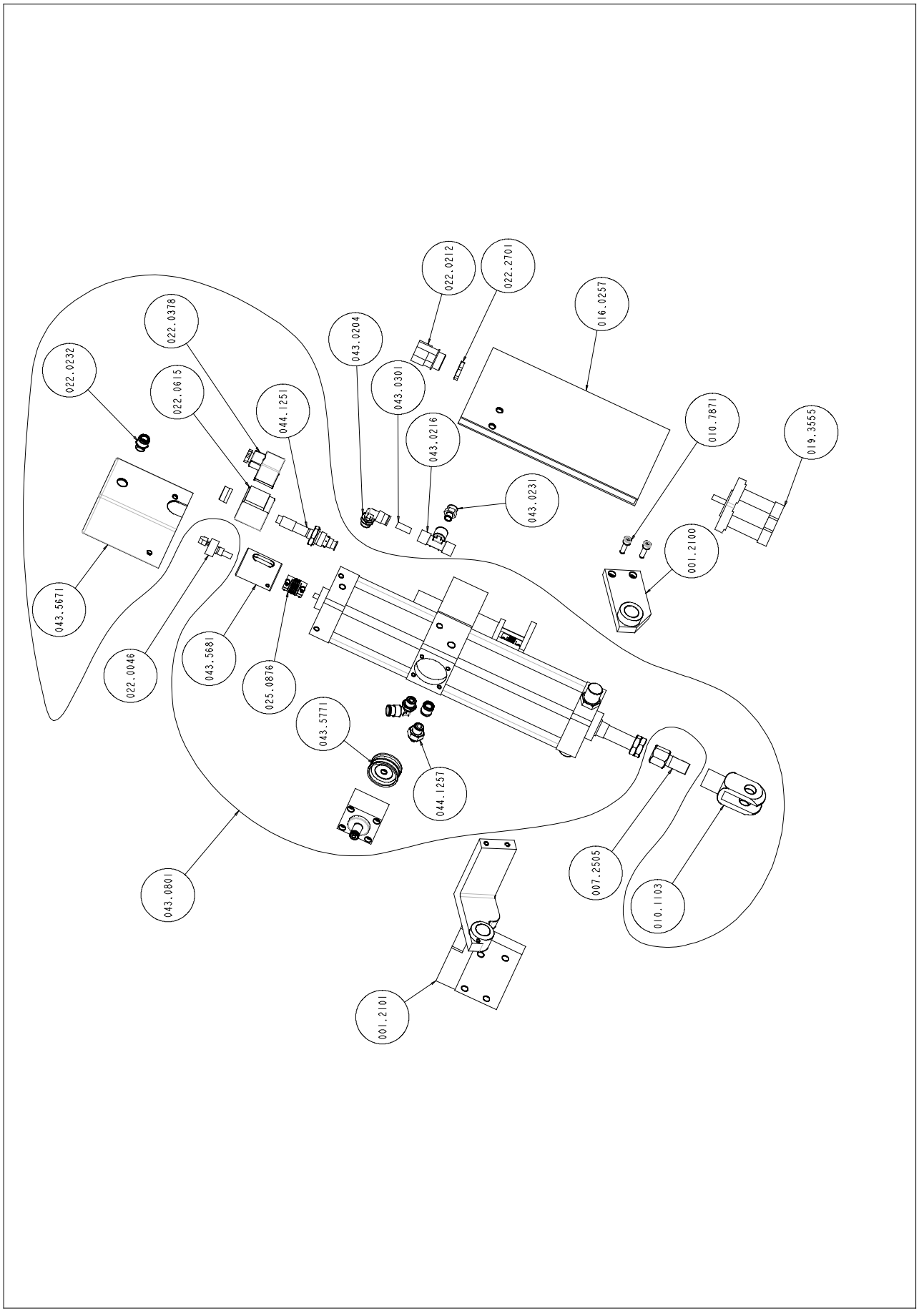
Code	Description	U. of M.	Quantity
001.3121	CHIOCCIOLAALIMENTATORE	NR	1
001.3124	MORSA ALIMENTATORE	NR	1
001.3125	CARRELLO ALIMENTATORE	NR	1
007.2512	SUPPORTO MORSA ALIMENTATORE	NR	1
007.2531	GANASCIA FIX ALIMENTATORE	NR	1
007.2532	GANASCIA MOB ALIMENTATORE	NR	1
007.3351	PIASTRA FIX SCORREVOLE	NR	1
007.3916	TASSELLO FIX RULLO SUPPLEMENTARE	NR	2
010.0252	VITE MORSA ALIMENTATORE	NR	1
010.0441	GRANO M8X12	NR	2
010.0785	RULLO ALIM DIAM30 220MM	NR	2
010.0927	MOLLA CARRELLO ALIMENTATORE	NR	4
010.1203	OLIATORE A SFERA DIA6 GOMITO	NR	2
010.1615	TASSELLO MORSA BASCULANTE	NR	2
010.1666	PERNO RULLO ALIMENTATORE	NR	4
010.3036	CHIOCCIOLA R20	NR	1
010.3144	SUPPORTO PREMIBARRA ALIMENTATORE	NR	2
010.3721	PERNO MORSA BASCULANTE ALIMENTATORE	NR	4
010.7233	DADO AUTOBLOCCANTE M16	NR	1
010.7450	GRANO M6X6 VCEI PC	NR	2
010.7452	GRANO M6X16 VCEI PC	NR	4
010.7455	GRANO M8X10 VCEI PC	NR	2
010.7456	GRANO M8X16 VCEI PC	NR	2
010.7602	ROSETTA 5_3X10	NR	6
010.7603	ROSETTA 6_4X12_5	NR	4
010.7604	ROSETTA 8_4X14	NR	2
010.7605	ROSETTA 10_5X21	NR	4
010.7644	ROSETTA GR M6	NR	6
010.7830	M5X10 BUTON	NR	2
010.7852	M4X12 TCEI	NR	2
010.7859	M5X12 TCEI	NR	8
010.7860	M5X16 TCEI	NR	6
010.7871	M6X20 TCEI	NR	10
010.7891	M8X16 TCEI	NR	1
010.7893	M8X20 TCEI	NR	2
010.7895	M8X30 TCEI	NR	4
010.7911	M10X20 TCEI	NR	4
010.7990	M4X8 TSPEI	NR	8
010.8858	SPINA ELASTICA 6X28	NR	2
016.0208	SUPPORTO CATENA	NR	1
016.0287	PROTEZIONE CILINDRO MORSA	NR	1
016.1509	PIASTRA FIX SOFFIETTO	NR	2
016.1513	STAFFA FIX FC ALIMENTATORE	NR	1
022.0376	CONNETTORE F303N5000 PROXIMITY	NR	1
022.0507	FINECORSA D4C1092 2M ALIMENTATORE	NR	1
022.0522	PROXIMITY	NR	1
025.0046	MANICOTTO DIAM 40	NR	4
025.0060	CUSCINETTO 6000 2Z	NR	4
034.0209	VOLANTINO MORSA DIAM 100	NR	1
043.0034	CILINDRO VOLAMPRESS 100_8	NR	1
043.0198	ATTACCO A GOMITO 4X1_4CL6521	NR	2
043.0421	SOFFIETTO CIRCOLARE	NR	2

Supply roller unit



Code	Description	U. of M.	Quantity
001.3126	STAFFA ANTERIORE ALIMENTATORE	NR	1
001.3127	STAFFA POSTERIORE ALIMENTATORE	NR	1
001.3128	SUPPORTO SCORREVOLE ALIMENTATORE	NR	1
007.6476	MANICOTTO VITE RICIRCOLO	NR	1
010.0380	GHIERA FIX VITE ALIMENTATORE	NR	1
010.0785	RULLO ALIMENTATORE DIAM30 220MM	NR	3
010.1666	PERNO RULLO ALIMENTATORE	NR	6
010.3013	VITE A RICIRCOLO	NR	1
010.3058	GUIDA CARRELLO ALIMENTATORE	NR	2
010.3132	SUPPORTO MOTORE P_P ALIMENTATORE	NR	1
010.7204	DADO M8	NR	2
010.7208	DADO M16	NR	4
010.7480	GRANO M8X30 VCEI	NR	2
010.7602	ROSETTA 5_3X10	NR	2
010.7603	ROSETTA 6_4X12_5	NR	2
010.7604	ROSETTA 8_4X14	NR	6
010.7859	M5X12 TCEI	NR	2
010.7860	M5X16 TCEI	NR	3
010.7861	M5X20 TCEI	NR	3
010.7870	M6X16 TCEI	NR	2
010.7871	M6X20 TCEI	NR	8
010.7891	M8X16 TCEI	NR	6
010.7942	M12X40 TCEI	NR	4
010.7992	M8X16 TSPEI	NR	2
016.0895	ADATTATORE K40 ALIMENTATORE	NR	1
016.1507	STAFFA COMANDO MICROINTERRUTORE	NR	1
016.1764	PROTEZIONE MOTORE ALIMENTATORE	NR	1
016.2078	STAFFA FIX ALIMENTATORE TI- CB NC- EVO	NR	2
019.3407	MOTORE PP	NR	1
025.0060	CUSCINETTO 6000 2Z	NR	6
025.0892	MOZZO 1A RTX 19	NR	2
025.0897	STELLA 1A RTX 19	NR	1
025.0969	CUSCINETTO 6002 2Z	NR	1
025.0970	CUSCINETTO 30302J2	NR	2

Cylinders


022.0212
022.2701
016.0257
043.0204
022.0378
043.0301
022.0232
022.0615
044.1251
043.0216
010.7871
019.3555
043.0231
001.2100
043.5671
043.5681
022.0046
025.0876
043.5771
044.1257
007.2505
010.1103
043.0801
001.2101

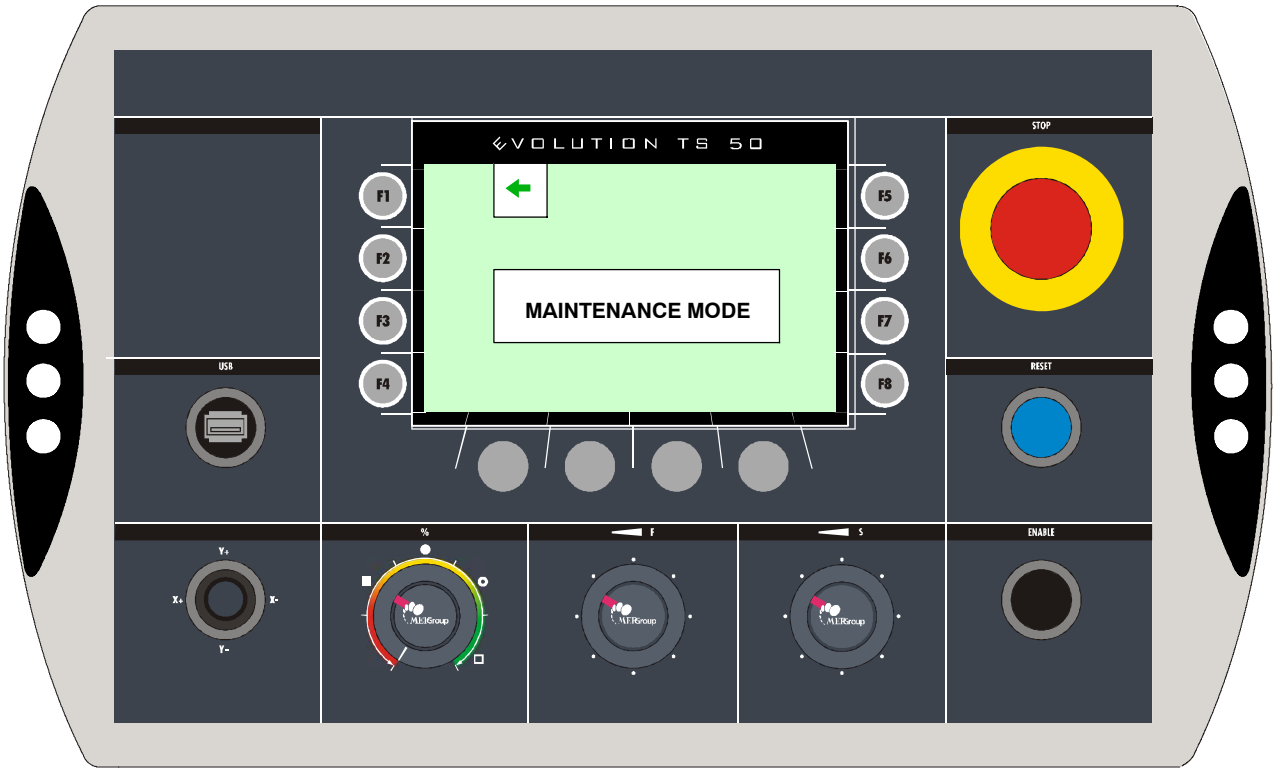
Code	Description	U. of M.	Quantity
001.2100	SUPPORTO ESTERNO CILINDRO CB SX- AX- CNC	NR	1
001.2101	STAFFA SOSTEGNO GRUPPO PNEUMATICO CB 350	NR	1
007.2505	PROLUNGA FORCELLA SH 280- CB 350	NR	1
010.1103	FORCELLA 16 X 1,5	NR	1
010.7871	VITE TCEI 6 X 20 (010.7871)	NR	1
016.0257	PROTEZIONE CILINDRO CB 350 CNCFE	NR	1
019.3555	MOTORE FL57STH76- 2804A- 12 X CILINDRO NC	NR	1
022.0046	POTENZIOMETRO 6639S- 001- 202 SH SX	NR	1
022.0212	RACCORDO RAPIDO SEM PG 16	NR	1
022.2701	DADO PG 11 BL03	NR	1
043.0204	ATTACCO A GOMITO 8X1/4 - CL 6521	NR	1
043.0216	RACCORDO A 'T' FFF 1/4 CL 2003	NR	1
043.0231	RIDUZIONE 1/8- 1/8 MF CL 2520	NR	1
043.0301	TUBO RILSAN 8X6 NERO COD.17257181	NR	1
043.0801	GRUPPO UNITA' IDROPNEUMATICA 0 63 C.70 CB AX- CNC	NR	1
022.0232	PRESSACAVO IN OTTONE 1/4 BM 2450	NR	1
022.0378	CONNETTORE X BOBINA VALVOLA	NR	1
022.0615	BOBINA V24 RAC X VALVOLA RIGENERATRICE	NR	1
025.0876	GIUNTO WA 6- 6 MM.28 X CILINDRO	NR	1
043.5681	SUPPORTO POTENZIOMETRO CILINDRO	NR	1
043.5671	PROTEZIONE POTENZIOMETRO CILINDRO	NR	1
043.5771	KIT COMPENSATORE UL 63- 80	NR	1
044.1251	VALVOLA RIGENERATRICE CILINDRO SH 310 SX	NR	1
044.1257	VALVOLA CARICO CILINDRO TI- CB CNC	NR	1

Adjustments

This chapter describes the operations required to adjust the electronic, mechanical and the hydraulic systems. By following these instructions, you can “customise” your machine to suit the type of cut required, thereby optimising cutting times.

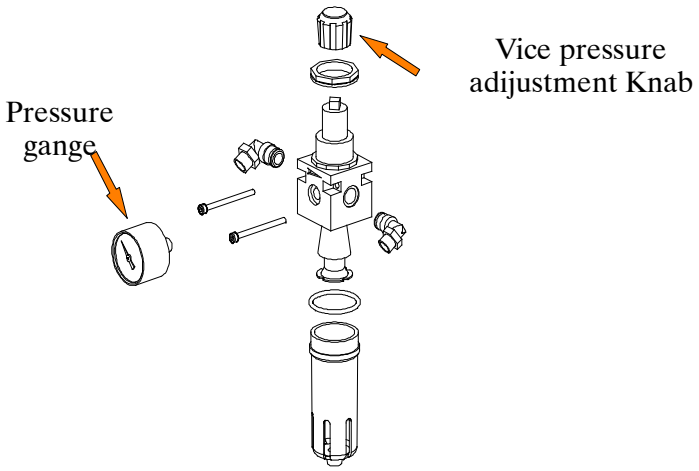
Displaying and editing the set- up parameters

Modifying the set- up parameters may compromise the operation of the machine. This functionality is to be used solely by the service technicians.



Air treatment unit

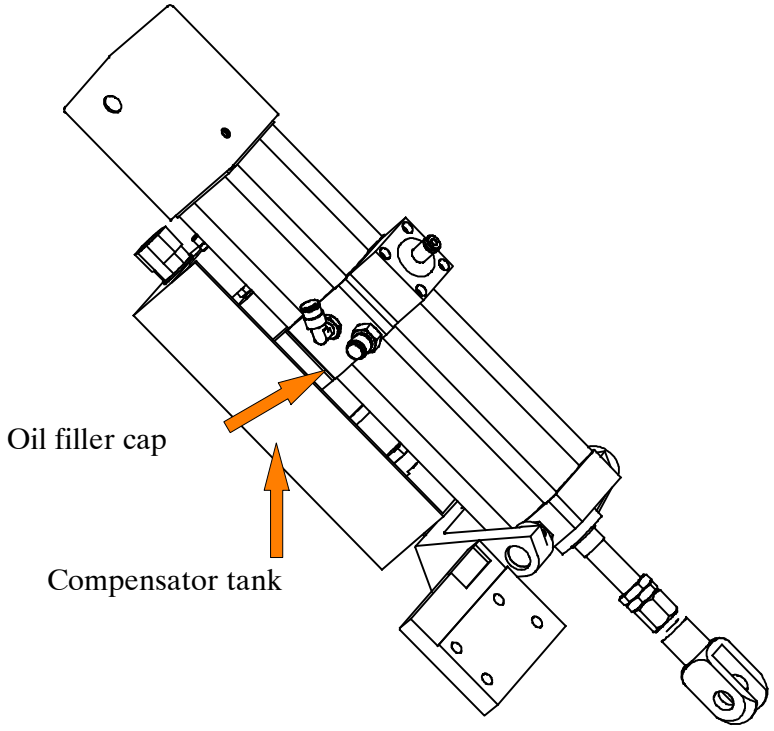
The machine pneumatic circuit operates the shearing vice and the feeding vice by their own pneumatic cylinders, and the machine cutting head by the oleo- pneumatic cylinder. The compressed air is conditioned and purified as it enters by a treatment unit that, when regulated, stabilises the pressure at around 6 Bar, depending on the pressure in use in the factory.
In any case, the pressure can be set where material may be deformed or may prove to be unstable during cutting, and the vice is positioned at 2÷3 mm from the workpiece before it is closed.
One requirement is for the the user of this machine to provide a plant in his factory with the characteristics shown in Chapter 4.
The figure below shows an exploded view of the air treatment unit. The operating pressure of the vice shown on the pressure gauge is set by rotating the handle indicated by the arrow.



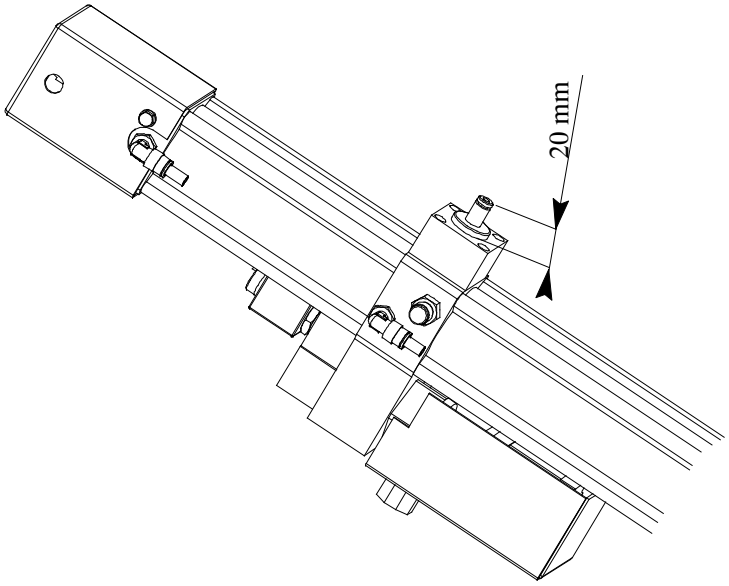
Cutting head actuator cylinder (CPT)

Replenishing the head cylinder

When the oil level in the compensator tank falls it must be topped up. The figure below illustrates the various components of the cutting head cylinder.

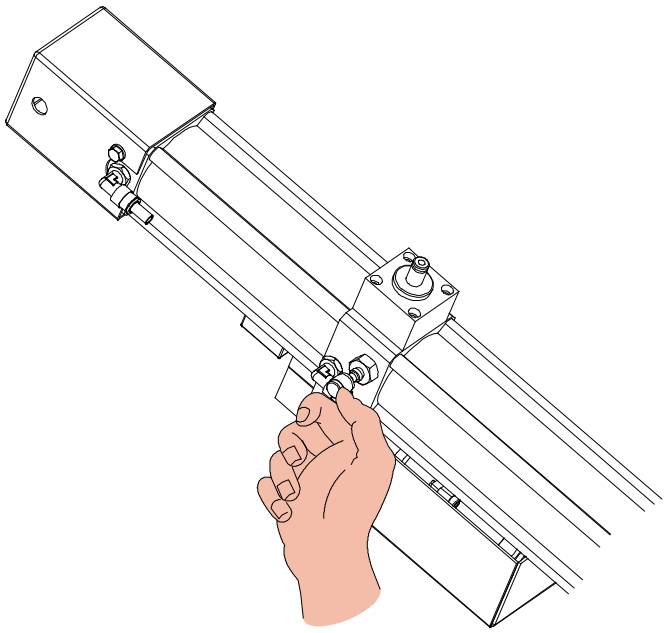


A drop in oil level is identified by the position of the ring on the rod in relation to the oil reservoir, which in normal conditions should be approximately 20 mm.

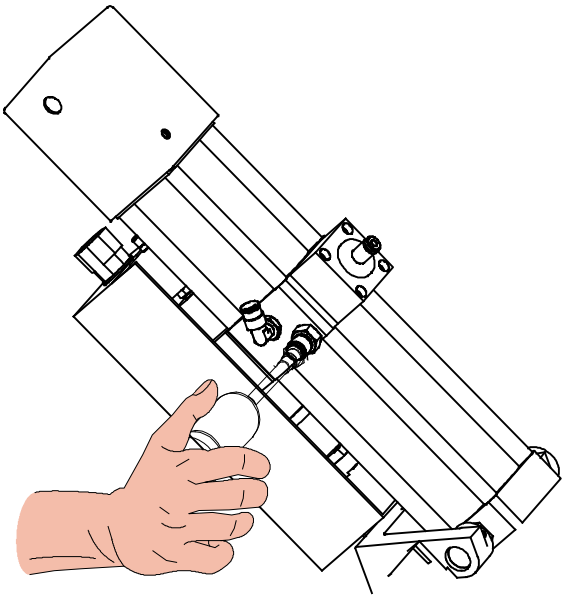


If this is not the case, top up the oil level as follows:

▶ unscrew and remove the filler cap on the side of the cylinder;



- then, using an electric or manual pump like the one shown in the figure, fill the cylinder with AGIP ATF DEXRON hydraulic oil or one with similar characteristics;



- when the rod protrudes by 20 mm, the correct oil level has been restored;
- run a few dummy cutting strokes in semi- automatic mode to expel any air from inside the circuit. If cutting head movement is not linear and constant, and the rod retracts by several millimetres, top up the oil level again.

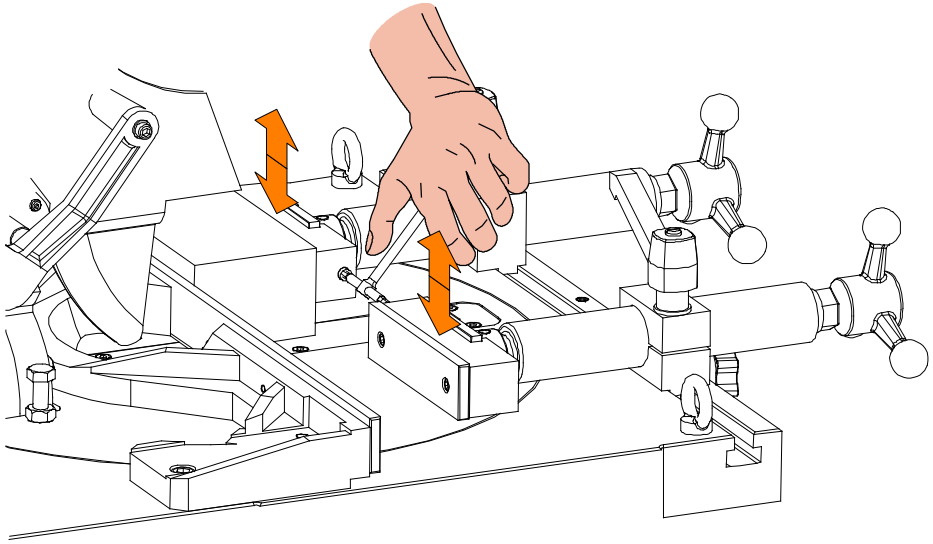
Shearing vices

The vices can move in longitudinal and cross direction, as they are installed on movable supports sliding on the prismatic guide of the fixed platform.

Jaws replacement and height adjustment

When cutting material with section equal to the machine max. capacity, it is necessary:

- to remove the standard jaws from the piece- supporting shoulder;
- install the jaws supplied with the accessory pack (see inside instructions);



- loosen the lock dowel of the movable jaws positioned outside the jaws supporting block;
- lift the block till getting the clearance necessary for tightening the material, then lock the obtained position tightening the two dowels.

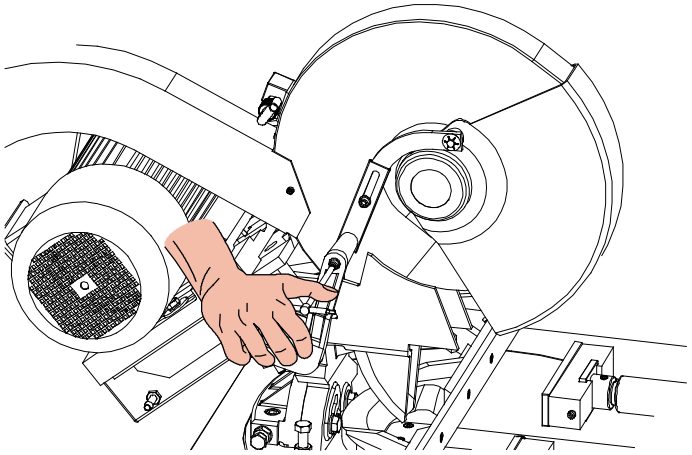
Disc

Circular saws with hard metal teeth for cutting non- ferrous metals offer all the advantages provided by metal carbides used as cutting tools. Their enormous wear resistance allows for high cutting speeds and a long lifetime. This leads to a big increase in the quantity of swarf removed per unit time and a consequent increase in efficiency. This is of great economic importance if you need to cut large quantities of material or highly resistant materials which would be difficult to cut in any other way.

Changing the blade

To change the blade proceed as follows:

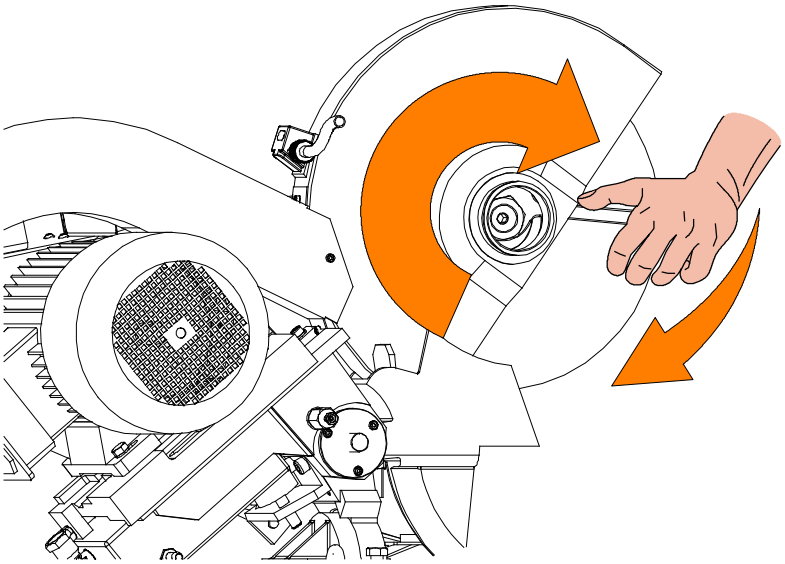
- ▶ switch off the machine;
- ▶ release the mobile disc guard;



- ▶ move the mobile guard upwards;
- ▶ take off the cap located at the central part of the guard and slacken the nut that locks the blade using a 36 mm wrench while holding the internal hexagonal screw steady;

N.B. The lock nut is always loosened in the same direction as the disk rotating one.

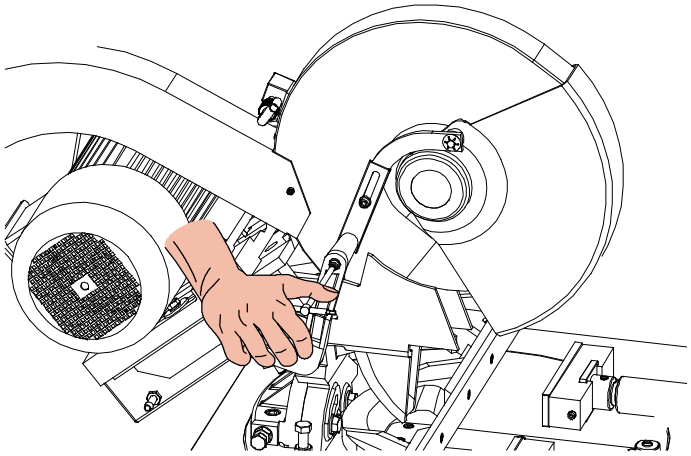
- ▶ now remove the broken or worn blade and replace it with a new one.



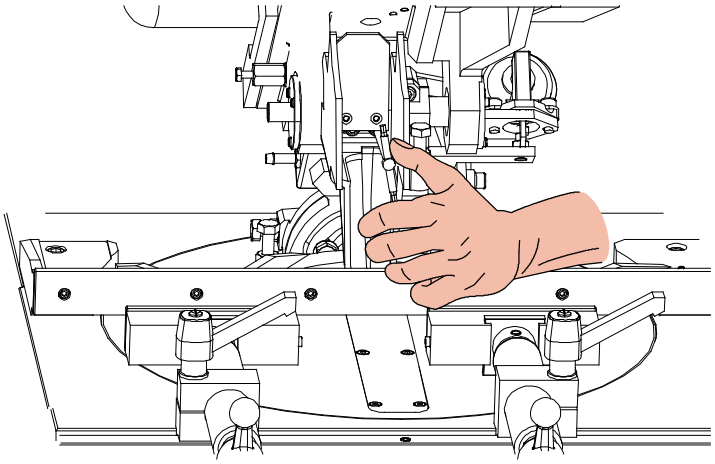
Adjustment of the squareness to the piece- supporting shoulder

The procedures for correcting and adjusting the blade at 0° and 45° to make cuts at right angles to the fixed vice jaw are described below. To carry out the right angle adjustment at 0°, use a workshop goniometer or a simple 90° square.

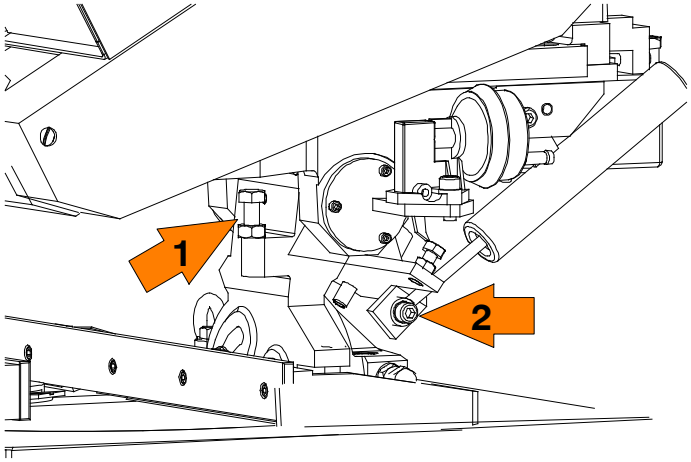
▶ release the mobile cover control rod and remove the two screws that lock the blade guard and the swarf conveyor;



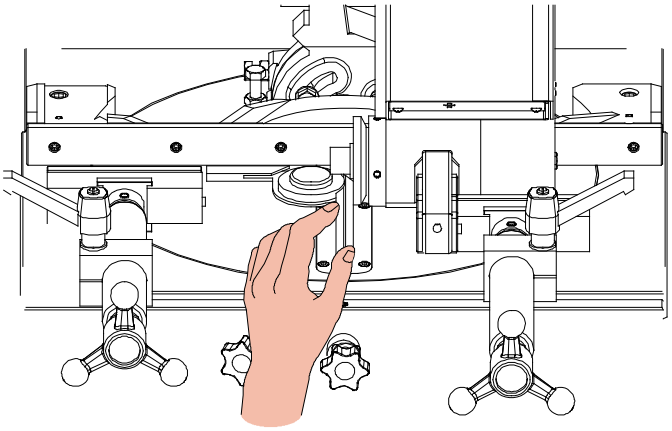
▶ remove the cutting disc and the lower fixed guard: note that it is fixed by two screws located underneath the rubber fabric;



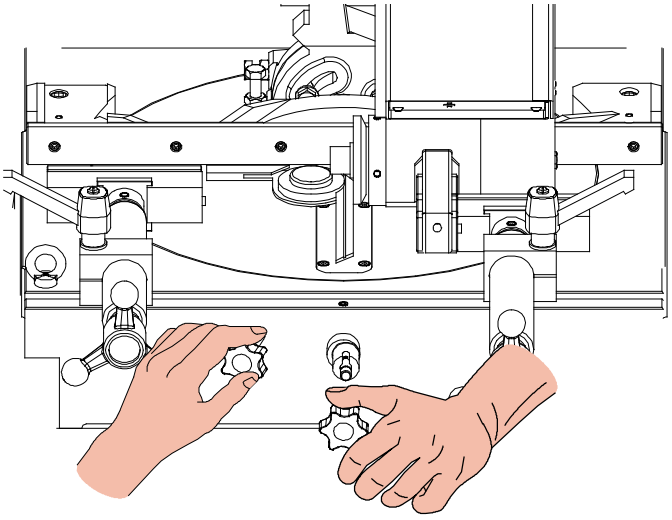
▶ take out the screw that functions as a pin for the head return cylinder (arrow no. 3) and the adjustable head lowering stop (arrow no. 1), so that it is possible to lower the head completely and rest the disc shaft flange on the working table;



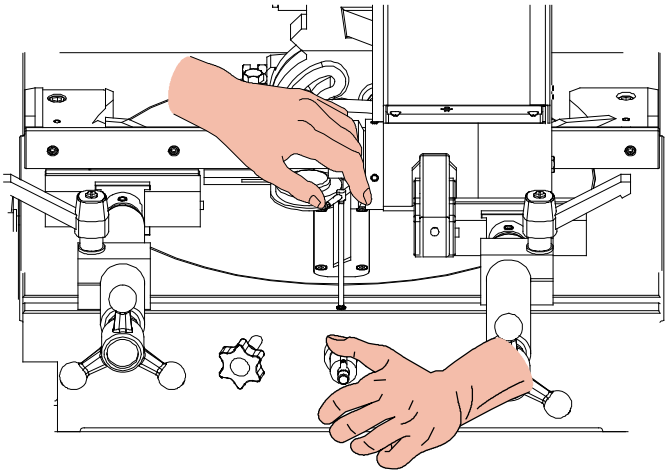
▶ position the goniometer or the square against the fixed vice jaw adjacent to the disc shaft flange;



▶ loosen the turntable locking handwheel M10;
▶ remove the eccentric locking pin knob;



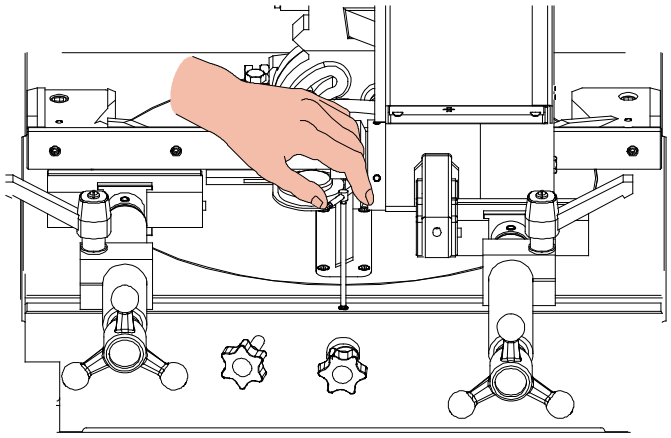
▶ slacken the grub screw.



If the right angle error is now small (about 1 degree), turn the eccentric pin until the error is corrected. If instead the error is greater than 1 degree proceed as follows:

▶ remove the eccentric pin;
▶ turn the head until the error is corrected;
▶ re- insert the eccentric pin;

▶ lock the grub screw and remount the knob.

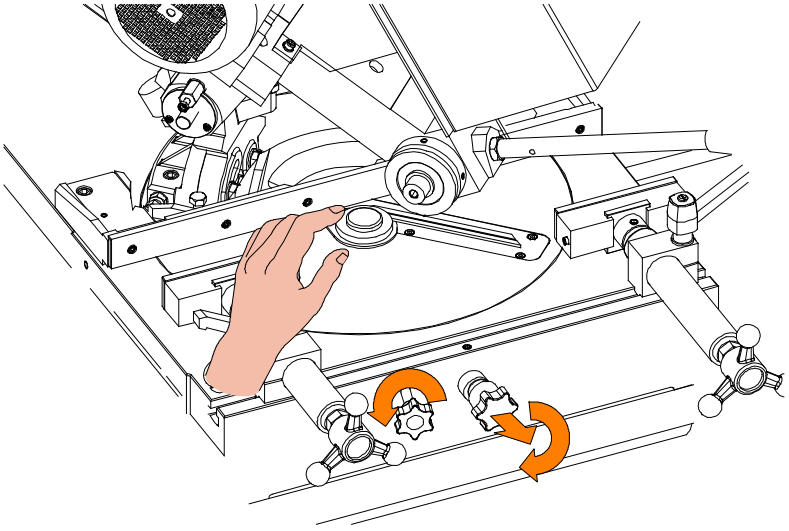


To adjust the 45° fixed point you will need a workshop goniometer or an instrument that can measure the exact angle of the disc shaft flange.

▶ loosen the handwheel M10 that locks the turntable;

▶ position the head at 45° (pull out the knob and turn it by half a turn to release the turntable);

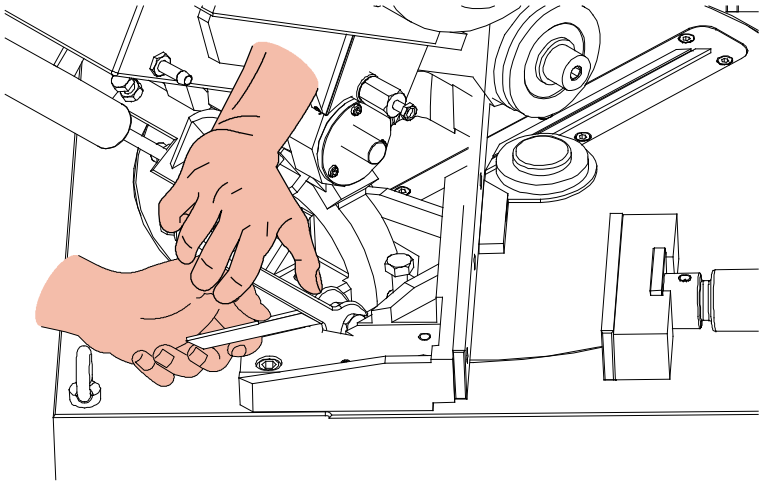
▶ position the goniometer (or the graduated square) against the fixed vice jaw, adjacent to the disc shaft flange;



▶ slacken the nut, while holding the screw steady with an open- end wrench;

▶ in this position you can adjust the depth of the screw that acts as a stop for the turntable until the angle error is corrected;

▶ tighten the nut, while keeping the stop screw steady.

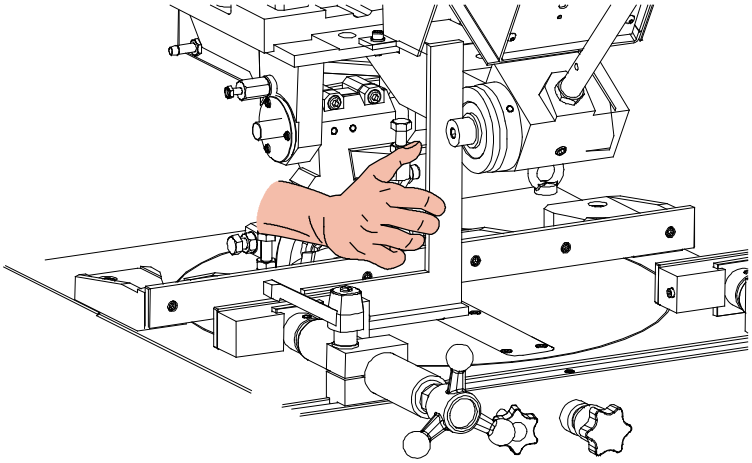


Repeat the operations for both the 45° right and the 45° left positions. Now check the values given on the graduated scale engraved on the turntable at the positions 0° and 45° right and left.

Adjustment of the perpendicularity to the cutting plane

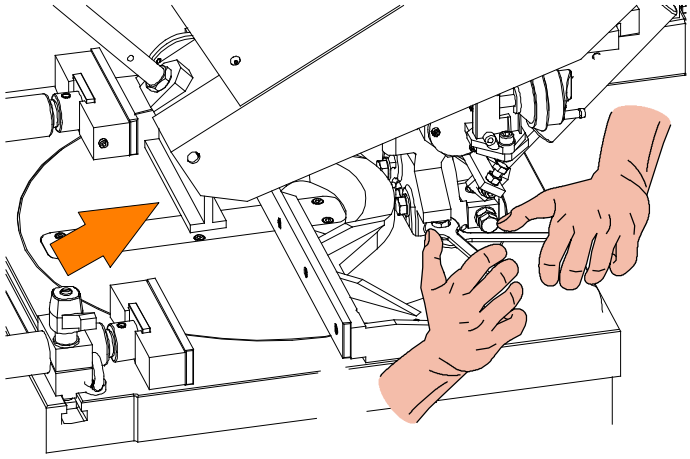
The perpendicularity of the blade to the work surface is of fundamental importance in obtaining straight cuts. This adjustment is carried out with the help of a workshop square, which should be placed adjacent to the fixed disc stop resting on the work surface.

▶ remove the blade so that the square can be rested against the disc shaft flange, position the square on the working table (which should be thoroughly cleaned beforehand) and rest it against the side of the disc next to the fixed vice jaw;

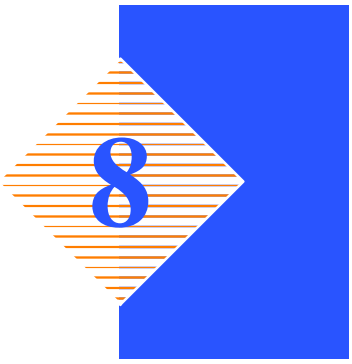


▶ by slackening the lock nuts on the adjustable stops located at the base of the head joint, you can tighten or loosen the stop nuts so as to adjust the perpendicularity of the disc with respect to the work table;

▶ as soon as the blade is perpendicular to the work table, tighten the two lock nuts; lastly check that the fixed disc- pressing flange is perpendicular to the square.



Maintenance and choice of consumables



PNF 350- 2 CNC is built to be sturdy and long- lasting It has no need of any special maintenance, though, like all other tools, it needs adjusting from time to time, especially if not regularly looked over or used without due care.

This chapter, therefore, is intended as a guide for those who want to look after the machine and get the most out of it for as long as possible.

The role of the operator

The person operating and maintaining the machine must follow these instructions for his own safety, as well as for the safety of other personnel, and in the interests of machine productivity:

- check that his own work and that of the other operators of the machine always complies with the relevant safety standards. Therefore, check that the safety devices are in position and work perfectly and that personal safety requirements are complied with.
- ensure that the working cycle is efficient and guarantees maximum productivity, checking:
  - the functions of the main components of the machine;
  - the sharpness of the blade and coolant flow;
  - the optimum working parameters for the type of material.
- Upewnić się, że cykl roboczy jest wykonywany w pełni skutecznie, zapewniając maksymalną wydajność, sprawdzając:
  - działanie głównych części maszyny;
  - naostrzenie narzędzia i przepływ cieczy chłodzącej;
- Upewnić się, że jakość cięcia jest odpowiednia i czy produkt końcowy nie ma wad obróbki.
- check that the quality of the cut is that required and that the final product does not have any machining defects.

Maintenance requirements

- All ordinary and extraordinary maintenance must be carried out with the power switched off and the machine in emergency condition.
- To guarantee perfect operation, all spare parts must be Hyd- Mech originals.
- On completion of maintenance works, ensure that the replaced parts or any tools used have been removed from the machine before starting it up.
- Any behaviour not in accordance with the instructions for using the machine may create risks for the operator.
- Wszystkie prace związane z konserwacją zwyczajną i specjalistyczną należy wykonywać po wyłączeniu głównego wyłącznika i wciśnięciu przycisku awaryjnego.
- Aby zapewnić poprawną pracę maszyny, konieczne jest stosowanie oryginalnych części zamiennych Hyd- Mech.
- Po zakończeniu prac konserwacyjnych i przed ponownym uruchomieniem maszyny sprawdzić, czy zdemontowane części i użyte narzędzia zostały usunięte z maszyny.
- Postępowanie niezgodne z instrukcjami użytkowania i konserwacji maszyny może stwarzać zagrożenie dla bezpieczeństwa operatora.
- Należy więc zapoznać się z wszystkimi zaleceniami dotyczącymi użytkowania i konserwacji tej maszyny, przestrzegać ich oraz stosować się do zamieszczonych na niej wskazówek.
- Therefore, read and follow all the instructions for use and maintenance of the machine and those on the product itself.

General maintenance

Daily

The daily maintenance operations to carry out on the machine are as follows:

- ▶ remove all swarf from the machine (Do not use compressed air or fluffy rags);
- ▶ top up the lubricant/coolant fluid level;
- ▶ check the wear of the blade and change if necessary.

Weekly

The weekly maintenance operations are as follows:

- ▶ remove all swarf from the machine, including chips that have fallen into the area underneath the turntable;
- ▶ clean the vice and lubricate all the joints and sliding surfaces using a good quality oil.

Monthly

This section lists the operations to be carried out for the monthly maintenance of the machine.

- check that the blade is perpendicular to the work surface; if necessary, adjust as described in cap. 7;
- check that the blade is at right angles to the workpiece rest shoulder; if necessary, adjust as described in cap. 7;
- check that the 0° notch on the fixed work table is in line with the graduation on the turntable. If not, adjust using the eccentric pin, then re- check that the blade is perpendicular to the work surface and at right angles to the shoulder.
- check the precision of the 45° right and 45° left stops. If they are adjusted incorrectly, follow the procedure described in cap. 7;
- check the tension and wear of the transmission belts.

Maintenance of working parts

During maintenance work on the **PNF 350- 2 CNC**, special attention should be paid to operating units such as the transmission belts.

Transmission belts

Tightening the belts:

- after the first 100 working hours, remove the transmission belt protective cover and check the tension and wear of the belts. Repeat the operation after every 500 working hours of the machine.
- To tighten the transmission belts: first remove the transmission belt protective cover, slacken the nut shown in the diagram and the one opposite to it which is not in view;
- then loosen the nut located below the motor and adjust the grub screw to tighten the belts; finally tighten up the locking nut and the two previously slackened bolts located at the side of the motor.

Consumable materials

It is essential to use specific oils for the pneumatic and lubricant/coolant circuits. The oils suitable for each of these circuits are listed below.

Oils for pneumatic and hydraulic circuit

The machine is supplied with AGIP ATF DEXRON oil, ISO and UNI grade FD 22. The oils are used with the air treatment unit and the hydro- pneumatic cylinder. However the following oils can be regarded as compatible or having equivalent specifications:

API Cis 22 - ARAL Dural SR 22 - CASTROL Hyspin AWS 22 ESSO Spinesso 22 - IP Hydrus oil 22 - TOTAL Azolla ZS 22 VALVOLINE ETC 22 - MOBIL Velocite oil D - Mobil DTE 22 MOBIL ATF 220 - OLIO FIAT HTF 22 - Q8 Haydn 22 - SHELL Tellus oil 22 - BP AUTRAN GM- MP

Oils for lubrication/coolant liquid

The oil used for the lubrication/coolant fluid in the machine is CASTROL Syntolin TFX. Though there are no specific standards for these types of oils, Hyd- Mech considers that CASTROL Syntolin
TFX is the best product available with regard to quality:price ratio. Nevertheless, the following oils of similar characteristics can be said to be compatible:

AGIP NB 200 - SHELL Lutem TT - IP Utens Fluid- F

Finally, one particular blade manufacturer (LENOX) recommends and supplies a coolant under the name of LENOX BAND- ADE SAWING FLUID.

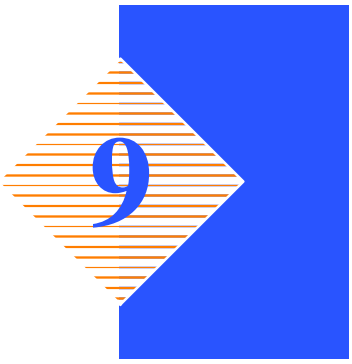
Oils for spray mist system (optional)

The used oil type for the optional spray mist system is BLASER Vascomill 22. The following oils can also be said to have similar characteristics and are therefore compatible:

UNIST Coolube 2210 - FUCHS Plantocut Micro Plus 27

- tank capacity Lt. 1

Cutting speed and choice of tools



The cut speed is determined by the speed the cutter disc rotates at, and by the feed speed. The latter is set manually by the movement of the tool head, whereas the cutter disc rotation speed is selected on the control panel with the speed setting switch. This chapter describes the various cutting speeds of which the standard and special machine configurations are capable.

Cutting speed

PNF 350-2 CNC three-phase with two speeds

The basic version with 2/4- pole motor, enables these cutting speeds:

- 1st speed = 1700 rpm
- 2nd speed = 3400 rpm

Choice of blade

The different types of cutter disks that the **PNF 350- 2 CNC** can mount must, however, have the following main characteristics.

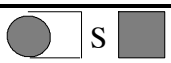
- Fine tooth pitch: for thin wall materials such as sheet steel, tubes and profiles;
- Coarse tooth pitch: for large cross-sections; for soft materials (aluminium alloys and soft alloys in general).

Tooth pitch

The choice of the most suitable tooth pitch depends on various factors:

- the size of the section;
- the hardness of the material;
- wall thickness.

Solid sections call for discs with a coarse tooth pitch, while small cross- sections require blades with finer teeth. This is because when cutting walls of small cross- section (1÷7 mm) profiles, it is important that the number of teeth actually making the cut should not be too small, otherwise the effect obtained will be one of tearing rather than of swarf removal, leading to a large increase in shearing stress. On the other hand, when cutting thick materials or solid sections using an excessively fine tooth pitch, the swarf collects as a spiral inside the gullet, and since fine tooth pitches have small gullets, the accumulated swarf will exceed the gullet capacity and press against the walls of the workpieces, resulting in poor cutting (same situation with soft materials), greater shearing stress and hence breakage of the blade.

Choice of tooth pitch T as a function of cross- section to be cut for light alloy solid pieces and profiles			
			
S in mm.	Pitch T	S and sp in mm.	Pitch T
10	4	10 sp = 0,5	3
30	6	30 sp = 1,5	4 - 5
50	8	50 sp = 2,5	5 - 6
70	10	70 sp = 3,5	6- 7
90	12	90 sp = 4,5	7 - 8
130	16	130 sp = 6,5	8

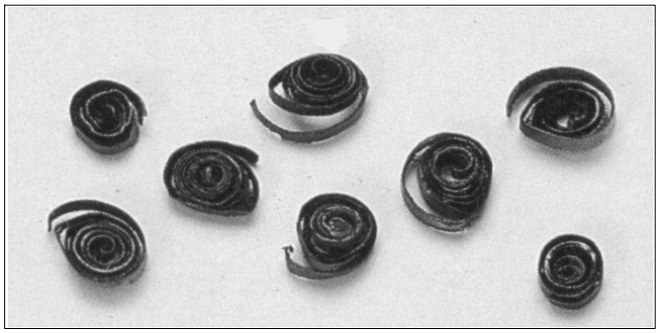
KEY:
S = diameter or width of the solid piece to be cut in mm;
sp = thickness of the wall to be cut in mm;
T = tooth pitch in mm.

A larger pitch should be chosen when, as a result of the shape of the piece to be cut, the cross- section at any given point exceeds the average cross- section given above.

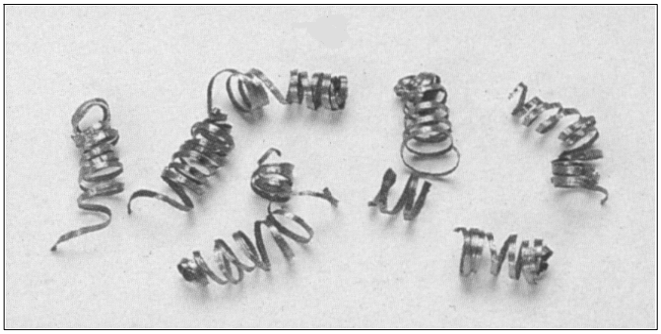
Types of swarf:

- Very fine or fragmented swarf indicates that the downstroke speed and/or cutting pressure is too low.

- Thick and/or blue swarf indicates that the blade is overloaded.



- Long coils of swarf indicate ideal cutting conditions.



Cutting and feeding speed

The cutting speed, in m/min, and the head feeding speed, in cm^2/min, are limited by the amount of heat generated near to the points of the teeth. If the head feeding speed is too high, the cut will not be straight in either the vertical or the horizontal plane. As we have already said, the cutting speed depends on the strength (kg/mm^2) and hardness (HRC) of the material and the dimensions of the thickest section. The feeding speed depends on the cross- section of the material. Solid or thick- walled materials (thickness > 5 mm), can therefore be cut at high speed providing there is sufficient swarf removal by the blade, while thin- walled materials such as tubes or thin profiles must be cut with a low feeding speed. A new blade requires a wearing- in period, during which time a feeding speed of about half normal speed should be used.

Lubricant/coolant

The lubricating/cooling fluid must ensure that the blade teeth and material in the area of the cut do not overheat. Furthermore, the quantity and pressure must be sufficient to remove the swarf from the cutting zone. The fluid must be an excellent lubricant, such that prevents abrasion of the teeth and welding of the swarf to the teeth themselves (seizing).

Blade structure

The circular blades most frequently used for cutting- off machines are HSS- DMo5/M2 consisting of a single piece and characterised by a high level of toughness and a good cutting resistance. With non- ferrous materials it is normal to use circular blades with brazed hard metal (HM) cutting edges, which offer excellent resistance to wear but low resistance to impact, which in any case is not generally a problem with non- ferrous materials.

Key									
Mo	Molybdenum	Ni	Nickel	Si	Silicon	V	Vanadium	W	Tungsten
Al	Aluminium	C	Carbon	Co	Cobalt	Cr	Chromium	Mn	Manganese

BLADE BODY	*C*	*Cr*	*W*	*Mo*	*V*	*Co*	*HRC*
71 Cr1	0,71 - 0,78	0,20 - 0,30	0,40 - 0,70				43+/- 1

N.B. The numbers in the columns indicate the % content of the element in the steel.

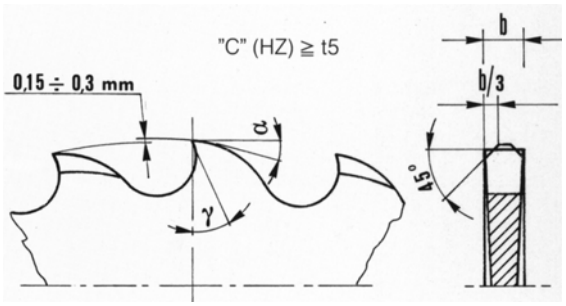
Types of blades

The blades fitted to the **PNF 350- 2 CNC** have dimensions 350 x 32 x 3.4 mm and are of HM hard steel type since the machine is to be used for cutting non- ferrous materials. In addition to the size and pitch of the teeth, however, the blades also have different geometric characteristics in accordance with their particular use:

- tooth cutting angle, which may be negative or positive;
- tooth sharpening, which in this case may be BW with an alternate raked tooth or C with a roughing tooth raked on both sides and a non-raked finishing tooth;
- tooth pitch, the distance between the crest of one tooth and the crest of the next tooth (tooth pitch = T).

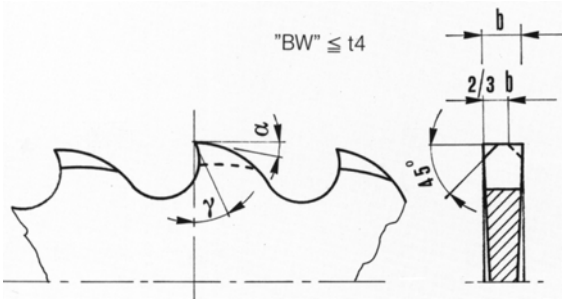
Tooth shape

”C” TYPE SHARPENING (HZ)
Coarse toothing with roughing tooth raked on both sides and non- raked finishing tooth. The roughing tooth is about 0.3 mm higher.



Coarse toothing with roughing tooth and finishing tooth. Used in saws with pitch greater than or equal to 5 mm for cutting ferrous and non- ferrous materials with solid or solid- profiled sections.

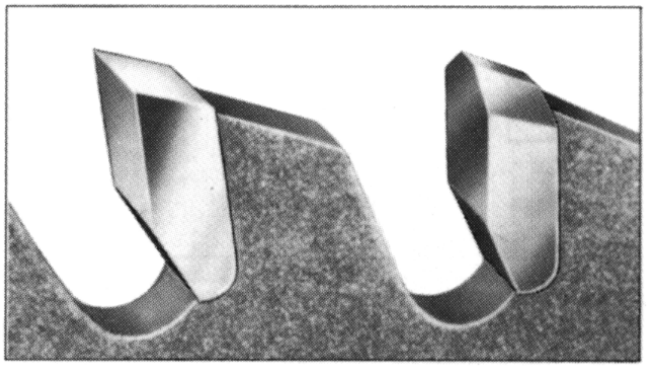
”BW” TYPE SHARPENING DIN 1838- UNI 4014
Coarse toothing with teeth alternately raked to the right and left.



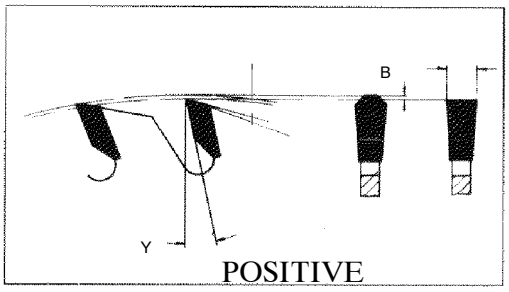
Toothing generally used on cutting- off machines for cutting ferrous and alloy materials with tubular and profiled sections.

POSITIVE AND NEGATIVE CUTTING ANGLES

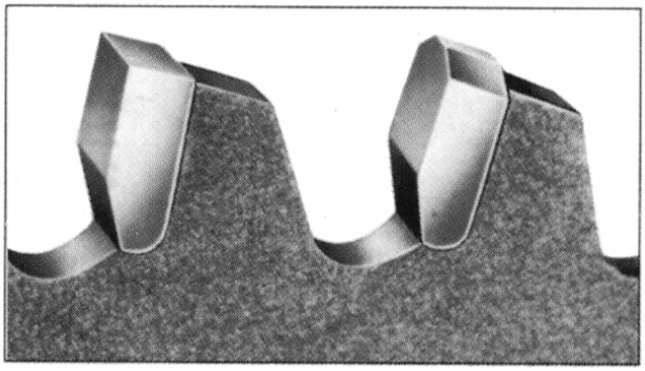
The cutting angle ϒ may vary from positive to negative depending on the cutting speed, the profile and the type of material to be cut.



A positive angle γ determines better penetration of the tool and hence lower shear stress and greater ease of sliding for the swarf over the cutting edge. On the other hand, the cutting edge has lower mechanical resistance, so as the breaking load of the material to be cut increases, the cutting angle decreases from positive until it becomes negative so as to offer a cutting edge with a larger resistant section.

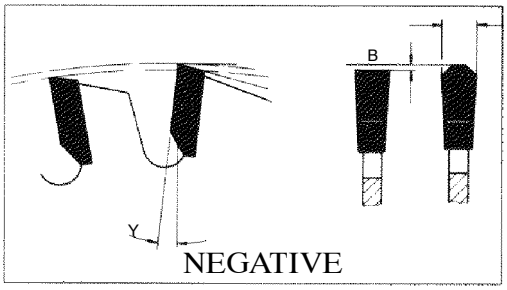


Short swarf material such as brass, bronze, aluminium and hard cast iron require smaller cutting angles because the swarf becomes crushed immediately and the rake angle has little effect during the cutting stage.



The **PNF 350- 2 CNC** uses discs with positive cutting angles for cutting solid materials and with negative cutting angles for cutting hollow profiles. This is because, as a result of the high cutting speeds (3400 rpm), even with non- ferrous

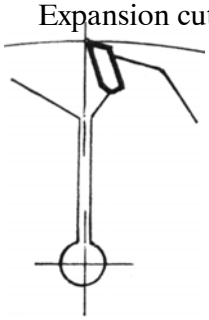
materials the tool ”strikes” against the wall of the profile to be cut several times, thus requiring a cutting edge with a larger resistant section.



Circular saws can also be characterised by other parameters such as the whine reduction feature, which cuts down noise at high speeds, or expansion, which compensates for the pushing of swarf inside the cutting edge, thus reducing the thrust on the walls of the material to be cut.

Whine reduction feature

Expansion cut



This table can be used to facilitate the choice of toothing since it takes into account both the size of the material to be cut and the diameter of the disc to be used.

	D 200		225		250		275		300		315		350		370		400		425		450		500	
Solid section S	t z	t z	t z	t z	t z	t z	t z	t z	t z	t z	t z	t z	t z	t z	t z	t z	t z	t z	t z	t z	t z	t z	t z	t z
10	5 130	6 100	5 140	6 120	5 160	6 128	5 180	6 140																
30	6 100	8 80	6 120	8 80	6 128	8 100	6 140	8 110	6 160	8 120	7 140	8 120												
50			8 90	10 70	8 100	10 80	8 110	10 90	8 120	10 90	8 120	10 100	9 120	10 110	10 110	11 100								
70							10 90	12 70	10 90	12 80	10 100	12 80	11 100	12 90	11 100	12 90	10 120	12 100	10 130	12 110	10 140	12 120	10 150	12 130
90									12 80	14 70	12 80	14 70	12 90	14 80	12 90	14 80	12 100	14 90	12 110	14 94	12 120	14 100	12 130	14 110
110											12 80	14 70	12 80	14 70	12 90	14 80	12 100	14 90	12 110	14 94	12 120	14 100	12 130	14 110
130													12 80	16 70	14 80	16 70	14 90	16 80	14 94	16 84	14 100	16 90	14 110	16 100
150																	14 90	16 80	14 94	16 84	14 100	16 90	14 110	16 100
Hollow section D																								
10	3 200	3 200	3 220	3 220	3 250	3 250	3 280	3 280																
30	4 160	5 130	4 180	5 140	4 200	5 160	4 220	5 180	4 220	5 180	4 240	5 200												
50			5 140	6 120	5 160	6 128	5 180	6 140	5 180	6 160	5 200	6 160	5 200	6 180	5 220	7 160								
70							6 140	8 110	6 160	8 120	6 160	7 140	6 180	7 160	7 160	8 140	6 200	7 180	6 220	7 190	6 230	7 200	6 260	7 220
90									8 120	10 100	7 140	8 120	7 160	8 140	7 160	8 140	7 180	8 160	7 190	8 160	7 200	8 180	7 220	8 200
110											8 120	10 100	8 140	9 120	8 140	9 120	8 160	9 140	8 160	9 150	8 180	9 160	8 200	9 170
130													9 120	10 110	9 120	10 110	9 140	10 120	9 150	10 130	9 160	10 140	9 170	10 150
150															9 120	10 110	9 140	10 120	9 150	10 130	9 160	10 140	9 170	10 150

Blade selection table with respect to cutting speed and downstroke speed

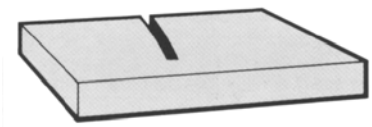
RECOMMENDED CUTTING PARAMETERS	CUTTING ANGLE α	CUTTING ANGLE γ	Cutting section (in mm)																							
					10- 20			20- 40			40- 60			60- 90			90- 110			110- 130			130- 150			
			T mm	Vt m/1'	Av mm/1'	T mm	Vt m/1'	Av mm/1'	T mm	Vt m/1'	Av mm/1'	T mm	Vt m/1'	Av mm/1'	T mm	Vt m/1'	Av mm/1'	T mm	Vt m/1'	Av mm/1'	T mm	Vt m/1'	Av mm/1'	T mm	Vt m/1'	Av mm/1'
Aluminium and alloys R = 200- 400 N/mmq	22	10	6	1100	1800	8	1000	1700	12	900	1600	16	800	1400	18	700	1300	20	600	1100	20	500	1100	900
Aluminium and alloys R = 300- 500 N/mmq	20	8	5	200	400	7	180	400	10	160	350	12	160	300	14	140	300	16	130	250	16	130	250	130	250
Copper R = 200- 350 N/mmq	20	10	6	400	600	8	350	600	11	300	550	14	250	550	17	200	500	18	150	500	18	120	500	120	400
Hard bronze R = 600- 900 N/mmq	15	8	5	400	800	7	400	700	10	350	700	12	300	600	14	250	600	16	200	500	18	150	400	150	400
Phosphor bronze R = 400- 600 N/mmq	12	8	4	120	160	8	110	150	8	100	140	10	90	130	12	70	110	14	60	100	16	50	90	50	90
Brass R = 200- 400 N/mmq	16	16	5	600	1100	6	600	1100	10	550	1000	12	550	900	16	500	900	18	500	800	18	450	800	400	800
Alloyed brass R = 400- 700 N/mmq	12	16	5	500	700	7	400	600	10	350	600	12	350	500	16	300	500	18	300	400	18	200	400	200	400
Recommended lubrificants			Emulsion - cut-																				Cutting oil		

Troubleshooting

10

This chapter describes the inspection and troubleshooting procedures for the **PNF 350- 2 CNC**. Regular inspections and efficient maintenance are essential to ensure your machine gives you a long, trouble- free service life. The chapter is divided into two sections: the first being dedicated specifically to TROUBLESHOOTING BLADE AND CUTTING PROBLEMS, while the second TROUBLESHOOTING section concerns troubleshooting general machine operating faults. Taken together they form a comprehensive troubleshooting guide which will enable you to follow a methodical procedure for solving any problem.

Troubleshooting blade and cutting problems

PROBLEM	PROBABLE CAUSE	SOLUTION
Cuts not at 90 degrees or angled 	◗ Head speed too high	☞Reduce head speed
	◗ Disc with worn teeth	☞Replace disc
	◗ Orthogonality of disc to workpiece rest shoulder	☞Adjust the position of the blade so that it is at right angles to the workpiece rest shoulder using the 0° adjuster pin; then set the stops at 45° right and left using the appropriate screws.
	◗ Perpendicularity of disc to work surface	☞Contact our Assistance Office
	◗ Cutting speed too low	☞Increase cutting speed.
	◗ Broken teeth	☞Check the hardness of the material being cut.
Teeth breaking	◗ Incorrect lubricant/coolant fluid	☞Check the water and oil emulsion; check that the holes and hoses are not blocked; direct the nozzles correctly.

PROBLEM	PROBABLE CAUSE	SOLUTION
Teeth breaking 	◗ Material too hard	☞Check the cutting speed, feed speed and disc pressure parameters and the type of disc you are using.
	◗ Disc not worn- in correctly	☞With a new disc it is necessary to start cutting at half feeding speed. After the wearing- in period (a cutting surface of about 300 cm2 for hard materials and about 1000 cm^2 for soft materials) the cutting and feed speeds can be brought up to normal values.
	◗ Disc with excessively fine tooth pitch	☞The swarf wedges into the bottom of the teeth causing excessive pressure on the teeth themselves.
	◗ New blade inserted in a partially completed cut.	☞The surface of the cut may have undergone local thermal alteration, making it harder: when starting work again, use a lower cutting speed and head feed speed. A tooth from the old blade may be left in the cut: check and remove before starting work again.
	◗ Workpiece not clamped firmly in place	☞Any movement of the workpiece during cutting can cause broken teeth: check the vice, jaws and clamping pressure.
	◗ Vibration	☞Workpiece vibrates in the vice: check that the slide has been adjusted correctly; check the clamping pressure and if necessary increase.

Rapid tooth wear 	◗ Head speed too slow	☞The blade runs over the material without removing it: increase head speed.
	◗ Cutting pressure too high	☞Reduce cutting pressure.
	◗ Cutting speed too high	☞The teeth slide over the material without cutting it: reduce the cutting speed.
	◗ Insufficient coolant	☞Check the coolant level and clean piping and nozzles.
	◗ Incorrect fluid concentration	☞Check and use the correct concentration.

PROBLEM	PROBABLE CAUSE	SOLUTION
Rapid tooth wear	◗ Material defective	☞The materials may present altered zones either on the surface, such as oxides or sand, or in section, such as under- cooled inclusions. These zones, which are much harder than the blade, cause the teeth to break: discard or clean these materials.

Broken blade	◗ Head speed too high	☞Reduce head speed.
	◗ Teeth in contact with material before starting the cut	☞Always check the position of the blade before starting a new job.
	◗ Insufficient coolant	☞Check the coolant level and clean piping and nozzles.
	◗ Vibrations	☞Workpiece vibrates in the vice: check that the slide is regulated correctly; check the clamping pressure and if necessary increase.

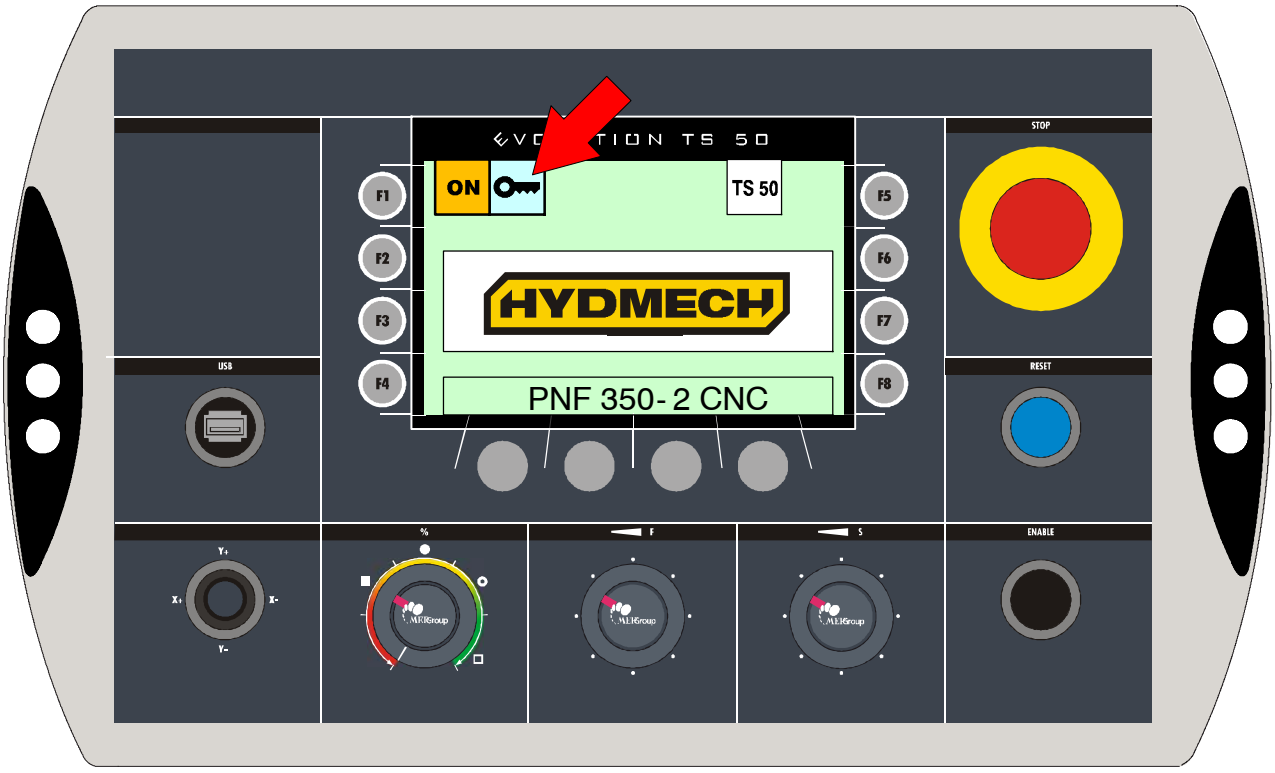
Troubleshooting

This section deals with the problems which may occur during machine operation. The M50 controller allows you to test all the machine's electric and electronic devices by checking the status of the input and output signals on the IUD/IUV card (see Chapter 5).

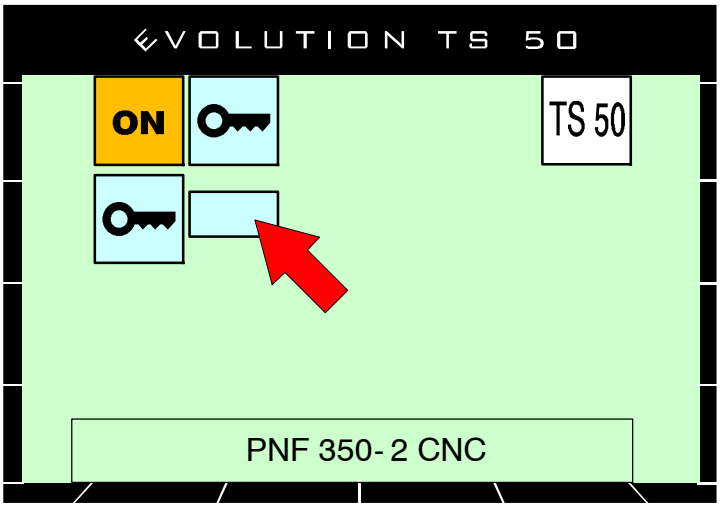
The board IUD/IUV is inside the electric board.

Displaying the diagnostics menu

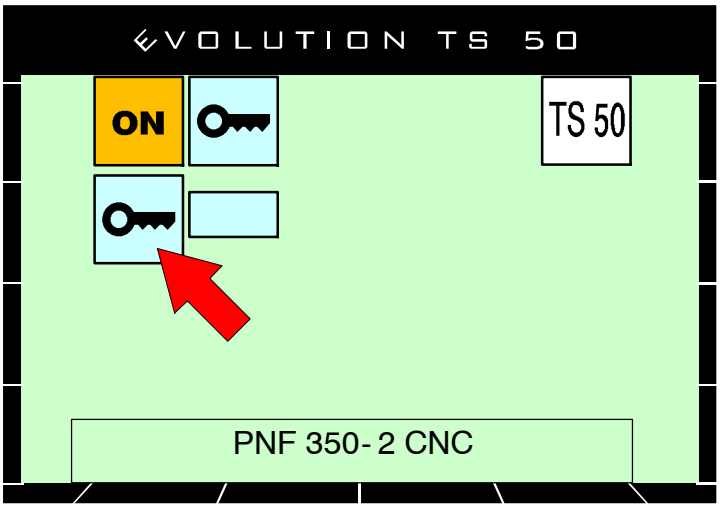
- ▶ Power the machine by turning the main switch on the left of the control board.
- ▶ Tap on the box on the touchscreen shown in the figure.



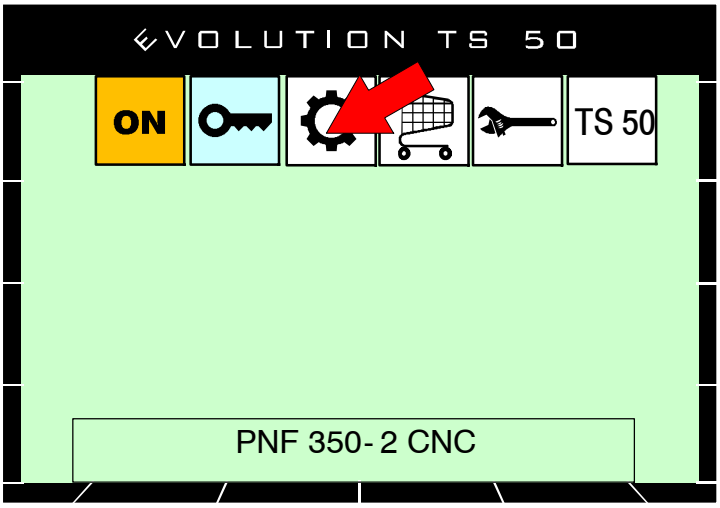
- ▶ The password entry box will open. Tap the box to open the keypad. Enter 734533.



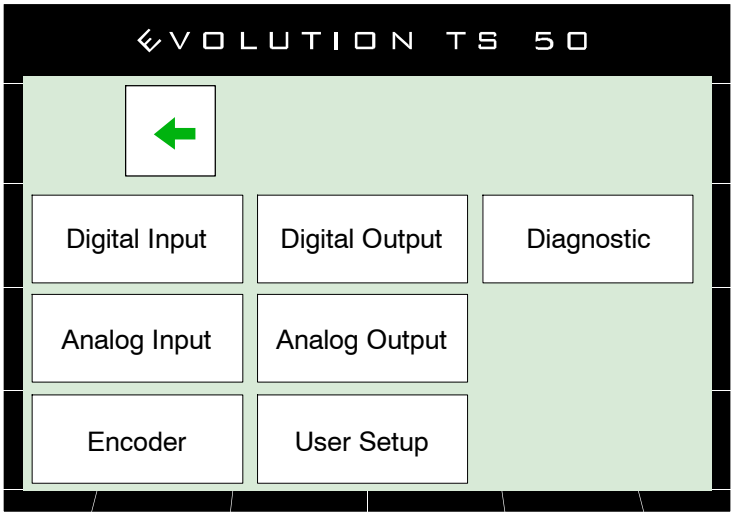
▶ Tap on the box shown in the figure.



▶ Tap on the box shown in the figure.



▶ In the Troubleshooting menu, select the type of input/output to be checked by tapping on the corresponding box:

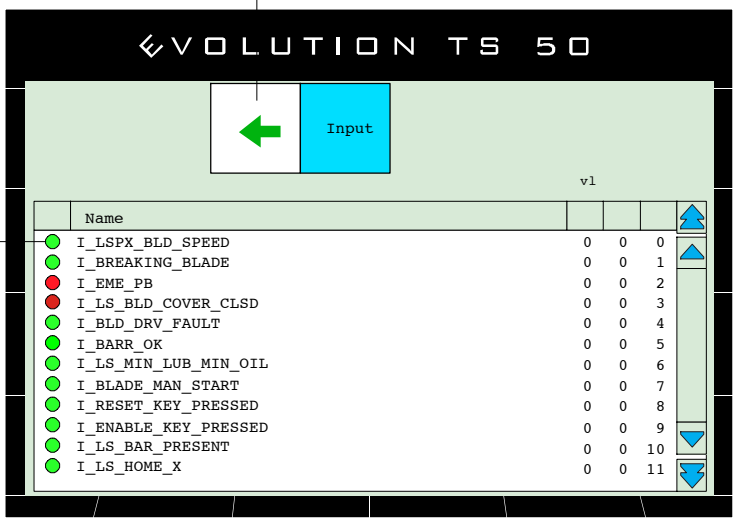


Digital Input

This page can be used to check the state of digital inputs. Information is organised in a table:

Box to go back to the initial list of all inputs and outputs

The icon indicates whether the respective output is on (green) or off (red)

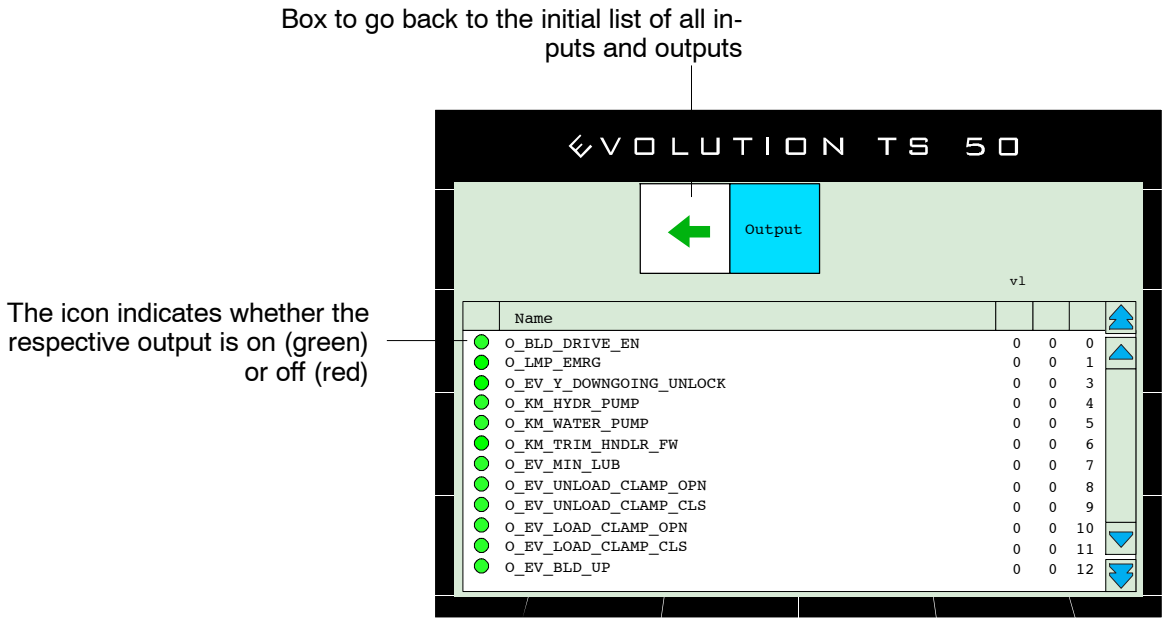


Digital INPUT list

CN13- ALL	**+ 24 VDC**
CN15- ALL	**0 VDC**
CN14- 1 INP 0	**Blade speed proximity switch**
CN14- 2 INP 1	**Blade breakage**
CN14- 3 INP 2	**EMERGENCY STOP BUTTON OK**
CN14- 4 INP 3	**BLADE GUARD CLOSED LIMIT SWITCH**
CN14- 5 INP 4	**ALARM INVERTER**
CN14- 6 INP 5	**START FROM PEDAL BOARD**
CN14- 7 INP 6	**LOW OIL LEVEL**
CN14- 8 INP 7	**Manual start of the disk rotation**
CN16- ALL	**+ 24 VDC**
CN19- ALL	**0 VDC**
CN17- 1 INP 8	**RESET BUTTON**
CN17- 2 INP 9	**ENABLE BUTTON**
CN17- 3 INP 10	**Bar presence limit switch**
CN17- 4 INP 11	**Zero- setting limit switch**
CN17- 5 INP 12	**JOYSTICK X-**
CN17- 6 INP 13	**JOYSTICK Y-**
CN17- 7 INP 14	**JOYSTICK Y+**
CN17- 8 INP 15	**OYSTICK Y+**

Digital Output

This page can be used to check the state of digital outputs. Information is organised in a table:

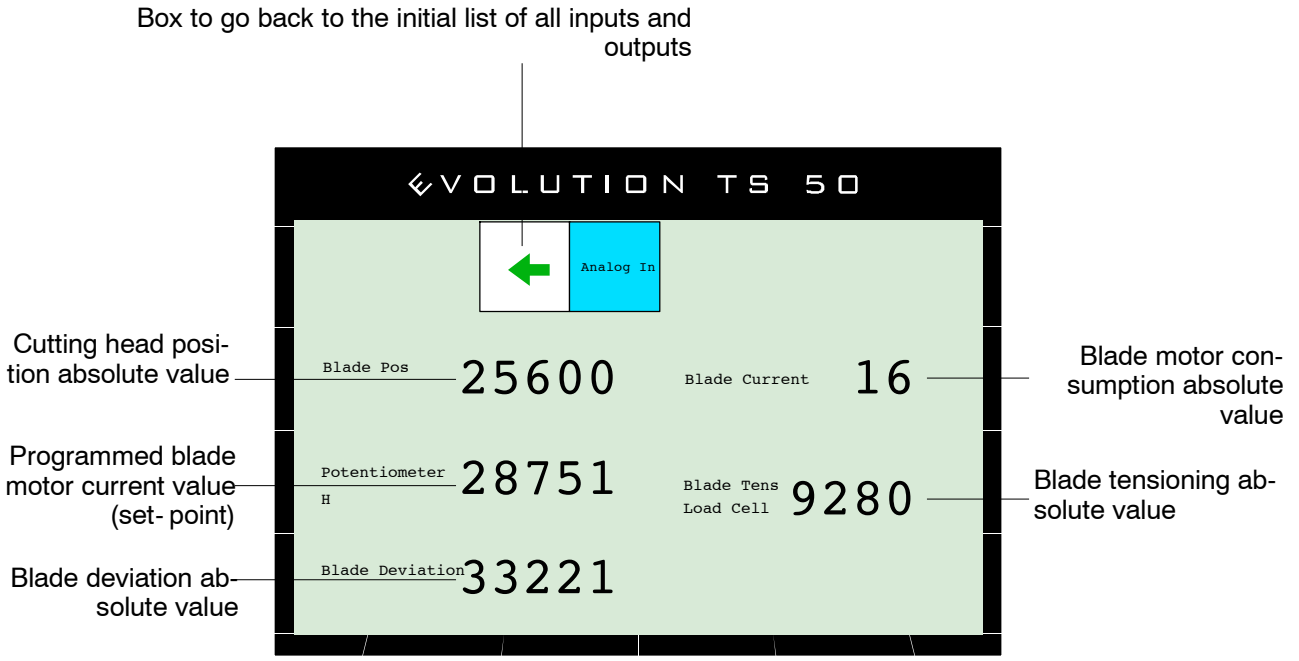


Digital OUTPUT list

CN21- 1 OUT 0	**START INVERTER**
CN21- 2 COM	**+24 VDC**
CN21- 3 OUT 1	**FLASHING**
CN21- 4 COM	**+24 VDC**
CN21- 5 OUT 2	**SPARE**
CN21- 6 COM	**+24 VDC**
CN21- 7 OUT 3	**HEAD LOCK/RELEASE SOLENOID VALVE**
CN21- 8 COM	**+24 VDC**
CN22- 1 OUT 4	**UNIT START KM**
CN22- 2 OUT 5	**WATER PUMP START KM**
CN22- 3 OUT 6	
CN22- 4 OUT 7	**LOW LUBRICATION SOLENOID VALVE**
CN22- 5 COM	**+24 VDC**
CN23- 1 OUT 8	**CHIP EJECTOR Km**
CN23- 2 OUT 9	**CUTTING VICE OPENING Km**
CN23- 3 OUT 10	**CUTTING VICE CLOSING Km**
CN23- 4 OUT 11	**FEEDER VICE OPENING Km**
CN23- 5 COM	**+24 VDC**
CN24- 1 OUT 12	**HEAD LIFTING SOLENOID VALVE**
CN24- 2 OUT 13	**HEAD LOWERING SOLENOID VALVE**
CN24- 3 OUT 14	**LASER PROJECTOR**
CN24- 4 OUT 15	**CUTTING ZONE LIGHT**
CN24- 5 COM	**+24 VDC**

Analog Input

This page can be used to check the state of analogue inputs. Information is organised in a table:

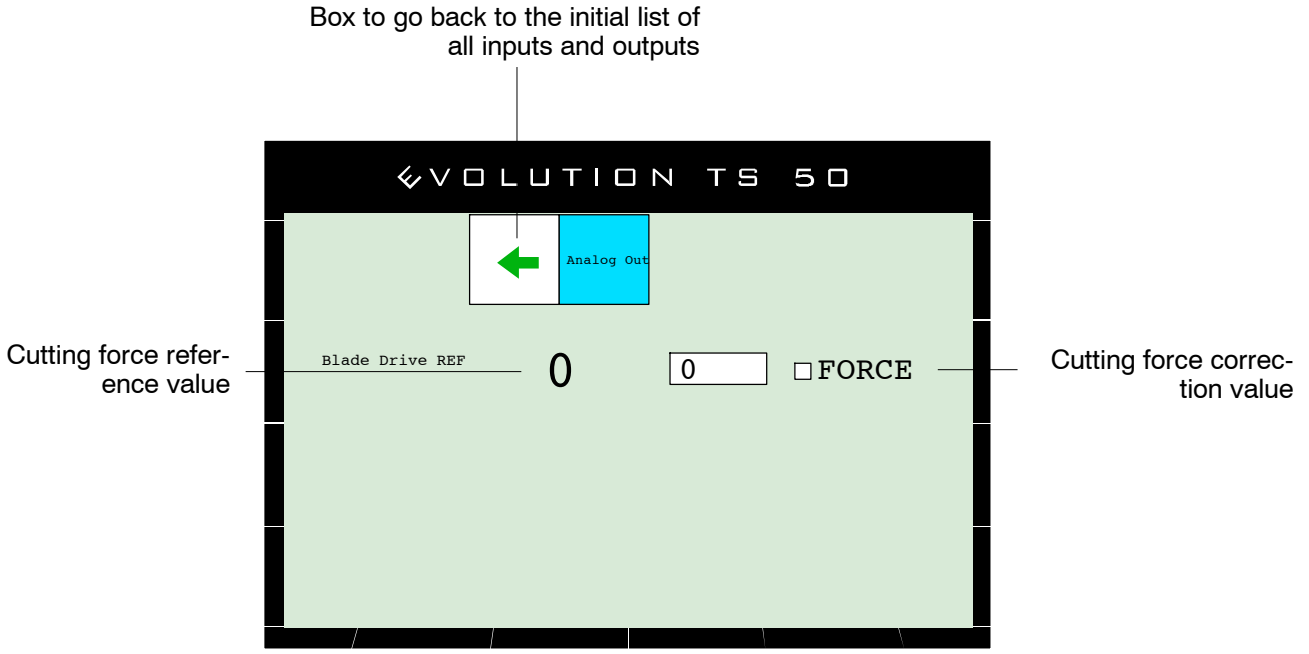


Analog INPUT list

CN26 INP 1 (16B)	**HEAD POSITIONING POTENTIOMETER**
CN27 INP 2	**BLADE MOTOR CONSUMPTION**
CN28 INP 3	**SPARE**
CN29 INP 4	**SPARE**
CN30 INP 5	**SPARE**

Analog Output

This page can be used to check the state of analogue outputs. Information is organised in a table:



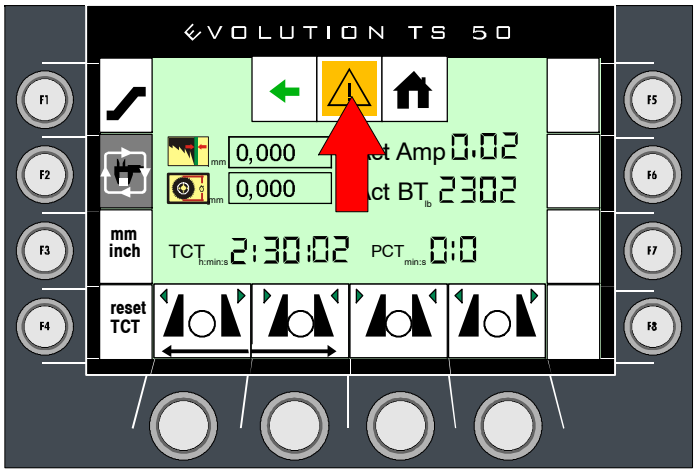
Analogue output list

CN25 OUT 1	**BLADE SPEED REFERENCE**
CN25 OUT 2	**SPARE**

Machine alarms and warning messages

Alarms

The machine's controller notifies the operator of any alarm or emergency condition which may occur during production by way of acoustic and visual signals. This section lists the messages shown on the display.



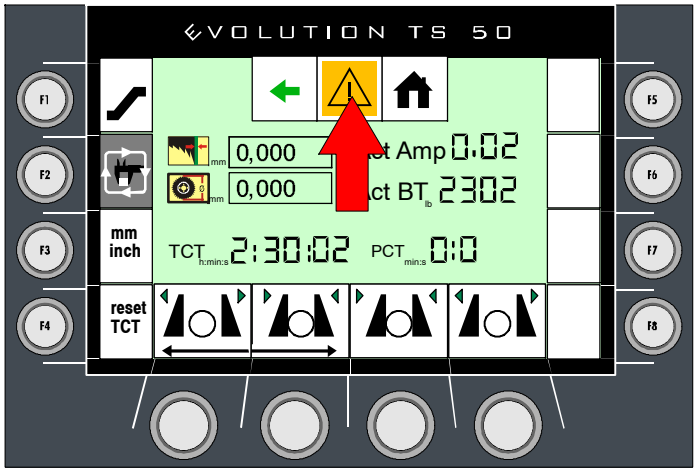
EMERGENCY: ONE OR MORE ALARMS HAVE TRIPPED - PRESS THE RESET BUTTON	This appears in case of a generic emergency. A specific message follows
BLADE TENSIONING	It is displayed when a mechanical problem occurs in the blade tensioning
BLADE MOTOR OVERCURRENT	It is displayed during the cutting when the value of the motor absorption is too high
INSUFFICIENT BLADE REVOLUTION SPEED	This appears when the blade jams in the cut or breaks ▶ Check blade integrity ▶ Check cutting parameters
PRESS RESET	This appears in case of controller malfunction
EMERG. BUTTON PRESSED	It is displayed when the emergency mushroom button is pressed
Y AXIS ST. M. NOT ZEROED: CLOSE THE LOGO PAGE AND GO BACK TO THE OPERATIVE PAGE	This appears when the head descent speed adjustment valve is not reset
X AXIS ST. M. DRIVER LOCKED	It is displayed when a feeder shuttle position error occurs
Y AXIS ST. M. DRIVER LOCKED	This appears in case of head descent adjustment valve malfunction

X AXIS ST. M. DRIVER LOCKED	This appears when there is a head revolution drive malfunction
SPRAY MIST OIL LEVEL	It is displayed when the oil level in the min. lubrication system lowers. ▶ Top the oil up in the tray till restoring the level.
BLADE GUARD OPEN	This message is displayed if the blade guard is opened, for example, to change the blade. ▶ Make sure the blade guard is closed. ▶ Check the safety limit switch. ▶ Check the connections.
FEEDER JAMMED	This appears in case of head revolution problem
INVERTER LOCKED	This is shown when the blade motor inverter does not work correctly
STOCK ALARM	Available
RHLS FHLS NOT COHERENT	This message is displayed when the cutting start position is lower than the previous position saved for the cutting end position. ▶ Save both the RHLS and FHLS positions again.
PARAMETER LOADING FAILED: RESTART THE MACHINE	This appears when the parameter reading procedure is not successful
INCONGRUENT HEAD LOWERING SPEED	This appears when the potentiometer is broken or sends a message which is not compatible with the machine
NO PROGRAM SELECTED	It is displayed when no program of the list has been activated during the automatic cycle.
STOCK ALARM	Available
OUT OF STOCK	It is displayed when the cutting material being fed runs out
SOFTWARE ERROR: LENGTH CALCULATION ERROR	It is displayed when a calculation error of the length to be fed occurs
SW ERROR: X AXIS NOT ZEROED	It is displayed when a feeder shuttle position error occurs

BLADE BROKEN	It is displayed when the blade breaks
CYCLE STARTING WITH BLADE NOT A FCTI	It is displayed when a cutting cycle is started with head not at RHLS (rear head limit switch)
BLADE DEVIATION MAX	It is displayed when an excessive blade deviation occurs while machining
BLADE DEVIATION MIN	It is displayed when a limited blade deviation occurs while machining
PERIMETRAL PROTECTION OPEN	It is displayed when opening any perimeter guard
AIR PRESSURE	It is displayed when the working pressure is below the min. operating threshold
HEAD JAMMED	It is displayed when the cutting head locks ▶Check the cause for the head lock.

Warning messages

Tap on the box shown on the figure to see warning messages:



ENABLE BLADE MOTOR	It is displayed when trying to start the cycle without having enabled the blade motor before
START FROM HANDLE	It is displayed when the cutting cycle is started with the grip during a semi- automatic cycle.
STOCK WARNING	Available
SPRAY MIST OIL LEVEL	This appears when there is no oil for minimum lubrication
RHLS FHLS NOT COHERENT	This appears when the RHLS and RHLS are not coherent
STOCK WARNING	Available
STOCK WARNING	Available
CLEAR PIECES, ENABLE BLADE MOTOR, LENGTH > 0	It is displayed when: the number of cut pieces must be zeroed; or the blade motor must be enabled; or it is necessary to set the cutting length (cutting length > 0).
HEAD LOWERING SPEED ADJUSTMENT ACTIVE	This appears when the blade motor current exceeds the setting and correction is applied
F A 0 ENCODER	This appears when the blade setting is too low

THERMAL SWITCHES TRIPPED	This appears when a thermal switch trips in the control panel
CHIP CONVEYOR BLOCKED	This appears when the chip ejector is blocked
X AXIS NOT ZEROED	It is displayed when the x axis must be zeroed.
AWAITING CORRECT BLADE SPEED	This appears when the blade setting is too low
END OF CUTS	It is displayed at the end of the programmed cuts
BLADE DEVIATION WARNING LEVEL	It is displayed when the blade deviation value has reached the caution level
STOCK WARNING	Available
INHIBITED COMMAND	This appears when an incorrect operation is attempted
PRESS START BUTTON WITH PEDAL ACTIVE	It is displayed when the cutting cycle is started from the control board, but with the setting starting from the pedal board
PEDAL PRESSED WITH BUTTON MODE ACTIVE	It is displayed when the cutting cycle is started from the control pedal, but with the setting starting from the control board
CYCLE STOPPED. PRESS START	It is displayed when the cutting cycle is paused from the control board
SINGLE CYCLE STOPPED. PRESS START	It is displayed when the cutting cycle is paused from the control board
STEP: PRESS START	It is displayed during the automatic cutting cycle, with the step function set, for the next cut
WARNING STOCK	Available

WARNING STOCK	Available
WARNING STOCK	Available
WARNING STOCK	Available
WARNING STOCK	Available
WARNING STOCK	Available
WARNING STOCK	Available

Accessory Installation

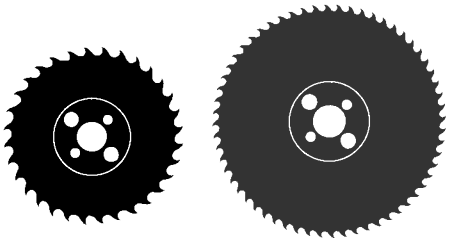
11

This chapter provides a list of the available accessories that can be fitted to this machine, along with assembly instructions.

Circular blade

The machine fits:

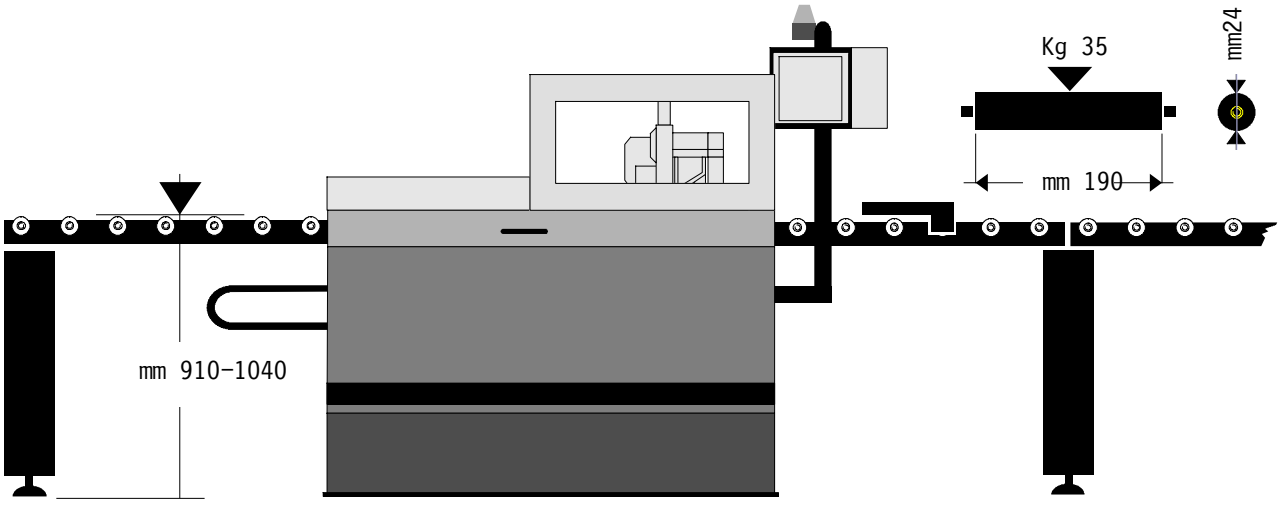
- circular blade HM Ø 350x32x3,4 for profiles (negative rake).
- piła tarczowa HM Ø 350 x 32 x 3,4 do elementów pełnych i profili (ujemny kąt natarcia).
- piła tarczowa HM Ø 350 x 32 x 3,4 do elementów pełnych i profili (dodatni kąt natarcia).
- circular blade HM Ø 350x32x3,4 for profiles (positive rake).



See chapter 7 of this manual for cutter blade installation instructions.

Roller table

- K40 roller table module for feed side, 1500 mm;
- Stół rolkowy K40 po stronie załadunku, z modułu składanego 1500 mm;
- Stół rolkowy K40 po stronie wyładunkowej 1500 mm;
- K40 roller table for discharge side, 1500 mm;



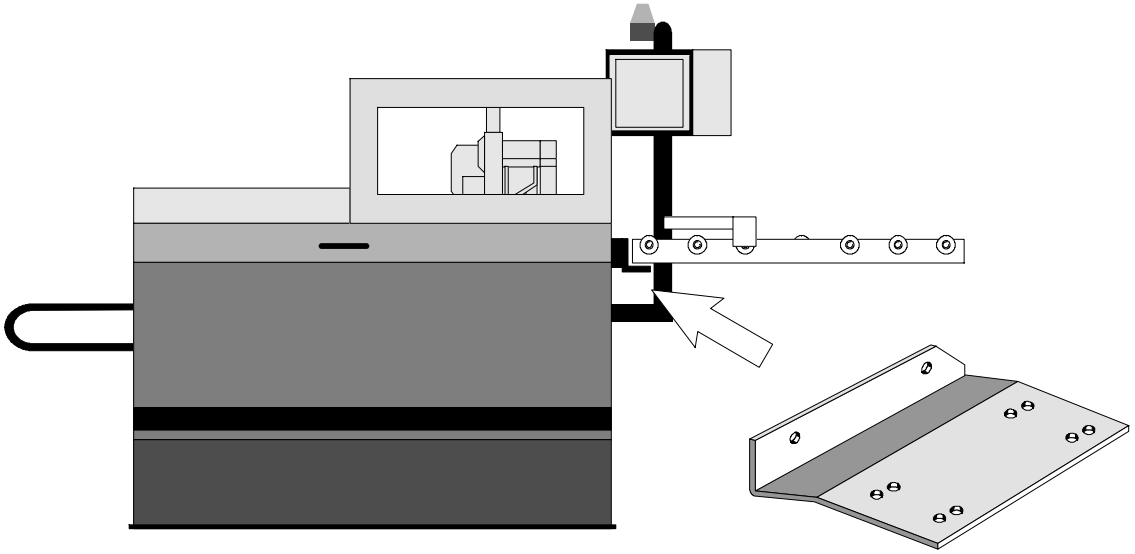
- K40 roller table for discharge side, 3000 mm;
- K40 roller table for discharge side, 4500 mm;
- K40 roller table for discharge side, 6000 mm.
- To fit the roller loading platform on the loading side, the machine has a bar- support arm that one end of the roller- way can be positioned on and then screwed in place.
- To install the roller loading platform on the discharge side an adapter must be used, with or without a support, as explained in the paragraphs that follow.
- stół rolkowy K40 po stronie wyładunkowej 3000 mm;
- stół rolkowy K40 po stronie wyładunkowej 4500 mm;
- stół rolkowy K40 po stronie wyładunkowej 6000 mm.
- Aby można było zamontować stoły rolkowe po stronie załadunkowej, maszyna jest wyposażona w ramię wspierające, na którym układa się końcówkę stołu rolkowego, mocowaną później za pomocą śrub.
- Do zamontowania stołu rolkowego po stronie wyładunkowej konieczny jest adapter, wyposażony w podparcie lub nie, tak jak zostało to wyjaśnione w następnych rozdziałach.

Adattatore pianale a rulli lato scarico

This device is used to attach the discharge roller table to the machine, and instructions are supplied below for how to assemble it:

▶ remove the two TE screws from the right side of the slideway;

▶ attach the adapter and secure it in place with the screws removed previously.

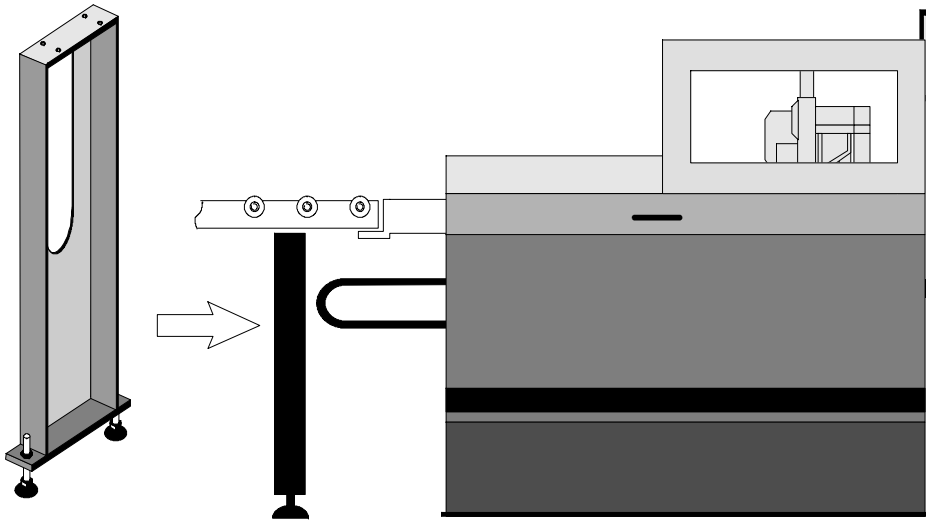


▶ Attach the outfeed rolling deck by fixing it with the screws supplied.

Feed side roller table support

This device is used to increase the load- bearing strength of the roller table, both during feeding and discharge. The steps which should be followed to assemble it are illustrated below:

▶ disconnect the table from the adapter (on the discharge side, for example);

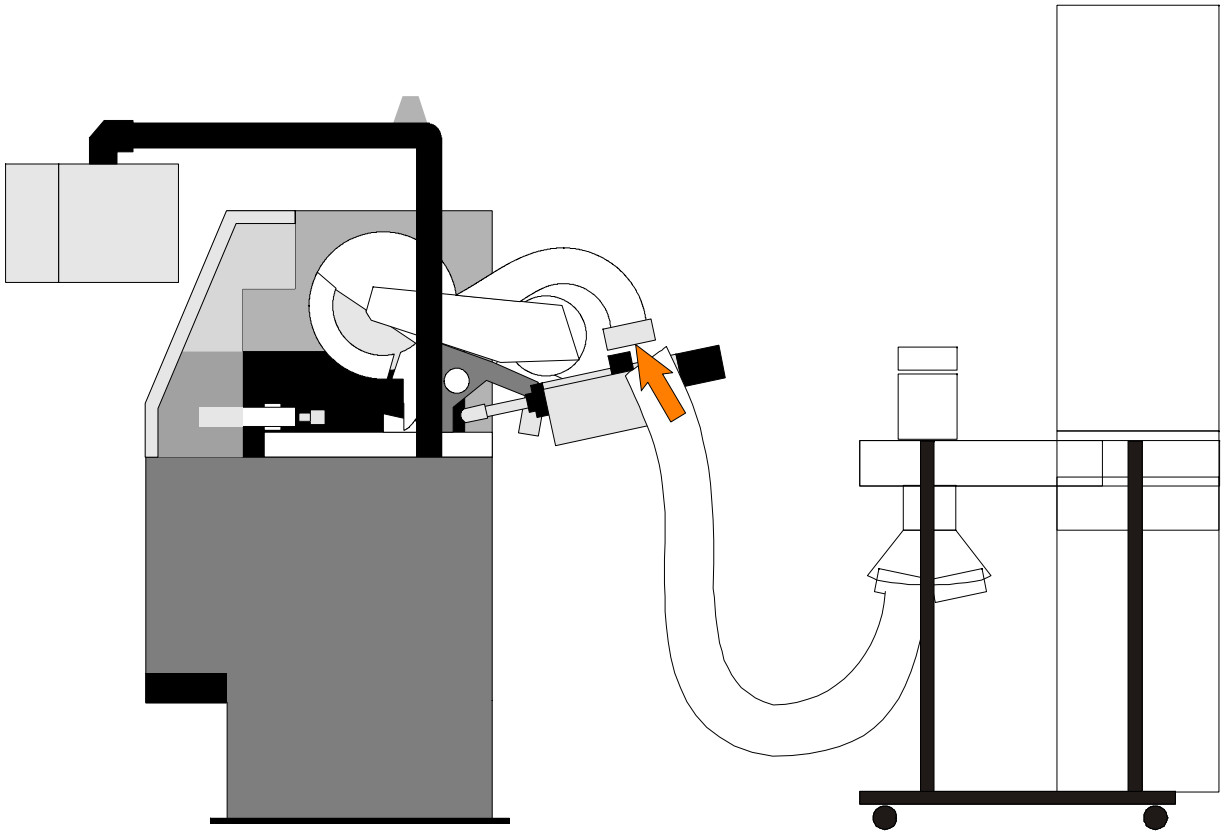


▶ position the support to correspond with the holes on the base of the trailer and reconnect to the adapter.

Chip aspirator

This device is used to aspirate and filter aluminum chips from the sawing machine. The operations needed for the assembly are the following:

- assemble the aspirator as described in the documentation enclosed to the aspirator;



- connect the aspirator hose to the chip conveyor projecting from the band cover fastening it with a metal strip;
- to use it while cutting, switch it on before starting the machining.

N.B. The chip aspirator is an optional that can be used only when connected with the sawing machine. If the chip aspirator is connected, it becomes an integral part of the machine and is thus included in the conformity self-certification (EC declaration) of the sawing machine.

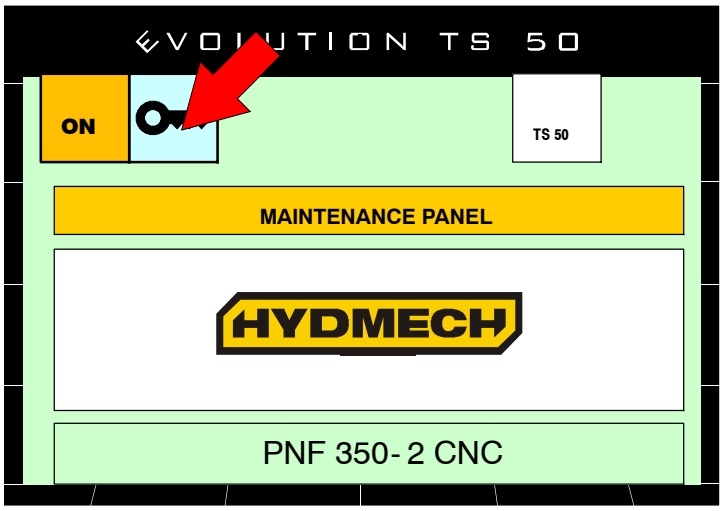
Minimal lubrication system

This device was designed to improve lubrication of the tool during cutting.

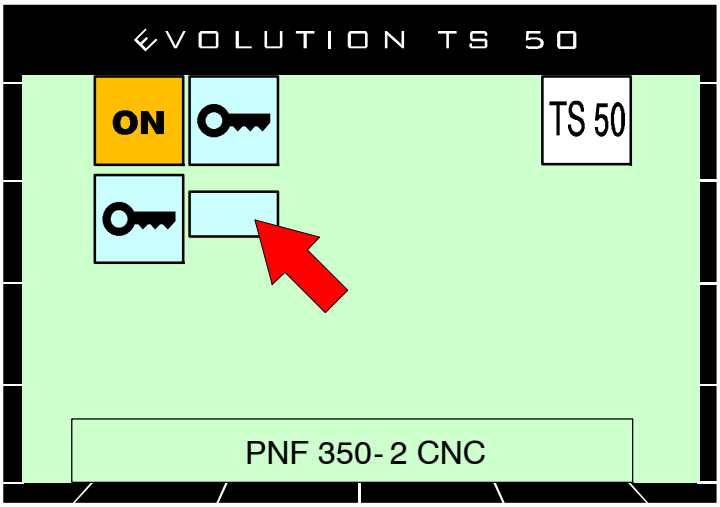
- An instruction book is supplied with the kit to explain how to install this optional unit.

Software setting for the options

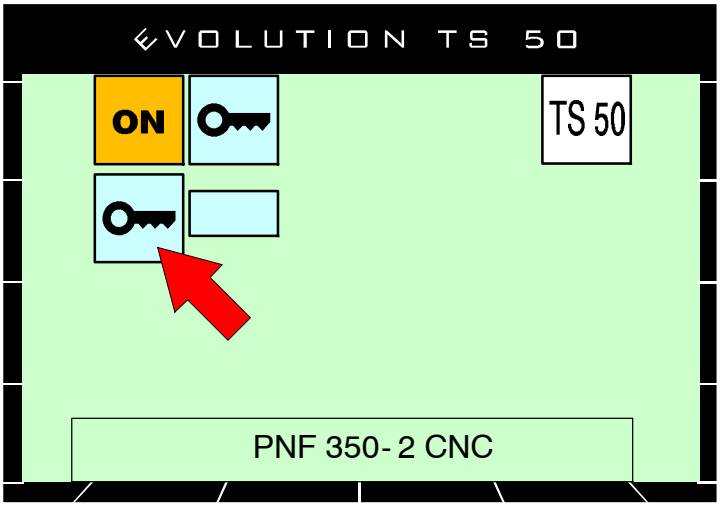
To access the options page of the software program, press the box shown in the figure:



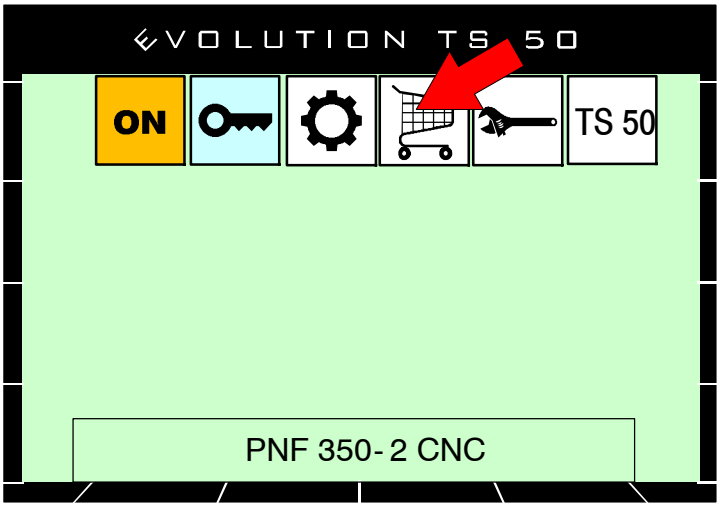
▶ The password entry box will open. Tap the box to open the keypad. Enter 734533.



▶ Tap on the box shown in the figure.



▶ Tap on the box shown in the figure.



The machine displays the list of options that can be installed and the parameters to be set:

OPTIONAL:		
Quantity	**Parameter / Description**	**Value**
OPT.1	**CLEAN CUT ENABLEMENT(1=YES \; 0=NO)** Enables or disables the clean cut function.	0.0000
OPT.2	**VICE STOPPING IN CYCLE (1=FWD.\; 0=BCKW.)** Sets the vice stopping during the cycle in forward or rear position.	0.0000
OPT.3	**PEDAL PRESENT (0=No\; 1=Yes)** Sets the presence of the pedal board.	0.0000
OPT.4	**LAMP AND LASER PRESENT (0=No\; 1=Yes)** Sets the presence of the lamp and of the cutting laser.	0.0000
OPT.5	**SPRAY MIST ENABLEMENT (ENABLED=1)** Enables or disables the blade mist lubrication while cutting.	0.0000
OPT.6	**Y RAISING IN MANUAL CYCLE (1=ENABLED)** Enables or disables the head rising function during the manual working cycle.	1.0000
OPT.7	**BLADE SPEED PROXY ENABLEMENT (1=ENABLED)** Enables or disables the blade current speed control.	0.0000
OPT.8	**CHIP EJECTOR ENABLEMENT (1=ENABLED)** Enables or disables the chip evacuator.	0.0000
OPT.9	**BLADE DEVIATION ENABLEMENT (1=ENABLED)** Enables or disables the blade deviation function.	0.0000
OPT.10	**EXTERNAL X ROTATION ENABLEMENT (1=ENABLED)** Enables or disables the control on the cutting table rotation.	0.0000
OPT.11	**BLADE TENSION TYPE (1=HYDRAULIC\; 0=MANUAL)** Sets the blade tensioning type.	0.0000
OPT.12	**CUTTING VICE OPENING (1=RHLS\; 2=FHLS\; 0=NEVER)** Enables to open the vice when the head is in RHLS, FHLS or NEVER.	1.0000
OPT.13	**ANGLE TYPE (0=MINUTE OF ARC\; 1=GRADIAN)** Sets the cutting angle dimension in sessagesimals or centesimals.	0.0000
OPT.14	**BLADE STOP (0=ON RHLS\; 1=ON FHLS\; 2=NEVER)** Enables the blade stop when the head is in RHLS, FHLS or NEVER.	2.0000
OPT.15	**CHIP EJECTOR TYPE (0=MICRO\;1=TOOTHED WHEEL)** Sets the control on the chip evacuator operation.	0.0000
OPT.16	**BLADE TENSIONING CONTROL ENABLEMENT** Enables the blade tensioning control.	0.0000
OPT.17	**FEEDER VICE CLOSING TIME (SEC)** Sets the closing time of the feeder vices.	0.5000
OPT.18	**FEEDER VICE OPENING TIME (SEC)** Sets the opening time of the feeder vices.	0.5000
OPT.19	**CUTTING VICE CLOSING TIME (SEC)** Sets the closing time of the cutting vices.	0.5000
OPT.20	**CUTTING VICE OPENING TIME (SEC)** Sets the opening time of the cutting vices.	0.5000
OPT.21	**VICE OPENING TIME WITH MANUAL PULSE CONTROL (SEC)** Sets the opening time of the vices with manual control from control board.	0.5000

OPTIONAL:		
OPT.22	**FEED. VICE TIME AT OUT OF STOCK FOR CLEAN CUT (SEC)** Sets the opening and closing time of the feeding vice during the cycle with clean cut function.	0.0000
OPT.23	**CHIP EJECTOR ON TIME IN AUTO (MIN)** Sets the operation interval time of the chip evacuator.	0.5000
OPT.24	**CHIP EJECTOR OFF TIME IN AUTO (MIN)** Sets the non- operation interval time of the chip evacuator.	0.5000
OPT.25	**ANGLE DISPLAY (1=90 DEGREES\;0=0 DEGREES)** Sets the angle reading of the metric system or MKS.	0.0000

Warranty

Hyd- Mech Group warrants each new sawing machine to be free from failure resulting from defective material and workmanship under proper use and service for a period of one year following the date of shipment to the user.
Hyd- Mech's sole obligation under this warranty is limited to the repair or replacement without charge, at Hyd- Mech's factory, warehouse, or approved repair shop, of any part or parts which Hyd- Mech's inspection shall disclose to be defective. Return freight must be prepaid by the user.

This warranty, in its entirety, does not cover maintenaince items, including but not limited to lubricating grease and oils, filters, V- belts, saw blades, etc, nor any items herein which show sign of neglect, overloading, abuse, accident, inadequate maintenance or unauthorized altering.

Liability or obligation on the part of Hyd- Mech for damages, whether general, special or for negligence and expressly including any incidental and consequential damages is hereby disclaimed. Hyd- Mech's obligation to repair or replace shall be the limit of its liability under this warranty and the sole and exclusive right and remedy of the user.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, WRITTEN OR ORAL, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

This warranty may be not changed, altered, or modified in any way except in writing by Hyd- Mech Group.

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